



**GOVERNMENT OF GUJARAT**

**ROADS AND BUILDING DEPARTMENT**

**Ahmedabad City (R&B) Circle,**

**Ahmedabad**

**Name  
of  
Work**

**S.R to New Annexe Building at shahibag, Ahmedabad.(repairing and renovation of 3rd floor suit rooms - shifting of walls, construction of new bathroom, flooring work, door work, false ceiling work, colour work, furniture work and Other misc.work)**

**VOLUME 5 : TECHNICAL SPECIFICATIONS**

## **Item No – 1**

**Dismantling aluminium/gypsum partitions, doors, windows, fixed glazing and false ceiling, including disposal of unserviceable material and stacking of serviceable material within a lead of 50 metres, complete as directed by the Engineer-in-Charge.**

### **1. Materials**

No major construction material is required for this item as the work pertains to dismantling of existing components.

Where temporary supports, packing materials, ropes, scaffolding, ladders or protective coverings are required for safe dismantling operations, the Contractor shall arrange the same at his own cost.

The materials recovered from dismantling shall be classified as:

#### **Serviceable Materials**

- Aluminium sections
- Aluminium doors and windows
- Glass panels and glazing units
- Gypsum boards in reusable condition
- Ceiling suspension systems
- Hardware and fittings
- Fasteners and accessories

#### **Unserviceable Materials**

- Broken glass
- Damaged gypsum boards
- Bent aluminium members
- Corroded fittings
- Damaged ceiling suspension members
- Debris and waste materials

All recovered materials shall remain the property of the department unless otherwise specified.

## 2. Workmanship

The dismantling work shall be carried out carefully and systematically to avoid damage to adjoining structures, finishes, services and reusable materials.

Before commencement of work, the contractor shall inspect the site and identify electrical, plumbing, fire-fighting, HVAC, communication and other services passing through or connected to the partitions, doors, windows, glazing or false ceiling.

Necessary precautions shall be taken to isolate or protect such services before dismantling operations begin.

The dismantling sequence shall be planned to ensure stability and safety throughout the operation.

### Dismantling of Aluminium Partitions

Aluminium partition members, cover plates, glazing beads, clips, fasteners and accessories shall be carefully removed.

Members intended for reuse shall be dismantled without bending, twisting or damaging the sections.

All screws, brackets and fixing accessories shall be removed completely.

### Dismantling of Gypsum Partitions

Gypsum boards shall be removed systematically from supporting framework.

Where materials are required to be salvaged, removal shall be carried out carefully to minimize breakage.

Metal studs, runners and accessories shall be dismantled after removal of boards.

Remaining anchors and projections shall be removed and surfaces made safe.

### Dismantling of Doors and Windows

Door shutters, hinges, locks, handles, floor springs, closers and other hardware shall be removed carefully.

Frames shall be dismantled without causing damage to adjacent walls, flooring or finishes.

All anchor fasteners, holdfasts and fixing arrangements shall be removed.

### Dismantling of Fixed Glazing

Glass panels shall be removed carefully using suitable tools and safety equipment.

Glazing beads, rubber gaskets, sealants and fixing accessories shall be removed completely.

Broken glass shall be immediately collected and safely disposed of.

Particular care shall be exercised to prevent injury to workers and occupants.

### Dismantling of False Ceiling

Ceiling tiles, gypsum boards, grid members, suspension rods, channels, hangers and accessories shall be dismantled systematically.

The work shall proceed in a manner that avoids sudden collapse or falling of materials.

Electrical fixtures, diffusers, grilles, detectors, speakers and other services installed in the ceiling shall be protected during dismantling.

### Stacking of Serviceable Materials

Serviceable materials shall be cleaned and stacked neatly at locations designated by the Engineer-in-Charge.

Materials shall be sorted according to type and size.

Glass panels shall be stacked vertically with proper support.

Aluminium sections shall be stacked to prevent distortion.

### Disposal of Unserviceable Materials

Unserviceable materials, debris and waste shall be collected, loaded and disposed of as directed.

Disposal shall be carried out within the specified lead of 50 metres unless otherwise directed.

The site shall be kept clean throughout the operation.

### Safety Requirements

Necessary barricading, warning signs and protective measures shall be provided.

Workers shall use appropriate personal protective equipment including helmets, gloves, safety shoes, eye protection and safety belts where required.

Special care shall be taken while handling glass and overhead dismantling works.

Upon completion, the area shall be left clean, safe and free from debris.

### 3. Mode of Measurement & Payment

Measurement shall be carried out in **Square Metre (Sq.M.)** of actual dismantled area.

## **Item No – 5**

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

### 1. Materials

No major construction material is required for this dismantling item.

Where required, the contractor shall arrange necessary tools, chisels, hammers, scrapers, wire brushes, ladders, scaffolding, debris collection bags and safety equipment for execution of the work.

Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

Water may be used for dust suppression and cleaning during removal operations.

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### 2. Workmanship

The work shall consist of removing and scraping old, loose, cracked, bulged, hollow, deteriorated or damaged plaster from walls, columns, beams, slabs, R.C.C. members and other surfaces as directed by the Engineer-in-Charge.

Prior to commencement of work, the contractor shall inspect the surfaces and identify the extent of damaged plaster requiring removal.

Necessary precautions shall be taken to protect adjoining finished surfaces, doors, windows, flooring, electrical fittings, plumbing fixtures and other installations from damage during dismantling operations.

#### Removal of Plaster

The deteriorated plaster shall be carefully removed manually using hammers, chisels, scrapers or approved mechanical tools.

Removal shall continue until sound and firm plaster or parent surface is exposed.

Partially detached, weak or hollow-sounding plaster shall also be removed even if not visibly damaged.

The operation shall be carried out carefully to avoid damage to masonry, concrete surfaces, reinforcement bars, embedded conduits or other structural elements.

#### Scraping and Cleaning

After removal of plaster, the exposed masonry or R.C.C. surface shall be thoroughly scraped and cleaned.

All loose mortar, dust, laitance, paint residues, efflorescence, dirt and foreign matter shall be removed.

The surface shall be left rough enough to provide adequate bond for subsequent repair plastering.

Any exposed reinforcement observed during dismantling shall be reported to the Engineer-in-Charge for further instructions.

#### Handling of Removed Material

The removed plaster debris shall be collected regularly and shall not be allowed to accumulate at the work location.

Serviceable materials, if any, identified by the Engineer-in-Charge shall be carefully separated and stacked at designated locations.

## Disposal of Unserviceable Material

All unserviceable debris, broken plaster, dust and waste materials shall be removed from the site of work and disposed of at approved dumping locations.

The rate shall include all leads and lifts involved in transporting debris from the point of dismantling to the disposal location.

## Protection and Safety

Necessary scaffolding, ladders, working platforms and safety arrangements shall be provided wherever required.

Care shall be taken to prevent falling debris from causing injury to workers or occupants.

Barricades, warning signs and protective coverings shall be provided in occupied areas.

Workers shall use appropriate personal protective equipment such as helmets, gloves, goggles, dust masks and safety shoes.

## Completion

Upon completion of dismantling, the exposed surface shall be thoroughly cleaned and made ready for further repair or plastering work.

The work area shall be left neat, clean and free from debris to the satisfaction of the Engineer-in-Charge.

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## 3. Mode of Measurement & Payment

Measurement shall be carried out in **Square Metres (Sq.M.)**.

### **Item No – 10**

**Providing and erecting two legged metal tubular scaffolding (cup lock type) of width 1200 to 1500mm largely free standing using H frames of tubular pipes of minimum 40mm diameter, with base plates fixed or adjustable with necessary clamps, couplers, brackets for projections, joint pins, pulleys and other accessories including steel angle or tubular pipe bracings at adequate intervals, access platforms of metal or timber planks of span not exceeding 1.5 metre centre to centre, horizontal & vertical tubes joint with cup & lock system with M.S.**

**Tubes, M.S. tube chalis, M.S. clamps and staircase system in the scaffolding for working platform etc. and maintaining it in a serviceable condition for execution of work including provision of rubber inserts to pipe ends at point of contact with structure to avoid damage, including ccess ladders with intermediate platforms. the scaffolding to be suitably braced and anchored to to the building using support systems created temporarily at the opening in walls using verticl and horizontal adjustable propson the exterior side of building structure, upto 25 metre height, above ground level**

## 1. Materials

### Mild Steel Tubular Sections

Structural Steel : Shall Conform to M22 Page No.-14 in General Technical Specification Booklet.

The scaffolding tubes shall be heavy-duty mild steel tubes conforming to relevant IS standards. Tubes shall be straight, free from cracks, dents, excessive corrosion, distortions and other defects.

### Base Plates

Base plates shall be fabricated from mild steel plates of adequate thickness capable of safely transferring loads to supporting surfaces.

### Adjustable Base Jacks

Adjustable base jacks shall be manufactured from heavy-duty steel and shall permit accurate leveling of scaffolding.

### Clamps, Couplers and Joint Pins

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

All couplers, clamps, locking devices and joint pins shall be of approved quality and capable of safely resisting design loads.

### Steel Bracings

Structural Steel : Shall Conform to M22 Page No.-14 in General Technical Specification Booklet.

Diagonal and horizontal bracing members shall be fabricated from steel tubes or steel angle sections.



### Timber Planks (Where Used)

Timber planks used as working platforms shall be sound, free from decay, splits, excessive knots and defects affecting strength.

### Metal Working Platforms

Steel platform members shall be slip-resistant and capable of supporting the imposed working loads safely.

### Rubber Inserts

Rubber inserts shall be provided at points where scaffolding comes in contact with the building structure to prevent damage to finished surfaces.

### Staircase Units and Access Ladders

Access systems shall be fabricated from steel sections and designed for safe movement of workers and materials.

### Safety Components

Guard rails, toe boards, hand rails, locking pins and safety accessories shall be provided as required under applicable safety standards.

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## 2. Workmanship

The scaffolding shall be designed, erected, maintained and dismantled under the supervision of competent personnel experienced in scaffolding works.

The entire scaffolding system shall be capable of safely carrying its self-weight, working loads, impact loads, material loads and wind loads anticipated during execution.

### Site Preparation

The ground on which scaffolding is erected shall be firm, stable and adequately prepared.

Loose soil, debris or unstable surfaces shall be compacted or suitably strengthened before erection.

Base plates and adjustable jacks shall be placed on firm bearing surfaces to ensure uniform load distribution.

### Erection of Scaffolding

The scaffolding shall consist of two-legged cup-lock type system having overall working width between 1200 mm and 1500 mm.

Vertical standards shall be erected truly plumb and accurately aligned.

Horizontal ledgers and transoms shall be connected using cup-lock arrangements to provide a rigid framework.

The cup-lock connections shall be fully locked and secured before loading the scaffold.

### Bracing

Adequate diagonal, horizontal and cross bracing shall be provided throughout the structure.

Bracing shall be installed at intervals sufficient to prevent sway, distortion or instability.

Special bracing arrangements shall be provided at corners, projections and areas subjected to higher loading.

### Working Platforms

Working platforms shall be provided at required elevations using approved steel decks or timber planks.

Platform spans shall not exceed 1.50 metres centre to centre.

Platforms shall be level, stable and securely fixed against displacement.

Gaps between adjacent platform members shall be minimized.

### Guard Rails and Toe Boards

All working platforms above ground level shall be provided with guard rails and toe boards.

Guard rails shall be securely fixed and capable of resisting accidental impacts.

Toe boards shall be provided to prevent materials from falling.

## Access Arrangements

Access to all working levels shall be provided through staircase systems and access ladders.

Intermediate landings shall be provided at suitable intervals.

Ladders shall be securely fixed and shall extend adequately above landing levels.

## Anchoring and Tying

The scaffolding shall be securely tied and anchored to the building structure.

Anchoring shall be carried out using approved support systems, adjustable horizontal and vertical props and temporary structural supports.

Anchors shall be provided at adequate spacing both vertically and horizontally.

The anchoring arrangement shall ensure stability under working and wind loads.

## Protection of Building Surfaces

Rubber inserts or approved protective materials shall be installed at contact points between scaffolding members and the building structure.

No damage to completed finishes, glazing, cladding, plaster or paintwork shall be permitted.

## Maintenance During Use

The contractor shall maintain the scaffolding in safe and serviceable condition throughout the contract period.

Loose fittings, damaged members, deformed tubes or defective components shall be immediately repaired or replaced.

Periodic inspections shall be carried out and recorded.

## Safety Requirements

The scaffolding shall comply with applicable safety regulations and good engineering practice.

The contractor shall provide:

- Guard rails
- Toe boards

- Safety handrails
- Access ladders
- Working platforms
- Warning signage
- Barricading
- Safety nets wherever required
- Illumination for night work

Overloading of scaffolding shall not be permitted.

Materials shall be distributed uniformly over working platforms.

Dismantling

After completion of work, the scaffolding shall be dismantled carefully without causing damage to the building, adjacent property or completed work.

All materials shall be removed from site and reusable components shall be properly stacked.

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### 3. Mode of Measurement & Payment

Mode of Measurement

The scaffolding shall be measured in **Square Metres (Sq.M.)** of the actual surface area of scaffolding erected against the structure.

#### **Item No – 13**

**Providing and laying AAC block masonry using factory-made Grade-I AAC blocks of density 551–650 kg/m<sup>3</sup> conforming to IS 2185 (Part 3), in superstructure above plinth level up to floor V level, in cement mortar 1:4 (1 cement : 4 coarse sand), including cutting, dressing, scaffolding, curing, and placing in position complete. The rate shall include providing and embedding 2 Nos. 6 mm diameter M.S. reinforcement bars at every third course of masonry, complete in all respects as directed by the Engineer-in-Charge.**

#### 1. Materials

AAC Blocks

AAC (Autoclaved Aerated Concrete) blocks shall be factory manufactured Grade-I quality conforming to **IS 2185 (Part 3)**.

The blocks shall have:

- Dry density between 551 kg/m<sup>3</sup> and 650 kg/m<sup>3</sup>.
- Uniform size and shape.
- Sharp edges and square corners.
- Homogeneous cellular structure.
- Freedom from cracks, warping and defects.

Blocks shall be supplied from approved manufacturers and shall comply with specified compressive strength requirements.

Cement

Cement : Shall Conform to M3 Page No.-9 in General Technical Specification Booklet.

Sand

Sand : Shall Conform to M6 Page No.-10 in General Technical Specification Booklet.

Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

Cement Mortar

Cement Mortar : Shall Conform to M11 Page No.-11 in General Technical Specification Booklet.

The mortar shall consist of one part cement and four parts coarse sand by volume.

Fresh mortar shall be prepared in quantities required for immediate use and shall not be retempered after initial setting.

Reinforcement Bars

Mild Steel Bars : Shall Conform to M18 Page No.-13 in General Technical Specification Booklet.

The reinforcement shall consist of **2 Nos. 6 mm diameter M.S. bars** embedded at every third course of masonry.

Bars shall be straight, free from rust, oil, scales and other deleterious matter.

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## 2. Workmanship

The work shall be executed in accordance with IS 1905, IS 2212, IS 2185 (Part 3), approved drawings and directions of the Engineer-in-Charge.

### Preparation

AAC blocks shall be properly stacked and protected from damage and moisture before use.

The top surface of plinth beam, slab or supporting member shall be cleaned and wetted before commencement of masonry work.

Layout lines shall be marked accurately to ensure proper alignment and dimensions.

### Preparation of Mortar

Cement mortar in proportion 1:4 shall be prepared using approved cement and coarse sand.

Mixing shall be carried out mechanically or manually on watertight platforms until a uniform mix is obtained.

Only fresh mortar shall be used.

### Laying of AAC Blocks

Blocks shall be laid in regular courses with full mortar bedding.

All bed joints and vertical joints shall be completely filled with mortar.

The thickness of joints shall generally be maintained between 10 mm and 12 mm unless otherwise specified.

Blocks shall be laid true to line, level and plumb.

Vertical joints in successive courses shall be staggered to ensure proper bond.

Half blocks and cut blocks shall be used only where necessary.

Cutting of AAC blocks shall be carried out using approved cutting tools to obtain neat and accurate dimensions.

Broken or damaged blocks shall not be used.

## Reinforcement in Masonry

Two numbers 6 mm diameter M.S. reinforcement bars shall be embedded continuously at every third course of masonry.

The reinforcement shall be placed centrally in the mortar bed and adequately covered with mortar.

Bars shall be properly lapped where required and securely positioned during laying.

Openings, junctions and corners shall receive additional reinforcement wherever directed by the Engineer-in-Charge.

## Alignment and Tolerances

The masonry shall be maintained truly plumb, level and aligned.

Maximum permissible deviation shall comply with IS recommendations.

Corners shall be accurately formed and properly bonded.

## Junction with RCC Members

At junctions of AAC block masonry with columns, beams and slabs, approved bonding arrangements shall be provided.

The masonry shall be properly integrated with adjoining structural elements to minimize cracking.

## Scaffolding

Suitable scaffolding shall be provided wherever necessary for execution of work.

Scaffolding shall be strong, safe and adequately braced.

Any holes left after removal of scaffolding shall be properly filled and finished.

## Curing

The masonry shall be protected from rapid drying and properly cured.

Curing shall commence as soon as the mortar has sufficiently hardened and shall continue for a minimum period of seven days.

## Finishing

The completed masonry shall present a neat, uniform and workmanlike appearance.

Mortar droppings and stains shall be cleaned regularly.

The masonry shall be left ready for plastering or finishing work.

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### 3. Mode of Measurement & Payment

Measurement shall be carried out in **Cubic Metres (Cu.M.)** of finished AAC block masonry.

### Item No – 14

**Providing and laying ordinary cement concrete M-25 Grade (1 Cement 1- coarse sand : 2- graded stone aggregates 20 mm nominal size) for R.C.C Item Like Slabs, landing, shelves, Balconis , Lintels, Beams, Girders, Cantilever, Column & Base of column including finishing smooth with,curing etc. complete including the cost of formwork but excluding the cost of reinforcement.**

#### 1. Materials

##### Cement

Cement : Shall Conform to M3 Page No.-9 in General Technical Specification Booklet.

Cement shall be fresh, free from lumps and of approved make. It shall be stored in dry weatherproof sheds and handled to prevent deterioration.

##### Sand

Sand : Shall Conform to M6 Page No.-10 in General Technical Specification Booklet.

The sand shall be clean, hard, durable and free from clay, silt, organic impurities and deleterious substances.

##### Coarse Aggregate

For nominal mix concrete:



Stone Coarse for Nominal Mix Concrete : Shall Conform to M12 Page No.-11 in General Technical Specification Booklet.

The aggregate shall consist of hard, strong, durable crushed stone of 20 mm nominal size, free from dust, clay, organic matter and other impurities.

Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

Water used for mixing and curing shall be clean and free from harmful salts, oils, acids, alkalis and organic matter.

Concrete

Concrete shall be M-25 Grade having characteristic compressive strength of 25 MPa at 28 days.

Materials shall conform to relevant provisions of IS 456 and IS 10262.

Formwork (Shuttering)

Shuttering : Shall Conform to M26 Page No.-14 in General Technical Specification Booklet.

Formwork materials shall be sufficiently rigid, watertight and capable of maintaining the required shape and dimensions of concrete members without excessive deflection.

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## 2. Workmanship

General

The work shall be carried out in accordance with IS 456, approved drawings, specifications and directions of the Engineer-in-Charge.

All plant, machinery, batching equipment, vibrators and accessories required for concrete work shall be arranged by the contractor.

Preparation Before Concreting

All formwork shall be checked for:

- Correct line, level and dimensions.
- Adequate strength and rigidity.

- Tightness of joints.
- Proper supports and bracing.
- Cleanliness of internal surfaces.

The inside surfaces of formwork shall be cleaned and coated with approved shuttering oil before concreting.

The formwork shall be thoroughly inspected and approved before placing concrete.

#### Batching and Mixing

Concrete shall be batched accurately by weight wherever possible.

The specified mix proportion shall be maintained throughout the work.

Mixing shall be carried out in approved mechanical mixers until a uniform and workable concrete is obtained.

Hand mixing shall not be permitted except with specific approval of the Engineer-in-Charge.

#### Transportation

Concrete shall be transported from mixer to place of deposition without segregation or loss of materials.

Concrete shall be placed within the permissible time after mixing.

#### Placing of Concrete

Concrete shall be deposited as nearly as possible in its final position.

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

Concreting shall proceed continuously between construction joints approved by the Engineer-in-Charge.

Particular care shall be taken while concreting columns, beams, slabs, lintels, balconies and cantilever members.

#### Compaction

Concrete shall be compacted immediately after placing using mechanical needle vibrators, surface vibrators or approved methods.

Vibration shall be sufficient to remove entrapped air and achieve full compaction without causing segregation.

Special attention shall be given at corners, around inserts and within congested sections.

#### Construction Joints

Construction joints shall be located only at approved positions.

Before placing fresh concrete, previously cast concrete surfaces shall be roughened, cleaned and treated as directed.

#### Finishing

Exposed concrete surfaces shall be finished smooth and even.

Slab surfaces shall be leveled, compacted and finished to required slope and profile.

Honeycombed, segregated or defective concrete shall not be accepted.

Any defects shall be rectified as directed by the Engineer-in-Charge.

#### Curing

Concrete shall be protected from rapid drying, rain, vibration and mechanical damage.

Curing shall commence as soon as the concrete has sufficiently hardened.

Continuous curing shall be carried out for a minimum period of 14 days.

Approved methods such as ponding, wet covering or continuous sprinkling shall be adopted.

#### Removal of Formwork

Formwork shall not be removed until concrete has attained sufficient strength.

Removal shall be carried out carefully to prevent damage to edges and surfaces.

Minimum striking periods shall comply with IS 456 requirements.

#### Quality Control

Concrete cubes shall be prepared, cured and tested as specified.

Concrete shall achieve the specified characteristic compressive strength.

Rejected concrete shall be removed and replaced at contractor's cost.

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### 3. Mode of Measurement & Payment

#### Mode of Measurement

Measurement shall be carried out in **Cubic Metres (Cu.M.)** of finished reinforced cement concrete work.

#### **Item No – 15**

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

#### . Materials

##### TMT Reinforcement Steel

High Yield Strength Steel Deformed Bars : Shall Conform to M19 Page No.-13 in General Technical Specification Booklet.

TMT reinforcement bars shall be Fe-500D grade conforming to relevant IS specifications.

The reinforcement bars shall:

- Be of approved manufacturer.
- Be free from loose rust, scales, oil, grease, paint and other harmful substances.
- Have uniform cross section and mechanical properties.
- Possess high ductility and weldability characteristics.
- Be supplied with manufacturer's test certificates.

The steel shall conform to the requirements of IS 1786 for Fe-500D grade reinforcement bars.

##### Binding Wire

Mild Steel Binding Wire : Shall Conform to M21 Page No.-14 in General Technical Specification Booklet.

Binding wire shall generally be 16 to 18 SWG annealed steel wire and shall be free from rust and defects.

## Cover Blocks

Cover blocks shall be precast cement concrete blocks of suitable grade and size approved by the Engineer-in-Charge.

Plastic, wooden, brick pieces or stone chips shall not be used as cover blocks.

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## 2. Workmanship

### General

The reinforcement work shall be carried out in accordance with approved structural drawings, bar bending schedules, IS 456, IS 2502 and directions of the Engineer-in-Charge.

The contractor shall carefully study all drawings before commencement of work.

### Storage of Reinforcement

Steel bars shall be stored above ground level on timber sleepers, steel racks or platforms.

Bars shall be protected from excessive rusting, mud, grease and contamination.

Different diameters and grades shall be stacked separately for easy identification.

### Straightening

Bars supplied in coils or bent condition shall be properly straightened without causing damage to the steel.

Mechanical straightening equipment shall be used wherever necessary.

### Cutting

Bars shall be accurately cut according to approved bar bending schedules.

Cutting shall be done using approved cutting machines.

Gas cutting shall not be permitted unless specifically approved.

## Bending

Bars shall be bent cold and accurately to the shapes and dimensions shown in approved drawings.

Bending shall conform to IS 2502.

Hooks, bends, crank bars, stirrups and anchorage lengths shall be provided as specified.

Bars shall not be re-bent or straightened after excessive bending without approval of the Engineer-in-Charge.

## Placing of Reinforcement

Reinforcement shall be placed accurately in position as shown on structural drawings.

Bars shall be securely tied with binding wire at all intersections to prevent displacement during concreting.

Proper spacing, laps, anchorage lengths and development lengths shall be maintained.

The reinforcement cage shall be rigid and capable of maintaining its position during concrete placement.

## Cover to Reinforcement

Specified concrete cover shall be maintained by means of approved precast concrete cover blocks.

Cover shall be checked before concreting.

