

SPECIFICATION

ITEM NO 01 - Providing and fixing coloured self adhesive PU-Tactile tile, ground surface indicators of Polyurethane) of size 300mm x 300mm for guiding/warning to the visually visitors in the centre/side of the pedestrian/approach pathway as per specification and guidelines complete in all respect to the entire satisfaction of in charge.

1. Scope of Work

The work involves providing, aligning, and fixing coloured, self-adhesive **Polyurethane (PU) Tactile Ground Surface Indicators (TGSIs)**. These tiles measure **300mm x 300mm**. They serve as guiding or warning indicators for visually impaired visitors. They are installed along the center or sides of pedestrian paths and approach walkways. The installation must strictly adhere to statutory accessibility design guidelines

2. Material & Physical Properties

The tactile tiles must be manufactured from high-grade, premium polyurethane material. They should feature the following physical specifications:

Parameter	Specification Standard
Dimensions	300 mm × 300 mm (Tolerance: \(\pm\) 1mm)
Base Thickness	Minimum 2.5 mm to 3.0 mm (excluding profile height)
Total Profile Height	7.0 mm to 7.5 mm
Material Base	100% Virgin Certified Polyurethane (UV Stabilized)
Surface Finish	Non-reflective, slip-resistant Matt Finish
Adhesive Type	Heavy-duty, high-performance self-adhesive backing (e.g., Butyl rubber / 3M / Tesa tape)
Weight	Approximately 350 grams to 400 grams per tile

3. Functional Profiles (Design Types)

The contractor must supply two specific patterns as dictated by the site drawing layout:

- Warning Profile (Hazard Indicator / Attention / Dot Paving):** Consists of 36 truncated studs/domes arranged in a square grid matrix. Designed to alert users to imminent hazards like kerb ramps, steps, crossings, or platform edges.

- **Guiding Profile (Directional Indicator / Leading / Rib Paving):** Consists of continuous, parallel flat-topped elongated bars. Designed to indicate designated accessible pathways.

4. Mechanical & Environmental Requirements

The tiles must safely withstand heavy pedestrian loads and outdoor exposure. They must meet the following performance criteria:

- **Compliance Standard:** Manufactured in accordance with global guidelines like **ISO 23599** (Tactile Ground Surface Indicators).
- **Slip Resistance:** Must achieve an excellent anti-skid rating under both wet and dry environmental conditions.
- **Luminance Contrast:** Tile colors (such as Safety Yellow, Charcoal Black, Terracotta, or Blue) must provide a minimum of **30% luminance contrast** against adjacent paving.
- **Weathering & Durability:** Must be stain-resistant, waterproof, and chemically stable against UV degradation to prevent fading or cracking in extreme climates.

5. Installation Procedure

1. **Surface Cleansing:** The surface substrate (concrete, natural stone, vitrified tile, or bitumen) must be clean, flat, completely dry, and free of oily residues.
2. **Priming:** Apply a thin, uniform coat of specialized bonding primer or hardener over the marked substrate area if required for outdoor durability.
3. **Application:** Peel off the release liner from the self-adhesive backing. Lay the tile precisely along the pre-marked alignment grids.
4. **Compression:** Use a uniform hand roller or rubber mallet across the surface to expel any trapped air pockets, ensuring edge-to-edge adhesion.
5. **Curing Period:** The installed area must remain isolated from any foot traffic for a minimum duration of **3 to 4 hours** (instant bond) up to **24 hours** for full curing of the primer.

6. Inspection & Quality Acceptance

- Joint lines must be perfectly flush with an alignment variance of less than 1.5mm.
- No loose corners or lifting edges will be permitted.
- The final layout will be subject to passing visual contrast inspection and manual adhesion peel tests to the complete satisfaction of the Engineer-in-Charge.

ITEM NO 02 - Providing and laying tactile tile (for vision impaired persons as per standards) of size 300x300x15 mm having with water absorption less than 0.5% and conforming to IS:15622 of approved make in all colours and shades in for outdoor floors such as footpath, court yard, multi modals location etc., laid on 20mm thick base of cement mortar 1:4 (1 cement : 4 coarse sand) in all shapes & patterns including grouting the joints with white cement mixed with matching pigments etc. complete as per direction.

1. Scope of Work

The work consists of providing, detailing, and laying premium quality, heavy-duty **fully vitrified tactile ground indicators (TGSIs)** measuring **300mm × 300mm × 15mm**. These tiles are designed to guide or warn visually impaired persons across outdoor infrastructure. Application zones include footpaths, multi-modal transport hubs, public courtyards, and approach walkways.

The installation features a **20mm thick cement mortar (1:4)** base bed, finished with colored joint grouting.

2. Material & Mechanical Properties

The tiles must consist of a uniform vitrified body adhering strictly to the **Bureau of Indian Standards (BIS) code IS:15622** (Group Bla, Pressed Ceramic Tiles).

Physical Test Parameter	Specification Requirement	Reference Standard
Dimensions	300 mm × 300 mm (± 0.6% tolerance)	IS:15622
Total Thickness	15 mm (± 5% tolerance)	IS:15622
Water Absorption	Extremely Low (< 0.5%)	IS 13630 (Part 2)
Modulus of Rupture (MOR)	Minimum 35 N/mm²	IS 13630 (Part 6)
Breaking Strength	≥ 2000 N (due to heavy-duty 15mm depth)	IS 13630 (Part 6)
Scratch Hardness (Mohs)	Minimum 6 (Unglazed/Vitrified matrix)	IS 13630 (Part 13)
Weathering Properties	100% Frost resistant & UV fade resistant	IS:15622

3. Functional Profiles & Accessibility Patterns

The tile profiles must follow standard design matrices to ensure distinctive underfoot and white-cane detection:

- **Directional / Guiding Pattern (Rib Paving):** Parallel, raised linear bars with flat tops running along the travel axis. This signals a safe path forward.
- **Hazard / Warning Pattern (Dot Paving):** Truncated domes or studs arranged in a uniform grid. This signals an approaching step, intersection, or transition.

4. Bedding Mortar & Sub-base Material Specifications

- **Cement Mortar Bedding:** Formulated using **1 part Portland Cement to 4 parts clean, graded coarse sand** (1:4 ratio).
- **Bed Thickness:** Finished uniform thickness of **20 mm** (± 3mm).
- **Slurry Bond:** A rich cement slurry mixed at approximately **4.4 kg/m²** must be spread over the mortar bed before setting the tiles.

5. Installation Methodology

1. **Subgrade Verification:** Clean the concrete base slab to remove debris or loose earth. Moisten the surface thoroughly before spreading the mortar.
2. **Mortar Laying:** Spread the 20mm thick cement mortar base uniformly. Slope the bed outward to prevent rain-water stagnation.
3. **Beating and Alignment:** Set the tiles in the specified patterns. Tap gently with a rubber mallet until the base is fully seated in the cement slurry, keeping the joint lines flush.

- 4. **Grouting the Joints:** Clean out any loose mortar from the tile gaps. Grout the joints securely using **white cement integrated with UV-stable matching pigments** to mirror the color profile of the tile matrix.
- 5. **Curing and Protection:** Cure the finished layout with water for a minimum period of **7 days**. Keep it completely barricaded from foot traffic during this phase.

6. Acceptance and Quality Testing

- At least 95% of the tiles in any given batch must be free from visible surface cracks, bubbles, or structural chips.
- The variation in joint line straightness must not exceed $\pm 1.5\text{mm}$ over a 3-meter straight edge.
- The installed surface must offer a clean, skid-resistant finish with zero loose or hollow-sounding spots under rolling structural loads

ITEM NO 03 - Providing & Fixing tactile layout plan of size 1500mm x 1200mm as approved design, made of 3.0mm thick acrylic non glare base plate and non glare cut out symbols with Braille on which individual facility points, like inquiry, reception, restrooms, medical room / first aid, cafeteria or breakout area, lounge, meeting room, conference room etc. present the respective floors with pictograph wherever needed all in tactile raised by minimum of 1.0mm to 2mm in various colours to make it legible for seniors, partial vision impaired etc. All the facility names should be in Braille, along with English or Hindi. The entire block of tactile signs should be mounted on wall for easy reading. The map to be installed at specified locations and installed at a height of 800mm from ground level complete in all respect as per Harmonized guideline & satisfaction of Engineer in charges.

1. Scope of Work

The work involves providing, fabricating, and fixing an indoor **Tactile Layout Plan/Map** measuring **1500 mm × 1200 mm**. The map must feature raised multi-colored floor layouts, non-glare symbols, pictographs, multi-lingual text (English and Hindi), and standard Grade-II Braille. The map will display all major facility points (such as inquiries, receptions, restrooms, medical rooms, cafeterias, and meeting rooms). It will be securely mounted to the wall at a dedicated, accessible height to guide seniors, visually impaired persons, and wheelchair users.

2. Base Plate & Structural Material Specifications

The tactile map assembly must use durable, high-impact polymers designed to withstand frequent touching without degrading:

Parameter	Technical Specification
Overall Matrix Size	1500 mm (Width) × 1200 mm (Height) ($\pm 2\text{mm}$ tolerance)
Base Material	Premium Grade-A Acrylic Sheet
Base Sheet Thickness	Minimum 3.0 mm thick
Surface Finish	Matte, non-glare, non-reflective micro-texture to prevent light bounce
Edge Profile	All edges must be machine-chamfered, smooth, and rounded (no sharp corners)
Signage Framework	Backed by a structural aluminum or heavy acrylic sub-frame for flush wall alignment

3. Tactile Graphic & Braille Requirements

All visual mapping elements must be mechanically raised to facilitate distinct fingertips tracking and high visual legibility:

- **Tactile Relief (Elevation Height):** All structural boundaries, pathways, facility icons, and text must be raised by **1.0 mm to 2.0 mm** from the base plate surface.
- **Graphic Production Process:** Raised elements must be executed via CNC routing of individual non-glare symbols or advanced UV-curable multi-layer tactile 3D printing. Liquid overlay or vinyl sticker methods are strictly prohibited.
- **Braille Transliteration:** Facilities must feature standard **Grade-II Braille** embossed with domed/rounded dots (not sharp points). Braille dot height must be 0.6mm to 0.9mm with standard cell spacing.
- **Typographic Text:** Visual text must be in clean, sans-serif fonts (e.g., Arial or Helvetica). Text must be provided in both **English and Hindi** directly adjacent to the Braille cells.