The minimum cover shall be as indicated in drawings or as directed by the Engineer-in-Charge.

## Lapping and Splicing

Laps shall be provided only at approved locations.

Lap lengths shall be as specified in structural drawings and relevant IS Codes.

Bars shall be staggered where required to avoid congestion.

## Reinforcement for Various Structural Members

The reinforcement shall be fixed in:

- Foundations
- Column bases
- Columns
- Beams
- Lintels
- Slabs
- Balconies
- Chajjas
- Staircases
- Landings
- Shelves
- Cantilever members
- Other R.C.C. components

as shown in structural drawings.

#### Inspection

No concreting shall commence until reinforcement has been inspected and approved by the Engineer-in-Charge.

The contractor shall provide all assistance required for checking bar diameters, spacing, cover, laps and positioning.

#### Cleaning Before Concreting

Immediately before concreting, reinforcement shall be thoroughly cleaned.

Loose rust, mud, oil, grease and foreign materials shall be removed.

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### 3. Mode of Measurement & Payment

#### Mode of Measurement

Reinforcement shall be measured in **Kilograms (Kg.)** or **Metric Tonnes (MT)** based on the theoretical weight of reinforcement actually placed in position as per approved drawings and Bar Bending Schedule (BBS).

#### **Item No – 16**

**Sliding Door/ Window in DGU:**

**Providing, fabricating, supplying and fixing uPVC windows made from lead-free and cadmium-free uPVC profiles, confirming to relevant IS/EN standards, with minimum 75 mm multi-chambered profile, reinforced with hot-dip galvanized GI steel insert (minimum 1.2 mm thick) for adequate strength and rigidity, including all necessary corner cleats, mullions, transoms, glazing beads, gaskets, weather strips and accessories. The windows shall be fitted with Double Glazed Units (DGU) comprising two 6mm glass panes with sealed 12mm air gap, of approved make and thickness, fixed using EPDM gaskets, complete with SS friction hinges, handles, locking system, fasteners, and all required hardware of approved quality. at all floors / all levels / all heights including all lead and lift**

**1. Materials****uPVC Profiles**

uPVC profiles shall be lead-free and cadmium-free, specially designed for door and window applications.

Profiles shall conform to relevant provisions of IS and EN standards applicable to uPVC fenestration systems.

The profiles shall:

- Have minimum 75 mm frame depth.
- Be multi-chambered construction.
- Be UV stabilized.
- Be weather resistant.
- Be termite proof.
- Be corrosion resistant.
- Have smooth and uniform finish.
- Be of approved make and colour.

The profile sections shall be capable of withstanding design wind loads and operational stresses.

**Galvanized Steel Reinforcement**

Galvanized steel reinforcement shall be inserted inside the uPVC profiles wherever required.

Galvanized iron sheets : Shall Conform to M23 Page No.-14 in General Technical Specification Booklet.

The reinforcement shall:



- Be minimum 1.2 mm thick.
- Be hot dip galvanized.
- Be free from rust and distortion.
- Be properly anchored within the profile.

#### Glass

Glass : Shall Conform to M38 Page No.-18 in General Technical Specification Booklet.

#### Double Glazed Unit (DGU)

The DGU shall consist of:

- Outer glass pane – 6 mm thick.
- Sealed air gap – 12 mm thick.
- Inner glass pane – 6 mm thick.

Total unit thickness shall generally be 24 mm.

The glazing unit shall be factory assembled with approved spacer bars and moisture absorbent desiccant.

The unit shall be hermetically sealed and free from dust, moisture and optical distortion.

#### EPDM Gaskets

EPDM gaskets shall be weather resistant and compatible with glazing and profile systems.

The gaskets shall provide:

- Air tightness.
- Water tightness.
- Noise reduction.
- Thermal insulation.

#### Weather Strips

Weather strips shall be polypropylene pile type or approved equivalent.

They shall provide smooth operation and protection against dust, rain and air infiltration.

## Hardware

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

All hardware shall be stainless steel or approved corrosion-resistant material and shall include:

- Sliding rollers.
- Locking system.
- Handles.
- Friction hinges (where applicable).
- Interlocks.
- Corner cleats.
- Fasteners.
- Screws.
- Fixing brackets.

## Sealant

Approved weatherproof silicone sealant shall be used around the perimeter wherever required.

Sealant shall be compatible with glass, masonry and uPVC surfaces.

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## 2. Workmanship

### General

The work shall be executed in accordance with approved shop drawings, manufacturer's specifications and directions of the Engineer-in-Charge.

All dimensions shall be verified at site before fabrication.

Fabrication shall not commence until openings are checked and approved.

### Fabrication of uPVC Frames

The profiles shall be machine cut and welded to form rigid and accurate frames.

Corners shall be fusion welded using approved welding machines.

The welded joints shall be smooth, strong and free from visible defects.

Steel reinforcements shall be securely fixed within profiles at locations specified by the manufacturer.

Mullions and transoms shall be reinforced adequately to resist design loads.

#### Installation of Frames

Frames shall be fixed plumb, level and square.

Fixing shall be carried out using approved fasteners, anchor screws and fixing brackets.

The spacing of anchors shall comply with manufacturer recommendations.

Necessary packing blocks shall be used to prevent distortion during fixing.

Any gaps between frame and wall shall be filled with approved backing material and sealant.

#### Glazing

Double glazed units shall be installed carefully without damage.

Glass shall not come into direct contact with metal components.

EPDM gaskets and glazing beads shall be properly fixed to achieve airtight and watertight performance.

The glazing shall be free from scratches, cracks, waviness and defects.

#### Installation of Sliding Shutters

Sliding shutters shall be installed on heavy-duty roller assemblies.

Rollers shall operate smoothly without vibration or excessive noise.

Interlocking arrangements shall be properly aligned.

The shutters shall move freely without obstruction.

#### Hardware Fixing

Handles, locks, friction hinges, rollers and accessories shall be fixed securely.

All moving parts shall function smoothly.

The locking mechanism shall provide positive engagement and secure operation.

#### Weatherproofing

All joints between frame and masonry shall be sealed using approved weatherproof sealant.

The completed installation shall be:

- Air tight.
- Water tight.
- Dust resistant.
- Weather resistant.

#### Tolerances

Frames and shutters shall be installed within acceptable tolerances for:

- Verticality.
- Level.
- Squareness.
- Alignment.

Misalignment, twisting or distortion shall not be accepted.

#### Protection

Completed windows and doors shall be protected against damage during construction.

Protective films shall remain in place until completion of surrounding works.

Any damaged component shall be replaced at contractor's cost.

#### Cleaning

After installation, all surfaces shall be cleaned.

Glass shall be free from stains, adhesive marks, scratches and dirt.

The completed unit shall be handed over in perfect working condition.

---

### 3. Mode of Measurement & Payment

#### Mode of Measurement

The item shall be measured in **Square Metres (Sq.M.)**.

#### **Item No – 17**

**Providing and fixing standard extruded of aluminium section of size 63 mm x 38.10 mm x 1.2mm@Wt. 0.643Kg/mt with colour anodized aluminium frame for ventilation with 5 mm thick frosted glass as details etc complete for Ventilation**

#### 1. Materials

##### Aluminium Sections

Aluminium Doors, Windows & Holdfasts : Shall Conform to M31 Page No.-17 in General Technical Specification Booklet.

The aluminium sections shall:

- Be standard extruded sections.
- Be of size 63 mm × 38.10 mm × 1.2 mm thick.
- Weigh approximately 0.643 kg per running metre.
- Be free from twists, warping, dents, cracks and surface defects.
- Be suitable for fabrication of ventilation frames.

##### Anodized Finish

The aluminium sections shall be colour anodized of approved shade.

The anodized coating shall:

- Be uniform in colour.
- Be resistant to corrosion and weathering.
- Have smooth and blemish-free finish.
- Be suitable for exterior and interior applications.

##### Glass

Glass : Shall Conform to M38 Page No.-18 in General Technical Specification Booklet.

The glass shall be:

- 5 mm thick frosted glass.
- Uniform in thickness.
- Free from bubbles, waves, scratches and visual defects.
- Properly finished at edges.

#### Fixtures and Fastenings

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

The item shall include:

- Stainless steel screws.
- Aluminium cleats.
- Corner connectors.
- Anchor fasteners.
- Fixing brackets.
- Necessary hardware.

#### Rubber Gaskets

Rubber gaskets shall be EPDM or approved equivalent quality.

The gaskets shall provide:

- Airtight glazing.
- Vibration resistance.
- Protection against glass breakage.

#### Sealant

Approved weather-resistant silicone sealant shall be used wherever required between frame and masonry and around glass fixing locations.

---

## 2. Workmanship

### General

The work shall be executed in accordance with approved drawings, manufacturer's recommendations and directions of the Engineer-in-Charge.

The contractor shall verify all opening dimensions at site before fabrication.

## Fabrication of Aluminium Frame

The aluminium sections shall be accurately cut to required lengths.

Frame members shall be assembled square, true and rigid using approved corner cleats and connectors.

The assembled frame shall be free from distortion, twists and misalignment.

All exposed surfaces shall be protected from scratches and damage during fabrication and installation.

## Fixing of Frame

The aluminium ventilation frame shall be fixed in position true to line, level and plumb.

Fixing shall be carried out using approved anchor fasteners, screws and brackets.

The frame shall be firmly secured to the surrounding masonry, concrete or structural members.

Packing pieces shall be used wherever necessary to ensure proper alignment.

## Glazing Work

The 5 mm thick frosted glass shall be carefully fixed within the aluminium frame.

Glass panels shall be cut accurately to required dimensions.

The glass shall be supported uniformly and shall not come into direct contact with aluminium members.

Approved rubber gaskets and glazing beads shall be provided for fixing.

Glass fixing shall be free from rattling, movement and stress concentrations.

Broken, chipped or scratched glass shall not be accepted.

## Joint Sealing

All joints between frame and adjoining construction shall be sealed with approved silicone sealant.

The sealant shall be neatly applied to achieve:

- Weather resistance.
- Dust resistance.
- Airtightness.

#### Alignment and Tolerances

The completed ventilation shall be:

- True to line.
- Level.
- Plumb.
- Square in shape.

The frame shall not show any distortion after installation.

#### Protection and Cleaning

Protective coverings shall be maintained during construction activities.

After completion, the aluminium surfaces and glass shall be cleaned thoroughly.

The finished ventilation shall be free from:

- Cement stains.
- Sealant marks.
- Scratches.
- Dust and dirt.

The completed work shall be handed over in perfect condition.

---

### 3. Mode of Measurement & Payment

#### Mode of Measurement

The ventilation shall be measured in **Square Metres (Sq.M.)**.

#### **Item No – 25**

**Providing and applying Premium Metallic Luxture Texture with basecoat 2 mm thick with durabond 1 bag 1.5 litre and top coat upto 5 mm thick on Interior Walls & Exterior walls with different style, shade, finish and texture coat including all material, labour , Transportation and all accessories, scaffolding & support system. Design as per Architect's Selection and as**



**per the direction of Engineer-in-charge at all floors / all levels / all heights including all lead and lift**

## 1. Materials

### Cement

Cement : Shall Conform to M3 Page No.-9 in General Technical Specification Booklet.

### Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

### Sand (Where Required for Surface Repairs)

Sand : Shall Conform to M6 Page No.-10 in General Technical Specification Booklet.

### Paints / Texture Coating Materials

Paints : Shall Conform to M44 Page No.-21 in General Technical Specification Booklet.

The Premium Metallic Luxury Texture material shall be:

- Factory manufactured.
- Ready-to-use or site-mixed as recommended by manufacturer.
- Suitable for interior and exterior application.
- Resistant to weathering, UV exposure and moisture.
- Available in approved shades and decorative finishes.
- Free from cracks, lumps and impurities.

The texture system shall comprise:

- Primer coat.
- Base coat (2 mm thick).
- Metallic texture coat (up to 5 mm thick).
- Protective finish coat where specified.

### Durabond / Bonding Additive

The bonding additive shall be of approved make and compatible with the texture system.

It shall be mixed in the proportion recommended by the manufacturer, generally one bag with approximately 1.5 litres of bonding additive or as approved.

## Metallic Pigments and Decorative Aggregates

Metallic pigments, mineral fillers and decorative additives shall be factory blended and shall provide the specified luxury metallic appearance.

## Scaffolding Materials

Shuttering : Shall Conform to M26 Page No.-14 in General Technical Specification Booklet (for staging/support materials where applicable).

Suitable scaffolding and access arrangements shall be provided for execution at all heights.

---

## 2. Workmanship

### Surface Preparation

The surface shall be thoroughly inspected before commencement of work.

All surfaces shall be:

- Sound and dry.
- Free from dust, oil, grease and loose particles.
- Free from efflorescence and laitance.
- Properly cured where new plaster is involved.

Loose paint, defective plaster, dirt and foreign matter shall be removed completely.

Cracks, undulations and surface defects shall be repaired before application of texture finish.

### Primer Application

Approved primer compatible with the texture system shall be applied uniformly on the prepared surface.

Primer shall be allowed to dry completely before subsequent coats.

### Application of Base Coat

A base coat of approximately 2 mm thickness shall be applied uniformly.

The base coat shall be mixed and applied strictly in accordance with manufacturer's specifications.

The surface shall be leveled and finished to receive the texture coat.

The base coat shall be allowed to cure and dry adequately.

#### Application of Metallic Texture Coat

The texture coat shall be applied over the prepared base coat to a thickness up to 5 mm.

Application shall be carried out using approved tools such as:

- Texture rollers.
- Trowels.
- Spray equipment.
- Pattern tools.
- Special texture applicators.

The final texture pattern shall be as selected by the Architect.

#### Texture Finish

The texture finish may include:

- Metallic finish.
- Rustic finish.
- Stone effect finish.
- Travertine effect.
- Stucco effect.
- Sand finish.
- Decorative textured finish.
- Customized architectural patterns.

The approved sample panel shall be prepared and approved before commencement of bulk work.

#### Uniformity

The completed finish shall be:

- Uniform in colour.
- Uniform in texture.
- Free from cracks.
- Free from peeling.
- Free from blistering.
- Free from visible patch marks.

Texture patterns shall be consistent throughout the completed surface.

#### External Wall Application

For exterior surfaces, additional care shall be taken to ensure:

- Weather resistance.
- UV resistance.
- Moisture resistance.
- Long-term durability.

Application shall not be carried out during rain, excessive humidity or unsuitable weather conditions.

#### Scaffolding and Access

Necessary scaffolding, platforms and support systems shall be erected, maintained and removed after completion.

The contractor shall ensure safe access to all work locations.

#### Protection

Adjacent finished surfaces, glass, aluminium work, stone cladding, flooring and fittings shall be protected during execution.

Any stains or damages caused during application shall be rectified at contractor's cost.

#### Cleaning

Upon completion, all surfaces shall be cleaned thoroughly.

The finished work shall present a uniform decorative appearance as approved by the Architect and Engineer-in-Charge.

---

### 3. Mode of Measurement & Payment

#### Mode of Measurement

The work shall be measured in **Square Metres (Sq.M.)** of actual textured surface finished and accepted.

## **Item No – 26**

**Mural art work : Design, supply, installation and finishing of decorative 3D wall art / feature wall panel, executed in high-relief sculptural finish, as per approved design and drawing. The wall art shall comprise hand-crafted / CNC-carved 3D motifs inspired by floral / lotus forms, executed using glass-reinforced gypsum (GRG) / fibre reinforced plastic (FRP) / high-density gypsum / cementitious composite (as approved). The relief shall be multi-layered with varying depths, creating a rich three-dimensional visual effect.**

**The surface shall be smoothly finished, crack-free, and uniformly textured, including surface preparation, joint filling, fine sanding, primer application and final paint finish in approved shade. All fixing shall be done using approved mechanical anchors and adhesives, ensuring long-term stability and alignment. at all floors / all levels / all heights**

**The item shall include all materials, moulding, carving, fixing framework, labour, tools, scaffolding, lighting coordination cut-outs (if required), finishing and cleaning, complete in all respects, as directed by the Engineer-in-Charge.**

### **1. Materials**

#### **Glass Reinforced Gypsum (GRG)**

GRG panels shall be factory manufactured using high quality gypsum reinforced with alkali-resistant glass fibres.

The material shall:

- Be dimensionally stable.
- Be free from cracks and warping.
- Have adequate strength for installation.
- Permit fine detailing and sculptural work.
- Be suitable for interior decorative applications.

#### **Fibre Reinforced Plastic (FRP)**

FRP components shall be manufactured using approved resin systems reinforced with glass fibre mats.

The material shall:

- Be lightweight and durable.
- Be resistant to cracking and moisture.
- Have smooth finished surfaces.
- Be suitable for decorative architectural applications.

### High Density Gypsum

Gypsum products shall be dense, durable and capable of receiving intricate carvings and surface finishes.

### Cementitious Composite

Where specified, cementitious composite materials shall consist of high-strength polymer modified cement-based compositions suitable for decorative sculptural applications.

### Supporting Framework

Structural Steel : Shall Conform to M22 Page No.-14 in General Technical Specification Booklet.

The supporting framework shall consist of M.S., G.I. or aluminium members as approved.

The framework shall be adequately designed to safely support the dead load of the mural panels.

### Plywood (Where Required for Backing)

Plywood : Shall Conform to M37 Page No.-18 in General Technical Specification Booklet.

### Adhesives

Adhesives shall be approved heavy-duty construction-grade products compatible with the substrate and mural material.

### Mechanical Fasteners

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

Mechanical anchors, screws, bolts and fixing accessories shall be corrosion resistant and of adequate strength.

### Jointing Compound

Joint fillers shall be compatible with the mural material and shall provide crack-free joints after finishing.

## Primer

Paints : Shall Conform to M44 Page No.-21 in General Technical Specification Booklet.

Primer shall be compatible with the substrate and finish paint system.

## Paint Finish

Paints : Shall Conform to M44 Page No.-21 in General Technical Specification Booklet.

The finish paint shall be of approved colour, texture and sheen level as selected by the Architect.

## Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

---

## 2. Workmanship

### Design Development

The contractor shall prepare:

- Shop drawings.
- Fabrication drawings.
- Detailed layout drawings.
- Installation drawings.
- Sample panels.

The design shall be approved by the Architect and Engineer-in-Charge before commencement of fabrication.

### Surface Preparation

The wall surface receiving the mural shall be:

- Structurally sound.
- Dry and clean.
- Free from dust, grease and loose material.
- Properly aligned for installation.

Any irregularities shall be rectified before installation.

## Fabrication of Mural Panels

The mural panels shall be fabricated using approved moulding, casting, CNC carving or hand sculpting techniques.

The decorative motifs shall:

- Follow approved design geometry.
- Exhibit varying depths and relief profiles.
- Have smooth and uniform contours.
- Be free from visible defects.

The relief shall create a three-dimensional architectural appearance with distinct visual depth.

## Framework Installation

Supporting framework shall be accurately fixed to the wall substrate.

The framework shall be:

- True to line and level.
- Properly anchored.
- Adequately braced.
- Capable of supporting all imposed loads.

Alignment shall be checked before panel installation.

## Fixing of Panels

Panels shall be installed using approved:

- Mechanical anchors.
- Screws.
- Brackets.
- Structural adhesives.

All fixings shall remain concealed wherever possible.

Panels shall be aligned accurately to maintain continuity of patterns.

The installation shall remain free from movement, vibration or deflection.



## Joint Treatment

All joints between adjacent panels shall be:

- Properly filled.
- Reinforced where necessary.
- Finished flush with surrounding surfaces.

No visible joint lines shall remain after finishing.

## Surface Finishing

The complete surface shall be:

- Sanded smooth.
- Free from imperfections.
- Uniform in texture.
- Free from cracks and pinholes.

All transitions between panels shall be seamless.

## Primer Application

Approved primer shall be applied uniformly over the entire mural surface.

The primer shall be allowed to dry fully before application of paint.

## Final Paint Finish

Final paint shall be applied in approved shade and finish.

Multiple coats shall be applied as required to achieve:

- Uniform colour.
- Complete coverage.
- Consistent appearance.

The finished mural shall exhibit a premium decorative architectural appearance.

## Lighting Coordination

Where lighting fixtures, LED strips or decorative illumination are incorporated, necessary recesses, grooves and cut-outs shall be accurately provided.

Coordination with electrical works shall be ensured during execution.

#### Scaffolding

Suitable scaffolding, platforms and access systems shall be provided for execution at all heights.

The scaffolding shall comply with safety requirements.

#### Protection and Cleaning

Completed work shall be protected against damage during subsequent construction activities.

After completion, the mural shall be cleaned and handed over in perfect condition.

---

### 3. Mode of Measurement & Payment

#### Mode of Measurement

The mural artwork shall be measured in **Square Metres (Sq.M.)** of finished visible surface area installed.

#### **Item No – 29**

**Providing and carrying out machine buffing, mirror polishing and finishing of existing marble flooring/wall cladding using approved polishing compounds, abrasives and sealants, including surface preparation, stain removal, edge finishing, cleaning and disposal of debris, complete to achieve a smooth, scratch-free, high-gloss surface as directed by the Engineer-in-Charge.**

#### 1. Materials

##### Marble Surface

Marble slab : Shall Conform to M51 Page No.-23 in General Technical Specification Booklet.

The existing marble surface shall be sound, firmly fixed and free from structural defects prior to commencement of polishing work.

##### Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

Water used during grinding, buffing and cleaning operations shall be clean and free from harmful impurities.

#### Polishing Compound

The polishing compound shall be of approved make specially designed for marble polishing applications.

The material shall:

- Produce a high gloss finish.
- Enhance natural marble appearance.
- Be non-staining.
- Be compatible with marble surfaces.

#### Abrasives

Abrasive pads, diamond polishing pads and grinding discs shall be of approved quality and suitable for marble polishing.

The abrasives shall be used progressively from coarse to fine grades to obtain the specified finish.

#### Crack Filling Compound

Where required, approved marble filler or epoxy-based filler matching the marble colour shall be used for filling cracks, pinholes and minor surface imperfections.

#### Marble Sealant / Surface Protector

The sealant shall be an approved marble protection treatment capable of:

- Enhancing gloss.
- Reducing stain absorption.
- Improving durability.
- Protecting polished surfaces.

#### Cleaning Materials

Cleaning agents shall be non-acidic and specifically suitable for natural marble surfaces.

---

## 2. Workmanship

### Surface Inspection

Before commencement of work, the existing marble surface shall be inspected for:

- Cracks.
- Chips.
- Open joints.
- Stains.
- Surface unevenness.
- Loose pieces.

Defective portions shall be identified and repaired before polishing.

### Surface Preparation

The marble surface shall be thoroughly cleaned.

Dust, dirt, wax, oil, paint marks, cement stains and other contaminants shall be removed.

All loose material shall be cleaned from joints and edges.

### Crack and Joint Treatment

Minor cracks, pinholes and imperfections shall be filled using approved matching fillers.

Filled areas shall be allowed to cure properly before polishing operations commence.

### Grinding and Honing

Where required, the marble surface shall be machine ground using approved abrasives.

Grinding shall be carried out progressively using finer abrasive grades to remove:

- Surface scratches.
- Unevenness.
- Stains.
- Minor defects.

The surface shall be brought to a uniform level without damaging adjoining finishes.

## Machine Buffing

Machine buffing shall be carried out using approved buffing machines fitted with suitable polishing pads.

Buffing shall be performed uniformly across the entire surface.

Special care shall be taken at corners, edges and junctions.

## Mirror Polishing

Mirror polishing shall be carried out using approved polishing compounds and fine polishing pads.

The process shall continue until the marble develops:

- Uniform gloss.
- Clear reflection.
- Smooth finish.
- Scratch-free appearance.

The completed surface shall exhibit a premium mirror finish.

## Edge Finishing

Edges adjoining skirting, walls, columns and other finishes shall be polished carefully.

No visible difference in finish shall remain between edge areas and main surfaces.

## Application of Sealant

After polishing, approved marble sealant shall be applied where specified.

The sealant shall be uniformly distributed and allowed to penetrate as recommended by the manufacturer.

Excess material shall be removed to avoid streaking.

## Cleaning

After completion, all polishing residues, slurry, stains and debris shall be removed.

The area shall be thoroughly cleaned and handed over in ready-to-use condition.

## Quality Requirements

The finished marble surface shall be:

- Smooth and level.
- Uniform in appearance.
- Free from scratches.
- Free from swirl marks.
- Free from stains.
- Free from polishing burns.
- Mirror finished with high gloss.

No patchiness or variation in gloss shall be acceptable.

## Protection

The polished surface shall be protected against damage until handover.

Appropriate covering shall be provided wherever necessary.

---

## 3. Mode of Measurement & Payment

### Mode of Measurement

The work shall be measured in **Square Metres (Sq.M.)** of actual marble surface polished and accepted.