4. Visual Contrast & Legibility Matrix

- **Luminance Contrast:** A minimum **30% to 60% luminance contrast** must exist between the text/symbols and the background base plate.
- **Color Coding:** Different facilities must be color-coded using distinct, high-contrast, UV-stable industrial inks to accommodate partially sighted or senior visitors:
 - *Emergency/First Aid:* Red Profile
 - *Restrooms/Sanitation:* Deep Blue or White Profile
 - *Public Circulation Paths:* High-Contrast Yellow/Orange or Contrasting Light-Grey Lines

5. Facility Mapping Features

The plan must map out the entire respective floor footprint with distinct icons and multi-sensory text blocks for:

- **Reception & Inquiry Desks** (with "You Are Here" clear tracking indicator)
- **Gender-segregated & Accessible (Divyangjan) Restrooms**
- **Medical / First Aid Rooms**
- **Cafeterias, Breakout Areas, and Lounges**
- **Meeting Rooms & Conference Halls**
- **Egress points**, fire exits, lifts, and staircase zones.

6. Installation & Wall Mounting Guidelines

1. **Location Selection:** The layout plan must be positioned directly inside the main building entrance lobby or adjacent to the primary reception desk. It should be situated clear of swing doors to prevent pedestrian conflict.
2. **Installation Height:** The map must be rigidly anchored to the wall framework. The center line of the main tactile reading field must sit exactly **800 mm from finished ground level (FFL)**. This allows comfortable access for wheelchair users, seniors, and standing pedestrians.
3. **Mounting Hardware:** The sign must be fastened securely using heavy-duty, tamper-proof stainless steel decorative standoff studs or industrial high-bond polyurethane adhesive backing to ensure zero wobble or shifting under finger pressure.
4. **Acceptance:** The map will be approved following a tactile readability test by an accessibility expert or to the complete satisfaction of the Engineer-in-Charge.

ITEM NO 04 - Providing and Fixing Ramp Railing Braille Signage of Size 200x50mm Made From 0.5mm SS 304 Grade Matt Finish Braille dots of 1.5mm braille dots are embossed precisely and are uniform in Size and spacing of Required location with required texts as per Instruction of Engineer in Charge.

1. Scope of Work

The work involves providing, fabricating, and securely fixing curved/flat **Stainless Steel Braille Signage plates** measuring **200 mm × 50 mm**. These plates are specifically designed to be installed on ramp handrails. They must feature precisely embossed Grade-II Braille dots, alongside high-contrast visual alphanumeric characters (English/Hindi). These plates serve as tactile directional and level identifiers for visually impaired individuals navigating public building ramps.

2. Material & Structural Specifications

The signage plates must be fabricated from premium automotive/architectural grade stainless steel to guarantee long-term corrosion resistance in indoor and outdoor settings:

Parameter	Technical Specification
Dimensions	200 mm (Length) × 50 mm (Width) (\(\pm\) 0.5 mm tolerance)
Material Composition	Stainless Steel (SS) Grade 304
Sheet Thickness	Minimum 0.5 mm thick
Surface Treatment	Satin / Matt Finish (to completely eliminate specular light reflections)
Edge Geometry	Machine-radius corners with micro-chamfered, smooth edges to protect user fingers

3. Tactile Relief & Braille Specifications

The tactile and Braille dimensions must strictly follow international accessibility parameters to be easily decipherable by touch:

- **Braille Dot Geometry:** The individual tactile Braille dots must have a **diameter of 1.5 mm** at the base with a rounded, domed top profile (never sharp or pointed).
- **Braille Dot Elevation:** The dots must be precisely and uniformly embossed from the rear side to achieve a consistent raised height of **0.6 mm to 0.9 mm**.
- **Spacing Dimensions:** Grid spacing between dots within a single Braille cell, and spacing between separate cells, must strictly comply with standard Grade-II Braille specifications.
- **Visual Graphics:** The plate must feature accompanying text in English/Hindi (e.g., "RAMP TO FIRST FLOOR / प्रथमतल रैम्प"). Letters must be deeply laser-etched, chemical-etched, or raised by 1.0mm, and filled with a dark, high-contrast, UV-stable epoxy paint (e.g., Matt Black).

4. Mechanical & Environmental Resilience

- **Vandal Resistance:** The SS 304 matrix must resist bending, scratching, denting, or deformation under heavy daily handling or deliberate vandalism.
- **Weatherproofing:** The entire assembly must be 100% rustproof, tarnish-resistant, and chemically stable against standard sweat acids, salt spray, rainwater, and sanitizing chemicals.

5. Installation & Fixing Methodology

1. **Pre-Forming (Curvature Matching):** The 0.5 mm thin SS plate must be pre-rolled or carefully shaped on-site to match the exact outer diameter profile of the circular or square ramp handrail (typically 38mm to 50mm diameter tubes).
2. **Surface Prep:** The metal or wooden handrail section must be thoroughly cleaned with an industrial degreaser or isopropyl alcohol to remove all oils, moisture, and dust.
3. **Adhesion Framework:** The plate must be affixed to the handrail using an ultra-strong, weather-resistant, industrial-grade **structural acrylic transfer tape (e.g., 3M VHB)** or high-performance polyurethane adhesive sealant.
4. **Placement Position:** Signage plates must be mounted on the upper or outer side of the handrail, positioned **at least 300 mm before the ramp begins and ends**, so visually impaired users can read the level transition before stepping onto the slope. The Braille dots must line up facing the user's natural finger-grip path.

6. Inspection & Quality Acceptance

- The plates must show zero lifted corners, zero loose gaps, and no sharp metal burrs along the perimeter.
- Tactile dots must be completely uniform across all installed plates. Any cracked metal or flattened dots around the embossed zones will result in immediate rejection by the Engineer-in-Charge.

ITEM NO 05 - Providing an fixing multilingual Braille (raised dots of SS 304 garde) DIRECTIONAL SIGNBOARDS of Required Size designed as per accessibility standard and having 3.5 mm thick acrylic base plate with Upper case San Serif words made of white acrylic non glare cut out letters of height 15 mm raised not less than 3.0 mm above base plate and the equivalent word written in hindi with devanagari non glare acrylic letter of height 15 mm raised not less than 3.0 mm above base plate and having a non -glare acrylic pointing in the required direction . Each signboard to be fixed as per manufacturers specification on the wall at thre approved acation and at a height of 1200 mm from FFFL Complete as per design / specificatuion and guidelines as per the entire satisfaction of the Engineer-in-charge.

The item itself specifies the requirement for supply and fixing of acrylic multilingual Braille (raised dots) signboards (DOOR SIGNBOARDS) of size 6"x 9" for room titles, designed as per the drawings issued and having 4mm thick blue acrylic base plate with Upper Case San Serif words made of white acrylic non glare cut out letters of height 15mm raised not less than 0.8mm above base plate and the equivalent word/s written in Hindi with Devanagari non glare acrylic letters of height 15mm raised not less than 0.8mm above base plate. Grade 2/ Grade 1 Braille to be integral with the sign face and be raised 0.5mm above base plate. Each signboard to be fixed as per manufacturers specifications on the wall adjoining the respective room door at a height of 1200mm from FFL complete as per design/specificaitons and guidelines complete.

The quoting price should be inclusive of all types of taxes & duties, packing, forwarding, loading, unloading, installation

Work shall be carried out As Per Direction & Instruction Of The Engineer In Charge.

1 Mode of Measurement

Measurement shall be on **No** basis

The payment shall be made on **No basis.**

ITEM NO 06 - Providing and Fixing CRUSE SET of CERA for handcape Toilet Inlcuding all Necessary Parts like One Piece EWS S Trap 300 mm with Soft Close Seat Cover, CRANE Wall Hung Washbasin 665 X 545 X 190 mm With Single Lever Clinical Faucet also Including Two Piece Wall Mounted Grab bar 600 mm Long ,Wall Mounted Hinged Hand Rail 750 x 100 with all Material and Fixing Charge as per instruction of Engineer In Charge .

1. Scope of Work

The work covers providing, assembling, testing, and fixing a complete **CERA Cruse Set (or approved equivalent Special Needs Combo Suite)** for physically handicapped/specially-abled toilets. The installation must include an elongated floor-mounted one-piece EWC with an S-trap, a soft-close hydraulic seat cover, a wall-hung wide-profile washbasin, a single-lever medical clinical faucet, stainless steel safety grab bars, and a wall-mounted hinged fold-up handrail. The contractor must provide all underlying internal connection accessories, anchor fasteners, brackets, and sealing compounds to complete the system.

2. Component-Wise Material & Dimensional Specifications

A. One-Piece EWC (European Water Closet) — CERA Cruse Series

- **Design Matrix:** Floor-mounted, unified single-piece vitrified vitreous china ceramic water closet with an extended, ergonomically elongated bowl profile.
- **Dimensions:** **710 mm (Length) × 370 mm (Width) × 770 mm (Height).**
- **Disability Height Compliance:** Finished rim seat height must sit between **450 mm to 480 mm** from the final finished floor level (FFL) to allow smooth wheelchair-to-closet lateral transfers.
- **Drainage Config:** **S-Trap with a 300 mm** wall-to-center rough-in distance.
- **Seat Cover:** Heavy-duty, high-impact polymer **Cruse Soft-Close Hydraulic Seat Cover**. It features anti-skid bumpers and open-front or ergonomic ease-of-use contours.
- **Flushing Mechanism:** Integrated dual-flush cistern with twin-flush pneumatic internal fittings (6-litre / 3-litre capacity configurations).

B. Wall-Hung Washbasin — CERA Crane Series

- **Dimensions:** **665 mm (Width) × 545 mm (Depth) × 190 mm (Height).**
- **Ergonomics:** Convex front curvature with smooth, shallow recess profiling. This allows a wheelchair user to roll underneath closely without leg obstruction.
- **Mounting Elevation:** Installed with the upper rim exactly **800 mm to 850 mm from the finished floor level**, keeping a clear minimum knee clearance space of 750 mm beneath the basin profile.

C. Single-Lever Clinical Basin Faucet

- **Operation:** Single-lever blend control featuring an **extended, elongated medical/clinical elbow-action lever**. This enables hands-free operation using the forearm or wrist.
- **Cartridge Technology:** High-durability 40mm ceramic disc cartridge for smooth operation under varying fluid pressures.