### **Item No – 33**

**Veneer Flush Door: Providing and fixing 35 mm thick Single/ Double shutters for Doors with both side Veneer including Indian teak wood frames and black enamelled iron oxidized fixtures and fastenings including PU Polish Finish of approved quality and necessary hardware such as hinges, door stopper, door closer, handle, mortice lock etc, complete. at all floors / all levels / all heights**

### 1. Materials

#### Teak Wood Frame

Teak Wood : Shall Conform to M29 Page No.-15 in General Technical Specification Booklet.

The door frame shall be made from well-seasoned Indian teak wood, free from sapwood, cracks, warping, insect attack and other defects.

The timber shall be properly seasoned and machined to the required dimensions and profiles.

#### Flush Door Shutter

Wooden Flush Door Shutters (Solid Core) : Shall Conform to M30 Page No.-16 in General Technical Specification Booklet.

The shutter shall be:

- 35 mm thick.
- Solid core or approved equivalent construction.
- Factory manufactured.
- Free from warping, twisting and delamination.
- Suitable for decorative veneer finish on both sides.

#### Decorative Veneer

The decorative veneer shall be:

- Natural wood veneer of approved species.
- Uniform in grain and colour.
- Free from splits, stains and defects.
- Properly bonded to the flush door shutter.

The veneer pattern and shade shall be approved by the Architect/Engineer-in-Charge.

#### Plywood (Where Used as Internal Facing)

Plywood : Shall Conform to M37 Page No.-18 in General Technical Specification Booklet.

#### Adhesives

Adhesives used for bonding veneer shall conform to relevant IS specifications and shall be waterproof and suitable for joinery work.

#### Fixtures and Fastenings

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

All fixtures and fastenings shall be of approved make and shall include:

- Screws.
- Holdfasts.
- Fixing bolts.
- Anchors.
- Necessary accessories.

#### Hinges

Hinges shall be heavy-duty oxidized iron or approved equivalent quality and adequate for the weight of the shutter.

#### Mortice Lock

Mortice lock shall be of approved make and size, complete with keys and all accessories.

#### Door Closer

Door closer shall be hydraulic type of approved make suitable for the size and weight of the shutter.

#### Door Stopper

Door stopper shall be of approved design and material.

#### Handles

Handles shall be of approved quality, size and finish as approved by the Engineer-in-Charge.

#### PU Polish

PU (Polyurethane) polish shall be of premium quality and suitable for veneer finished surfaces.

The finish shall provide:

- Smooth appearance.
- Scratch resistance.
- Durability.
- Uniform gloss level.

#### Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.



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## 2. Workmanship

### General

The work shall be executed in accordance with approved drawings, architectural details and directions of the Engineer-in-Charge.

All dimensions shall be verified at site before fabrication.

### Preparation of Door Frame

The teak wood frame shall be accurately cut, planed and assembled.

The frame shall be:

- Straight and true.
- Properly jointed.
- Free from distortions.
- Adequately strengthened at corners.

Necessary grooves, rebates and fixing arrangements shall be provided.

### Fixing of Door Frame

The frame shall be fixed truly in line, level and plumb.

Holdfasts shall be securely embedded in masonry or concrete.

Temporary supports shall be provided until the frame is firmly fixed.

The frame shall not show movement after installation.

### Fabrication of Flush Door Shutter

The flush door shutter shall be factory manufactured.

Decorative veneer shall be bonded on both sides under controlled conditions.

Edges shall be neatly finished and protected.

The shutter shall be free from:

- Delamination.
- Open joints.
- Surface undulations.
- Warping.

#### Veneer Finishing

The veneer surface shall be properly sanded before application of PU polish.

The grain pattern shall be continuous and aesthetically pleasing.

Visible joints shall be minimized.

#### Fixing of Door Shutter

The shutter shall be fixed to the frame using approved hinges.

The shutter shall operate smoothly without binding.

Uniform clearances shall be maintained around the perimeter.

Double shutters, where provided, shall be properly aligned and fitted.

#### Hardware Installation

All hardware shall be fixed accurately and securely.

The installation shall include:

- Hinges.
- Mortice lock.
- Handles.
- Door closer.
- Door stopper.
- Required accessories.

Hardware shall operate smoothly and efficiently.

#### PU Polish Finish

The veneer surface shall be prepared by sanding and cleaning.

PU polish shall be applied in multiple coats as per manufacturer's recommendations.

Each coat shall be allowed to dry before application of the next coat.

The finished surface shall be:

- Smooth.
- Uniform.
- Free from brush marks.
- Free from stains.
- Free from scratches.

Protection

Completed doors shall be protected against damage during subsequent construction activities.

Any damaged component shall be repaired or replaced at contractor's cost.

Cleaning

After completion, all surfaces shall be cleaned thoroughly.

The door shall be handed over in perfect operating condition.

---

### 3. Mode of Measurement & Payment

Mode of Measurement

The door shall be measured in **Square Metres (Sq.M.)** of shutter area.

#### **Item No – 34**

##### **Polymer modified Water Proofing**

**Providing and applying two component cement based polymer modified flexible ,elastic water Water Proofing in Two coat layer Treatment with hard brush or trowel to give even coverage.the consumption range is 20-22 Sqft per unit of 2 kg to creat a uniform film on surface. 1-apply one coat of SBR Primer on surface area. 2- Apply Two Coat Part 1-crystalline whitish grey powder), part 2- syrupy white milky liquid in mixing ratio 1:1, parts by weight to be used. for curing time 3 days and surface dry time 1 to 2 hr of open air**

## 1. Materials

### Cement

Cement : Shall Conform to M3 Page No.-9 in General Technical Specification Booklet.

### Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

### Polymer Modified Waterproofing Compound

The waterproofing system shall be a two-component cementitious polymer modified coating consisting of:

#### *Part – 1 (Powder Component)*

The powder component shall be:

- Cement based.
- Crystalline grey/whitish grey powder.
- Factory manufactured.
- Free from lumps and impurities.
- Compatible with the polymer liquid component.

#### *Part – 2 (Liquid Component)*

The liquid component shall be:

- Synthetic polymer modified liquid.
- Milky white syrupy emulsion.
- Flexible and elastic in nature.
- Compatible with the cementitious powder component.

### SBR Primer

The primer shall be Styrene Butadiene Rubber (SBR) based bonding and priming agent of approved make.

The primer shall:

- Improve adhesion.
- Reduce surface porosity.
- Enhance waterproofing performance.

## Repair Mortar (Where Required)

Cement Mortar : Shall Conform to M11 Page No.-11 in General Technical Specification Booklet.

The mortar shall be used for repairing cracks, honeycombs and surface defects before waterproofing.

## Reinforcing Mesh (If Specified)

Where directed by the Engineer-in-Charge, alkali-resistant reinforcing mesh shall be embedded at critical junctions, corners and cracks.

---

## 2. Workmanship

### General

The waterproofing work shall be carried out strictly in accordance with the manufacturer's specifications and directions of the Engineer-in-Charge.

Only trained and experienced applicators shall execute the work.

### Surface Preparation

The surface shall be thoroughly prepared before application.

The substrate shall be:

- Structurally sound.
- Clean and dry.
- Free from dust.
- Free from oil, grease and laitance.
- Free from loose particles and paint.

All cracks, honeycombs, holes and surface imperfections shall be repaired before waterproofing application.

Loose plaster and weak concrete shall be removed and repaired.

### Wetting of Surface

The surface shall be pre-wetted with clean water prior to application.

Standing water shall not be allowed on the surface.

The substrate shall remain in a saturated surface dry (SSD) condition before coating.

#### Application of SBR Primer

A uniform coat of approved SBR primer shall be applied over the prepared surface.

The primer shall be applied using:

- Brush.
- Roller.
- Spray equipment.

The primer coat shall be allowed to become tacky before application of the waterproofing coating.

#### Preparation of Waterproofing Mix

The two components shall be mixed in the specified proportion:

Part-1 (Powder) : Part-2 (Liquid) = 1 : 1 by weight

Mixing shall be carried out using a slow-speed mechanical stirrer until a smooth lump-free homogeneous slurry is obtained.

Only such quantity as can be used within the pot life shall be prepared.

#### First Coat Application

The first coat shall be applied uniformly using:

- Hard brush.
- Trowel.
- Approved applicator.

The coating shall cover the entire surface without pinholes or discontinuities.

The first coat shall be allowed to dry sufficiently before application of the second coat.

#### Second Coat Application

The second coat shall be applied perpendicular to the direction of the first coat.

The coat shall provide complete and uniform coverage.

The finished membrane shall be continuous and free from:

- Pinholes.
- Blisters.
- Cracks.
- Voids.

#### Coverage

The waterproofing compound shall be applied at the manufacturer's recommended consumption.

The consumption shall generally be:

Approximately 20–22 Sq.Ft. per 2 kg unit

or as required to achieve the specified dry film thickness and waterproofing performance.

#### Junction Treatment

Special attention shall be given to:

- Wall-floor junctions.
- Corners.
- Pipe penetrations.
- Construction joints.
- Drain outlets.

Additional coats or reinforcing mesh shall be provided where necessary.

#### Drying Time

The coating shall be allowed to dry under natural atmospheric conditions.

Surface drying time shall generally be:

1 to 2 Hours

depending upon temperature and humidity conditions.

## Curing

The waterproofed surface shall be cured for a minimum period of:

3 Days

using approved curing methods.

Premature drying shall be prevented.

## Protection

The treated surface shall be protected from:

- Mechanical damage.
- Rainfall.
- Traffic.
- Contamination.

until fully cured.

## Quality Requirements

The finished waterproofing treatment shall be:

- Flexible.
- Elastic.
- Crack resistant.
- Continuous.
- Uniform in thickness.
- Free from visible defects.

The completed membrane shall provide effective waterproofing protection.

---

## 3. Mode of Measurement & Payment

### Mode of Measurement

The waterproofing treatment shall be measured in **Square Metres (Sq.M.)** of actual treated surface area.



### **Item No – 35**

**Sunk Filling: Providing and filling AAC (Autoclaved Aerated Concrete) blocks in sunken slab areas for plumbing and sanitary works, including supply of AAC blocks of required size (typically 600mm x 200mm x 100/150mm), laying in position with necessary , ramming, leveling and compacting to achieve a uniform surface, all complete as per specifications and directions of the Engineer-in-charge. (Chemical for Joint)**

#### **1. Materials**

##### **AAC Blocks**

AAC blocks shall be factory manufactured and conform to the requirements of **IS 2185 (Part-3)**.

The blocks shall:

- Be lightweight cellular concrete blocks.
- Have uniform dimensions.
- Be free from cracks and damages.
- Have density as specified by the manufacturer.
- Possess adequate compressive strength.
- Be suitable for non-structural filling applications.

Typical block size shall be:

- 600 mm × 200 mm × 100 mm, or
- 600 mm × 200 mm × 150 mm,

or as approved by the Engineer-in-Charge.

##### **Cement**

Cement : Shall Conform to M3 Page No.-9 in General Technical Specification Booklet.

(Only where required for local packing, repairs or bedding.)

##### **Water**

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

## Jointing Chemical / AAC Block Adhesive

The jointing chemical shall be a factory manufactured polymer-modified AAC block adhesive of approved make.

The adhesive shall:

- Be suitable for AAC block applications.
- Provide high bond strength.
- Have low shrinkage characteristics.
- Be water resistant.
- Be compatible with AAC block surfaces.

The material shall be used strictly as per manufacturer's recommendations.

## Cement Mortar (Where Directed)

Cement Mortar : Shall Conform to M11 Page No.-11 in General Technical Specification Booklet.

Mortar may be used only where specifically directed by the Engineer-in-Charge for local adjustments and edge filling.

---

## 2. Workmanship

### General

The work shall be carried out in accordance with approved drawings, plumbing layouts and directions of the Engineer-in-Charge.

The purpose of filling shall be to reduce dead load over sunken slabs while creating a stable base for subsequent floor finishes and waterproofing layers.

### Preparation of Sunken Slab

Before commencement of filling work:

- The slab surface shall be cleaned thoroughly.
- Dust, debris, mortar droppings and loose materials shall be removed.
- Plumbing and sanitary pipelines shall be completed and tested.
- Waterproofing work, if specified below the filling layer, shall be completed and approved.

The sunken slab shall be inspected and approved before laying AAC blocks.

#### Preparation of AAC Blocks

AAC blocks shall be stacked properly and protected from damage.

Damaged or broken blocks shall not be used.

Blocks shall be cut neatly using approved cutting tools wherever required.

#### Laying of AAC Blocks

The AAC blocks shall be laid systematically within the sunken area.

Blocks shall be placed tightly against one another to minimize voids.

Jointing chemical shall be applied uniformly to all contact surfaces as recommended by the manufacturer.

The blocks shall be arranged in regular courses maintaining proper alignment.

#### Cutting and Fitting

Blocks shall be cut accurately around:

- Soil pipes.
- Waste pipes.
- Water supply lines.
- Floor traps.
- Sleeves.
- Service penetrations.

No excessive gaps shall be left around services.

#### Joint Treatment

All joints between blocks shall be filled using approved AAC block adhesive.

Open joints and cavities shall not be permitted.

The adhesive shall provide a monolithic and stable filling system.

## Leveling

The completed AAC filling shall be brought to the required level shown on drawings.

The top surface shall be:

- Even.
- Stable.
- Properly aligned.
- Ready for subsequent screed or flooring work.

## Ramming and Compacting

Where specified, the AAC blocks shall be properly seated and adjusted to ensure stability.

Care shall be taken not to damage waterproofing layers or plumbing services during execution.

## Protection

Completed filling shall be protected against:

- Impact damage.
- Premature loading.
- Water stagnation.
- Disturbance by other trades.

## Quality Requirements

The completed AAC filling shall be:

- Uniform.
- Properly bonded.
- Level.
- Stable.
- Free from loose blocks.
- Free from excessive voids.

The finished surface shall be ready for subsequent screed, waterproofing or flooring layers.

---

### 3. Mode of Measurement & Payment

#### Mode of Measurement

The AAC block filling shall be measured in **Cubic Metres (Cu.M.)** of completed filling work.

#### **Item No – 36**

**Providing and applying polyurethane sealant, repair mortar or equivalent material/item for repairing of the exterior/interior cracks of any width on any structure for all heights and number of rooms/cabins and floors including scaffolding/ jhulaetc, with all raw materials, tools, tackles, labour, scrapping, cleaning as per IS technical requirement and manufacturer's specifications etc. as complete per instruction of Engineer-in-Charge.**

#### 1. Materials

##### Cement

Cement : Shall Conform to M3 Page No.-9 in General Technical Specification Booklet.

##### Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

##### Sand

Sand : Shall Conform to M6 Page No.-10 in General Technical Specification Booklet.

##### Cement Mortar

Cement Mortar : Shall Conform to M11 Page No.-11 in General Technical Specification Booklet.

##### Polyurethane Sealant

The polyurethane sealant shall be:

- Single component or two component as specified.
- Elastomeric in nature.
- UV resistant.
- Weather resistant.

- Non-shrinking.
- Suitable for internal and external applications.
- Capable of accommodating structural movements.

The sealant shall conform to relevant provisions of IS and manufacturer's specifications.

#### Polymer Modified Repair Mortar

Repair mortar shall be factory manufactured polymer modified cementitious mortar suitable for crack repair and concrete restoration.

The repair mortar shall possess:

- High bond strength.
- Low shrinkage.
- Non-sag characteristics.
- Crack resistance.
- Durability under exterior exposure.

#### Bonding Agent

Where required, approved SBR or acrylic polymer bonding agent shall be used to improve adhesion between existing substrate and repair material.

#### Backer Rod (Where Required)

Closed-cell polyethylene backer rod shall be used for wider cracks prior to application of polyurethane sealant.

#### Primer

Primer recommended by the sealant manufacturer shall be used wherever required to achieve proper adhesion.

#### Scaffolding Materials

Shuttering : Shall Conform to M26 Page No.-14 in General Technical Specification Booklet.

Suitable scaffolding, suspended platforms (jhula), ladders and working arrangements shall be provided.

---

## 2. Workmanship

### General

The work shall be executed strictly in accordance with:

- Relevant IS Codes.
- Manufacturer's technical specifications.
- Approved repair methodology.
- Directions of the Engineer-in-Charge.

The contractor shall inspect all cracks and classify them based on:

- Width.
- Depth.
- Nature of crack.
- Structural or non-structural condition.

### Surface Preparation

The affected area shall be thoroughly cleaned before commencement of repair work.

All loose material, dust, dirt, paint, plaster, laitance and deteriorated material shall be removed.

The crack shall be exposed fully to assess its depth and condition.

### Opening of Cracks

Where directed, cracks shall be enlarged into a V-groove or square groove profile using suitable tools.

The groove dimensions shall be adequate to ensure proper filling and bonding.

All debris generated during groove cutting shall be removed.

### Cleaning

Compressed air, wire brushing, vacuum cleaning or approved methods shall be used to clean the crack surfaces.

The prepared surfaces shall be free from:

- Dust.
- Oil.

- Grease.
- Loose particles.
- Moisture (where sealant requires dry substrate).

#### Application of Bonding Agent

For repair mortar applications, approved bonding agent shall be applied to the prepared substrate prior to placing repair mortar.

#### Crack Filling using Repair Mortar

For non-moving cracks and damaged areas:

- Polymer modified repair mortar shall be mixed as per manufacturer's recommendations.
- Mortar shall be applied firmly into the prepared groove.
- The material shall be compacted properly to eliminate voids.
- The repaired surface shall be finished flush with adjoining surfaces.

#### Crack Sealing using Polyurethane Sealant

For moving cracks and expansion joints:

- Backer rod shall be inserted where required.
- Primer shall be applied if recommended.
- Polyurethane sealant shall be applied uniformly using sealant guns.
- The sealant shall completely fill the joint depth.
- The surface shall be neatly tooled to achieve smooth finish.

#### Finishing

The repaired surface shall match adjoining surfaces in:

- Alignment.
- Texture.
- Profile.
- Appearance.

No visible depressions, projections or irregularities shall remain.

#### Curing

Where cementitious repair mortar is used, curing shall be carried out as per manufacturer's recommendations and relevant IS provisions.



## Exterior Repairs

For external elevations, all necessary safety arrangements, scaffolding and suspended platforms shall be provided.

Repair work shall not be carried out during rainfall or unsuitable weather conditions.

## Quality Control

The completed repair shall be:

- Fully bonded.
- Crack free.
- Void free.
- Durable.
- Waterproof where required.

There shall be no signs of:

- Shrinkage.
- Debonding.
- Peeling.
- Surface cracking.

## Cleaning and Disposal

After completion, all debris, waste materials and dismantled materials shall be removed from the site.

The area shall be cleaned and handed over in satisfactory condition.

---

## 3. Mode of Measurement & Payment

### Mode of Measurement

The repair work shall be measured in **Running Metres (R.M.)** of cracks actually repaired and accepted.

## **Item No – 37**

**Providing and fixing washbasin platform counter comprising bottom layer of 25mm thick Kota stone and top layer of 18mm thick mirror polished granite of approved shade and pattern, fixed with 25mm thick cement mortar bed/approved adhesive complete with cutting, moulded 3" fascia, nosing, chamfered edges, sink/wash basin cutouts, joint filling with matching pigment, polishing, finishing, debris disposal and all accessories complete as per approved drawings, samples and instructions of Architect/EIC.**

## 1. Materials

### Cement

Cement : Shall Conform to M3 Page No.-9 in General Technical Specification Booklet.

### Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

### Cement Mortar

Cement Mortar : Shall Conform to M11 Page No.-11 in General Technical Specification Booklet.

### Rough Kota Stone

Rough Kota Stone : Shall Conform to M48 Page No.-23 in General Technical Specification Booklet.

The Kota stone shall:

- Be 25 mm thick.
- Be hard, sound and durable.
- Be free from cracks, cavities and laminations.
- Have uniform thickness and texture.
- Provide adequate support to granite top.

### Granite Stone Slab

Granite Stone Slab : Shall Conform to M52 Page No.-23 in General Technical Specification Booklet.

The granite shall:

- Be 18 mm thick.
- Be mirror polished.
- Be of approved colour, shade and pattern.

- Be free from cracks, pinholes, stains and structural defects.
- Have uniform texture and finish.

#### Adhesive (Where Specified)

The adhesive shall be polymer modified stone fixing adhesive of approved make suitable for fixing granite and natural stone surfaces.

#### Joint Filling Compound

Joint filler shall consist of approved resin-based or cement-based filler mixed with matching colour pigments.

The filler shall:

- Match the granite colour.
- Be non-shrinking.
- Produce smooth joints.

#### Fixtures and Fastenings

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

All accessories required for fixing shall be of approved quality.

---

## 2. Workmanship

### General

The work shall be carried out in accordance with approved architectural drawings, details and directions of the Engineer-in-Charge.

The contractor shall verify all dimensions and wash basin locations before commencement of fabrication.

### Preparation of Surface

The supporting masonry, RCC slab or structural surface shall be:

- Clean.
- Sound.

- Properly cured.
- Free from dust, grease and loose materials.

All irregularities shall be corrected before installation.

#### Fixing of Kota Stone Base Layer

The 25 mm thick Kota stone shall be laid over:

- 25 mm thick cement mortar bed, or
- Approved stone fixing adhesive.

The stone shall be properly bedded and aligned.

Voids below the stone shall not be permitted.

The Kota stone shall provide a rigid and stable base for the granite top.

#### Fixing of Granite Top

The 18 mm thick granite slab shall be fixed over the Kota stone layer using approved adhesive or mortar bedding.

The granite shall be accurately aligned and leveled.

Proper bearing shall be ensured throughout the platform.

The granite shall be cut and finished to the approved dimensions.

#### Wash Basin Cut-Outs

Cut-outs for wash basins, sinks, faucets and accessories shall be machine cut.

The cut edges shall be:

- Smooth.
- Neatly polished.
- Free from chipping.

The openings shall exactly match the approved sanitary fixture dimensions.

#### Fascia and Nosing

A moulded fascia of 75 mm (3") depth shall be provided along exposed edges.

The fascia shall be:

- Properly bonded.
- Aligned with countertop.
- Finished to match granite surface.

All exposed edges shall receive:

- Rounded nosing.
- Chamfered edges.
- Smooth polishing.

Joint Treatment

All joints shall be filled with matching coloured filler.

The joints shall be:

- Neat.
- Flush.
- Impervious.
- Free from visible gaps.

Polishing and Finishing

The granite surface shall be mirror polished.

The completed finish shall be:

- Smooth.
- Uniform.
- Free from scratches.
- Free from stains.
- Free from cracks and chips.

All exposed edges, cut-outs and fascia portions shall receive matching polish.

Alignment and Levels

The platform shall be:

- True to line.
- True to level.
- Properly supported.

- Free from rocking and deflection.

Water shall not stagnate on the finished surface.

#### Protection

Completed work shall be protected against damage during subsequent construction activities.

Any damaged portion shall be replaced at contractor's cost.

#### Cleaning

After completion, the entire platform shall be thoroughly cleaned.

All debris, mortar stains, adhesive residues and waste materials shall be removed from site.

The completed platform shall be handed over in ready-to-use condition.

---

### 3. Mode of Measurement & Payment

#### Mode of Measurement

The work shall be measured in **Square Metres (Sq.M.)** of finished counter top surface.

#### **Item No – 38**

**Water Proofing Treatment in Sunken Portion of WCs & Bathroom: Providing and laying Water proofing treatment in sunken portion of WCS, Bathrooms etc. by applying cement slurry mixed with water proofing cement compound consisting of applying: (a) First layer of slurry of cement @ 0.488 kg/sqm mixed with water proofing cement compound @0.253 kg/sqm. This layer will be allowed to air cure for 4 hours.(b) Second layer of slurry of cement @ 0.242 kg/sqm mixed with water proofing cement compound @ 0.126 kg/sqm.This layer will be allowed to air cure for 4 hours followed with water curing for 48 hours. The rate includes preparation of surface, treatment and sealing of all joints, corners of pipes and masonry with polymer mixed slurry.**

## 1. Materials

### Cement

Cement : Shall Conform to M3 Page No.-9 in General Technical Specification Booklet.

### Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

### Waterproofing Compound

The waterproofing cement compound shall conform to relevant IS specifications and shall be approved by the Engineer-in-Charge.

The compound shall:

- Be compatible with cement slurry.
- Reduce permeability.
- Improve waterproofing performance.
- Be resistant to dampness and moisture penetration.
- Be suitable for wet area waterproofing applications.

### Polymer Additive

The polymer additive used for treatment of corners, joints and pipe penetrations shall be of approved make and compatible with cementitious waterproofing systems.

The polymer shall:

- Improve adhesion.
- Improve flexibility.
- Enhance crack resistance.
- Improve waterproofing performance.

### Cement Slurry

The slurry shall be prepared fresh by mixing cement, waterproofing compound and water in the proportions specified.

Only sufficient quantity required for immediate application shall be prepared.

---

## 2. Workmanship

### General

The waterproofing treatment shall be carried out only after completion of:

- Structural work.
- Plumbing pipe installation.
- Floor trap installation.
- Chasing and service embedding works.

The surface shall be approved by the Engineer-in-Charge before commencement.

### Surface Preparation

The sunken slab surface shall be thoroughly cleaned.

All loose particles, laitance, dust, grease, oil and foreign matter shall be removed.

The surface shall be roughened wherever necessary to provide proper bond.

Honeycombs, cracks and surface defects shall be repaired before waterproofing.

### Treatment of Joints and Junctions

Special treatment shall be provided at:

- Wall-floor junctions.
- Pipe penetrations.
- Floor trap locations.
- Construction joints.
- Masonry and RCC junctions.

The treatment shall consist of polymer modified cement slurry applied thoroughly to vulnerable locations.

Fillets of suitable size shall be formed at internal corners where required.

### Pre-wetting

Before application of slurry, the surface shall be thoroughly wetted with clean water.

The surface shall be maintained in Saturated Surface Dry (SSD) condition.



No standing water shall remain.

---

#### First Coat

The first coat shall consist of cement slurry prepared using:

- Cement @ 0.488 kg per Sq.M.
- Waterproofing compound @ 0.253 kg per Sq.M.

The slurry shall be applied uniformly over the prepared surface using:

- Brush.
- Broom.
- Approved applicator.

The coating shall completely cover the surface without pinholes or discontinuities.

The first coat shall be allowed to air cure for:

Minimum 4 Hours

before application of the second coat.

---

#### Second Coat

The second coat shall consist of cement slurry prepared using:

- Cement @ 0.242 kg per Sq.M.
- Waterproofing compound @ 0.126 kg per Sq.M.

The second coat shall be applied uniformly over the first coat.

Application shall be carried out perpendicular to the direction of the first coat wherever practical.

The finished coating shall form a continuous waterproof membrane.

The second coat shall be allowed to air cure for:

Minimum 4 Hours

before commencement of water curing.

---

### Curing

After air curing of the second coat, water curing shall be carried out continuously for:

Minimum 48 Hours

The waterproofing layer shall be protected against damage during curing.

### Protection

The completed waterproofing treatment shall be protected from:

- Foot traffic.
- Mechanical damage.
- Impact.
- Disturbance from subsequent trades.

No further work shall be permitted until the waterproofing treatment is fully cured and approved.

### Water Tightness

Where specified, ponding or water retention tests shall be conducted before covering the waterproofed surface.

Any leakage observed shall be rectified at contractor's cost.

### Quality Requirements

The completed waterproofing treatment shall be:

- Continuous.
- Uniform.
- Crack free.
- Fully bonded.
- Free from pinholes and blisters.

The treated area shall effectively prevent seepage and dampness.

---

### 3. Mode of Measurement & Payment

#### Mode of Measurement

The waterproofing treatment shall be measured in **Square Metres (Sq.M.)** of actual treated surface area.

#### **Item No – 39**

**Providing & Applying two coat of Dr. Fixit / Sika / Fosroc Waterproofing treatment including thoroughly brushing the surface free from motar dropping and other foreign matter &masonry surface fully cured & dried before application.**

#### 1. Materials

##### Cement

Cement : Shall Conform to M3 Page No.-9 in General Technical Specification Booklet.

##### Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

##### Waterproofing Compound

The waterproofing material shall be:

- Dr.Fixit Waterproofing System, or
- Sika Waterproofing System, or
- Fosroc Waterproofing System,

or equivalent approved product.

The material shall be:

- Factory manufactured.
- Suitable for masonry and concrete waterproofing.
- Resistant to water penetration.
- Weather resistant.
- Durable under service conditions.

The waterproofing system shall be applied strictly in accordance with the manufacturer's technical literature.

#### Polymer Bonding Agent (Where Required)

The bonding agent shall be of approved make and compatible with the waterproofing system.

#### Crack Repair Material (Where Required)

Cracks, honeycombs and surface defects shall be repaired using approved repair mortar or polymer modified repair compounds before waterproofing treatment.

#### Cement Mortar (Where Required)

Cement Mortar : Shall Conform to M11 Page No.-11 in General Technical Specification Booklet.

---

## 2. Workmanship

### General

The waterproofing treatment shall be executed only by skilled applicators trained in the application of the approved waterproofing system.

The work shall be carried out strictly in accordance with:

- Manufacturer's specifications.
  - Relevant IS Codes.
  - Directions of the Engineer-in-Charge.
- 

### Surface Preparation

Before application, the surface shall be thoroughly prepared.

The surface shall be:

- Sound and stable.
- Fully cured.
- Dry or SSD condition as recommended by manufacturer.
- Free from dust.
- Free from oil and grease.
- Free from paint, algae and loose particles.

- Free from mortar droppings and laitance.

Mechanical brushing, wire brushing or approved cleaning methods shall be used.

---

#### Repair of Defects

Prior to waterproofing application:

- Cracks shall be opened and repaired.
- Honeycombs shall be filled.
- Surface depressions shall be repaired.
- Loose plaster shall be removed and reinstated.

Pipe penetrations and service entries shall be properly sealed.

---

#### Application of First Coat

The first coat of waterproofing compound shall be prepared and applied as per manufacturer's instructions.

Application may be carried out using:

- Brush.
- Roller.
- Spray equipment.

The coat shall completely cover the surface and penetrate into pores and micro-cracks.

No untreated patches shall remain.

---

#### Drying Period

The first coat shall be allowed to dry for the period recommended by the manufacturer before application of the second coat.

The surface shall not be disturbed during this period.

---

## Application of Second Coat

The second coat shall be applied after the first coat has sufficiently dried.

The second coat shall generally be applied perpendicular to the first coat wherever recommended.

Uniform coverage shall be ensured over the entire surface.

Special attention shall be given to:

- Corners.
  - Pipe penetrations.
  - Construction joints.
  - Junctions between masonry and concrete.
- 

## Curing

Where specified by the manufacturer, curing shall be carried out for the recommended duration.

Improper curing shall not be permitted.

---

## Protection

The completed waterproofing layer shall be protected against:

- Mechanical damage.
- Rainfall (during curing period).
- Dust contamination.
- Traffic or loading.

No subsequent work shall be allowed until the waterproofing treatment has fully matured.

---

## Quality Control

The completed waterproofing treatment shall be:

- Continuous.

- Uniform.
- Crack free.
- Free from pinholes.
- Fully bonded to substrate.
- Waterproof and durable.

Any defective area shall be removed and redone at contractor's cost.

---

## Cleaning

After completion, the work area shall be cleaned.

All debris, waste materials and surplus waterproofing compounds shall be removed from the site.

---

## 3. Mode of Measurement & Payment

### Mode of Measurement

The waterproofing treatment shall be measured in **Square Metres (Sq.M.)** of actual treated surface area.

### Item No – 41

**Gypsum Ceiling: Pro. And fixing single layerwater proof gypsum board 12.5mm thick sections using water proof board of size 1220mm x 1830mm x 8.0mm suspended by GI suspender channel of size 25mm x3 mm with intermediate channelog size 18mm x 40mm x 0.8mm at 1220 mm center to center ceiling section of size 40mm x 35mm x 0.55mm at 457mm c/c and perimeter channel A of size 20mm x 27mm x 30mm x 0.5mm at edges & drops incl. paper taps and sofit cleat, anchor fastener, scoch bolt connecting cleat, joining compound top coat on ceiling incl.makingnecy.opening for light fitting,diffuser etc. comp. as per detail drawing as directedat all floors / all levels / all heights**

## 1. Materials

### Gypsum Board

The moisture resistant (MR) gypsum board shall conform to **IS 2095 (Part-1): Gypsum Plaster Boards**.

The board shall:

- Be water resistant/moisture resistant type.
- Be 12.5 mm thick.
- Be factory manufactured.
- Have tapered edges.
- Be free from cracks, warping and damage.
- Be suitable for false ceiling applications.

### Galvanized Iron Framework

The GI framework shall conform to **IS 277** and relevant manufacturer's specifications.

The framework shall comprise:

#### *GI Suspender Channel*

- Size : 25 mm × 3 mm
- Galvanized steel
- Adequate strength to support ceiling load

#### *Intermediate Channel*

- Size : 18 mm × 40 mm × 0.80 mm thick
- Installed at 1220 mm c/c

#### *Ceiling Section*

- Size : 40 mm × 35 mm × 0.55 mm thick
- Installed at 457 mm c/c

#### *Perimeter Channel*

- Size : 20 mm × 27 mm × 30 mm × 0.50 mm thick
- Fixed along wall perimeter and ceiling drops



## Fixtures and Fastenings

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

The fixing system shall include:

- Anchor fasteners.
- Soffit cleats.
- Connecting clips.
- Scotch bolts.
- Self-drilling screws.
- Expansion anchors.
- Suspension rods.

All fasteners shall be corrosion resistant.

## Jointing Compound

Jointing compound shall be proprietary gypsum-based joint treatment material approved by the manufacturer.

The compound shall provide:

- Smooth finish.
- Crack resistance.
- Good adhesion.

## Paper Tape

Paper tape shall be perforated reinforced joint tape specifically designed for gypsum board joints.

## Finishing Compound

Finishing compound shall be gypsum-based finishing material compatible with the jointing system.

## Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

---

## 2. Workmanship

### General

The false ceiling work shall be carried out in accordance with:

- Approved architectural drawings.
- Manufacturer's specifications.
- Relevant IS Codes.
- Directions of the Engineer-in-Charge.

All dimensions shall be verified at site before commencement.

---

### Surface Preparation

Before installation:

- Structural soffit shall be checked.
- Loose materials shall be removed.
- MEP services above ceiling shall be coordinated.
- Levels shall be marked accurately.

Any discrepancies shall be reported to the Engineer-in-Charge.

---

### Layout and Marking

The ceiling grid layout shall be established using approved levels.

The finished ceiling shall be:

- True to line.
  - True to level.
  - Free from sagging.
  - Properly aligned with architectural details.
- 

### Fixing of Perimeter Channel

Perimeter channels shall be fixed along walls, beams and ceiling drops.

Fixing shall be done using approved fasteners at regular intervals not exceeding manufacturer's recommendations.

The perimeter framework shall be rigid and continuous.

---

#### Installation of Suspender System

GI suspender channels shall be fixed securely to the structural soffit using anchor fasteners and soffit cleats.

Spacing shall conform to approved drawings and manufacturer's specifications.

Suspension members shall be perfectly vertical.

---

#### Installation of Intermediate Channels

Intermediate channels shall be fixed at:

1220 mm centre-to-centre

The channels shall be properly connected to the suspension system.

All channels shall be aligned accurately.

---

#### Installation of Ceiling Sections

Ceiling sections shall be fixed at:

457 mm centre-to-centre

The framework shall be adequately braced to prevent movement or deflection.

Completed framework shall form a rigid ceiling grid.

---

#### Fixing of Gypsum Boards

The moisture resistant gypsum boards shall be fixed using approved self-drilling screws.

Boards shall be:

- Properly aligned.
- Tightly fixed.
- Installed with staggered joints.
- Supported adequately by ceiling sections.

Damaged boards shall not be used.

---

## Joint Treatment

All joints shall receive:

- Jointing compound.
- Paper tape.
- Finishing coats.

The joint treatment process shall include:

1. Filling of joints with jointing compound.
2. Embedding of paper tape.
3. Application of second coat.
4. Application of finishing coat.
5. Sanding to smooth finish.

All joints shall become invisible after finishing.

---

## Openings and Cut-Outs

Necessary openings shall be made for:

- Light fittings.
- Diffusers.
- Air-conditioning grilles.
- Access panels.
- Fire alarm devices.
- Sprinklers.
- Other services.

Cut-outs shall be neatly executed without damaging boards.

No additional payment shall be made for such openings.

---

## Finishing

The ceiling surface shall be:

- Smooth.
- Uniform.
- Free from visible joints.
- Free from undulations.
- Free from cracks.
- Ready for painting.

The finished ceiling shall comply with approved architectural requirements.

---

## Tolerances

The completed ceiling shall not show:

- Deflection.
- Misalignment.
- Joint cracking.
- Screw popping.
- Surface waviness.

Level variation shall remain within permissible limits specified by IS standards.

---

## Protection

Completed ceiling work shall be protected from:

- Water leakage.
- Impact damage.
- Excessive loading.
- Subsequent construction activities.

Damaged portions shall be replaced at contractor's cost.

---

## Cleaning

Upon completion, the ceiling surface shall be cleaned thoroughly.

All debris, waste materials and surplus materials shall be removed from site.

---

## 3. Mode of Measurement & Payment

### Mode of Measurement

The false ceiling shall be measured in **Square Metres (Sq.M.)** of actual finished ceiling area.

## **Item No – 42**

**ACP Sheet Cladding: Providing and fixing 4 mm thick Aluminium Composite Panel (ACP) cladding of approved colour and shade, comprising PVDF-coated aluminium skins bonded to a fire-retardant core, fixed over 3kg /smtaluminium framework with necessary brackets, cleats, anchor fasteners, stainless steel screws, rivets, and structural silicone sealant. The work shall include cutting, grooving, bending, joint treatment, edge finishing, scaffolding, and all accessories required for complete installation as per approved drawings and engineer's instructions**

### 1. Materials

#### Aluminium Composite Panel (ACP)

The ACP shall conform to relevant provisions of **ASTM, BS, EN Standards and manufacturer's specifications.**

The ACP shall:

- Be 4 mm thick.
- Consist of two aluminium skins bonded to a fire-retardant mineral core.
- Have PVDF (Polyvinylidene Fluoride) coating on exposed face.
- Be weather resistant.
- Be UV resistant.
- Be corrosion resistant.
- Be suitable for exterior and interior cladding applications.

The panel shall be:

- Uniform in thickness.
- Free from dents and surface defects.
- Factory finished.
- Approved by the Engineer-in-Charge.

#### Aluminium Framework

Aluminium Doors, Windows, Hold Fast : Shall Conform to M31 Page No.-17 in General Technical Specification Booklet.

The supporting framework shall consist of:

- Extruded aluminium sections.
- Aluminium brackets.
- Aluminium cleats.
- Aluminium runners.

Framework weight shall not be less than:

3.0 Kg per Sq.M of cladding area

The aluminium shall be:

- Corrosion resistant.
- Straight and true.
- Free from distortion.

#### Structural Silicone Sealant

The sealant shall be:

- Neutral cure silicone.
- Weather resistant.
- UV resistant.
- Compatible with ACP surfaces.
- Approved for façade applications.

#### Stainless Steel Screws

The screws shall be:

- Stainless steel grade SS-304 or higher.

- Corrosion resistant.
- Self-tapping where required.

#### Rivets

The rivets shall be:

- Aluminium or stainless steel.
- Corrosion resistant.
- Suitable for ACP fixing systems.

#### Anchor Fasteners

Anchor fasteners shall be:

- Stainless steel or galvanized steel.
- Of approved make.
- Adequate to withstand design loads.

#### Fixtures and Fastenings

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

#### Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

(Where required for cleaning and related operations.)

---

## 2. Workmanship

### General

The work shall be executed strictly in accordance with:

- Approved architectural drawings.
- Shop drawings.
- Manufacturer's recommendations.
- Engineer-in-Charge instructions.



The contractor shall prepare detailed fabrication and installation drawings for approval before commencement.

---

#### Site Verification

All dimensions shall be verified at site before fabrication.

No fabrication shall commence until dimensions are confirmed.

Any discrepancies shall be brought to the notice of the Engineer-in-Charge.

---

#### Preparation of Supporting Surface

The supporting RCC, masonry or structural steel surface shall be checked for:

- Alignment.
- Line.
- Level.
- Structural adequacy.

Necessary corrections shall be made before installation.

---

#### Fabrication of Aluminium Framework

The aluminium framework shall be fabricated accurately.

The framework shall consist of:

- Vertical members.
- Horizontal members.
- Brackets.
- Cleats.
- Support members.

The framework shall be rigid and capable of resisting:

- Wind loads.
- Dead loads.
- Thermal movements.

---

### Fixing of Framework

The framework shall be securely fixed to the structure using approved anchor fasteners.

Brackets shall be fixed at suitable intervals as per design requirements.

The framework shall be:

- True to line.
- True to level.
- Properly aligned.

No visible distortion shall be permitted.

---

### Fabrication of ACP Panels

ACP panels shall be fabricated using approved machinery.

The fabrication shall include:

- Cutting.
- Grooving.
- Folding.
- Bending.
- Edge returns.

All fabricated edges shall be smooth and free from burrs.

No damage to PVDF coating shall occur during fabrication.

---

### Installation of ACP Panels

ACP panels shall be fixed to the framework using approved fixing systems.

Fixing shall ensure:

- Firm attachment.
- Proper alignment.
- Uniform joint widths.
- Provision for thermal expansion and contraction.

Panels shall be installed without:

- Surface waviness.
- Buckling.
- Distortion.

---

#### Joint Treatment

Uniform joints shall be maintained between adjacent panels.

Joints shall be sealed using approved structural silicone sealant where specified.

Sealant application shall produce:

- Weatherproof joints.
- Clean appearance.
- Uniform finish.

---

#### Edge Finishing

All exposed edges, returns and corners shall be neatly finished.

Exposed sharp edges shall not be permitted.

Edge treatment shall match approved façade details.

---

#### Alignment and Tolerances

The completed ACP cladding shall be:

- Plumb.
- Level.
- True to line.

Variation from specified alignment shall remain within permissible tolerances.

Visible panel irregularities shall not be accepted.

---

## Protection

Protective film on ACP panels shall remain intact during installation.

The film shall be removed only after completion of work.

Finished surfaces shall be protected from:

- Scratches.
  - Impact.
  - Staining.
  - Construction damage.
- 

## Cleaning

Upon completion:

- Protective coverings shall be removed.
- Surface shall be cleaned.
- Sealant stains and marks shall be removed.

The cladding shall be handed over in clean and finished condition.

---

## 3. Mode of Measurement & Payment

### Mode of Measurement

ACP cladding shall be measured in **Square Metres (Sq.M.)** of actual finished cladding area.

### **Item No – 43**

**Providing and fixing Cement sheet manufactured from SuperHD Cement Board (2440 × 1220 × 12 mm) conforming to IS 14862: Type A – Category IV of approved design and patterns shall be executed using CNC-controlled Water Jet Cutting fixed on a GI steel frame fabrication, fixing with hinges and locking arrangement, finished with one coat red oxide primer and two coats synthetic enamel paint, complete as per directions of Engineer-in-Charge.**

## 1. Materials

### Cement Board

The Cement Board shall conform to:

#### **IS 14862 – Fibre Cement Flat Sheets Specification**

The board shall be:

- Super HD Cement Board.
- Size: 2440 mm × 1220 mm.
- Thickness: 12 mm.
- Type A – Category IV.
- Factory manufactured.
- Dimensionally stable.
- Moisture resistant.
- Fire resistant.
- Termite resistant.
- Free from cracks, warping and defects.

The board shall be capable of CNC water jet cutting without edge deterioration.

---

### Structural Steel / GI Steel Framework

Structural Steel : Shall Conform to M22 Page No.-14 in General Technical Specification Booklet.

The framework shall consist of:

- GI square tubes.
- GI rectangular hollow sections.
- GI support members.
- GI stiffeners.

The framework shall be adequately designed to support dead load and wind load requirements.

All steel members shall be straight, free from bends, corrosion and manufacturing defects.

---

## Mild Steel Fasteners and Accessories

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

The fixing system shall include:

- Stainless steel screws.
- Anchor fasteners.
- Bolts.
- Nuts.
- Washers.
- Cleats.
- Holders.
- Clamps.

All exposed fasteners shall be corrosion resistant.

---

## Hinges

The hinges shall be:

- Heavy duty type.
  - Mild steel or stainless steel.
  - Suitable for the panel size and weight.
  - Smooth in operation.
- 

## Locking Arrangement

Locking arrangements shall be:

- Heavy duty.
- Corrosion resistant.
- Approved by the Engineer-in-Charge.

The locking system shall permit secure opening and closing of the panel wherever access is required.

---

## Paint System

### Red Oxide Primer

The primer shall be approved anti-corrosive red oxide metal primer suitable for steel surfaces.

The primer shall provide:

- Corrosion resistance.
- Strong adhesion.
- Uniform coverage.

### Paints

Paints : Shall Conform to M44 Page No.-21 in General Technical Specification Booklet.

### Synthetic Enamel Paint

The paint shall:

- Be premium quality synthetic enamel.
- Be suitable for exterior/interior applications.
- Have good weather resistance.
- Produce smooth uniform finish.

The colour and shade shall be approved by the Engineer-in-Charge.

---

## Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

Water used for cleaning and painting preparation shall be clean and free from harmful impurities.

---

## 2. Workmanship

### General

The work shall be executed in accordance with:

- Approved architectural drawings.

- Shop drawings.
- Manufacturer's specifications.
- Engineer-in-Charge instructions.

The contractor shall prepare detailed fabrication drawings before execution.

---

#### Measurement and Site Verification

All dimensions shall be verified at site prior to fabrication.

Any discrepancy between drawings and site conditions shall be brought to the notice of the Engineer-in-Charge.

---

#### CNC Water Jet Cutting

The decorative patterns shall be cut using CNC-controlled Water Jet Cutting machines.

The cutting process shall ensure:

- Sharp and accurate edges.
- Smooth profiles.
- Precise reproduction of approved design.
- No cracking or edge damage.

Manual cutting of decorative motifs shall not be permitted unless specifically approved.

---

#### Fabrication of GI Framework

The GI framework shall be fabricated accurately as per approved drawings.

The framework shall:

- Maintain rigidity.
- Prevent vibrations.
- Support the cement board uniformly.
- Resist distortion.

All joints shall be properly welded, bolted or mechanically fixed.



---

## Surface Preparation of Framework

Before painting:

- Weld spatters shall be removed.
- Sharp edges shall be smoothened.
- Rust and scale shall be cleaned.
- Surfaces shall be made ready for painting.

---

## Application of Primer

One coat of approved red oxide primer shall be applied to all exposed steel surfaces.

The primer coat shall:

- Cover the entire surface uniformly.
- Be free from runs and sags.
- Be allowed to dry before top coats.

---

## Application of Synthetic Enamel Paint

After primer drying:

Two coats of synthetic enamel paint shall be applied.

Each coat shall:

- Be uniformly applied.
- Achieve full coverage.
- Be allowed to dry before subsequent coat.

The final finish shall be:

- Smooth.
  - Uniform.
  - Free from brush marks.
  - Free from peeling and blistering.
-

## Fixing of Cement Board Panels

The CNC-cut cement board panels shall be fixed securely onto the GI framework.

Fixing shall be done using:

- Screws.
- Bolts.
- Concealed fixing systems where specified.

The panel shall remain:

- True to line.
- True to level.
- Free from distortion.

---

## Hinges and Locking Arrangement

Where shown in drawings:

- Hinges shall be fixed accurately.
- Locking arrangements shall be installed properly.
- Opening panels shall operate smoothly.

The opening and closing operation shall not damage adjacent finishes.

---

## Alignment and Tolerances

The completed installation shall be:

- Plumb.
- Level.
- Properly aligned.
- Free from visible irregularities.

Pattern continuity and symmetry shall be maintained.

---

## Protection

Completed work shall be protected from:

- Impact damage.
- Paint damage.
- Construction activities.

Any damaged panel shall be replaced at contractor's expense.

---

## Cleaning

After completion:

- Surfaces shall be cleaned.
  - Paint stains shall be removed.
  - Debris shall be disposed of.
  - The installation shall be handed over in finished condition.
- 

## 3. Mode of Measurement & Payment

### Mode of Measurement

The work shall be measured in **Square Metres (Sq.M.)** of finished panel area installed and accepted.

### **Item No – 44**

**Providing and fixing frameless shower partition made of 12 mm thick clear toughened safety glass conforming to relevant standards, complete with SS 304 grade top track, rollers, handles, hinges, floor guides, rubber gaskets, sealant, and all necessary accessories, including cutting, drilling, fitting, and installation as per approved design and direction of Engineer-in-Charge.**

## 1. Materials

### Toughened Safety Glass

Glass : Shall Conform to M38 Page No.-18 in General Technical Specification Booklet.

The glass shall conform to **IS 2553 (Part-1)** and **IS 14900 (Safety Glass Standards)**.

The glass shall be:

- Clear toughened safety glass.
- 12 mm thick.
- Heat treated and tempered.
- Free from scratches, bubbles, waviness and visible defects.
- Uniform in thickness and transparency.
- Machine cut and edge polished.