- **Spout System:** Fixed spout fitted with an anti-splash, pressure-compensating eco-flow aerator.

D. Wall-Mounted Straight Safety Grab Bars (2 Units)

- **Dimensions:** **600 mm length** with a rigid outer diameter tube profile of 32 mm.
- **Material Base:** Premium **Stainless Steel (SS 304 Grade)** coated with a high-visibility, anti-slip nylon/plastic textured sleeve for enhanced wet-grip traction.
- **Anchoring Base:** Heavy-duty multi-hole mounting flanges anchored securely into masonry using stainless steel expansion fasteners.

E. Wall-Mounted Hinged Handrail (Fold-Up Drop Bar)

- **Dimensions:** **750 mm projection length × 100 mm axis clearance.**
- **Mechanism:** Wall-anchored fold-away vertical hinge system with a smooth counterbalanced lift assist. It locks securely into a vertical position when not in use to leave wheelchair space clear.
- **Material Base:** Premium **Stainless Steel (SS 304 Grade)** with a non-slip, anti-bacterial textured plastic outer layer.

3. Installation Methodology & Layout Parameters

1. **Wall Conditioning:** Ensure grab bars and hinged rails are mounted exclusively to solid brickwork, concrete blocks, or reinforced structural framing. Hollow partition walls must be reinforced internally using steel backing plates before anchoring.
2. **EWC Layout:** Place the [EWC](#) with its center line exactly **450 mm** from the adjacent finished side wall where the fixed 600mm grab bar is situated.
3. **Grab Bar Placements:**
 - Mount the horizontal **600mm fixed grab bar** on the side wall at a height of **750 mm** from the floor level.
 - Secure the **750mm hinged drop-down bar** to the rear/side wall structure, positioned **320 mm** away from the center line of the EWC pan, sitting at an identical horizontal height of 750 mm.
4. **Leak Proofing:** Joint seals along the base of the EWC pan and around the washbasin-to-wall interfaces must be cleanly treated using anti-fungal, non-staining, grade-A silicone sealants.

4. Inspection, Testing, and Commissioning

- **Load Endurance Test:** Grab bars and hinged rails must exhibit zero deflection or anchor shifting when a static horizontal/vertical load test of **110 kg to 150 kg** is applied.
- **Hydraulic Test:** Run full plumbing flow cycles across the EWC flush tank and basin faucet to verify zero leaks along water supply channels or the waste line.
- **Seat Performance:** The hydraulic soft-close mechanism must lower smoothly without dropping abruptly or slamming onto the ceramic rim.

ITEM NO 07 - Demolition including stacking of serviceable materials and disposal of unserviceable materials with all lead and lift.(i) R.C.C. work .

1.0. Workmanship

- 1.1. The demolition shall consist of demolition of one or more parts of the building as specified or shown in the drawings. Demolition implies taking up or down or breaking up. This shall consist of demolishing whole or part of work including all relevant items as specified or shown in the drawings.
- 1.2. The demolition shall always be planned before hand shall be done in reverse order to the one in which the structure was constructed. This scheme shall be got approved form the Engineer-in-charge before starting the work. This however will not absolve the contractor from the responsibility of proper

and safe demolition.

- 1.3. Necessary propping, shoring and under pinning shall be provided for the safety of the adjoining work or property, which is to be left intact, before dismantling and demolishing is taken up and the work shall be carried out in such a way that no damage is caused to the adjoining property.
- 1.4. Wherever required, temporary enclosures or partitions shall also be provided. Necessary precautions shall be taken to keep the dust nuisance down as and where necessary.
- 1.5. Dismantling shall be commenced in a systematic manner. All materials which are likely to be damaged by dropping from a height or demolishing roof, masonry etc. shall be carefully dismantled first. The dismantled articles shall be properly stacked as directed.
- 1.6. All materials obtained from demolition shall be the property of Government unless otherwise specified and shall be kept in safe custody until handed over to the Engineer-in-charge.
- 1.7. Any serviceable materials, obtained during dismantling or demolition shall be separated out and stacked properly as directed with all lead and lift. All unserviceable materials, rubbish etc., shall be stacked as directed by the Engineer-in-charge.
- 1.8. On completion of work, the site shall be cleared of all debris rubbish and cleaned as directed.

2.0. Mode of measurements and payment

- 2.1. Measurements of all work except hidden work shall be taken before demolition or dismantling and no allowance for increase in bulk shall be allowed. The demolition of lime concrete shall be measured under this item. Specification for deduction for voids, openings etc. shall be on same basis as that employed for construction of work.
- 2.2. All work shall be measured in decimal system as fixed in its place subject to the following limits; unless otherwise stated hereinafter : (a) Dimensions shall be measured to the nearest 0.01 mt. (b) Area shall be worked out to the nearest 0.01 sq.mt. (c) Cubical contents shall be worked out to the nearest 0.01 Cu.m.
- 2.4. The unserviceable materials shall be stacked as directed by Engineer-in-charge with all leads and lifts.
- 2.5. The rate shall include cost of all labour involved and tools used in demolishing and dismantling including scaffolding. The rate shall also include the charges for separating out and stacking the serviceable materials properly and disposing the unserviceable materials with all lead and lift. The rate also includes for temporary shoring for the safety of the portion not required to be pulled down or of adjoining property and providing temporary enclosures or portions where considered necessary.
- 2.6. The rate shall be for a unit of one cubic meter.

ITEM NO 08 - Providing and fixing conspectus tape 50 mm width on treads of staircase including cutting, pasting etc. as per harmonized guidelines complete in all respects on the entire satisfaction of engineer in charge.

Technical Specification: Staircase Tread Conspectus Tape

1. Scope of Work

The work involves providing and fixing high-visibility, anti-slip **conspectus tape** of **width** across the entire horizontal length of staircase treads. The scope includes thorough surface preparation, precision layout, cutting, alignment, self-adhesive pasting or epoxy bonding, rolling, and finishing. The installation must strictly deliver standard universal

accessibility and high visual contrast for safety.

2. Material Specifications

2.1. Physical Properties

- **Width:** Exactly
- **Structure & Carrier:** Heavy-duty, dimensionally stable **Polyvinyl Chloride (PVC)** or **Polyethylene Terephthalate (PET)** carrier film coated with hard, durable grit particles (such as aluminium oxide or quartz sand) to guarantee robust traction.
- **Thickness:** Minimum total thickness of (excluding liner).

• 2.2. Performance & Adherence Standards

- **Anti-Slip Property:** Must achieve a minimum slip resistance rating of **R11 or higher** as per [DIN 51130 standards](#).
- **Adhesive Backing:** High-performance, pressure-sensitive **modified acrylic solvent adhesive** providing an adhesion strength to steel of
- **Durability & Environment:** Highly resistant to moisture, UV degradation, water immersion, and general cleaning chemicals.

2.3. Visual Contrast & Color

- **Color Selection:** High-contrast options such as **Solid Yellow**, **Luminous (Glow-in-the-dark)**, or **Black-and-Yellow hazard stripes**.
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- **Contrast Requirement:** Per the *Harmonised Guidelines*, the tape color must establish at least a **(30%) Light Reflectance Value (LRV) difference** relative to the underlying step material (e.g., granite, marble, concrete, or terrazzo).

3. Placement Layout & Guidelines

To satisfy the statutory mandate for universal accessibility, positioning must comply with the following configurations:

- **Placement Edge:** Placed parallel to the leading edge of the stair nosing.
- **Setback Distance:** Recessed exactly 5 mm to 10 mm backward from the absolute front face of the riser to prevent premature peeling from vertical foot impact.
- **Coverage:** Extended across the complete width of the usable tread, leaving a maximum clearance of 25 mm at each side wall or stringer junction.

4. Execution & Installation Procedure

4.1. Surface Preparation

1. The base substrate (stone, concrete, or metal tiles) must be structurally sound, level, and completely dry.
2. Wash the application area using an industrial degreaser or an **Isopropyl Alcohol (IPA) solvent solution** to completely remove accumulated dust, wax, oils, or curing compounds.
3. Any minor cracks or unevenness on the nosing surface must be rectified using high-strength polymer modified repair mortar prior to installation.

4.2. Application Methodology

1. **Cutting:** Cut the tape cleanly using industrial shears or utility knives to the exact required lengths. **Round the corners** of each cut piece to a radius of approximately to minimize edge-lifting risks over long-term usage.

2. **Pasting:** Peel back roughly of the protective release liner. Position the exposed adhesive edge accurately on the layout line without touching the glue surface.
3. **Pressing:** Gradually pull away the remaining liner while firmly smoothing down the tape from the centre outward to push out trapped air pockets.
4. **Compaction:** Run a heavy **hand-pressure silicone roller** back and forth over the entire applied strip to fully activate the pressure-sensitive adhesive.

4.3. Curing & Protection

- The treated staircase must be completely cordoned off from pedestrian foot traffic for at least 1 post-application to achieve maximum adhesive bonding strength.

Quality Control & Acceptance Standards

- **Adhesion Check:** No visible edge curling, bubbling, lifting, or loose ends are permitted along any part of the staircase.
- **Alignment:** The visual line must appear perfectly straight when viewed from the landing. Variations exceeding over a length will be rejected.
- **Approval:** Samples of the chosen tape variant must be submitted and approved by the **Engineer-in-Charge** before launching bulk procurement and application.

5. Mode of Measurement

- **Unit of Measurement:** The work executed will be measured linearly in **Running Metres (Rmt)** of installed tape.
- **Deductions:** No payments will be cleared for overlaps or wasted cut pieces. Only the net exposed length of functional tape fixed on the treads will be recorded

ITEM NO 09 - Providing and fixing machine cut, free edges, pre mirror 16 mm Avg. thick telephone black/selected by engineer in charge Granite Slabe One Side polished for vertical wall/Doors/Windows Sill,Jams for cladding as per design including full moulded round inside edge and laid on 10 mm thick cement mortar 1:3 (1 cement: 3 coarse sand) jointed with grey cement slurry including rubbing and polishing finishing etc. complete.