All exposed edges shall be factory polished.

No site cutting of toughened glass shall be permitted after tempering.

---

### Stainless Steel Hardware

The hardware shall be manufactured from:

#### **Stainless Steel Grade 304**

The hardware shall include:

- Top track.
- Rollers.
- Pull handles.
- Hinges.
- Floor guides.
- Glass connectors.
- Brackets.
- Clamps.
- Fasteners.

The stainless steel shall:

- Be corrosion resistant.
- Have satin/matt/mirror finish as approved.

- Be suitable for wet area applications.
- 

## Rollers

Rollers shall be:

- Heavy duty precision rollers.
  - Corrosion resistant.
  - Suitable for the weight of glass panels.
  - Capable of smooth and silent operation.
- 

## Hinges

Hinges shall be:

- SS 304 heavy duty hinges.
  - Self-closing type where specified.
  - Suitable for 12 mm thick toughened glass.
- 

## Handles

Handles shall be:

- Stainless steel Grade 304.
  - Ergonomically designed.
  - Adequately sized for easy operation.
  - Securely fixed.
- 

## Floor Guides

Floor guides shall be:

- SS 304 or approved polymer type.
  - Suitable for frameless shower enclosures.
  - Corrosion resistant.
-

## Rubber Gaskets

Rubber gaskets shall be:

- EPDM or equivalent approved quality.
  - Water resistant.
  - Durable and flexible.
  - Compatible with glass fixing systems.
- 

## Silicone Sealant

The sealant shall be:

- Neutral cure silicone sealant.
- Fungus resistant.
- Waterproof.
- Non-staining.
- Suitable for sanitary and shower applications.

The sealant shall provide watertight joints.

---

## Fixtures and Fastenings

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

All screws, anchors and fasteners shall be corrosion resistant and suitable for wet area installation.

---

## 2. Workmanship

### General

The work shall be carried out in accordance with:

- Approved architectural drawings.
- Manufacturer's recommendations.
- Approved shop drawings.
- Directions of the Engineer-in-Charge.

All dimensions shall be verified at site before fabrication.

---

#### Site Measurement

Accurate site measurements shall be taken after completion of:

- Wall finishes.
- Floor finishes.
- Waterproofing works.

Fabrication shall commence only after verification of actual site dimensions.

---

#### Fabrication of Glass Panels

The glass shall be factory processed and tempered.

Fabrication shall include:

- Cutting.
- Drilling.
- Notching.
- Edge polishing.

All fabrication shall be completed before tempering.

No cutting, drilling or modification shall be carried out after toughening.

---

#### Edge Finishing

All exposed glass edges shall be:

- Machine polished.
- Smooth finished.
- Free from chips and sharp corners.

The finished edges shall provide safe handling and appearance.

---

## Fixing of Hardware

All hardware shall be fixed accurately in accordance with manufacturer's recommendations.

The hardware installation shall ensure:

- Structural stability.
- Smooth operation.
- Proper alignment.

All fasteners shall be tightened securely.

---

## Installation of Glass Panels

The glass panels shall be installed carefully to avoid breakage.

Panels shall be:

- Vertical.
- Properly aligned.
- Firmly supported.
- Free from stress concentrations.

Suitable packers and spacers shall be used where required.

---

## Installation of Sliding Components (Where Applicable)

Top tracks and rollers shall be installed accurately.

The sliding panel shall:

- Move smoothly.
- Operate without noise.
- Remain properly aligned.

Rollers shall be adjusted after installation.

---



## Installation of Hinged Components (Where Applicable)

Hinges shall be aligned properly.

Doors shall:

- Open and close smoothly.
- Maintain uniform clearances.
- Remain free from sagging.

---

## Joint Sealing

All junctions between:

- Glass and wall.
- Glass and floor.
- Glass and fixed panels.

shall be sealed with approved silicone sealant.

Sealant application shall be neat and continuous.

No gaps shall remain.

---

## Water Tightness

The completed shower partition shall effectively contain water within the shower area.

All joints and interfaces shall be checked for leakage.

Necessary rectifications shall be carried out before handover.

---

## Quality Requirements

The completed installation shall be:

- Rigid.
- Stable.
- Properly aligned.

- Scratch free.
- Watertight.
- Free from visible defects.

There shall be no rattling, vibration or movement during operation.

---

## Cleaning and Protection

After installation:

- Protective stickers shall be removed.
- Glass surfaces shall be cleaned.
- Hardware shall be polished.

The completed partition shall be protected until project handover.

---

## 3. Mode of Measurement & Payment

### Mode of Measurement

The shower partition shall be measured in **Square Metres (Sq.M.)** of installed glass partition area.

### **Item No – 59**

**Provide and install a premium health faucet (bidet spray) set in polished chrome finish, featuring a modern ergonomic spray handset for comfortable handling and precise water control. The assembly shall include a durable flexible metal hose and a matching wall-mounting bracket. Designed for targeted water spray, smooth trigger operation, corrosion resistance, and leak-proof performance, the work shall include supply, wall fixing, water connection, sealing, and testing, with all necessary connectors, fittings, washers, and accessories for a complete, reliable installation at all floors, levels, and heights.**

### 1. Materials

#### Health Faucet (Bidet Spray)

The health faucet shall be of approved make and conform to relevant Indian Standards for sanitary fittings.

The health faucet shall:

- Be premium quality chrome plated brass/ABS body.
- Have ergonomic design for comfortable operation.
- Provide smooth trigger action.
- Deliver controlled water spray.
- Be corrosion resistant.
- Be leak-proof under operating pressure.
- Have durable internal mechanism.

The finish shall be:

- Mirror polished chrome finish.
- Scratch resistant.
- Uniform in appearance.

---

#### Flexible Hose

The flexible hose shall:

- Be stainless steel braided type.
- Have minimum length of 1.0 to 1.2 metres unless otherwise specified.
- Be capable of withstanding working water pressure.
- Be corrosion resistant.
- Be kink resistant.
- Have brass end fittings.

The hose shall be free from leakage under operating pressure.

---

#### Wall Mounting Bracket

The bracket shall:

- Be chrome plated.
  - Match the finish of the health faucet.
  - Be securely fixed to wall.
  - Hold the spray handset firmly.
-

### Angle Valve / Stop Valve (Where Required)

Bid Cocks and Stop Cocks : Shall Conform to M57 Page No.-25 in General Technical Specification Booklet.

The valve shall:

- Be brass body chrome plated type.
- Be suitable for health faucet connection.
- Operate smoothly without leakage.

---

### Fixtures and Fastenings

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

The fixing accessories shall include:

- Stainless steel screws.
- Anchor plugs.
- Connectors.
- Couplings.
- Washers.
- Clamps.

All fixtures shall be corrosion resistant.

---

### Rubber Washers and Seals

The washers and seals shall:

- Be high quality EPDM or approved rubber.
- Be suitable for potable water applications.
- Prevent leakage at all joints.

---

### Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

Water used for testing shall be clean and free from harmful impurities.

---

## 2. Workmanship

### General

The work shall be executed in accordance with:

- Approved drawings.
- Manufacturer's specifications.
- Plumbing layout drawings.
- Directions of the Engineer-in-Charge.

The contractor shall verify the exact location before installation.

---

### Preparation

The water supply point shall be checked for:

- Alignment.
- Water pressure.
- Serviceability.

All debris, dust and foreign materials shall be removed before installation.

---

### Fixing of Angle Valve

Where required, the angle valve shall be installed at the designated water supply outlet.

The valve shall be:

- Properly aligned.
- Securely tightened.
- Leak-proof.

Thread sealing tape or approved sealant shall be used at threaded joints.

---

## Installation of Health Faucet Assembly

The health faucet assembly shall be connected to the water supply system through the flexible hose.

The installation shall include:

- Spray handset.
- Flexible hose.
- Wall bracket.
- Connectors.
- Couplings.

The assembly shall be securely fixed without imposing stress on the hose or fittings.

---

### Fixing of Wall Bracket

The wall bracket shall be installed at an approved height and location.

The bracket shall be:

- Firmly anchored.
- Properly aligned.
- Convenient for operation.

Loose fixing shall not be permitted.

---

### Jointing and Sealing

All threaded joints shall be sealed using approved sealing materials.

All connections shall be:

- Water-tight.
  - Properly tightened.
  - Free from leakage.
-

## Testing

After installation, the complete assembly shall be tested under working water pressure.

The testing shall confirm:

- Leak-proof joints.
- Proper spray pattern.
- Smooth trigger operation.
- Adequate water flow.

Any leakage or malfunction shall be rectified immediately.

---

## Quality Requirements

The completed installation shall:

- Operate smoothly.
- Be free from leakage.
- Be properly aligned.
- Have uniform chrome finish.
- Be free from scratches and defects.

The spray trigger shall function without sticking or excessive force.

---

## Cleaning

After installation:

- Protective coverings shall be removed.
  - Chrome surfaces shall be cleaned.
  - Excess sealant shall be removed.
  - The fitting shall be handed over in ready-to-use condition.
- 

## 3. Mode of Measurement & Payment

### Mode of Measurement

The health faucet set shall be measured in **Numbers (Nos.)**.

## **Item No – 62**

**Provide and install a single-control tall basin mixer faucet in polished chrome finish for vessel-type washbasins. The faucet shall feature a minimalist high-arc spout and single lever control for precise adjustment of water flow and temperature, with a durable ceramic cartridge for drip-free performance. Installation shall include flexible hot and cold hoses, mounting hardware, washers, and fittings. Scope covers supply, fixing, water connection, sealing, alignment, and testing, ensuring a secure, leak-proof, premium installation at all floors, levels, and heights.**

### **1. Materials**

#### **Basin Mixer Faucet**

The basin mixer shall conform to relevant Indian Standards for sanitary fittings.

The mixer faucet shall:

- Be single lever operated.
- Be tall body type suitable for vessel wash basins.
- Have high arc spout design.
- Be manufactured from high-quality brass body.
- Have chrome plated finish.
- Be resistant to corrosion and tarnishing.
- Be suitable for hot and cold water supply systems.
- Be capable of smooth operation throughout its service life.

The finish shall be:

- Polished chrome finish.
- Uniform and defect free.
- Scratch resistant.

---

#### **Ceramic Cartridge**

The faucet shall be fitted with high quality ceramic disc cartridge.

The cartridge shall:

- Provide drip-free performance.



- Permit smooth operation.
- Ensure precise flow control.
- Ensure accurate temperature control.

The cartridge shall be replaceable without dismantling major components.

---

#### Flexible Connection Hoses

The flexible hoses shall:

- Be stainless steel braided type.
- Be suitable for hot and cold water supply.
- Be pressure resistant.
- Be corrosion resistant.
- Have brass end fittings.

The hoses shall be capable of withstanding operating pressure without leakage.

---

#### Connecting Fittings

The connecting fittings shall include:

- Brass connectors.
- Couplings.
- Adaptors.
- Union fittings.

All fittings shall be compatible with the plumbing system.

---

#### Washers and Seals

The sealing elements shall consist of:

- EPDM rubber washers.
- Neoprene washers.
- O-rings.

The seals shall:

- Prevent leakage.
  - Resist deterioration.
  - Be suitable for potable water systems.
- 

## Fixtures and Fastenings

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

The fixing accessories shall include:

- Mounting studs.
- Nuts.
- Washers.
- Screws.
- Anchor fasteners.

All exposed components shall be corrosion resistant.

---

## Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

Water used for testing shall be clean and free from impurities.

---

## 2. Workmanship

### General

The work shall be executed in accordance with:

- Approved plumbing drawings.
- Manufacturer's installation instructions.
- Directions of the Engineer-in-Charge.

The contractor shall verify the exact location and basin type before installation.

---

## Preparation

Prior to installation:

- Water supply points shall be checked.
- Hot and cold water lines shall be identified.
- Mounting surface shall be cleaned.
- Basin opening dimensions shall be verified.

Any defects affecting installation shall be rectified before commencement.

---

## Installation of Mixer Faucet

The mixer faucet shall be installed centrally and accurately aligned with the vessel basin.

The faucet shall be fixed using approved mounting hardware.

The installation shall ensure:

- Proper vertical alignment.
- Firm fixing.
- Adequate clearance above basin.
- Ease of operation.

The mixer shall not exhibit movement after installation.

---

## Water Connections

Hot and cold water supply lines shall be connected through flexible hoses.

Connections shall be made using approved fittings.

Threaded joints shall be sealed using:

- PTFE tape, or
- Approved thread sealant.

All joints shall be watertight.

---

## Alignment

The faucet shall be:

- Centered with respect to the basin.
- Plumb and level.
- Positioned to ensure proper water discharge into the basin.

The spout outlet shall not cause splashing during normal use.

---

## Testing

Upon completion of installation, the faucet shall be tested under operating pressure.

Testing shall verify:

- Leak-proof performance.
- Smooth lever operation.
- Proper mixing of hot and cold water.
- Uniform water flow.
- Absence of vibration and noise.

Any leakage or operational defect shall be rectified immediately.

---

## Quality Requirements

The completed installation shall:

- Be secure and rigid.
  - Be free from leakage.
  - Have smooth lever movement.
  - Have drip-free shut-off.
  - Have uniform chrome finish.
  - Be free from scratches and visible defects.
- 

## Cleaning and Protection

After installation:

- Chrome surfaces shall be cleaned.
  - Fingerprints and stains shall be removed.
  - Protective coverings shall be removed.
  - The fitting shall be protected until project handover.
- 

### 3. Mode of Measurement & Payment

#### Mode of Measurement

The basin mixer faucet shall be measured in **Numbers (Nos.)**.

#### **Item No – 63**

**Provide and install a 2-way bib tap in polished chrome finish with two independent quarter-turn lever controls and ceramic disc cartridges for smooth, drip-free operation. Made of corrosion-resistant metal with durable chrome plating, it allows dual water outlet use. Work includes supply, wall fixing, water connection, sealing, and testing, with all required connectors, fittings, and accessories at all floors, levels, and heights.**

#### 1. Materials

##### Bib Tap

Bid Cocks and Stop Cocks : Shall Conform to M57 Page No.-25 in General Technical Specification Booklet.

The bib tap shall:

- Be 2-way bib tap type.
- Be manufactured from heavy-duty brass body.
- Be chrome plated.
- Have two independent outlets.
- Have two separate quarter-turn lever handles.
- Be suitable for potable water supply.
- Be corrosion resistant.
- Be leak-proof under operating pressure.

The finish shall be:

- Mirror polished chrome finish.

- Uniform and defect free.
  - Resistant to peeling and tarnishing.
- 

### Ceramic Disc Cartridge

Each operating lever shall be fitted with ceramic disc cartridge.

The cartridge shall:

- Provide smooth quarter-turn operation.
  - Ensure drip-free closing.
  - Be wear resistant.
  - Be suitable for repeated operation.
- 

### Connecting Nipples and Adaptors

The connection fittings shall be:

- Brass construction.
- Chrome plated where exposed.
- Compatible with water supply piping.

The fittings shall include:

- Brass nipples.
  - Adaptors.
  - Reducers (where required).
  - Union connectors.
- 

### Washers and Seals

The sealing components shall comprise:

- EPDM rubber washers.
- O-rings.
- Neoprene seals.

The sealing materials shall:

- Prevent leakage.

- Resist water pressure.
- Be durable in service.

---

## Fixtures and Fastenings

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

The accessories shall include:

- Screws.
- Anchor plugs.
- Mounting brackets (if required).
- Fastening accessories.

All exposed components shall be corrosion resistant.

---

## Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

Water used for testing shall be clean and free from harmful impurities.

---

## 2. Workmanship

### General

The installation shall be carried out in accordance with:

- Approved plumbing drawings.
- Manufacturer's recommendations.
- Relevant IS Codes.
- Directions of the Engineer-in-Charge.

The contractor shall verify all dimensions and connection points before installation.

---

## Preparation

Prior to installation:

- Water supply lines shall be checked.
- Existing threads shall be cleaned.
- The wall surface shall be inspected.
- Pipe alignment shall be verified.

Any defective fittings shall be replaced before installation.

---

## Installation of Bib Tap

The bib tap shall be installed at the approved location and height.

The fitting shall be:

- Properly aligned.
- Firmly fixed.
- Easily accessible for operation.

The tap shall be fixed without inducing stress on connected piping.

---

## Water Connection

The bib tap shall be connected to the water supply line using approved fittings.

All threaded joints shall be sealed using:

- PTFE tape, or
- Approved thread sealant.

The connections shall be fully watertight.

---

## Alignment

The bib tap shall be:

- Fixed horizontally.



- Properly oriented.
- Aligned with adjoining sanitary fittings.

Both outlet points shall be positioned correctly for intended use.

---

#### Operation Check

Both quarter-turn handles shall be checked individually.

The operation shall ensure:

- Smooth opening.
- Smooth closing.
- Proper flow control.
- No sticking or jamming.

Each outlet shall function independently.

---

#### Testing

The complete installation shall be tested under working pressure.

The test shall verify:

- Leak-proof joints.
- Smooth operation.
- Adequate water discharge.
- Drip-free shut-off.

Any leakage or malfunction shall be rectified immediately.

---

#### Quality Requirements

The completed installation shall:

- Be secure and rigid.
- Be free from leakage.
- Have smooth lever action.
- Have uniform chrome finish.

- Be free from scratches and dents.

Both outlets shall function independently and effectively.

---

## Cleaning and Protection

After installation:

- Surfaces shall be cleaned.
- Excess sealant shall be removed.
- Chrome finish shall be polished.
- The fitting shall be protected until handover.

---

## 3. Mode of Measurement & Payment

### Mode of Measurement

The 2-way bib tap shall be measured in **Numbers (Nos.)**.

## **Item No – 64**

**Supply and install a premium recessed thermostatic shower and bathing system in polished chrome finish, including a thermostatic control with universal trim and a 2-outlet thermostatic valve for precise temperature and anti-scald protection. The system shall feature a 254 mm square rain showerhead mounted on a wall-arm, a wall-mounted bath spout, and a hidden square floor drain. All exposed components shall be corrosion- and tarnish-resistant, and installation shall follow manufacturer specifications to ensure a luxury, leak-proof, high-end finish at all floors, levels, and heights.**

### 1. Materials

#### Thermostatic Shower Mixer

Bid Cocks and Stop Cocks : Shall Conform to M57 Page No.-25 in General Technical Specification Booklet.

The thermostatic mixer shall:

- Be concealed type.

- Be manufactured from high-quality brass.
- Be chrome plated.
- Have thermostatic temperature control.
- Provide constant outlet temperature.
- Include anti-scald safety mechanism.
- Be suitable for hot and cold water systems.
- Have smooth operating controls.
- Be capable of operating under specified water pressures.

The trim plate shall be:

- Premium quality.
- Corrosion resistant.
- Flush mounted.
- Chrome finished.

---

#### Thermostatic Valve

The valve shall:

- Be 2-outlet concealed thermostatic type.
- Permit independent operation of shower and bath outlet.
- Have ceramic disc control cartridges.
- Incorporate temperature limiting safety stop.
- Be leak-proof and maintenance friendly.

---

#### Rain Shower Head

The shower head shall:

- Be square type.
- Size : 254 mm × 254 mm.
- Manufactured from stainless steel or brass.
- Chrome plated finish.
- Anti-clog silicone nozzles.
- Corrosion resistant.
- Uniform spray distribution.

The shower head shall provide:

- Rainfall spray pattern.

- Uniform water coverage.
  - Smooth operation under designed pressure.
- 

### Shower Arm

The shower arm shall:

- Be wall-mounted type.
  - Manufactured from brass or stainless steel.
  - Chrome plated finish.
  - Suitable to support the rain shower head.
  - Conceal all fixing arrangements.
- 

### Bath Spout

The bath spout shall:

- Be wall-mounted type.
- Manufactured from brass.
- Chrome plated finish.
- Corrosion resistant.
- Suitable for high flow discharge.

The spout shall provide smooth and splash-free water delivery.

---

### Hidden Square Floor Drain

The floor drain shall:

- Be concealed square type.
- Manufactured from SS 304 grade stainless steel.
- Suitable for tile insert application where specified.
- Have removable grating.
- Have anti-corrosion finish.
- Include trap connection arrangement.

The drain shall permit effective removal of wastewater without obstruction.

---

## Flexible Connections and Fittings

The connecting system shall include:

- Brass fittings.
- Connectors.
- Couplings.
- Adaptors.
- Unions.
- Concealed connection accessories.

All fittings shall be compatible with hot and cold water systems.

---

## Fixtures and Fastenings

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

The accessories shall include:

- Anchor fasteners.
- Mounting brackets.
- Fixing screws.
- Clamps.
- Support members.

All exposed metal components shall be corrosion resistant.

---

## Sealants

The sealant shall be:

- Neutral cure silicone.
  - Waterproof.
  - Fungus resistant.
  - Suitable for sanitary installations.
-

## Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

Water used for testing and commissioning shall be clean and free from harmful impurities.

---

## 2. Workmanship

### General

The work shall be executed in accordance with:

- Approved plumbing drawings.
- Approved bathroom layout drawings.
- Manufacturer's installation manuals.
- Engineer-in-Charge instructions.

All dimensions shall be verified prior to installation.

---

### Preparation

Before installation:

- Wall chasing work shall be completed.
- Water supply lines shall be pressure tested.
- Levels and centerlines shall be marked.
- Concealed pipework shall be checked.

Any defective pipe or fitting shall be replaced before installation.

---

### Installation of Concealed Thermostatic Valve

The thermostatic valve body shall be installed within the wall at the specified depth.

The valve shall be:

- Firmly fixed.
- Properly aligned.
- Accessible through trim assembly for maintenance.

The installation depth shall comply with manufacturer's recommendations.

---

#### Installation of Thermostatic Controls

The trim plate and controls shall be installed after wall finishing.

The controls shall:

- Operate smoothly.
- Be perfectly aligned.
- Maintain flush appearance.

The anti-scald temperature setting shall be adjusted as recommended by the manufacturer.

---

#### Installation of Rain Shower Head

The shower arm shall be securely fixed to the wall.

The rain shower head shall be installed level and centered at the designated location.

The installation shall ensure:

- Proper alignment.
  - Uniform water distribution.
  - Stable support.
- 

#### Installation of Bath Spout

The bath spout shall be fixed securely to the concealed outlet connection.

The spout shall:

- Be level.
  - Be properly aligned.
  - Provide unobstructed water discharge.
-

## Installation of Hidden Floor Drain

The concealed floor drain shall be installed at the lowest point of the shower area.

The drain shall be:

- Properly connected to the drainage system.
- Level with finished flooring.
- Adequately sealed against leakage.

The surrounding floor shall be graded toward the drain.

---

## Sealing and Finishing

All wall penetrations and exposed junctions shall be sealed with approved silicone sealant.

The finished installation shall be:

- Watertight.
  - Neat in appearance.
  - Free from visible gaps.
- 

## Testing and Commissioning

After installation, the complete system shall be tested.

Testing shall verify:

### Water Tightness

- No leakage from concealed or exposed fittings.
- No seepage through wall penetrations.

### Functional Performance

- Proper operation of thermostatic controls.
- Accurate temperature regulation.
- Anti-scald protection.
- Smooth operation of diverter and controls.
- Uniform shower spray.
- Proper bath spout discharge.



### Drainage Performance

- Proper drainage through floor drain.
- No water stagnation.

Any defects observed during testing shall be rectified before acceptance.

---

### Quality Requirements

The completed installation shall:

- Be fully operational.
  - Be leak-proof.
  - Be corrosion resistant.
  - Have uniform chrome finish.
  - Be free from scratches and dents.
  - Meet approved performance requirements.
- 

### Cleaning and Protection

After installation:

- All chrome surfaces shall be cleaned.
  - Excess sealants shall be removed.
  - Protective coverings shall be removed.
  - The system shall be protected until final handover.
- 

## 3. Mode of Measurement & Payment

### Mode of Measurement

The complete thermostatic shower and bathing system shall be measured in **Numbers (Nos.)**.

### Item No – 67

**Towel Ring : Provide and install a towel ring in polished chrome finish with chrome-plated brass brackets, securely fixed to wooden plugs. Installation shall be complete for all floors, levels, and heights as per project specifications.**

## 1. Materials

### Towel Ring

The towel ring shall be:

- Premium quality bathroom accessory.
- Manufactured from brass.
- Chrome plated finish.
- Circular or approved design.
- Free from sharp edges and manufacturing defects.
- Suitable for humid and wet area conditions.

The finish shall be:

- Mirror polished chrome finish.
  - Corrosion resistant.
  - Tarnish resistant.
  - Scratch resistant.
- 

### Brackets

The brackets shall be:

- Heavy-duty brass construction.
- Chrome plated finish.
- Matching the towel ring design.
- Adequately strong to support service loads.

The brackets shall be securely connected to the ring assembly.

---

### Wooden Plugs

Wooden plugs shall conform to good engineering practice.

The plugs shall:

- Be seasoned hardwood.
- Be free from cracks and defects.
- Provide firm anchorage in masonry or concrete surfaces.

#### Non-Teak Wood

Non-Teak Wood : Shall Conform to M29.A Page No.-16 in General Technical Specification Booklet.

---

#### Fixtures and Fastenings

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

The fixing accessories shall include:

- Brass screws.
- Stainless steel screws.
- Anchor plugs.
- Washers.
- Fasteners.

All exposed fasteners shall be corrosion resistant.

---

## 2. Workmanship

### General

The work shall be executed in accordance with:

- Approved architectural drawings.
- Bathroom accessory layout drawings.
- Manufacturer's recommendations.
- Directions of the Engineer-in-Charge.

The contractor shall verify the exact mounting location before installation.

---

## Surface Preparation

The wall surface shall be:

- Completed and finished.
- Clean and dry.
- Free from loose material.

The location shall be marked accurately before drilling.

---

## Fixing of Wooden Plugs

Holes shall be drilled in masonry, concrete or partition surfaces as required.

Wooden plugs shall be inserted firmly into drilled holes.

The plugs shall provide rigid anchorage for screws.

Loose plugs shall not be accepted.

---

## Installation of Towel Ring

The towel ring assembly shall be fixed using approved screws and fasteners.

The installation shall ensure:

- Firm fixing.
- Proper alignment.
- Smooth appearance.
- Adequate clearance from adjoining fixtures.

The ring shall be mounted at the approved height and location.

---

## Alignment

The towel ring shall be:

- Level.
- Securely fixed.

- Symmetrical in appearance.

The completed installation shall not exhibit:

- Looseness.
- Vibration.
- Misalignment.

---

### Quality Requirements

The completed installation shall:

- Be rigid and stable.
- Be free from scratches and dents.
- Have uniform chrome finish.
- Be corrosion resistant.
- Be suitable for regular use.

Any damaged component shall be replaced at contractor's cost.

---

### Cleaning and Protection

After installation:

- All surfaces shall be cleaned.
- Finger marks and stains shall be removed.
- Protective coverings shall be removed.
- The accessory shall be protected until project handover.

---

## 3. Mode of Measurement & Payment

### Mode of Measurement

The towel ring shall be measured in **Numbers (Nos.)**.

**Item No – 68**

**Soap Dispenser: Provide and install a wall-mounted soap dispenser with frosted glass bottle in polished chrome finish, including a matching holder. Installation shall include wall fixing, sealing, and testing, complete for all floors, levels, and heights.**

## 1. Materials

### Soap Dispenser

The soap dispenser shall be:

- Premium quality wall-mounted type.
- Suitable for liquid soap dispensing.
- Durable and aesthetically finished.
- Designed for easy refilling and maintenance.
- Free from defects, cracks and sharp edges.

The dispenser assembly shall consist of:

- Frosted glass bottle.
- Chrome plated holder.
- Dispensing mechanism.
- Fixing accessories.

---

### Frosted Glass Bottle

Glass : Shall Conform to M38 Page No.-18 in General Technical Specification Booklet.

The bottle shall:

- Be made from high-quality frosted glass.
- Have smooth uniform finish.
- Be resistant to normal bathroom usage.
- Be free from cracks, chips and visible defects.

The capacity shall be as approved by the Engineer-in-Charge.

---

### Chrome Plated Holder

The holder shall be:

- Brass construction.
- Chrome plated finish.
- Corrosion resistant.
- Suitable for wet and humid conditions.
- Strong enough to safely support the filled soap bottle.

The finish shall be:

- Mirror polished chrome finish.
- Uniform and free from blemishes.

---

#### Dispensing Mechanism

The dispensing mechanism shall:

- Operate smoothly.
- Deliver controlled soap quantity.
- Be leak resistant.
- Be corrosion resistant.
- Be easily removable for maintenance and refilling.

---

#### Wooden Plugs / Anchor Fasteners

##### Non-Teak Wood

Non-Teak Wood : Shall Conform to M29.A Page No.-16 in General Technical Specification Booklet.

Where anchor fasteners are used, they shall be of approved make and corrosion-resistant quality.

---

#### Fixtures and Fastenings

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

The fixing accessories shall include:

- Stainless steel screws.
- Brass screws.

- Anchor plugs.
- Washers.
- Fasteners.
- Mounting brackets.

All exposed fasteners shall be corrosion resistant.

---

## Sealant

The sealant shall be:

- Neutral cure silicone sealant.
  - Waterproof.
  - Fungus resistant.
  - Suitable for sanitary installations.
- 

## 2. Workmanship

### General

The work shall be carried out in accordance with:

- Approved architectural drawings.
- Bathroom accessory layout drawings.
- Manufacturer's specifications.
- Directions of the Engineer-in-Charge.

The contractor shall verify the exact mounting position before installation.

---

### Surface Preparation

The wall surface shall be:

- Finished and cured.
- Clean and dry.
- Free from dust and loose particles.

The installation location shall be accurately marked prior to drilling.



---

### Fixing Arrangement

Necessary holes shall be drilled carefully without damaging adjacent finishes.

Wooden plugs or anchor fasteners shall be securely fixed into the wall.

The fixing arrangement shall provide firm and long-lasting support.

---

### Installation of Holder

The chrome plated holder shall be fixed rigidly to the wall.

The holder shall be:

- Properly aligned.
- Level.
- Firmly secured.

No movement shall be observed after installation.

---

### Installation of Soap Dispenser

The frosted glass bottle and dispensing assembly shall be mounted in the holder as per manufacturer's recommendations.

The dispenser shall:

- Be easily removable for cleaning and refilling.
  - Operate smoothly.
  - Remain securely seated in the holder.
- 

### Sealing

Where required, joints between mounting accessories and wall finish shall be sealed using approved silicone sealant.

The sealant shall:

- Prevent moisture ingress.
  - Provide neat appearance.
- 

## Testing

After installation, the soap dispenser shall be tested for:

- Proper mounting stability.
- Smooth dispensing action.
- Leakage from dispensing mechanism.
- Ease of refill and maintenance.

Any defects shall be rectified before acceptance.

---

## Quality Requirements

The completed installation shall:

- Be rigid and secure.
  - Be free from scratches, dents and defects.
  - Have uniform chrome finish.
  - Have properly functioning dispensing mechanism.
  - Be aesthetically aligned with adjacent sanitary accessories.
- 

## Cleaning and Protection

After installation:

- Glass surfaces shall be cleaned.
- Chrome surfaces shall be polished.
- Excess sealant shall be removed.
- Protective coverings shall be removed.

The completed installation shall be protected until final handover.

---

### 3. Mode of Measurement & Payment

#### Mode of Measurement

The soap dispenser shall be measured in **Numbers (Nos.)**.

#### **Item No – 69**

**Soap Dish: Provide and install a square soap dish in polished chrome finish, including wall fixing, sealing, and testing, complete for all floors, levels, and heights.**

#### 1. Materials

##### Soap Dish

The soap dish shall be:

- Premium quality wall-mounted type.
- Square design.
- Suitable for bathroom and wash area use.
- Free from cracks, chips, sharp edges and manufacturing defects.
- Resistant to moisture and regular cleaning.

The soap dish shall consist of:

- Soap holding tray.
- Supporting frame/holder.
- Fixing accessories.

---

##### Soap Holding Tray

The tray shall be:

- Toughened glass / frosted glass / ceramic / approved equivalent material as specified.
- Smooth finished.
- Easy to clean.
- Resistant to staining and water exposure.

Where glass tray is provided:

## Glass

Glass : Shall Conform to M38 Page No.-18 in General Technical Specification Booklet.

The glass shall be free from:

- Cracks.
- Scratches.
- Chips.
- Manufacturing defects.

---

## Chrome Plated Holder / Frame

The holder shall be:

- Brass construction.
- Chrome plated finish.
- Corrosion resistant.
- Suitable for humid and wet conditions.
- Capable of securely supporting the soap dish.

The finish shall be:

- Mirror polished chrome finish.
- Uniform and blemish free.

---

## Wooden Plugs / Anchor Fasteners

### Non-Teak Wood

Non-Teak Wood : Shall Conform to M29.A Page No.-16 in General Technical Specification Booklet.

Where anchor fasteners are used, they shall be approved corrosion-resistant type.

---

## Fixtures and Fastenings

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

The fixing accessories shall include:

- Stainless steel screws.
- Brass screws.
- Anchor plugs.
- Washers.
- Mounting brackets.
- Fasteners.

All exposed components shall be corrosion resistant.

---

## Sealant

The sealant shall be:

- Neutral cure silicone sealant.
  - Waterproof.
  - Fungus resistant.
  - Suitable for sanitary applications.
- 

## 2. Workmanship

### General

The work shall be carried out in accordance with:

- Approved drawings.
- Bathroom accessory layout.
- Manufacturer's specifications.
- Directions of the Engineer-in-Charge.

The exact location shall be verified before installation.

---

### Surface Preparation

The wall surface shall be:

- Finished.
- Clean.

- Dry.
- Free from dust and loose materials.

The fixing position shall be accurately marked prior to drilling.

---

#### Fixing Arrangement

Necessary holes shall be drilled carefully without damaging adjoining finishes.

Wooden plugs or anchor fasteners shall be inserted firmly into the wall.

The fixing arrangement shall provide rigid and durable support.

---

#### Installation of Holder

The chrome plated holder/frame shall be fixed securely to the wall.

The holder shall be:

- Properly aligned.
- Level.
- Firmly anchored.

No looseness shall be permitted after installation.

---

#### Installation of Soap Dish

The soap tray shall be placed and secured in the holder as per manufacturer's recommendations.

The installation shall ensure:

- Proper seating.
- Stability during use.
- Easy cleaning and maintenance.

The soap dish shall not wobble or move during service.

---

## Sealing

Where required, joints between holder and finished wall surface shall be sealed using approved silicone sealant.

The sealing shall:

- Prevent moisture ingress.
  - Provide neat appearance.
- 

## Testing

After installation, the soap dish assembly shall be checked for:

- Proper fixing.
- Stability.
- Alignment.
- Safe load carrying capacity under normal use.

Any loose fixing or defects shall be rectified immediately.

---

## Quality Requirements

The completed installation shall:

- Be rigid and secure.
- Be free from scratches, dents and cracks.
- Have uniform chrome finish.
- Be properly aligned.
- Match adjacent sanitary accessories.

Damaged components shall be replaced at contractor's cost.

---

## Cleaning and Protection

After installation:

- Glass/ceramic surfaces shall be cleaned.
- Chrome plated surfaces shall be polished.

- Excess sealant shall be removed.
- Protective coverings shall be removed.

The completed installation shall be protected until final handover.

---

### 3. Mode of Measurement & Payment

#### Mode of Measurement

The soap dish shall be measured in **Numbers (Nos.)**.

#### **Item No – 72**

**Providing and fixing PVC SWR Vent Cowl 110 mm dia with mesh at the exterior surface to Avoid Birds Entering For Bathroom/Office/Kitchen Ventilation/Exhaust Fan of approved company at the output for the toilets. It should be assembled and fixed as per the direction of the Engineer-in-Charge.**

#### 1. Materials

##### PVC SWR Vent Cowl

The PVC SWR Vent Cowl shall conform to:

#### **IS 13592 – Unplasticized PVC Pipes and Fittings for Soil, Waste and Ventilation (SWR) Systems**

The vent cowl shall:

- Be 110 mm nominal diameter.
- Be manufactured from virgin uPVC material.
- Be UV resistant.
- Be weather resistant.
- Be free from cracks, pinholes and manufacturing defects.
- Be designed to prevent rainwater ingress.
- Permit free circulation of air.
- Be suitable for external installation.

The vent cowl shall be of approved make and quality.

---



## Bird/Insect Protection Mesh

The mesh shall be:

- Stainless Steel Grade 304 or UV stabilized polymer mesh.
- Corrosion resistant.
- Rigidly fixed inside the cowl.
- Suitable to prevent entry of birds, insects and rodents.
- Non-obstructive to airflow.

The mesh opening size shall be adequate to maintain proper ventilation while preventing bird entry.

---

## PVC SWR Fittings

The fittings shall conform to:

### **IS 13592**

The fittings may include:

- Couplers.
- Reducers.
- Adaptors.
- Bends.
- Socket fittings.

All fittings shall be compatible with the SWR piping system.

---

## Solvent Cement

The solvent cement shall:

- Be approved for uPVC SWR systems.
  - Be of manufacturer's recommended grade.
  - Provide watertight and airtight joints.
-

## Clamps and Supports

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

The supports shall consist of:

- GI clamps.
- Stainless steel clamps.
- Anchor fasteners.
- Screws and fixing accessories.

All exposed metallic parts shall be corrosion resistant.

---

## Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

Water used for cleaning and testing shall be clean and free from harmful impurities.

---

## 2. Workmanship

### General

The work shall be executed in accordance with:

- Approved plumbing drawings.
- Ventilation layout drawings.
- Manufacturer's recommendations.
- Directions of the Engineer-in-Charge.

The contractor shall verify the location and size of vent pipe before installation.

---

### Surface Preparation

The pipe end shall be:

- Cleaned thoroughly.
- Free from dust, oil and foreign materials.

- Properly aligned.

Any damaged pipe section shall be replaced before installation.

---

#### Fixing of Vent Cowl

The vent cowl shall be installed at the terminal end of the SWR vent pipe.

The installation shall ensure:

- Secure fixing.
- Correct orientation.
- Free airflow.
- Proper weather protection.

The cowl shall be fitted firmly without causing damage to the pipe.

---

#### Fixing of Mesh

The bird protection mesh shall be securely fixed within the cowl.

The mesh shall:

- Remain rigid.
- Be free from deformation.
- Not obstruct ventilation.

Loose mesh installation shall not be permitted.

---

#### Jointing

The connection between vent cowl and SWR pipe shall be made using approved solvent cement and fittings.

The joint shall be:

- Airtight.
- Watertight.
- Properly aligned.

Excess solvent cement shall be removed after fixing.

---

## Support and Stability

Where necessary, additional supports shall be provided to prevent movement due to:

- Wind load.
- Vibration.
- Maintenance activities.

The installation shall remain stable throughout its service life.

---

## Testing and Inspection

After installation, the vent cowl shall be inspected for:

- Proper fixing.
- Correct alignment.
- Free air passage.
- Secure mesh installation.

The completed assembly shall permit unrestricted ventilation of the system.

---

## Quality Requirements

The completed installation shall:

- Be weatherproof.
- Be corrosion resistant.
- Be free from cracks and defects.
- Prevent entry of birds and insects.
- Permit proper ventilation.

Any damaged component shall be replaced at contractor's expense.

---

## Cleaning

After completion:

- Surfaces shall be cleaned.
- Excess adhesive shall be removed.
- Debris shall be cleared from site.

The installation shall be handed over in satisfactory working condition.

---

### 3. Mode of Measurement & Payment

#### Mode of Measurement

The PVC SWR Vent Cowl shall be measured in **Numbers (Nos.)**.

#### **Item No – 78**

**Fiberglass Mesh : Providing and Fixing Fiberglass Mesh with alkali resistant coating having mass per unit area 145 gram/M2, Mesh size 3.9 x 4.0 mm +\_ 10% with all labour and accessories of fixing. As per direction of Engineer-in-charge. at all floors / all levels / all heights (1Cement :1Sand)**

#### 1. Materials

##### Fiberglass Mesh

The fiberglass mesh shall conform to relevant international standards for alkali-resistant glass fibre mesh used in plaster reinforcement systems.

The mesh shall:

- Be alkali resistant coated.
- Have mass per unit area of 145 g/m<sup>2</sup>.
- Have mesh opening size of 3.9 mm × 4.0 mm (±10%).
- Be manufactured from woven fiberglass yarn.
- Be resistant to moisture, alkali attack and ageing.
- Be free from tears, folds and manufacturing defects.
- Have adequate tensile strength for crack control applications.

The mesh shall be supplied in continuous rolls.

---

## Cement

Cement : Shall Conform M3 Page No.-9 in General Technical Specification Booklet.

The cement shall be fresh, sound and free from lumps.

---

## Sand

Sand : Shall Conform M6 Page No.-10 in General Technical Specification Booklet.

The sand shall be clean, hard, durable and free from clay, silt and organic impurities.

---

## Cement Mortar

Cement Mortar : Shall Conform M11 Page No.-11 in General Technical Specification Booklet.

The mortar shall consist of:

- 1 Part Cement
- 1 Part Fine Sand

The mortar shall be prepared in small batches and used before initial setting.

---

## Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

Water used for mortar preparation and curing shall be clean and free from harmful impurities.

---

## Fixtures and Fastenings (Where Required)

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

Where mechanical fixing is required, suitable fasteners, washers and fixing accessories shall be used.

---

## 2. Workmanship

### General

The work shall be carried out in accordance with:

- Approved drawings.
- Manufacturer's recommendations.
- R&B Specifications.
- Directions of the Engineer-in-Charge.

The contractor shall inspect all surfaces before commencement of work.

---

### Surface Preparation

The surface shall be:

- Cleaned thoroughly.
- Free from dust, oil, grease and loose particles.
- Free from laitance and weak plaster.
- Slightly dampened before application of mortar.

Loose plaster and unsound material shall be removed before fixing the mesh.

---

### Preparation of Mortar

Cement mortar shall be prepared in the proportion:

**1 Cement : 1 Sand**

Mixing shall be done mechanically or manually until uniform consistency is achieved.

Only workable quantities shall be prepared.

Set mortar shall not be re-used.

---

## Fixing of Fiberglass Mesh

The fiberglass mesh shall be cut to required dimensions.

The mesh shall be fixed centrally over:

- Cracks.
- Construction joints.
- AAC block joints.
- RCC and masonry junctions.
- Plastered surfaces.
- Other locations as directed.

The mesh shall be laid wrinkle-free and properly tensioned.

---

## Embedding in Mortar

A base layer of cement mortar shall first be applied.

The mesh shall then be embedded into the wet mortar.

An additional mortar layer shall be applied to fully cover the mesh.

The mesh shall remain completely embedded within the mortar layer.

No portion of mesh shall remain exposed after completion.

---

## Overlaps

Where joints occur, mesh overlaps shall not be less than:

**100 mm**

or as recommended by the manufacturer.

The overlap shall ensure continuous reinforcement.

---



## Finishing

The finished surface shall be:

- Smooth.
- Even.
- Free from undulations.
- Properly bonded.

No bulging, wrinkles or exposed mesh shall be permitted.

---

## Curing

The treated area shall be cured for a minimum period of:

**7 days**

or as directed by the Engineer-in-Charge.

Curing shall be carried out without damaging the mortar surface.

---

## Quality Requirements

The completed work shall:

- Be firmly bonded.
- Be free from hollow patches.
- Be free from visible cracks.
- Have complete mesh embedment.
- Provide continuous reinforcement across joints.

Any defective area shall be removed and redone at contractor's expense.

---

## Protection

The treated surface shall be protected against:

- Mechanical damage.
- Impact.

- Premature drying.
- Rain and moisture during setting period.

---

## Cleaning

After completion:

- Excess mortar shall be removed.
- Adjacent surfaces shall be cleaned.
- Debris shall be disposed of properly.

The work area shall be handed over in neat condition.

---

## 3. Mode of Measurement & Payment

### Mode of Measurement

The fiberglass mesh reinforcement shall be measured in **Square Metres (Sq.M.)** of actual surface area

### Item No – 79

**INVISIBLE GRILL WORK:**Providing and fixing Invisible grills for balconies made with high-tensile stainless steel cables ss 316 grade 18 gauge with spacing not more than 50 mm , coated with nylon for rust and dust prevention , to provide safety from entering birds and provide aesthetics and safety by maintaining an unobstructed view. The grill is made partially openable so that it is fixed on a periferalaluminum tube section of 75 mm x 25 mm and 2mm thick with anodizing 10mm fastner fixed on the balcony with standard hardware like hinges, screws and stoppers to make partially openable . The openable and fixed section are to be fitted with Tube section for firm gripping.The anodizing colour is as per the drawinga and architect selection.

### 1. Materials

#### Stainless Steel Cables

The stainless steel cables shall:

- Be manufactured from SS 316 Grade stainless steel.
- Be high tensile type.
- Be 18 Gauge.
- Have uniform diameter throughout the length.
- Be free from bends, kinks and surface defects.
- Have adequate tensile strength for safety applications.
- Be suitable for exterior exposure.

The cable spacing shall not exceed:

**50 mm centre to centre**

or as shown on approved drawings.

The cables shall be tensioned adequately to prevent excessive deflection.

---

#### Nylon Coating

The cable coating shall:

- Be UV resistant.
- Be weather resistant.
- Be transparent or approved colour.
- Protect against corrosion and dust accumulation.
- Remain intact throughout service life.

The coating shall be factory applied and uniformly bonded to the cable surface.

---

#### Aluminium Peripheral Frame

##### Aluminium Doors, Windows and Holdfasts

Aluminium Doors, Windows and Holdfasts : Shall Conform M31 Page No.-17 in General Technical Specification Booklet.

The aluminium frame shall:

- Be extruded aluminium section.
- Size 75 mm × 25 mm.
- Minimum thickness 2 mm.
- Be free from twists, bends and surface defects.

- Be structurally adequate to resist imposed loads.

The frame shall accommodate:

- Fixed panels.
  - Openable panels.
  - Cable tensioning arrangement.
- 

#### Anodizing

The aluminium sections shall be anodized.

The anodizing shall:

- Be uniform throughout.
- Have approved colour and finish.
- Be selected by Architect/Engineer-in-Charge.
- Provide protection against atmospheric corrosion.

Minimum anodizing thickness shall conform to relevant IS standards.

---

#### Hinges

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

The hinges shall:

- Be SS 304 or SS 316 Grade.
  - Heavy duty type.
  - Suitable for outdoor applications.
  - Allow smooth operation of openable panel.
- 

#### Locking Arrangement

The locking arrangement shall:

- Be stainless steel or approved equivalent.
- Be corrosion resistant.
- Provide safe locking of openable portion.

- Prevent unauthorized opening.
- 

## Stoppers

The stoppers shall:

- Be heavy duty type.
  - Corrosion resistant.
  - Suitable for repetitive operation.
  - Prevent excessive opening movement.
- 

## Fasteners and Anchors

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

The fixing system shall include:

- Stainless steel anchor fasteners.
- Expansion bolts.
- Screws.
- Washers.
- Nuts and bolts.
- Mounting brackets.

All exposed metallic components shall be corrosion resistant.

---

## Tensioning Devices

The tensioning accessories shall:

- Be stainless steel.
  - Be capable of maintaining cable tension.
  - Permit future adjustment if required.
  - Be concealed wherever possible.
-

## 2. Workmanship

### General

The work shall be executed in accordance with:

- Approved architectural drawings.
- Structural requirements.
- Manufacturer's specifications.
- Directions of the Engineer-in-Charge.

Measurements at site shall be verified before fabrication.

---

### Fabrication of Aluminium Frame

The aluminium frame shall be factory fabricated to required dimensions.

The fabrication shall include:

- Cutting.
- Drilling.
- Jointing.
- Reinforcement where required.

All joints shall be:

- Neat.
- Accurate.
- Rigid.

Sharp edges shall be removed.

---

### Installation of Aluminium Frame

The frame shall be installed true to line, level and plumb.

The frame shall be securely anchored to:

- RCC members.
- Masonry surfaces.
- Structural steel members.

Suitable anchor fasteners shall be provided at regular intervals.

The frame shall remain rigid without distortion.

---

#### Installation of Stainless Steel Cables

The stainless steel cables shall be fixed within the frame using approved tensioning devices.

The installation shall ensure:

- Uniform spacing.
- Proper alignment.
- Uniform tension throughout.

The cables shall be stretched sufficiently to avoid sagging.

No cable shall show excessive looseness after installation.

---

#### Openable Section

The openable portion shall be fabricated as shown on approved drawings.

The panel shall:

- Open smoothly.
- Be properly aligned.
- Have secure hinges and locking system.
- Have stoppers to limit movement.

The operation shall be tested after installation.

---

#### Safety Requirements

The installed system shall:

- Prevent accidental falls.
- Restrict entry of birds.
- Maintain unobstructed visibility.
- Withstand normal service loads and wind loads.

The completed installation shall be safe for residential and commercial balcony applications.

---

#### Alignment and Finishing

The completed grill system shall:

- Be plumb and level.
- Have straight cable lines.
- Have uniform spacing.
- Have matching anodized finish.

No visible distortion shall be permitted.