Technical Specification: 16mm Granite Cladding, Sills & Jambs

1. Scope of Work

The work consists of supplying, cutting, dressing, polishing, and fixing machine-cut Telephone Black (or any alternative premium granite approved by the Engineer-in-Charge) stone slabs. This applies to vertical walls, cladding, door/window frames, sills, and jambs. The process includes a full-moulded round inside edge, a 10mm thick base layer of cement mortar 1:3, jointing with grey cement slurry, and final surface polishing

2. Material Specifications

2.1. Granite Slabs

- **Type & Color:** Telephone Black or an equivalent premium-grade granite selected by the Engineer-in-Charge. It must feature a uniform crystalline structure, deep black tone, and be completely free from veins, cracks, or white spots.
- **Thickness:** **16mm average thickness** with an allowable tolerance of $\pm 1 \text{ mm}$ at any single point.
- **Surface Finish:** Pre-mirror polished on the exposed structural side. The stone must display an uniform mirror finish free from surface waviness or scratch marks.
- **Edges:** Machine-cut square, true, and straight. The inside visible edge must be factory or site-crafted to a **full-moulded round (bullnose)** profile.

2.2. Mortar and Slurry Base

- **Cement:** Standard Ordinary Portland Cement (OPC) 43 or 53 Grade conforming to IS 269 or IS 12269.
- **Coarse Sand:** Clean, sharp, well-graded river or manufactured sand conforming to IS 383, zone-II or III, completely free from silt, clay, or organic impurities.
- **Bedding Mortar:** **1:3 Mix Ratio** (1 part cement to 3 parts coarse sand by volume) thoroughly mixed with a controlled water-cement ratio.
- **Jointing Slurry:** A workable paste made of grey cement mixed with water, applied at a standard consumption rate of (4.4 kg/m^2) to ensure a rigid bond

3. Execution & Workmanship.

3.1. Surface Preparation

- The underlying brickwork, concrete wall, or concrete lintel surface must be thoroughly cleaned, hacked (rough-textured), and cleared of loose particles, dust, and shuttering oil.
- Wet the backing wall surface with water prior to mortar application to prevent it from absorbing water out of the bedding mortar layer.

3.2. Dressing and Moulding

- Cut the slabs precisely to the required window sill, jamb, or cladding design dimensions using a heavy-duty mechanical diamond-blade cutter.
- Shape the inside exposed edge into a smooth, consistent **full-moulded round edge** profile.
- Polish the newly moulded edge through successive grades of polishing stones (up to 2000+ grit) to seamlessly match the pre-mirror factory shine of the flat face.

3.3. Fixing and Laying

1. **Mortar Application:** Apply a uniform **10mm thick layer of 1:3 cement mortar** onto the backing wall or sill surface.
2. **Slurry Application:** Coat the unpolished rear side of the clean granite slab with a thin, uniform layer of neat grey cement slurry.
3. **Positioning:** Press the slab firmly against the mortar bed. Gently tap it with a rubber mallet until the slab is perfectly level, plumb, and aligned with adjacent panels.
4. **Joints:** Keep the joints perfectly straight, tight, and uniform (not exceeding 1mm in width). Any squeezed-out slurry must be wiped away immediately from the face using a clean cloth.

3.4. Curing

- The finished granite installation must be continuously cured with wet hessian cloth or clean water spray for a minimum duration of **7 days** to ensure the mortar sets properly.

4. Quality Control & Acceptance Standards

- **Plumb & Level:** The vertical faces of jambs and claddings must be completely vertical (checked with a plumb-bob), showing a maximum variance of $\pm 1.5 \text{ mm}$ over a 2-metre height.

- **Hollowness Test:** Tap the set slabs lightly with a wooden mallet. Any spot emitting a hollow sound indicates a void in the mortar backing and must be dismantled and re-fixed.
- **Edge Alignment:** The full-moulded round edge profiles must run in a perfectly straight line without any offsets at slab junctions.

5. Mode of Measurement

- **Unit of Measurement:** The finished work will be measured and paid for based on the net surface area in **Square Metres**, correct to two decimal places.
- **Deductions & Additions:** Calculations will follow the actual visible exposed area. The cost of edge moulding, cutting, profiling, jointing, and polishing is fully inclusive within the item rate; no separate linear measurements will be recorded for edge treatment

ITEM NO 10 - Providing 15mm thick cement plaster in single coat on fair side brick/concrete wall for interior plastering up to floor two level and finished even and smooth in (1) cement mortar 1:3 (1 cement; 3 coarse sand).

1.0. Materials

- 1.1. Water shall conform to M-1. The cement mortar of proportion **1:3** shall conform to M-13.

2.0. Workmanship

2.1. Scaffolding:

Wooden bullies, bamboos, planks, trestles and other scaffolding shall be sound. These shall be properly examined before erection and use. Stage scaffolding shall be provided for ceiling plaster which shall be independent of the walls.

2.2. Preparation of back ground :

- 2.2.1. The surface shall be cleaned of all dust, loose mortar droppings, traces of algae, efflorescence and other foreign matter by water or by brushing. Smooth surface shall be toughened by wire brushing if it is not hard and by hacking if it is hard. In case of concrete surface, if a chemical retarded has been applied to the form work, the surface shall be roughened by wire brushing and all the resulting dust and loose particles cleaned off and care shall be taken that none of the readers if left on the surface. Trimming of projections on brick/concrete surfaces where necessary shall be carried out to get an even surface.

- 2.2.2. Raking of joints in case of masonry where necessary shall be allowed to dry out for sufficient period before carrying out the plaster work.

- 2.2.3. The work shall not be soaked but only damped evenly before applying the plaster. If the surface becomes dry, such area shall be moistened again.

- 2.2.4. For external plaster, the peasting operation shall be started from top floor and carried downwards. For internal plaster, the plastering operations may be-started wherever the building frame and cladding work are ready and the temporary supports of the ceiling resting on the wall of the floor have been removed. Ceiling plaster shall be completed before starting plaster to walls.

2:3. Application of plaster :

- 2.3.1. The plaster about 15x15 cms. shall be first applied horizontally and vertically at not more than 2 meters intervals over the entire surface to serve as gauge. The surfaces of these gauges shall be truly in plane of the finished plastered surface. The mortar shall then be applied in uniform surface slightly more than the specified thickness, then brought to a true surface by working a wooden straight

edge reaching across the gauges with small upward and sideways movements at a time. Finally, the surface shall be finished off true with a trowel or wooden float according as a smooth or a smooth or a sandy granular texture is required Excessive troweling or overworking the float shall be avoided. All corners, arises, angles and junctions shall be truly vertical or horizontal as the case may be and shall be carefully finished. Hounding or chamfering, corners, arises junctions etc. shall be carried out with proper templates to be size required.

- 2.3.2.** Cement plaster shall be used within half an hour after addition of water and mortar or plaster which is partially set shall be rejected and removed forthwith from the site.
- 2.3.3.** In suspending the work at the end of the day, the plaster shall be left out clean to the line both horizontally and vertically, when recommencing the plaster, the edges of the old work shall be scraped clean and wetted with cement putty before plaster is applied to the adjacent areas to enable the two to properly join together. Plastering work shall be closed at the end of the day on the body of the wall and nearer than **15 cm.** to any corners or arises. It shall not be closed on the body of features such as plaster bands and cornices not at the corners or arises. Horizontal joints in plaster work shall not also occur on parapet tops and copings as these invariably lead to leakage. No portion of the surface shall be left out initially to be packed up later on.
- 2.3.4.** Each coat shall be kept damp continuously till the next coat is applied or for a minimum period of 7 days. Moistening shall commence as soon as plaster is hardened sufficiently. Soaking of walls shall be avoided and only as much water as can be readily absorbed shall be used, excessive evaporation on the sunny or windward side of building in hot air or dry weather shall be prevented by hanging matting or gunny bags oh the outside of the plaster and keeping them wet.
- 2.3.5.** The plastering work shall be in single coat on brick / concrete walls for interior plastering up to floor two level, finished even and smooth **in C.M. 1:3.**
- 2.3.6** The coat of cement and fine sand mortar of proportion 1:1 (15 mm thick about) shall be applied to the plastered surface with a trowel to provide uniform texture while the base coat is still plastic.
- 2.3.7.** In any continuous face of wall the finishing treatment should be carried out continuously and day lo day breaks made to coincide with architectural breaks in order to avoid unsightly Junctions
- 2.3.8. Curing :** All the plaster work shall be kept damp continuously for a period 7 days.
- 2.3.9.** Providing necessary grooves between structural members as directed by Engineer in charge.

3.0. Mode of measurements & payment

- 3.1.** The rate shall include the cost of all materials, labour and scaffolding etc. involved in the operations described under workmanship.
- 3.2.** All plastering shall be measured in square meters unless otherwise specified. Length breadth or height shall be measured correct to a centimeter.
- 3.3.** Thickness of the plaster shall be exclusive of he thickness of the key i.e. grooves or open joints in brick work, stone work etc. or space between laths. Thickness of plaster shall be average thickness with minimum **15 mm** at any point on this surface.
- 3.4.** This item includes plastering for **all floors.**
- 3.5.** The measurement of wall plastering shall be taken between the walls or partition (dimensions before plastering being taken) for length and from the top of floor or skirting to ceiling for height. Depth of cover of cornices if any shall be deducted.

- 3.6. Soffits of stairs shall be measured as plastering on ceilings, following soffits shall be measured separately.
- 3.7. For jambs, soffits, sills etc. for openings not exceeding 0.5 sq. met each in area for ends of joints beams, posts, girders, steps etc. not exceeding 0.5 sq.mt each in area and for openings exceeding 0.5. sq.mt and not exceeding 3.00 sq.mt. in each area deductions and additions shall be made in the following manners.
- (a) No deductions shall be made for ends of joints, beams, posts etc. and openings not exceeding 0.5 sq. mt each and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings, for finish to plaster around ends of joints, beams posts etc.
- (b) Deduction for openings exceeding 0.5 sq. mt but not exceeding 3 sq.mt. each shall be made as follows and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings, (i) When both faces of all wall are plastered with same plaster, deduction shall be made for one face only, (ii) When two faces of wall are plastered with different types of plasters or if one face is plastered and the other pointed, deductions shall be made from the plaster or pointing on the side of frame for door, window etc. on which width of reveals is less than that on the other side but no deductions shall be made on the other side. Where width of reveals on both faces of all are equal, deductions of 50% of area of opening on each face shall be made from areas of plaster and / or pointing as the case may be.
- 3.8. For openings having door frames equal to or projecting beyond the thickness of wall, full deduction for opening shall be made from each plastered face of the wall.
- 3.9. In case of openings of area above 3 sq.mt. each, deduction shall be made for openings but jambs, soffits sand sills shall be measured.
- 3.10 The payment shall be made for a unit of 1.0 sq.mt of work done over an above the finishing of work of base coat.
- 4.0. The rate shall be for a unit of **One sq. meter**.