---

#### Testing

After installation, the contractor shall inspect and test:

- Cable tension.
- Fastener tightness.
- Locking system.
- Hinge operation.
- Openable panel movement.
- Structural stability.

Any loose or defective component shall be replaced.

---

#### Cleaning and Protection

Upon completion:

- Aluminium surfaces shall be cleaned.
- Cable surfaces shall be wiped clean.
- Protective films shall be removed.
- Debris shall be removed from site.

The system shall be protected until project handover.

---



### 3. Mode of Measurement & Payment

#### Mode of Measurement

The Invisible Grill Work shall be measured in **Square Metres (Sq.M.)**.

#### **Item No – 80**

**Core Cutting Work: Providing and wet drilling accurate and clean holes of specified diameter in RCC walls, slabs, beam or any other RCC member without vibration by core cutting (diamond drilling) machine of approved make for laying service lines including scaffolding, safety majors, disposing the debris, cleaning, making good, providing epoxy mortar / micro concrete / patch repair mortar for concrete for grouting the gaps around the pipes for all levels / all height, after approval of engineer in charge etc compete. Measurement shall be taken for the depth of holes in running meter for specified diameter. Holes shall be made by authorized approved agency. Scanning of reinforcement shall be carried out before core cutting if required and as suggested by Engineer in charge. Location of core cutting shall be approved by Engineer in charge. (ii) Beyond 50mm dia to 175mm dia.**

#### 1. Materials

##### Reinforced Cement Concrete

The RCC member in which core cutting is carried out shall be existing structure as indicated in drawings and approved by the Engineer-in-Charge.

---

##### Cement

Cement : Shall Conform M3 Page No.-9 in General Technical Specification Booklet.

---

##### Sand

Sand : Shall Conform M6 Page No.-10 in General Technical Specification Booklet.

---

##### Cement Mortar

Cement Mortar : Shall Conform M11 Page No.-11 in General Technical Specification Booklet.

Where ordinary patch repair is permitted by Engineer-in-Charge.

---

### Epoxy Mortar

The epoxy mortar shall:

- Be two-component or three-component system.
- Be suitable for structural repair applications.
- Possess high bond strength with concrete and steel.
- Be non-shrink.
- Be resistant to water and chemicals.
- Be of approved make.

The material shall conform to relevant provisions of:

- IS 16920 (Structural Strengthening using Composite Materials)
  - Manufacturer's specifications.
- 

### Micro Concrete / Non-Shrink Repair Mortar

The repair mortar shall:

- Be factory manufactured.
  - Free flow/non-shrink type.
  - Suitable for concrete repair and gap filling.
  - Possess high compressive strength.
  - Be approved by Engineer-in-Charge.
- 

### Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

Water used for drilling and cleaning shall be clean and free from harmful impurities.

---

### Diamond Core Drill Bit

The drill bit shall:

- Be industrial diamond tipped.
  - Suitable for RCC drilling.
  - Capable of cutting concrete and reinforcement without vibration.
  - Produce smooth and accurate holes.
- 

## Reinforcement Scanner

The reinforcement scanner shall:

- Be electronic reinforcement locator.
- Capable of detecting reinforcement position and cover.
- Be calibrated and approved.

The scanning shall be carried out wherever instructed by Engineer-in-Charge.

---

## Safety Equipment

The safety equipment shall include:

- Safety helmets.
  - Safety harnesses.
  - Gloves.
  - Goggles.
  - Barricading arrangements.
  - Protective sheets.
- 

## 2. Workmanship

### General

The work shall be executed strictly under supervision of experienced personnel and approved specialized agency.

The contractor shall obtain approval of:

- Core cutting location.
- Diameter.
- Depth.
- Service routing.

Before commencement of drilling work.

---

## Structural Verification

Before drilling:

- Structural drawings shall be reviewed.
- Existing services shall be identified.
- Structural members shall be inspected.

No core cutting shall commence without approval from Engineer-in-Charge.

---

## Reinforcement Scanning

Where directed, reinforcement scanning shall be carried out before drilling.

The scanning shall identify:

- Reinforcement position.
- Reinforcement spacing.
- Cover depth.
- Embedded services.

The contractor shall submit findings before drilling.

---

## Marking and Setting Out

The drilling location shall be accurately marked.

The alignment shall be checked with service drawings to ensure proper routing of:

- Plumbing lines.
  - HVAC pipes.
  - Electrical conduits.
  - Fire fighting pipes.
  - Drainage lines.
-

## Core Drilling

The drilling shall be performed using:

- Wet diamond core cutting machine.
- Suitable guide supports.
- Controlled drilling equipment.

The drilling operation shall:

- Produce smooth circular holes.
- Avoid excessive vibration.
- Avoid damage to adjoining concrete.
- Minimize disturbance to reinforcement.

Hammering or chiseling shall not be permitted unless specifically approved.

---

## Removal of Core

The extracted concrete core shall be carefully removed.

The removed material shall be:

- Lowered safely.
- Stacked temporarily.
- Disposed as directed.

No debris shall be allowed to fall freely from height.

---

## Cleaning

After drilling:

- The hole shall be cleaned thoroughly.
- Loose particles shall be removed.
- Surface shall be washed where required.

The opening shall be prepared for installation of services.

---

## Making Good Around Services

After installation of pipe/conduit/cable tray:

The annular space shall be filled using:

- Epoxy mortar, or
- Micro concrete, or
- Approved repair mortar.

The repair shall:

- Restore surrounding concrete surface.
- Ensure proper sealing.
- Prevent leakage and deterioration.

---

## Surface Finishing

The repaired surface shall be:

- Smooth.
- Properly finished.
- Matching adjacent surface finish.

Any damaged plaster or concrete shall be repaired.

---

## Safety Requirements

The contractor shall provide:

- Barricading.
- Dust control.
- Water collection arrangements.
- Safe access.
- Fall protection systems.

Special care shall be taken while working at height.

---

## Quality Control

The completed opening shall:

- Be of specified diameter.
- Be properly aligned.
- Have smooth edges.
- Be free from cracks and spalling.

Any structural damage caused by improper drilling shall be repaired at contractor's cost.

---

## Disposal of Debris

All debris, slurry and waste material generated during drilling shall be:

- Collected.
- Transported.
- Disposed of at approved locations.

The work area shall be kept clean throughout execution.

---

## 3. Mode of Measurement & Payment

### Mode of Measurement

The work shall be measured in **Running Metres (RM)**

### **Item No – 81**

**Rebaring: Providing and Laying in Position rebar as specified in true line & Level including drilling adequate hole, cleaning the same, grouting with HILTI, HY-200 , Fischer, Forsoc, or Equivalent rebar system as per manufacturers specifications strictly in accordance with structural details having minimum depth of embedment 150 mm, etc complete. (a) 10 to 25 mm dia.**

## 1. Materials

### Reinforcement Bars

#### High Yield Strength Steel Deformed Bars

High Yield Strength Steel Deformed Bars : Shall Conform M19 Page No.-13 in General Technical Specification Booklet.

The reinforcement bars shall:

- Be Fe 500D or grade specified in structural drawings.
- Be TMT bars.
- Be free from rust, oil, paint, loose mill scale and other deleterious matter.
- Have proper identification marks.
- Be straight and free from bends and distortions.

The reinforcement shall conform to:

- IS 1786

#### Chemical Anchoring Adhesive

The chemical anchoring material shall be:

- Hilti HY-200, Fischer FIS series, FosrocLokfix or approved equivalent.
- Injection type structural adhesive.
- Suitable for post-installed reinforcement anchorage.
- Approved by Engineer-in-Charge.

The adhesive shall possess:

- High bond strength.
- Non-shrink characteristics.
- Crack resistance.
- Resistance to moisture and temperature variations.
- Compatibility with RCC structures.

The material shall be supplied in original sealed containers.

#### Water

Water : Shall Conform to M1 Page No.-9 in General Technical Specification Booklet.

Water used for cleaning shall be clean and free from harmful impurities.



## Cleaning Accessories

The cleaning system shall comprise:

- Wire brushes.
- Nylon brushes.
- Air blow pumps.
- Compressed air equipment.

The cleaning accessories shall be suitable for complete removal of dust and loose particles from drilled holes.

## Drilling Equipment

The drilling equipment shall include:

- Rotary hammer drill.
- Diamond drilling machine where required.
- Approved drilling bits.

The equipment shall be capable of producing accurate holes without damaging existing concrete.

## 2. Workmanship

### General

The work shall be executed strictly in accordance with:

- Approved structural drawings.
- Manufacturer's recommendations.
- Method statement approved by Engineer-in-Charge.
- Relevant IS Codes.

The contractor shall engage experienced personnel for chemical anchoring work.

### Marking and Setting Out

The locations of rebar installation shall be marked accurately as per structural drawings.

Before drilling:

- Existing reinforcement shall be identified.
- Existing services shall be checked.

- Structural approval shall be obtained.

No drilling shall commence without approval of Engineer-in-Charge.

#### Drilling of Holes

Holes shall be drilled using approved equipment.

The diameter of hole shall be as recommended by:

- Chemical anchor manufacturer.
- Structural consultant.

The drilling shall ensure:

- Correct alignment.
- Correct depth.
- No damage to surrounding concrete.

The minimum embedment depth shall be:

150 mm

or as specified in structural drawings, whichever is greater.

#### Cleaning of Holes

After drilling, the hole shall be thoroughly cleaned.

The cleaning sequence shall comprise:

1. Air blowing.
2. Wire brushing.
3. Air blowing.
4. Final cleaning.

The hole shall be completely free from:

- Dust.
- Loose particles.
- Moisture.
- Oil or contaminants.

Improperly cleaned holes shall not be accepted.

## Injection of Chemical Adhesive

The approved chemical anchoring compound shall be injected using manufacturer's dispensing equipment.

The adhesive shall:

- Fill the hole uniformly.
- Be injected from bottom upwards.
- Avoid air pockets and voids.

Mixing nozzles shall be replaced as recommended by manufacturer.

## Insertion of Reinforcement Bars

The reinforcement bar shall be inserted immediately after adhesive injection.

The insertion shall be carried out by:

- Slow rotational movement.
- Full embedment to required depth.
- Maintaining proper alignment.

Excess adhesive shall be removed from exposed surfaces.

## Curing

The anchored reinforcement shall remain undisturbed during curing period.

The curing period shall be as recommended by the manufacturer considering:

- Ambient temperature.
- Hole diameter.
- Bar diameter.

No load shall be applied before completion of curing period.

## Alignment and Positioning

The reinforcement bars shall be:

- Installed in true line.
- Installed in true level.
- Positioned accurately as shown in drawings.

The completed anchorage shall satisfy structural requirements.

#### Testing and Inspection

The Engineer-in-Charge may direct pull-out tests where required.

The contractor shall provide necessary testing arrangements.

The installation shall be checked for:

- Hole depth.
- Hole diameter.
- Adhesive quantity.
- Embedment depth.
- Alignment.

Defective anchorage shall be replaced at contractor's cost.

#### Quality Requirements

The completed work shall:

- Achieve specified bond strength.
- Be free from movement.
- Be properly aligned.
- Meet structural design requirements.

Any damaged concrete around drilled holes shall be repaired by approved repair mortar.

#### Cleaning and Protection

After completion:

- Surplus adhesive shall be removed.
- Work area shall be cleaned.
- Installed bars shall be protected against damage until further construction.

### 3. Mode of Measurement & Payment

#### Mode of Measurement

Rebaring work shall be measured in **Number** of reinforcement bars actually anchored and accepted.

## **Item No – 82**

**Bed Suit Size Of 2.1x1.8mm : Supply, installation and placing of premium upholstered bed, complete with designer padded headboard, executed in contemporary luxury style, as per approved design and drawing.**

**The bed shall be constructed with a robust internal framework of seasoned solid wood / BWP grade plywood, designed for long-term structural stability. The headboard shall be fully upholstered with high-density foam cushioning, ergonomically contoured and finished with premium fabric / leatherette upholstery in approved colour and texture. Upholstery shall be neatly stitched, wrinkle-free, and securely fixed.**

**The bed base shall be upholstered to match the headboard and designed to support standard mattress size (as specified), with adequate ventilation and load-bearing capacity. Legs shall be metal / solid wood, finished in approved shade and fitted with floor-protecting bushes to prevent damage to flooring.**

**The item shall include all materials, upholstery work, foam, internal framing, fittings, labour, handling, transportation, installation and positioning, complete in all respects, as approved by the Engineer-in-Charge.at all floors / all levels / all heights**

### **1. Materials**

**Timber Framework**

**Non-Teak Wood**

**Non-Teak Wood : Shall Conform M29.A Page No.-16 in General Technical Specification Booklet.**

**The timber used for the internal framework shall:**

- Be seasoned and kiln dried.
- Be free from knots, cracks, warping and decay.
- Have adequate strength for furniture applications.
- Be treated against termite and borer attack.

**The framework shall be capable of supporting the design load without deformation.**

**Plywood**

**Plywood : Shall Conform M37 Page No.-18 in General Technical Specification Booklet.**

**The plywood shall:**

- Be BWP Grade (Boiling Water Proof) or approved equivalent.
- Be free from delamination and surface defects.
- Be of approved thickness suitable for structural furniture work.

- Be resistant to moisture and dimensional changes.

#### Upholstery Foam

The cushioning foam shall:

- Be high-density polyurethane foam.
- Be resilient and durable.
- Be uniform in density and thickness.
- Be free from sagging and deformation.

The foam density shall generally not be less than:

- 32 kg/m<sup>3</sup> for headboard cushioning.
- 40 kg/m<sup>3</sup> where specified for luxury applications.

#### Upholstery Fabric / Leatherette

The upholstery material shall be:

- Premium quality fabric, suede, velvet or leatherette as approved.
- Tear resistant.
- Fade resistant.
- Stain resistant.
- Free from visible defects.

The colour, pattern and texture shall be selected by the Architect/Engineer-in-Charge.

The upholstery shall be:

- Uniformly stretched.
- Wrinkle free.
- Neatly stitched.

#### Adhesives

The adhesive shall:

- Be approved furniture-grade adhesive.
- Provide durable bonding.
- Be resistant to peeling and separation.

## Metal Components (Where Applicable)

The metallic components shall:

- Be MS, SS or Aluminium as approved.
- Be rust resistant.
- Have approved finish.
- Be free from sharp edges and burrs.

## Bed Support System

The mattress support system shall comprise:

- Plywood platform, or
- Timber slats, or
- Combination support system.

The support system shall:

- Provide adequate ventilation.
- Prevent sagging.
- Distribute loads uniformly.

## Bed Legs

The bed legs shall be:

- Solid wood, stainless steel or powder-coated metal.
- Designed to carry the imposed load safely.
- Fixed rigidly to the bed structure.

The finish shall be as approved by Architect/Engineer-in-Charge.

## Protective Bushes

The bed legs shall be provided with:

- Nylon bushes, or
- Rubber bushes, or
- Felt pads.

The bushes shall protect finished flooring from scratches and damage.

## Fixtures and Fastenings

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

The fixing accessories shall include:

- Screws.
- Bolts.
- Nuts.
- Connectors.
- Corner brackets.
- Joining plates.

All fasteners shall be suitable for furniture applications.

## 2. Workmanship

### General

The work shall be carried out as per:

- Approved furniture drawings.
- Approved samples.
- Manufacturer's recommendations.
- Architect's requirements.
- Directions of the Engineer-in-Charge.

All dimensions shall be verified before fabrication.

### Fabrication of Internal Framework

The internal framework shall be fabricated from seasoned timber and/or BWP plywood.

The framework shall:

- Be rigid and stable.
- Have proper joints and supports.
- Be capable of supporting mattress and occupant loads.

All joints shall be:

- Properly fixed.
- Securely fastened.



- Free from movement.

#### Fabrication of Headboard

The headboard shall be fabricated to approved design.

The headboard shall:

- Be ergonomically designed.
- Have smooth contours.
- Incorporate high-density foam cushioning.

The foam shall be fixed uniformly over the supporting framework.

#### Upholstery Work

The upholstery material shall be applied over foam and backing surfaces.

The upholstery shall be:

- Properly stretched.
- Free from wrinkles.
- Free from sagging.
- Properly aligned.

All visible seams shall be:

- Straight.
- Neat.
- Uniformly stitched.

No exposed staples, nails or fixing marks shall be visible.

#### Fabrication of Bed Base

The bed base shall:

- Match the headboard design.
- Support the specified mattress size.
- Provide adequate ventilation.

The bed base shall be rigid and free from deflection during normal use.

## Installation of Legs

The legs shall be fixed securely to the structural frame.

The fixing shall ensure:

- Stability.
- Proper load transfer.
- Long service life.

Protective bushes shall be installed before placing the bed.

## Transportation and Handling

The bed shall be transported carefully to avoid:

- Damage to upholstery.
- Damage to foam.
- Damage to finished surfaces.

The furniture shall be protected during handling and installation.

## Installation and Positioning

The bed shall be placed at approved location.

The installation shall ensure:

- Proper alignment.
- Level positioning.
- Stability without rocking.

Any adjustment required shall be carried out before final approval.

## Quality Requirements

The completed bed shall:

- Be structurally stable.
- Be free from squeaking.
- Be free from visible defects.
- Have uniform finish.
- Have wrinkle-free upholstery.
- Have smooth edges and corners.

- Match approved sample and drawings.

Any damaged component shall be replaced at contractor's cost.

Cleaning and Protection

Upon completion:

- Upholstery surfaces shall be cleaned.
- Dust and stains shall be removed.
- Protective coverings shall be maintained until handover.

The bed shall be handed over in perfect condition.

### 3. Mode of Measurement & Payment

Mode of Measurement

The premium upholstered bed suite shall be measured in **Numbers (Nos.)**.

### **Item No – 83**

**TV Unit Suit : Providing and placing low-height TV unit made of approved quality material such as Veneer With PU plywood/MDF, including drawers, shelves, and cable management provisions as per approved design. Finished with laminate/polish/paint, complete with hardware fittings and accessories, as directed by Engineer-in-Charge, complete in all respects as per drawing and specifications.**

**polish system, complete with hardware fittings, drawer channels, hinges, handles, edge banding, fixing accessories, transportation, installation and positioning, complete in all respects as directed by the Engineer-in-Charge.**

#### 1. Materials

Plywood

Plywood : Shall Conform to M37 Page No.-18 in General Technical Specification Booklet.

The plywood shall:

- Be BWP/BWR grade where required.
- Be free from delamination, warping and defects.

- Have uniform thickness.
- Be suitable for furniture applications.

Minimum thickness shall be as approved in shop drawings.

#### MDF (Medium Density Fibre Board)

The MDF shall conform to relevant IS standards and shall:

- Be moisture resistant grade where specified.
- Have uniform density.
- Be free from swelling, cracks and defects.
- Be suitable for decorative furniture applications.

The thickness shall be as per approved drawings.

#### Veneer

The natural wood veneer shall:

- Be approved species and shade.
- Be free from cracks, knots and surface defects.
- Have uniform grain pattern.
- Be properly seasoned and bonded.

The veneer pattern shall be approved by the Architect/Engineer-in-Charge before installation.

#### PU Polish Finish

The PU finish shall:

- Be premium quality polyurethane coating.
- Provide smooth, durable and scratch-resistant finish.
- Be resistant to moisture and normal household cleaning.
- Be applied in approved sheen level (matt, semi-gloss or gloss).

The finish shall be uniform without brush marks, bubbles or pinholes.

#### Hardware and Fittings

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

The hardware shall include:

- Soft closing drawer channels.
- Concealed hinges.
- Handles.
- Knobs.
- Connectors.
- Shelf supports.
- Magnetic catches.
- Fixing brackets.

All hardware shall be of approved make and quality.

#### Adhesives

The adhesive shall:

- Be synthetic resin based.
- Suitable for veneer bonding and furniture assembly.
- Water resistant.
- Free from staining properties.

#### Edge Banding

Edge banding shall:

- Match veneer finish.
- Be machine applied.
- Be securely bonded.
- Protect exposed edges against damage.

#### Cable Management Accessories

The cable management system shall include:

- Cable access holes.
- Cable sleeves.
- Grommets.
- Concealed routing provisions.

The arrangement shall allow neat management of TV, internet and electrical wiring.

## 2. Workmanship

### General

The work shall be carried out by skilled furniture craftsmen in accordance with:

- Approved drawings.
- Approved samples.
- Architectural details.
- Directions of the Engineer-in-Charge.

All dimensions shall be verified at site prior to fabrication.

### Fabrication

The TV unit shall be factory fabricated to the approved dimensions.

The construction shall include:

- Base unit.
- Drawers.
- Shelves.
- Vertical partitions.
- Cable management system.

All joints shall be:

- Accurate.
- Tight fitting.
- Mechanically secured.

The structure shall remain rigid and free from distortion.

### Veneer Application

The veneer shall be bonded uniformly to prepared substrate.

The application shall ensure:

- Proper grain matching.
- Bubble-free finish.
- Uniform appearance.

All visible surfaces shall receive approved veneer finish unless otherwise specified.

## PU Polishing

The polishing process shall include:

1. Surface preparation.
2. Sanding.
3. Sealer coat.
4. Intermediate sanding.
5. Multiple PU finish coats.

The final finish shall be:

- Smooth.
- Uniform.
- Scratch resistant.
- Free from visible defects.

## Drawers and Shelves

Drawers shall:

- Operate smoothly.
- Be properly aligned.
- Have soft closing mechanism where specified.

Shelves shall:

- Be level.
- Adequately supported.
- Capable of carrying intended loads.

## Cable Management Provision

Cable openings shall be accurately positioned.

The cable management arrangement shall:

- Permit concealed routing of wires.
- Allow maintenance access.
- Prevent visible cable clutter.

All edges of cable openings shall be finished smoothly.

## Installation

The completed TV unit shall be transported carefully and installed at designated location.

The installation shall include:

- Positioning.
- Levelling.
- Alignment.
- Anchoring where required.

The unit shall not rock or wobble after installation.

## Quality Requirements

The completed unit shall:

- Be true to dimensions.
- Be structurally stable.
- Have uniform veneer and polish finish.
- Have smooth drawer operation.
- Be free from scratches, dents, cracks and defects.

Any defective work shall be repaired or replaced at contractor's cost.

## Cleaning and Protection

After completion:

- All surfaces shall be cleaned.
- Protective coverings shall be removed.
- Hardware shall be checked for smooth operation.

The completed unit shall be protected until final handover.

## 3. Mode of Measurement & Payment

### Mode of Measurement

The TV Unit shall be measured in **Smt.**

### **Item No – 84**



**Dressing Unit Suit Size Of 1.5x1.8m at 450mm Depth : Providing and fixing a modern dressing table unit comprising a full-length mirror with base storage cabinet, fabricated from 18mm thick commercial/marine grade plywood with 12mm plywood for internal members, finished externally with high-quality natural veneer and PU (polyurethane) polish in approved shade and finish. The unit includes a 5–6mm thick mirror fixed on plywood backing, bottom storage with drawers fitted with soft-close channels and necessary hardware of approved make, complete with all fittings, edge finishing, polishing, transportation, and installation as per design approved by the architect and directions provided by the Engineer-in-Charge**

## 1. Materials

### Plywood

Plywood : Shall Conform to M37 Page No.-18 in General Technical Specification Booklet.

The plywood shall:

- Be commercial grade or marine grade as specified.
- Be free from warping, delamination and defects.
- Be properly seasoned.
- Have uniform thickness throughout.

The external carcass, drawer fronts, side panels and visible members shall be manufactured from **18 mm thick plywood**.

Internal partitions, drawer boxes, shelves and backing members shall be manufactured from **12 mm thick plywood** unless otherwise specified.

### Veneer

The natural wood veneer shall:

- Be of approved species and pattern.
- Have uniform grain and colour.
- Be free from cracks, knots and defects.
- Be properly bonded to the plywood substrate.

The veneer selection shall be approved by the Architect/Engineer-in-Charge before execution.

### PU Polish Finish

Paints : Shall Conform to M44 Page No.-21 in General Technical Specification Booklet.

The polyurethane finish shall:

- Be premium quality two-component PU system.
- Be resistant to moisture, stains and abrasion.
- Provide smooth, durable and uniform finish.
- Be applied in approved shade, texture and gloss level.

The finish shall be free from brush marks, orange peel effect, bubbles and pinholes.

#### Mirror

Glass : Shall Conform to M38 Page No.-18 in General Technical Specification Booklet.

The mirror shall:

- Be 5 mm to 6 mm thick.
- Be distortion-free float mirror quality.
- Have silver-coated reflective backing.
- Be free from scratches, waviness and black spots.

The mirror shall be mounted on plywood backing using approved adhesive and fixing system.

#### Drawer Channels

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

The drawer channels shall:

- Be telescopic soft-close type.
- Be corrosion resistant.
- Have smooth and silent operation.
- Be of approved make.