ITEM NO 11 - Providing and fixing 90 cm high Stainless steel railing 304 Grade made from anticorrosive S S pipe of 50 mm dia (16Gauge) as hand rail With Necessary Required Support at Regular Interval Made from SS Pipe of Required Dia as per detailed drawing as directed by Engineer In Charge etc. complete.

- **General**

This work shall consist of Providing and fixing 90 cm high Stainless steel railing 304 Grade made from anticorrosive S S pipe of 50 mm dia (16Gauge) as hand rail With Necessary Required Support at Regular Interval Made from SS Pipe of Required Dia as per detailed drawing as directed by Engineer In Charge etc. complete. of the shape and dimensions shown on the drawings and conforming to these specifications or as approved by the Engineer in charge.

1.0 MATERIAL

1.1 50 mm diameter hollow stainless steel pipe for railing

Hollow stainless steel pipe conform to I.S. 226-1985: The Hollow stainless steel pipe shall be free from the defects mentioned in I.S 226-1975 and shall have a smooth finish. The material shall be free from loose mill scale, rust pits or other defects affecting the strength and durability. River bars

shall conform to I.S. 1148-1973.

When the stainless steel pipe is supplied by the Contractor test certificate of the manufacturers shall be obtained according to I.S. 226-1975 and other relevant Indian Standards.

Hollow stainless steel Pipe for railing shall be of 50 mm diameter and confirming general Indian standards. Hollow pipe shall be free from the defects and shall have smooth finish.

Vertical support shall be fixed in RCC slab at 1.2 m C/C incl. 3 horizontal S.S. pipe of 25mm dia. of 16 gauge at equal distance fixed by 18.75 mm S.S. pipe with balastrode including accessories.

2.0. Workmanship

- 2.1. Vertical / Horizontal supports of to get 90 cm height of railing shall be fixed as directed and round hollow pipe shall be fixed by welding in true line and level and slope the railing shall be powder coated finish as per standards

2.0 Mode of Measurement & Payment :

- 2.1 The payment will be made on running meter basis of the finished work.
- 2.3 All necessary labour materials, equipments, tools and plant, conveyance including loading and unloading etc. shall be provided by the Contractors directed by the Engineer in charge.
- 2.4 The S.S. railing shall be measured for its length, limiting dimensions to those specified on plan or as directed and shall be measured in running meters.
- 2.5 The rate shall be for a unit of **one Running meter**.

ITEM NO 12 - Brick work using common burnt clay building bricks having crushing strength not less than 35 kg./Sq.Cm. in foundation and plinth in Cement Mortar 1:5. (1- Cement: 5 - fine sand) (B) Conventional Bricks.

1.0. Materials

Bricks shall conform to M-15. Cement mortar shall conform to M-11.

2.0. Workmanship

2.1. Proportion:

- 2.1.1. The proportion of the cement mortar shall be 1:5 (1 cement : 5 fine sand) by volume.

2.2. Wetting of bricks:

- 2.2.1. The bricks required for masonry shall be thoroughly wetted with clean water for about two hours before use or as directed. The cessation of bubbles, when the bricks are wetted with water is as indication of through wetting of bricks.

2.3. Laying:

- 2.3.1. Bricks shall be laid in English bond unless directed otherwise. Half or cut bricks shall not be used except when necessary to complete to bond, closures in such case shall be cut to required size and used near the ends of walls.
- 2.3.2. A layer of mortar shall be spread on full width for suitable length of the lower course. Each brick shall first be property bedded and set home by gently tapping with handle of trowel or wooden mallet. Its inside face shall be flushed with mortar before the next brick is laid and pressed against it. On completion of course, the vertical joints shall be fully filled from the top with mortar.
- 2.3.3. The walls shall be taken up truly in plumb. All courses shall be laid truly horizontal and all vertical joint shall be truly vertical. Vertical joints in alternate course shall generally be directly one over the other.

The thickness of brick course shall be kept uniform.

2.3.4. The brick shall be laid with frog up wards. A set of tools comprising of wooden straight edges, mason's spirit level, square half meter rub, and pins, string and plumb shall be kept on the site of work for frequent checking during the progress of work.

2.3.5. Both the faces of walls of thickness greater than 23 cms. shall be kept in proper place. All the connected brick work shall be kept not more than one meter over the rest of the work. Where this is not possible, the work shall be raked back according to bond (and not left toothed) at an angle not steeper than 45 degrees.

2.3.6. All futures, pipes, outlets of water, hold fasts of doors and windows etc. which are required to be built in wall shall be embedded in cement mortar.

2.4. Joints:

2.4.1. Bricks shall be so laid that all joints are quite flush with mortar. Thickness of joints shall not exposed 12 mm. The face joints shall be raked out as directed by raking tools daily during the progress of work, when the mortar is still green so as to provide key for plaster or pointing to done.

2.4.2. The face of brick shall be cleaned the very day on which the work is laid and all mortar dropping removed.

2.5. Curing:

2.5.1. Green work shall be protected from rain suitably. Masonry work shall be kept moist on all the faces for a period of seven days. The top of masonry work shall be kept well wetted at the close of the day.

2.6. Preparation of foundation bed:

2.6.1. If the foundation is to be laid directly on the excavated bed, it shall be leveled, cleared of all loose materials, cleaned and wetted before stating masonry, If masonry is to be laid on concrete footing, the top of concrete shall be cleaned and moistened. The contractor shall obtain the engineer's approval for the foundation bed before foundation masonry is started. When pucca flooring is to be provided flush with the top to plinth, the inside plinth offset shall be kept lower than the outside plinth top by the thickness of the flooring.

2.7. The frames of doors, windows, cupboards etc. shall be housed into the brick work at the correct location and level as directed. The heavy steel doors, window frames etc. shall be built in with work, but for ordinary steel doors and windows required opening for frames, hold-fasts etc. shall be in the wall and frame embedded later on in order to avoid damage to the frames.

2.8. Necessary scaffolding shall be provided. The supports of the scaffolding shall be sound and strong tied, together with horizontal pieces over which the scaffolding plunks shall be fixed. Simple scaffolding shall be allowed normally. In this case scaffolding hole shall rest in hole header horizontal coarse only. Minimum number of holes be left in brick work for supporting horizontal scaffolding poles. The contractor is responsible for providing and maintaining sufficiently strong scaffolding so as to withstand all loads likely to come upon it.

2.9. For the face of brick work, where plastering is to be done, joints shall be racked out to a depth not less than thickness of joints. The face of brick work shall be cleaned and mortar dropping removed on very same day that brick work is laid.

3.0. Mode of measurements & payment

3.1. The masonry work of G.F. & First floor shall be measured and paid under this item rate includes cost

of all materials & labour.

- 3.2.** Brick work in parapet shall be included in the corresponding masonry item of floor immediately below the floor above which the parapet is built.
- 3.3.** No deduction shall be made from quantity of brick work nor any extra payment made for embedding in masonry of marking holes in respect of following item.
- (1) Ends of joints, beams, posts, girders, rafters, purlins trusses corbel, steps, etc. where cross sectional area does not exceed 500 sq.cm.
 - (2) Opening not exceed in 1000 sq.cm.
 - (3) Wall plate sand bed plates bearing of slab, chhajjas, and like whose thickness does not exceed 10 cms. and the bearing does not extend the full thickness of wall.
 - (4) Drainage holes and recesses for cement concrete blocks to embed hold fasts for doors, window etc.
 - (5) Iron fixtures, pipes up to 300 mm. dia. hold fasts of doors, and window built into masonry and pipes etc. for concealed wiring.
 - (6) Forming charges of section not exceeding 350 sq.cm. in masonry.
 - (7) Apparatuses for fire places shall not be deducted nor shall extra labour required to make splaying of jumps, throating and making trenches over the aperture be paid for separately.
- 3.4.** The rate shall be for a unit of **one cubic meter**.

ITEM NO 13 - Providing and laying cement concrete 1:4:8 (1 cement; 4 coarse sand; 8 hand broken stone aggregate 40mm nominal size) and curing complete excluding cost of form work in (A) Foundation and plinth.

1.0. Materials

1.1. Water shall conform to M-1. Cement shall conform to M-4. Sand shall conform to M-8. Graded stone aggregate 40 mm. nominal size shall conform to M-12.

2.0. Workmanship

2.1. General

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

2.2. Proportion of Mix:

2.2.1. The proportion of cement, sand and stone aggregate shall be one part of cement. 4 parts of coarse sand and 8 parts of **graded** stone aggregates and shall be measured by volume.

2.3. Mixing:

2.3.1. The concrete shall be mixed in a mechanical mixer at the site of work. Hand mixing may however be allowed for smaller quantity of work if approved by the Engineer-in-charge. When hand mixing is permitted by the Engineer-in-charge in case of break-down of machineries and in the interest of the work, it shall be carried out on a water tight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency, However in such case 10% more cement than otherwise period 1 1/2 to 2 minutes. The quantity

of water shall be just sufficient to produce a dense concrete of required workability for the purpose.

2.4. Transporting & Placing the Concrete:

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

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

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

2.6. Curing:

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

3.0. Mode of measurement and payment

3.1. The concrete shall be measured for its length, breadth and depth, limiting dimensions to those specified on plans or as directed

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

ITEM NO 14 - Providing and Supplying Superio Aluminum Wheel Chair With fixed Wheels & Plastic Rim, Fixed Armrest, Foldable Weight Bearing Capacity 110 Kg (Multicolor) For Handicap Person as per required specifications and guidelines as per the entire satisfaction of the engineer in charge.

1. Scope of Supply

The work involves providing, checking, and supplying the premium-grade **"Superio" Lightweight Aluminum Manual Wheelchair** (or an approved equivalent institutional model). The wheelchair must feature high-durability fixed rear wheels with integrated plastic hand rims, fixed armrests, a collapsible/foldable frame chassis, and a minimum certified **weight-bearing capacity of 110 kg**. Units must be delivered complete with all functional elements, operating manuals, and standard manufacturer warranties to the entire satisfaction of the Engineer-in-Charge.

2. Structural & Frame Specifications

The frame construction must utilize advanced lightweight alloys to ensure low rolling resistance, easy portability, and high structural integrity:

Parameter [Technical Specification Requirement
Frame Material	High-tensile, aircraft-grade Aluminum Alloy
Surface Treatment	Multi-color anodized or premium powder-coated anti-scratch finish
Folding Mechanism	Heavy-duty Dual Cross-Brace System for stable, tool-free side folding
Weight Capacity	Minimum 110 kg certified safe structural payload
Gross Weight	Lightweight design (typically ranging between 12 kg to 15 kg)

3. Wheel, Rim, and Brake Assemblies

The wheel units must be built for low maintenance and flat-free operation on both smooth indoor surfaces and outdoor walkways:

- **Rear Wheels:** Heavy-duty, large-diameter **Fixed Propelling Wheels** (typically 22 to 24 inches) featuring impact-resistant solid rubber or polyurethane (PU) tubeless tires (100% puncture-proof).
- **Hand Rims:** High-impact, ergonomically molded **Plastic Hand Rims** attached securely to the rear wheels to allow self-propulsion without transferring cold or heat to the user's hands.
- **Front Castors:** Heavy-duty, 6-inch to 8-inch wide-profile PU solid front omnidirectional wheels fitted with precision steel ball bearings for smooth $\{360^{\circ}\}$ maneuvering.
- **Braking System:** Dual, hand-operated **Toggle-Link Wheel Parking Brakes** accessible on both sides. These must lock the rear wheels firmly during patient boarding or wheelchair-to-bed transfers.

4. Seating, Armrest, and Footrest Ergonomics

- **Upholstery Matrix:** Heavy-duty, double-stitched **Nylon or Oxford fabric** that is breathable, washable, stain-resistant, and fire-retardant. It should feature a reinforced internal lining to prevent sagging over extended use.
- **Armrests:** **Fixed, padded armrests** featuring heavy-duty top cushions. Side panels must include integrated clothing guards to prevent loose garments from tangling in the rear wheel spokes.
- **Footrests:** Swing-away or fixed impact-resistant composite/aluminum footplates. They should include a flip-up design for compact storage and adjustable length settings to comfortably accommodate various user heights.
- **Rear Push Handles:** Ergonomic rubberized attendant handles fitted securely to the rear backrest frame extensions for effortless pushing.

5. Dimensional Constraints

- **Seat Width:** Standard comfort width of **440 mm to 460 mm** (approx. 18 inches).
- **Seat Depth:** Ergonomic depth of **400 mm to 420 mm**.
- **Overall Open Width:** Designed to easily pass through standard accessible toilet/room door clear openings (maximum overall open width under **650 mm**).

6. Inspection and Quality Acceptance

- **Mechanical Testing:** The folding mechanism must operate smoothly without jamming, sticking, or showing frame play.
- **Stability Check:** Each unit must undergo a static stability check with zero frame deformation, wobble, or structural twisting under a 110 kg distributed load.
- **Delivery Condition:** All units must be delivered fully assembled, protected in heavy-duty transit packaging, and free of superficial scratches, dents, or paint defects.

ITEM NO 15 - Providing and supplying STAIRWAY EVACUATION CHAIR evacuation chair for PWD person with 4 Passenger Safety Belts (Head, Chest, Thigh, Foot), Photoluminescent Signage , Adjustable patient head restraint , Wall Mounting Brackets , Friction tracks (Evac+Track technology), Heavy duty wheels , Fold away grip handle /footrest, Footrest, Dual position seat and Dust Cover and as directed by Engineer in charge.

1. Scope of Supply & Installation

The work involves providing, checking, testing, and supplying a premium-grade, tracked **Stairway Evacuation Chair** explicitly designed for the safe horizontal and vertical emergency egress of

Persons with Disabilities (PwD), senior citizens, and injured individuals. The supply must include a comprehensive 4-point safety harness system, specialized friction descent tracking, adjustable posture restraints, integrated fold-away structural extensions, heavy-duty tracking wheels, wall-mounting accessories, photoluminescent directional signage, and an industrial-grade protective dust cover. All components must be delivered fully functional as directed by the Engineer-in-Charge.

2. Structural & Mechanical Framework

Structural Parameter	Technical Specification Standard
Frame Material Matrix	High-tensile, heavy-duty, marine/aircraft-grade Aluminum Alloy
Chassis Surface Finish	Anti-scratch, chemical-resistant, UV-stable powder-coated textured finish
Payload Capacity	Minimum 150 kg to 182 kg safe certified working load
Net Chair Weight	Lightweight, rapid-deployment layout (Maximum weight limit ≤ 14 kg)
Folded Dimensions	Ultra-compact structural footprint (\approx 1050mm Height × 520mm Width × 210mm Depth)

3. Safety, Tracking, & Braking Systems

- **Descent Friction Tracks (Evac+Track Technology):**
 - Fitted with continuous, reinforced, rubberized traction belts supported by self-braking inner tension gear pulleys.
 - The track matrix must establish continuous, slip-free contact across at least two stair nosings simultaneously to automatically govern descending momentum, enabling uniform, single-operator control without runaway risks.
- **4-Point Passenger Safety Harness:**
 - Equipped with four distinct, ultra-heavy-duty woven polypropylene webbed restraint belts featuring heavy-duty, quick-release mechanical buckles.
 - Separate structural anchor zones must lock down the occupant precisely across the **Head/Forehead, Chest, Thighs, and Feet/Ankles** to guarantee zero slip or forward pitch on steep (40°) staircase descents.
- **Wheel Assembly:**
 - **Rear System:** Dual, oversized, heavy-duty puncture-proof castor wheels equipped with fully sealed industrial steel ball bearings for rolling over uneven masonry or debris.
 - **Braking Mechanism:** Dual foot-actuated positive locking rear brakes to keep the chair entirely stationary while boarding the passenger.
- **4. Seating & Passenger Ergonomics**
- **Dual Position Seating Matrix:** Constructed using an industrial-grade, flame-retardant, heavy-duty reinforced woven vinyl hammock seat. The frame must feature adjustable side panels

allowing a flat-seat configuration or a deep-pocket hammock configuration to cater to variable physical deformities or spinal trauma.

- **Adjustable Patient Head Restraint:** A slide-adjustable, padded contour headrest pad designed to limit lateral neck swinging, providing comfort and stability for passengers lacking independent upper-body motor control.
- **Fold-Away Grip Handle & Footrest:** Front-end integrated swing-out or flip-down footplates coupled with rear-hinged ergonomic lift bars. These components must fold completely flush with the primary frame profile when nested on a wall mounting hook.

5. Essential Accessories & Signage Sourcing

1. Photoluminescent Signage:

- A premium **Glow-in-the-Dark Photoluminescent rigid wall plate** (minimum size 200mm × 250mm) to be mounted directly above the stored chair.
 - Signage must comply with **IS 9457 / NBC Part 4** standards, using Class-B or higher strontium aluminate crystals to ensure high-intensity visibility for at least 6 to 8 hours in complete grid power failure darkness.
- ### 2. Wall Mounting Brackets:
- Heavy-duty, industrial carbon-steel hook hangers powder-coated to prevent rust. They must anchor the chair cleanly flush to the wall masonry, leaving the emergency exit corridors completely unobstructed.
- ### 3. Protective Dust Cover:
- Heavy-duty, rip-stop canvas or premium Oxford-weave synthetic fabric dust cover tailored to sit snug over the folded chair. Must feature highly reflective safety decals on the exterior for rapid flashlight locating.

6. Installation & Quality Acceptance Testing

- **Mounting Height Strategy:** Securely bolt the wall mounting bracket to a solid concrete or structural brick column using anchor fasteners. The chair must hang so that its base sits roughly **150 mm to 300 mm off the finished floor level (FFL)** for quick lifting during an emergency evacuation drill.
- **On-Site Mechanical Stress Trial:** Each unit must be deployed from its wall hook within **10 seconds** without binding or jamming. It must demonstrate zero structural twist, track misalignment, or buckle slip under a 110 kg static payload down at least one continuous floor flight of steps

ITEM NO 16 - Providing and laying anti-skid Ceramic tiles 6mm thick in flooring treads of steps and landing laid on a bed of 12mm thick cement mortar 1:3 (1-cement : 3- coarse sand) finishing with flush pointing in white cement.

1.0. Materials

Water shall conform to M-1. Cement mortar shall conform to M-11. **Ceramic 6mm thick tiles** shall conform to relevant Indian standard. The size & colour of **ceramic** tiles shall be approved by Engineer in charge.

2.0. Workmanship

2.1. Bedding :

2.1.1. The sub grade shall be cleaned, wetted and mopped. The bedding shall then be laid evenly over the surface tamped and corrected to desired level and allowed to harden enough to offer a rigid cushion to tiles and to enable the mason to place wooden planks across and squat on it.

2.1.2. The **ceramic flooring tiles** shall be laid on a bed of 12 mm thick cement mortar 1:3 (1 cement : 3 coarse sand). The mortar shall have sufficient plasticity for laying and there shall be no hard lumps that would interfere with the evenness of bedding. The base shall be cleared and well wetted. The mortar shall then be spread in thickness not less than 8 mm. at any place and average 12 mm. thickness. The proportion of the cement mortar shall be as specified in the item.

2.2. Fixing tiles :

2.2.1. The tiles before laying shall be soaked in water for at least two hours. Neat gray cement grout at 33 kg/Cement/Sq.mt. of honey like consistency shall be spread over the mortar bedding as directed. The edges of the tiles shall be smeared with neat cement slurry. The tiles shall be well pressed and gently tapped with a wooden mallet till they are properly bedded and in level with the adjoining tiles. There shall be no hollows in bed or joints. The joints between the tiles shall be as thin as possible in straight line or as per pattern.

2.2.2. The tiles shall not have staggered joints. The joints shall be true to centre line both ways. The Nahni trap coming in the flooring shall be so positioned that its grating shall replace only one tile as far as possible. Where full size tiles cannot be fixed they shall be cut (Swan) to the required size and the edges rubbed smooth to ensure straight and true joints. The joints shall be filled with grey cement grout with wire brush or trowel to a depth of 5 mm. and loose material removed. White cement shall be used for pointing the joints. After fixing the tiles finally in an even plane the flooring shall be kept wet and allowed to nature undisturbed for 7 days. The pattern shall be approved by Engineer in charge.

2.3. Cleaning :

2.3.1. The surplus cement grout that may have come out of the joints shall be cleaned off before it sets. Once the floor has set, it shall be carefully washed, cleared by dilute acid and dried. Proper precautions and measures shall be taken to ensure that the tiles are not damaged in any way till the completion of the construction.

3.0. Mode of measurements & payment

3.1. The work done shall be measured in sq.mt. for visible area of work done. The length and width of the flooring shall be measured not between the faces of skirting or dedos or plastered face of wall as the case may be. The paving under dedo or skirting shall not be measured. No deduction shall be made not extra paid for any opening in the floor of area upto 0.1 sq.mt. Nothing extra shall be paid for laying the floors at different levels in the same rooms.

3.2. The rate shall be for a unit of **one sq. meter**.

ITEM NO 17 - Providing and laying white glazed tiles 6mm thick in skirting risers of steps and dedo on 10mm thick cement plaster 1:3 (1-cement : 3-coarse sand) and jointed with white cement slurry.

1.0. Materials

Water shall conform to M-1. Cement mortar shall conform to M-11. **Glazed vitrified tiles 6 mm thick** shall conform to M-55.

2.0. Workmanship

2.1. Preparation of Surface:

In case of brick masonry wall, the joints shall be raked out to a depth of least **6 mm**. while the masonry

is being laid. In case of concrete wall the surface shall be chiseled and roughed with wire brushes. The surface shall be cleaned and wetted thoroughly before commencing the laying work.

2.2. Laying ;

- 2.2.1.** The wall surface shall be covered with 10 mm. thick plaster of cement plaster 1:3 mix and allowed to harden. The plaster shall be roughened with wire brushes both way. The back of tiles shall be floated with grey cement slurry set and edges with white cement slurry in bedding mortar. The tiles shall be gently tapped in position on after the other keeping the joints as thin as possible. Top of skirting or dedo shall be truly horizontal and the joints vertical or as per required pattern.
- 2.2.2.** Risers of steps, skirting and dedo shall rest on top of treads or flooring where full size tiles cannot be fixed. They shall be cut to the required size and the edges be smoothened.
- 2.2.3.** The joints shall be cleaned and flush pointed with white cement. The surface shall be kept wet for seven days. After curing the surface shall be washed clean.

3.0. Mode of measurements and payment

- 3.1.** The rate shall include the cost of all materials and labour required for various operations described above.

Risers of steps : skirting and dedo shall be measured in square meters, length and height shall be measured along the finished face of the skirting or dedo including curves, where special such as covers internal and external angles, etc. used. The length and height shall be measured correct to the centimeter except in case of risers and skirting where height shall be measured correct to 3 mm.

- 3.2.** The rate shall be for a unit of one **sq. meter**.

ITEM NO 18 - Dismantling tiled of stone floors laid in mortar including stacking of serviceable materilas and disposal of unserviceable materials with all lead and lift.

1.0. Workmanship

- 1.1.** The dismantling tiled of stone floors laid in mortar shall consist of dismantling of one or more parts of the building as specified or shown in the drawings. Dismantling implies taking up or down or breaking up. This shall consist of demolishing whole or part of work including all relevant items as specified or shown in the drawings.
- 1.2.** The dismantling tiled of stone floors laid in mortar shall always be planned before hand shall be done in reverse order to the one in which the structure was constructed. This scheme shall be got approved from the Engineer-in-charge before starting the work.
This however will not absolve the contractor from the responsibility of proper and safe demolition.
- 1.3.** Necessary propping, shoring and under pinning shall be provided for the safety of the adjoining work or property, which is to be left intact, before dismantling and demolishing is taken up and the work shall be carried out in such a way that no damage is caused to the adjoining property.
- 1.4.** Wherever required, temporary enclosures or partitions shall also be provided. Necessary precautions shall be taken to keep the dust nuisance down as and where necessary.
- 1.5.** Dismantling shall be commenced in a systematic manner. All materials which are likely to be damaged by dropping from a height or demolishing roof, masonry etc. shall be carefully dismantled first. The dismantled articles shall be properly stacked as directed.

- 1.6. All materials obtained from demolition shall be the property of Government unless otherwise specified and shall be kept in safe custody until handed over to the Engineer-in-charge.
- 1.7. Any serviceable materials, obtained during dismantling or demolition shall be separated out and stacked properly as directed with all lead and lift. All unserviceable materials, rubbish etc. shall be stacked as directed by the Engineer-in-charge.
- 1.8. On completion of work, the site shall be cleared of all debris rubbish and cleaned as directed. Dismantling implies carefully taking up or down or removing without damage. The articles shall be passed by hand where necessary and lowered and where these are fixed by nail, screws, bolts etc., these shall be taken out with proper tools.
- 2.0. Mode of measurements and payment**
- 2.1. Measurements of all work except hidden work shall be taken before dismantling tiled or stone floors laid in mortar and no allowance for increase in bulk shall be allowed. The dismantling tiled or stone floors laid in mortar of lime concrete shall be measured under this item. Specification for deduction for voids, openings etc. shall be on same basis as that employed for construction of work,
- 2.2. All work shall be measured in decimal system as fixed in its place subject to the following limits; unless otherwise stated hereinafter : (a) Dimensions shall be measured to the nearest 0.01 mt. (b) Area shall be worked out to the nearest 0.01 sq. mt. (c) Cubical contents shall be worked out to the nearest 0.01 Cu.m.
- 2.3. The rate shall include cost of all labour involved and tools used in demolishing and dismantling including scaffolding. The rate shall also include the charges for separating out and stacking the serviceable materials properly and disposing the unserviceable materials with all lead and lift. The rate also includes for temporary shoring for the safety of the portion not required to be pulled down or of adjoining property and providing temporary enclosures or portions where considered necessary. The rate shall include stacking the unserviceable materials as directed with all lead and lift.
- 2.2. The Rate shall be for a unit of one sq. meter.

ITEM NO 19 - Dismantling sanitary fittings like wash basin . W.C. pan Indian and European type, flushing tank etc. including stacking the materials with all lead and lift.

1.0. Workmanship

The relevant specifications of **Item No. 18** shall be followed except that the Wash Basin , W.C. pan indian & European type , flushing tank , including chowkhats, architraves, hold fasts and other attachments etc. are to be dismantled.

2.0. Mode of measurements & payment

- 2.1. The relevant specifications of **Item No. 18** shall be followed.
- 2.2. The doors, windows, ventilator etc. not exceeding 3 sq. mt. in area (each) including shutters and chowkhats. Architraves, hold fasts and other attachments to frames etc. will be dismantled and measured under this item.
- 2.3. The rate includes stacking the serviceable materials as and where directed with all leads and lifts.
- 2.4. The rate shall be for a unit of one **number**.

ITEM NO 20 - Providing and fixing screw down bib taps of following size. (A) Brass screw down bib tap polished bright. (i) 15mm dia.

General

This work shall consist of providing and fixing screw down bib taps of the shape and dimensions shown on the drawings and conforming to these Specifications or as approved by the Engineer in charge.

1.0 MATERIAL

1.0 Bib Cock

1.1. Bib cock of specified 15 mm diameter nominal bore shall conform to I.S. 781-1977. The Bib Cock shall be best Indian make and quality .

1.2 Bib cock shall be polished bright of best quality.

1.3 A Bib cock is a draw off tap with a horizontal inlet and free outlet. A stop cock is a valve with a suitable means of connection of insertion in a pipe line for controlling or stopping the flow.

1.4 They shall be screw down type and or polished bright and of diameter as specified in the description of the item. They shall conform to I.S 781-1977 and they shall be of best Indian make. They shall be polished bright.

1.5 The minimum finished weight of bib cock and stop cock shall be as given below

Diameter	Bib cock	Stop Cock	Diameter	Bib cock	Stop cock
8 mm	0.25 kg.	0.25 kg.	15 mm	0.40 kg.	0.40 kg.
10 mm	0.30 kg.	0.35 kg.	20 mm	0.75 kg.	0.75 kg.

1.6. The Necessary galvanized fittings like Nipple, Casing etc, of best quality and makes as approved by the Engineer-in-charge required for specified dia. bore Bib cock shall be used for fitting Bib cock as necessary

.2.0. WORKMANSHIP

Curing, Laying & Jointing

2.1. When the Bib cock is to be fitted, the ends shall be carefully filed out so that no obstruction to bore in offered. The Bib cock shall be fitted with pipes carefully in such a manner as will not result in slackness of joints when the two pieces are screwed together

2.2 In jointing the Bib cock the inside of the socket and the screwed end of the Bib cock shall be oiled and smeared with the white or red lead and wrapping around with a few turns of fine spun yarn round the screwed end of the Bib cock. The end shall then be tightly screwed in the socket, Tees etc with a pipe wrench Care shall be taken that all items are free from dust, dirt and rust during fixing Burr from the joints shall be removed after screwing After laying the open ends of the Bib cock shall be temporarily plugged to prevent excess of water soil or any other foreign matter.

2.3. Any threads exposed after jointing shall be painted or in the case of underground piping thickly coated

with approved anti corrosive paint to prevent corrosion

TESTING OF JOINTS

After fitting, the Bib cocks shall be inspected under working conditions of pressure and flow. Any joints found liken shall be redone, and all leaking Bib cocks shall be removed and replaced without extra cost.

The Bib cocks after they are fitted shall be tested to hydraulic pressure of 6 kg / sq. cm. The Bib cock shall be slowly and carefully charged with water allowing all air to escape and avoiding all shock and water hammer. The draw off takes and stop cock shall then be closed and specified hydraulic pressure shall be applied gradually. The Bib cocks shall be tested in sections as the work laying proceeds, veeping the joints exposed for inspection during the testing.

3.0 MODE OF MEASUREMENT & PAYMENT :

3.1. The unit rate of Bib cock shall include the cost of all materials, tools and plant required for fitting, the same to specified position as per drawings, and as directed by Engineer in charge finishing structure, etc. and all other incidental expenses for producing Bib cock work to complete the structure or its components as shown on the drawings, and as directed by Engineer in charge and according to these specifications. They shall also include the cost of making, fixing and removing of all scaffolding and forms required for the work.

The rate of Bib cocks shall include the cost of all labour, materials, G. I. fittings as required, tools and plant scaffolding and all incidental expenses as described herein above.

3.2. The Bib cock shall be measured for its Number, limiting dimensions to those specified on plan or as directed. The rate shall be for a unit of one Number.

3.3. The payment will be made on **number** basis of the finished work.

ITEM NO 21 - Excavation for foundation upto 1.50 m. depth including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 meter lead (A) Loose or soft soil.

1.0. All sorts of soil

Any soil which generally require close application of picks or jumpers or scarifies to loosen it stiff clay, gravel and stone etc. fall under this category.

2.0. Workmanship

The relevant specifications of **Item No. 1** shall be followed except that the excavation work shall be carried out in dense or hard soil with lift **from 1.5 mt. to 3.00 mt.** depth.

3.0. Mode of measurements & payment

3.1. The relevant specifications of **item No. 1** shall be followed

- 3.2. The excavation work of **depth from 1.5 mt. to 3.00 mt.** shall be measured under this item
- 3.3. The rate shall be for a unit of one cubic meter.

ITEM NO 22 - Filling in plinth with sand under floors including watering, ramming, and consolidating, dressing etc. Complete.

1 Scope

- Filling the excavated or void spaces in foundation trenches (sides/backfill) and within the plinth area (inside walls, up to plinth beam bottom or finished floor level) with approved filling material, placed, watered, rammed/compactified in controlled layers to achieve proper density and avoid future settlement.

2 Material

- **Murum** (preferred in many regions): Well-graded, reddish/yellowish murum soil (lateritic/gravelly type), free from organic matter, roots, vegetation, black cotton soil, clay lumps, salts, debris, or deleterious materials. Typical acceptable properties (from various project specs): Liquid limit ≤ 40 , Plasticity index ≤ 20 , minimum dry density after compaction $\sim 1.7\text{--}1.8 \text{ g/cm}^3$ or as per field Proctor test.
- **Selected soil / Selected earth:** Granular soil, sandy loam, or excavated earth free from black cotton soil, organic content, roots, stones $>75\text{--}100 \text{ mm}$, garbage, or harmful salts. Avoid expansive clays.
- Material source shall be approved by the Engineer-in-Charge.
- No black cotton soil, marshy/peaty soil, or topsoil with vegetation shall be used.

3 Preparation of Area

- Clear the area of all loose soil, debris, vegetation, roots, stumps, water, slush, or organic matter.
- Level the base surface (bottom of excavation or after foundation concrete).
- Remove any soft pockets and replace with approved material if needed.
- Ensure no standing water; dewater if required.

4 Layering and Placement

- Fill in **horizontal layers not exceeding 20 cm loose thickness** (before compaction).
- Some stricter specifications allow 15-20 cm or max 15 cm for better control.
- Spread uniformly; break clods/lumps.
- Do not dump material in thick heaps—spread evenly to avoid poor compaction in lower parts.

5 Watering / Moisture Content

- Add water to bring the material to **optimum moisture content (OMC)** for best compaction (typically checked by feel or Proctor test).
- Sprinkle water uniformly (do not flood excessively to avoid softening base or washing fines).
- In dry areas, water may be added during spreading; in wet seasons, natural moisture may suffice.

6 Compaction / Ramming / Consolidation

- Each layer shall be thoroughly compacted to achieve **dense, uniform mass** with no voids.
- Methods (as per site conditions and approval):
 - Manual: Heavy rammers (7-10 kg iron rammers), crowbars, or wooden/steel tampers (common in small/medium residential works).
 - Mechanical (preferred for larger areas): Plate compactors, vibratory rollers (8-10 tonne), or smooth drum rollers (4-6 passes typical).

- Compact until no further settlement occurs under the rammer/roller, surface appears firm, and achieves min. 90-95% of Standard Proctor density (field density test may be required in important works).
- Successive layers shall only be placed after the previous layer is fully compacted and approved.

7 Sequence and Precautions

- Start filling immediately after foundation concrete gains strength (to utilize curing water for moisture).
- Fill symmetrically on both sides of walls/columns to avoid unequal pressure.
- Protect foundations from damage during ramming.
- In plinth area, fill up to bottom of plinth beam/floor level (or as per drawing).
- Top surface shall be trimmed/levelled to required slope/grade.

8 Testing / Quality Control

- Visual: Firm surface, no settlement under foot/roller, no pumping.
- Field density test (sand replacement or core cutter) if specified (common in govt./large projects).
- No layer shall be covered until approved by Engineer-in-Charge.

9 Measurement & Payment

- Measured in cubic metres (m³) of finished compacted volume.
- Deduct volume of concrete/structures within the filled area.
- Rate includes all leads, material (if brought from outside), watering, compaction tools, labour, etc.

ITEM NO 23 - Providing and laying cement concrete flooring 1:2:4 (1-cement : 2- coarse sand : 4-graded stone aggregate 20mm nominal size) laid in one layer and finished with a floating coat of neat cement. (B) 50mm thick.

1.0 Materials

1.1. Water shall conform to M-1. Cement shall conform to M-1. Sand shall conform to M-2. Graded stone aggregate 20 mm. nominal size shall conform to M-15.

2.0 Workmanship

2.1. General

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

2.2. Proportion of Mix:

2.2.1. The proportion of cement, sand and stone aggregate shall be one part of cement. 4 parts of coarse sand and 8 parts of **graded** stone aggregates and shall be measured by volume.

2.3. Mixing:

2.3.1. The concrete shall be mixed in a mechanical mixer at the site of work. Hand mixing may however be allowed for smaller quantity of work if approved by the Engineer-in-charge. When hand mixing is permitted by the Engineer-in-charge in case of break-down of machineries and in the interest of the work, it shall be carried out on a water tight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency, However in such case 10% more cement than otherwise period 1 1/2 to 2 minutes. The quantity of water shall be just sufficient to produce a dense concrete of required workability for the purpose.

2.4. Transporting & Placing the Concrete:

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

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

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

2.6. Curing:

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

3.0 Mode of measurement and payment

3.1. The concrete shall be measured for its length, breadth and depth, limiting dimensions to those specified on plans or as directed

3.2. The rate shall be for a unit of **one Square meter**.

ITEM NO 24 - Finishing wall with weather proof exterior emulsion paint on wall surface (two coats) to give an required shape even shade after thoroughly brushing the surface to remove all dirt, and remains of loose powdered materials.etc complete.

General

This work shall consist of painting the walls with weather proof exterior emulsion paint on wall surfaces two coats of painting and one coat of primer coat paint of the shape and dimensions shown on the drawings and conforming to these specifications or as approved by the Engineer in charge.

MATERIALS

1.0 Exterior Emulsion Paint

Exterior emulsion paint shall be of specified colour as approved by Engineer in charge the ready mixed exterior emulsion paint shall not be allowed, If however ready mix emulsion paint of specified shade or tint is not available white ready mixed paint with approved Steiner will be allowed in such case the contractor shall ensure that the shade of the paint so allowed shall be uniform exterior emulsion paint shall meet with the following general requirements

1. Exterior emulsion paint shall not show excessive setting in freshly opened full can and shall easily be redepressed with a paddle to a smooth homogeneous state. The exterior emulsion paint shall show no curding, livering cracking or colour separation and shall be free from lumps and skins.
2. The exterior emulsion paint as received shall brush easily possess good leveling

properties and show no running or sagging tendencies.

3. The exterior emulsion paint shall not skin within 48 hours in a three quarters filled closed container
4. The exterior emulsion paint shall dry to a smooth uniform finish free from roughness grit unevenness and other imperfections
5. Ready mix exterior emulsion paint if allowed for specified shade, shall be used exactly as received from the manufacturers and generally according to their instruction and without any admixtures whatsoever.

2.0 WORKMAN SHIP

2.1 Scaffolding :

Where scaffolding is required, it shall be erected in such a way that as far as possible no part of scaffolding shall rest against the surface to be distempered. A properly secured strong and well tied suspended platform (joola) may be used for distempering. Where ladders are used, pieces of old gunny bags.

3.0 Application coat :

The exterior emulsion paint on wall surfaces two coats of painting and one coat of primer coat paint of shall be diluted with water or any other prescribed thinner in a manner recommended by the manufacturer only. Sufficient quantity of distemper required for a day's work shall be prepared.

- 3.1 For undecorated surfaces, after the primer coat is dried for at least 48 hours, the surface shall be lightly sand papered to make it smooth for receiving the exterior emulsion paint, taking care not to rub out the priming coat. All loose particles shall be dusted off after rubbing. Minimum two coats of the exterior emulsion paint shall be applied with brushes in horizontal strokes followed immediately by vertical strokes which together shall constitute one coat. The subsequent coats shall be applied after a time interval of at least 24 hours between consecutive coats to permit proper drying of the preceding coat. The finished surface shall be even and uniform without patches, brush marks, distemper drops etc.
- 3.2 Sufficient quantity of the exterior emulsion paint shall be mixed to finish one room at a time.

3.0 MODE OF MEASUREMENT & PAYMENT :

- 3.1. The unit rate wall painting with exterior emulsion paint shall include the cost of all materials, tools and plant required for mixing, cleaning brushing sand papering & painting with all required specials and Lapi compound, finishing as per direction of the Engineer-in-charge, and all other incidental expenses for producing pipe line work of specified diameter to complete the structure or its components as shown on the drawings and according to these specifications. They shall also include the cost of making, fixing and removing of all

scaffolding and forms required for the work.

- 3.2 The rate of wall painting with exterior emulsion paint shall include the cost of all labour, materials tools and plant scaffolding and all incidental expenses as described herein above.
- 3.3. The wall painting with exterior emulsion paint shall be measured for its length and height limiting dimensions to those specified on plan or as directed. The rate shall be for a unit of one square meter.
- 3.4. The payment will be made on **square meter** basis of the finished work.

ITEM NO 25 - Dismantling of old railing including distempering and stacking the materials with all lead and lift.

1.0. Workmanship

The relevant specifications of **Item No. 18** shall be followed except that the old railing including distempering and stacking the materials etc. are to be dismantled.

2.0. Mode of measurements & payment

- 2.1. The relevant specifications of **Item No. 18** shall be followed.
- 2.2. The doors, windows, ventilator etc. not exceeding 3 sq. mt. in area (each) including shutters and chowkhats. Architraves, hold fasts and other attachments to frames etc. will be dismantled and measured under this item.
- 2.3. The rate includes stacking the serviceable materials as and where directed with all leads and lifts.
- 2.4. The rate shall be for a unit of one **number**.

Deputy Executive Engineer
Pan R & B Sub Division
Patan

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Pan R & B Sub. Division
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