#### Hinges

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

The hinges shall:

- Be concealed type.
- Soft closing mechanism.
- Corrosion resistant.
- Suitable for furniture applications.

## Handles and Knobs

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

Handles shall be:

- Stainless steel, aluminium or approved designer hardware.
- Ergonomically designed.
- Durable and corrosion resistant.

## Adhesives

The adhesive shall:

- Be synthetic resin based.
- Suitable for veneer fixing.
- Moisture resistant.
- Approved for furniture applications.

## Edge Banding

The exposed edges shall be protected with matching veneer lipping or approved edge banding.

The edge finishing shall:

- Match the veneer finish.
- Be smooth and damage resistant.
- Be securely bonded.

## 2. Workmanship

### General

The dressing unit shall be fabricated by experienced furniture craftsmen strictly in accordance with:

- Approved architectural drawings.
- Approved shop drawings.
- Approved material samples.
- Directions of the Engineer-in-Charge.

All site dimensions shall be verified before fabrication.

## Fabrication of Unit

The unit shall comprise:

- Full-length mirror panel.
- Base storage cabinet.
- Drawer units.
- Shelving compartments.
- Decorative side panels where specified.

All components shall be accurately cut and assembled.

The structure shall remain rigid without deformation or movement.

## Mirror Installation

The mirror shall be fixed over plywood backing.

The installation shall ensure:

- Full support behind mirror.
- Proper alignment.
- Firm fixing.
- Safe handling.

No distortion, vibration or movement shall occur after installation.

## Veneer Application

The veneer shall be machine pressed or properly bonded using approved adhesive.

The veneer work shall ensure:

- Uniform grain pattern.
- Matching veneer joints.
- Smooth surface finish.

Open joints and bubbles shall not be permitted.

## PU Polishing

The polishing system shall include:

1. Surface preparation.

2. Sanding.
3. Sealer coat.
4. Intermediate sanding.
5. Multiple PU finish coats.

The final finish shall be:

- Uniform.
- Smooth.
- Durable.
- Free from visible defects.

#### Drawers and Storage Units

Drawers shall:

- Operate smoothly.
- Have soft-close action.
- Be properly aligned.
- Be free from rattling.

Storage compartments shall be level and capable of carrying intended loads.

#### Installation

The completed dressing unit shall be:

- Transported carefully.
- Positioned at designated location.
- Properly levelled.
- Secured where required.

The installation shall not damage adjacent finishes.

#### Quality Requirements

The completed dressing unit shall:

- Be true to dimensions.
- Be structurally stable.
- Have uniform veneer finish.
- Have defect-free mirror installation.
- Have smooth operation of drawers and shutters.
- Be free from scratches, dents and workmanship defects.

Defective work shall be rectified or replaced at contractor's cost.

### Cleaning and Protection

After installation:

- Surfaces shall be cleaned.
- Mirror shall be polished.
- Hardware shall be tested.
- Protective coverings shall be removed.

The completed unit shall be protected until project handover.

### 3. Mode of Measurement & Payment

#### Mode of Measurement

The Dressing Unit shall be measured in **Numbers (Nos.)**.

#### **Item No – 85**

**WARDROBE: Manufacturing, supply, arrangement and keeping in good condition until project completion of freestanding/ wall fixed wardrobe storage unit having drawers, shelves, hangers etc up to 600 mm deep as per drawings and instruction of EIC. Carcass, boxes, shelves, drawers and shutters made with 8/ 12 / 18 / 25 mm thick block board/ ply wood confirming to Urea formaldehyde free MR/ BWP grade Decorative type (BWP/MR-DEC) as per relevant IS codes using low VOC adhesive with 9 mm solid wood lipping having colour, shade and grain selected by architect low using VOC CFC HFCF free suitable adhesive. External facia of plywood to be covered with 4mm Thick Veneer With PU Polish as per selection and 9 mm thick solid wood batten as per design and all internal facia of ply wood for shutters, drawers, shelves to be covered with 0.8 mm thick laminate. Aluminium pipe framing for shutters as per design to be included. All joinery to be based on good practices such as tounge and groove joint, dovetail joint etc and using hardware such as "L" brace, Tee, corner brace, screws, nails and pocket-screw joinery etc. as per drawings, specification and instruction by architect. Price to be inclusive of all other such as adhesive, nails, screws, fasteners, telescopic channel, sliding channel, clips, abro tap, ABS parts, SS/ solid wooden handle, etc and all labour All external wood to be seasoned indian teak wood. All veneer/ solid wooden surfaces shall be polished with water based low VOC PU polish in shade, finish, texture and specification as per architect including fine sanding before and after insulator (sealer) coats and first coat of PU, clear non-toxic low VOC termite control additive, 2 coat of clear epoxy insulator in 1:1 proportion of hardner and epoxy, dent filling with matching putty, wooden stainer and 2 coats of water based PU etc. complete. Area to be measured in elevation. All**

**plywood/ solid wood to be treated for termite using PIDILITE Terminator Wood Preservative or equivalent. at all floors / all levels / all heights**

## 1. Materials

### Plywood

Plywood : Shall Conform to M37 Page No.-18 in General Technical Specification Booklet.

The plywood shall:

- Be MR Grade or BWP Grade as specified.
- Be Urea Formaldehyde Free.
- Be Decorative Grade (MR-DEC/BWP-DEC).
- Be free from warping, delamination and manufacturing defects.
- Be suitable for premium furniture applications.

Thicknesses shall be:

- 8 mm
- 12 mm
- 18 mm
- 25 mm

as indicated in approved drawings.

### Block Board

The block board shall conform to relevant IS specifications and shall:

- Be seasoned timber core type.
- Be free from twists and warping.
- Be suitable for wardrobe shutter and partition construction.

### External Veneer Finish

The veneer shall:

- Be natural wood veneer.
- Be 4 mm thick.
- Have approved colour, grain and texture.
- Be selected by the Architect.

The veneer shall be free from:

- Cracks.
- Open joints.
- Surface defects.
- Colour variations beyond approved samples.

#### Internal Laminate Finish

The laminate shall:

- Be 0.8 mm thick.
- Decorative grade.
- Scratch resistant.
- Moisture resistant.

The laminate shall be fixed on:

- Drawer interiors.
- Shelf surfaces.
- Internal shutters.
- Internal partitions.

Colour and shade shall be approved by the Architect.

#### Solid Wood Lipping

##### Teak Wood

Teak Wood : Shall Conform to M29 Page No.-15 in General Technical Specification Booklet.

The exposed edges shall be provided with:

- 9 mm thick solid wood lipping.
- Properly seasoned timber.
- Smooth finished edges.

The lipping shall be securely bonded and mechanically fixed where required.

#### Aluminium Framing

##### Aluminium Doors, Windows and Holdfasts

Aluminium Doors, Windows and Holdfasts : Shall Conform M31 Page No.-17 in General Technical Specification Booklet.

The aluminium framing provided to shutters shall:



- Be extruded aluminium sections.
- Be straight and defect free.
- Have approved finish and colour.
- Be adequately stiff to support shutter panels.

#### Adhesives

The adhesive shall:

- Be Low VOC type.
- Free from CFC and HCFC.
- Suitable for veneer and laminate bonding.
- Moisture resistant.

Only approved furniture-grade adhesives shall be used.

#### Hardware and Accessories

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

The hardware shall include:

- Soft close hinges.
- Telescopic drawer channels.
- Sliding channels.
- SS handles.
- Wooden handles.
- ABS fittings.
- Shelf supports.
- Corner brackets.
- Tee braces.
- L braces.
- Locks.
- Magnetic catches.
- Screws.
- Nails.
- Fasteners.
- Clips.

All hardware shall be of approved make and premium quality.

## Termite Treatment

The entire plywood, block board and timber components shall be treated using:

- PIDILITE Terminator Wood Preservative

or approved equivalent.

The treatment shall provide protection against:

- Termites.
- Wood borers.
- Fungus attack.

## PU Polish System

Paints : Shall Conform to M44 Page No.-21 in General Technical Specification Booklet.

The PU polishing system shall comprise:

### Surface Preparation

- Fine sanding.
- Surface cleaning.

### Insulator Coating

- Two coats epoxy insulator.
- Epoxy and hardener mixed in ratio 1:1.

### Putty Work

- Matching wood putty.
- Dent filling.

### Staining

- Approved wood stain.

### Final Finish

- Two coats water-based low VOC PU polish.

The finish shall be:

- Smooth.
- Uniform.
- Scratch resistant.
- Moisture resistant.

## 2. Workmanship

### General

The wardrobe shall be fabricated by experienced furniture craftsmen strictly in accordance with:

- Approved architectural drawings.
- Approved shop drawings.
- Approved material samples.
- Engineer-in-Charge instructions.

All dimensions shall be verified at site prior to fabrication.

### Fabrication

The wardrobe shall comprise:

- Vertical partitions.
- Shelves.
- Hanging sections.
- Drawers.
- Shutters.
- Internal accessories.

The wardrobe depth shall not exceed:

600 mm

unless otherwise shown on drawings.

### Joinery

All joinery shall follow accepted furniture manufacturing practices including:

- Tongue and groove joints.
- Dovetail joints.
- Mortise and tenon joints.
- Pocket screw joinery.

- Mechanical fastening systems.

The completed assembly shall remain rigid and distortion free.

#### Veneer Application

The veneer shall be bonded uniformly.

The application shall ensure:

- Matching grains.
- Tight joints.
- Bubble free finish.

Open joints and lifting of veneer shall not be permitted.

#### Laminate Application

The laminate shall be machine pressed or properly bonded.

The finish shall be:

- Smooth.
- Uniform.
- Free from bubbles and wrinkles.

#### Drawer Installation

Drawers shall:

- Move smoothly.
- Have proper alignment.
- Operate without rattling.
- Be fitted with soft-close telescopic channels.

#### Hanging Arrangements

The hanging rods shall:

- Be stainless steel or anodized aluminium.
- Properly supported.
- Capable of carrying intended loads.

## Installation

The wardrobe shall be:

- Transported safely.
- Positioned accurately.
- Fixed securely to wall where required.
- Installed plumb and level.

All joints between wardrobe and building surfaces shall be neatly finished.

## Polishing

The polishing sequence shall include:

1. Sanding.
2. Epoxy insulator coat.
3. Putty filling.
4. Staining.
5. Intermediate sanding.
6. Final PU coats.

The completed finish shall be free from:

- Brush marks.
- Colour variation.
- Pin holes.
- Scratches.

## Quality Requirements

The completed wardrobe shall:

- Be structurally stable.
- Be free from visible defects.
- Have uniform finish.
- Have smooth operation of shutters and drawers.
- Have proper alignment.

Any defective component shall be replaced at contractor's expense.

## Cleaning and Protection

After installation:

- All surfaces shall be cleaned.
- Protective coverings shall be removed.
- Hardware operation shall be checked.

The wardrobe shall be protected until final handover.

### 3. Mode of Measurement & Payment

#### Mode of Measurement

The wardrobe shall be measured in **Square Metres (Sq.M.)**.

#### **Item No – 86**

**Veneer Wall Panelling: Providing and fixing Veneer wall panelling and false ceiling work as per drawing and as per following: 1) Providing and fixing of Close stud type wall panelling framing system of approved make, which includes good quality framing like Gypsteel ULTRA CLOSED STUD partition of Saint Gobain or as per approved make. 48x0.6mm Gypsteel ULTRA CLOSED STUD should be placed at 600mm c/c in 50x0.5mm Gypsteel ULTRA floor and ceiling channel including bracing, noggin channel, necessary accessories rawl plug, SS 304 fastner, angle cleat has to be provided at the horizontal joints of the two ply. 2) Providing and fixing 12 mm thick water resistant ply confirming IS 303 BWR on installed wall panelling framing, with SS 304 screw, fastner as suggested by framing vendor. 3) Providing and fixing 3.5 to 4 mm thick Veneer of approved make and shade on ply panelling work, fixed partition, ceiling work, any ply surface etc with necessary nails, screws, adhesives as per drawings and approved sample. Veneer shall be selected and sorted for uniform straight lined, light colored from matching group. 4) Polishing work shall be carried out as specified of approved make, shade and texture. 5) For the false ceiling work, the veneer panelling should be done on the surface of gypsum false ceiling by the help of drilling and screwing by desired dimensions of screws. And veneer should be applied and fixed similarly as that in the wall panelling by the help of any bonding agent or glue and polished accordingly. 5) The rate shall be for all heights, all places, all places, etc complete as directed by engineer in charge. Actual laid area shall be measured and paid without considering any wastage. Provide and install as per the directions provided by the Engineer-in-Charge**

#### 1. Materials

##### G.I. Closed Stud Framing System

The framing system shall consist of approved make closed stud partition framing system such as Saint-Gobain Gypsteel Ultra Closed Stud System or approved equivalent.

The framing shall comprise:

### Stud Section

- 48 mm × 0.60 mm thick G.I. Ultra Closed Stud

### Floor and Ceiling Channel

- 50 mm × 0.50 mm thick G.I. Channel

The framing members shall be:

- Factory manufactured.
- Zinc coated.
- Straight and free from distortion.
- Corrosion resistant.

The framing shall conform to relevant IS standards for galvanized steel framing systems.

### Plywood

Plywood : Shall Conform to M37 Page No.-18 in General Technical Specification Booklet.

The plywood shall:

- Be 12 mm thick.
- Water resistant BWR Grade.
- Conform to IS 303.
- Be free from warping and delamination.
- Have smooth surface suitable for veneer application.

### Veneer

The veneer shall:

- Be 3.5 mm to 4.0 mm thick natural wood veneer.
- Of approved species, colour and texture.
- Selected from matching lots for uniform appearance.
- Free from knots, cracks, stains and defects.

The veneer shall be carefully selected to provide:

- Uniform grain pattern.
- Straight line matching.
- Consistent colour tone.

Approval of Architect/Engineer-in-Charge shall be obtained before installation.

#### Adhesives

The adhesive shall:

- Be premium grade synthetic resin adhesive.
- Suitable for veneer bonding.
- Moisture resistant.
- Low VOC type.

The adhesive shall provide permanent bonding without veneer lifting or bubbling.

#### Fasteners

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

Fasteners shall include:

- SS 304 screws.
- Rawl plugs.
- Expansion fasteners.
- Anchor fasteners.
- Cleats.
- Angle brackets.
- Fixing clips.

All fasteners shall be corrosion resistant.

#### G.I. Bracing and Accessories

The framing accessories shall include:

- Noggin channels.
- Bridging members.
- Bracing channels.
- Corner profiles.
- Cleats.
- Connector plates.

Accessories shall be of approved system manufacturer.



### Gypsum Ceiling Substrate

Where veneer finish is applied on false ceiling, the gypsum ceiling substrate shall be properly completed, levelled and approved prior to fixing veneer panels.

The gypsum ceiling shall be capable of supporting the additional load of plywood and veneer finish.

### PU Polish System

Paints : Shall Conform to M44 Page No.-21 in General Technical Specification Booklet.

The polishing system shall comprise:

#### Surface Preparation

- Sanding.
- Cleaning.

#### Sealer Coat

- Approved wood sealer.

#### Intermediate Sanding

- Fine sanding between coats.

#### Final Finish

- Multiple coats of PU polish.

The finish shall be:

- Smooth.
- Uniform.
- Durable.
- Scratch resistant.

Shade and gloss level shall be as approved by Architect.

## 2. Workmanship

### General

The work shall be carried out by skilled craftsmen strictly in accordance with:

- Approved drawings.
- Approved shop drawings.
- Approved material samples.
- Manufacturer's recommendations.
- Directions of Engineer-in-Charge.

Site measurements shall be verified before commencement.

### Framing Work

The closed stud framing shall be erected plumb, level and aligned.

### Stud Spacing

Studs shall be fixed at:

600 mm Centre to Centre

within floor and ceiling channels.

Additional studs shall be provided at:

- Corners.
- Junctions.
- Openings.
- Heavy fixture locations.

Noggin channels and bracing shall be installed to provide rigidity.

### Fixing of Plywood

The 12 mm thick BWR plywood shall be fixed over framing system using SS 304 screws and approved fasteners.

The fixing shall ensure:

- Firm support.
- Flush joints.

- No vibration.
- Proper alignment.

The screw spacing shall be as recommended by framing system manufacturer.

#### Veneer Application

The veneer shall be applied over prepared plywood surface using approved adhesive.

The veneer work shall ensure:

- Grain matching.
- Uniform pattern.
- Tight joints.
- Bubble-free finish.

Book matching or straight line matching shall be carried out wherever specified.

Open joints shall not be accepted.

#### Veneer Ceiling Work

For false ceiling application:

- Plywood shall be fixed securely to gypsum ceiling framework.
- Veneer shall be applied over plywood substrate.
- Mechanical fixing and adhesive bonding shall be provided as required.

The completed ceiling shall remain free from sagging or distortion.

#### Joint Treatment

All joints shall be carefully aligned.

Visible joints shall:

- Match veneer pattern.
- Be smooth and neat.
- Remain free from gaps.

#### Polishing Work

The polishing process shall include:

1. Surface sanding.
2. Sealer application.
3. Intermediate sanding.
4. PU finish coats.

The final finish shall be:

- Uniform in colour.
- Free from brush marks.
- Free from scratches.
- Free from pinholes.

#### Alignment and Finishing

The completed panelling shall:

- Be true to line.
- Be true to level.
- Have consistent joint pattern.
- Have uniform finish throughout.

Defective veneer sheets shall be replaced.

#### Protection

Completed work shall be protected against:

- Moisture.
- Mechanical damage.
- Scratches.
- Staining.

Protective covering shall be maintained until handover.

### 3. Mode of Measurement & Payment

#### Mode of Measurement

The work shall be measured in **Square Metres (Sq.M.)**.

#### **Item No – 87**

#### **Acoustic Fabric panelling :**

**Providing and supplying Acoustical Wall Paneling with square edges made of fibre glass**

which have the LOW-VOC content as per the GRIHA 3star/IGBC gold rating substrate of 25mm thick and wrapped on the front side with an acoustically transparent and classified for Fire reaction Class B-s1, d1 as per EN13501, fabric with an option of colors which have the LOW-VOC content as per the GRIHA 3star/IGBC gold rating – Ivory, Autumn Orange, Pista Green, Straw Gold, Rustic Green, Burgundy, Rust, Peacock Blue, Ash Grey, Mocha as per the choice of the Architect of size 600X1200 mm providing a minimum sound absorption level of 0.90 NRC to be affixed to wall using Wall panel impalers supplied and construction adhesives as per the instructions laid down by the manufacturer. INSTALLATION: 4 nos. wall panel Impalers shall be fixed to the wall surface using self tapping screws. Silica based construction adhesive which have the LOW-VOC content as per the GRIHA 3star/IGBC gold rating to be dabbed on to the projecting elements (spikes) of the impalers. wall panels shall be pierced through the spikes of the impalers ensuring the line and level of the panels are maintained. Installation to be carried out by Trained Installation team & Installation should be carried out as per recommended procedure. Warranty Certificate and Test Reports for NRC and Fire rating shall be provided by Vendor. To be fixed as per the instructions of Engineer-in-Charge .at all floors / all levels / all heights

#### 1. Materials

##### Fiberglass Acoustic Core

The acoustic core shall consist of:

- High density fiberglass board.
- Thickness: 25 mm.
- Dimension: 600 mm × 1200 mm.
- Square edge profile.
- Uniform density throughout panel thickness.

The fiberglass shall:

- Be dimensionally stable.
- Be free from sagging.
- Be resistant to fungal growth.
- Be suitable for interior acoustic applications.

The acoustic core shall provide:

Minimum NRC = 0.90

Tested as per applicable acoustic testing standards.

## Acoustical Fabric Finish

The fabric shall be:

- Acoustically transparent.
- Fire rated.
- Low VOC content.
- Suitable for GRIHA 3-Star and IGBC Gold projects.

Available colours shall include:

- Ivory
- Autumn Orange
- Pista Green
- Straw Gold
- Rustic Green
- Burgundy
- Rust
- Peacock Blue
- Ash Grey
- Mocha

or any approved colour selected by Architect.

The fabric shall be:

- Uniformly stretched.
- Wrinkle free.
- Fade resistant.
- Stain resistant.

## Fire Performance

The fabric covering system shall achieve:

Fire Reaction Classification

**Class B-s1,d1 as per EN 13501**

The contractor shall submit:

- Fire test certificates.
- Laboratory test reports.
- Manufacturer's compliance certificates.

Prior to approval.

#### Adhesive

The adhesive shall be:

- Silica-based construction adhesive.
- Low VOC content.
- Suitable for GRIHA 3-Star / IGBC Gold requirements.
- Recommended by panel manufacturer.

The adhesive shall provide permanent bonding without deterioration.

#### Wall Panel Impalers

Wall panel impalers shall be:

- Galvanized steel or approved corrosion-resistant metal.
- Manufacturer-approved type.
- Suitable for acoustic panel installation.

Each panel shall be fixed using:

Minimum 4 Nos. Impalers

or as recommended by manufacturer.

#### Screws and Fasteners

Fixtures and Fastenings : Shall Conform to M43 Page No.-19 in General Technical Specification Booklet.

Fasteners shall include:

- Self-tapping screws.
- Wall plugs.
- Anchors.
- Fixing clips.

All fasteners shall be corrosion resistant.

#### Supporting Surface

The wall surface receiving acoustic panels shall:

- Be dry.
- Structurally sound.
- Level and true.
- Free from dust and loose particles.

Any preparation required before fixing shall be included in the item.

#### Environmental Requirements

The acoustic panel system shall comply with:

- Low VOC emission requirements.
- Indoor air quality standards.
- Sustainable building requirements.

Suitable for:

- GRIHA 3-Star Projects.
- IGBC Gold Rated Projects.

The manufacturer shall provide supporting environmental certification.

## 2. Workmanship

### General

The work shall be executed by trained and authorized installation personnel approved by the manufacturer.

Installation shall strictly follow:

- Manufacturer's specifications.
- Approved shop drawings.
- Approved material samples.
- Directions of Engineer-in-Charge.

### Surface Preparation

Before installation:

- Wall surfaces shall be cleaned.
- Dust, oil and loose particles shall be removed.
- Uneven surfaces shall be corrected.



No installation shall commence until the substrate is approved.

### Setting Out

The panel layout shall be marked carefully.

The layout shall ensure:

- Uniform alignment.
- Consistent joint pattern.
- Proper symmetry.
- Architectural appearance.

Panel positioning shall be approved before installation.

### Fixing of Impalers

Wall panel impalers shall be fixed to wall using:

- Self-tapping screws.
- Approved anchors.

Minimum four impalers shall be provided per panel unless otherwise recommended by manufacturer.

Impalers shall be:

- Properly aligned.
- Firmly secured.
- Installed true to line and level.

### Adhesive Application

Silica-based low VOC construction adhesive shall be applied on the projecting spikes of impalers.

The adhesive application shall ensure:

- Proper bonding.
- Uniform adhesion.
- Long-term stability.

## Installation of Acoustic Panels

The acoustic panels shall be carefully pressed onto impaler spikes.

Installation shall ensure:

- Proper engagement of impalers.
- Accurate positioning.
- Uniform joint alignment.

Panels shall remain:

- Level.
- Plumb.
- Free from distortion.

## Joint Alignment

All joints between panels shall:

- Be straight.
- Uniform in width.
- Properly aligned.

Visible gaps and uneven joints shall not be accepted.

## Finishing

The completed panel installation shall:

- Have wrinkle-free fabric.
- Be free from dents and punctures.
- Have consistent appearance.

Any damaged panel shall be replaced.

## Testing and Documentation

The contractor shall submit:

Acoustic Performance Report

Showing:

- NRC value  $\geq 0.90$

Fire Performance Report

Showing:

- Class B-s1,d1 Certification

Manufacturer Warranty Certificate

Prior to final acceptance.

Protection

Completed acoustic panels shall be protected against:

- Dust.
- Water.
- Mechanical damage.
- Staining.

Protection shall remain until project handover.

### 3. Mode of Measurement & Payment

Mode of Measurement

The acoustic wall panelling shall be measured in **Square Metres (Sq.M.)**.

#### **Item No – 88**

**Providing and fixing custom-made 3D Stainless Steel (SS 304) letters for building name signage, fabricated from laser/CNC-cut stainless steel sheets with raised profile, mirror/matt finish and approved colour coating. The letters shall be securely mounted on the building façade/parapet using stainless steel brackets, studs and fixing accessories. The work includes design, fabrication Board, transportation, installation, alignment, finishing and all materials, labour and equipment required for complete installation as approved by the Engineer-in-Charge. (Min. 300-600mm Each letter)**

#### 1. MATERIALS

All materials shall be new, best quality, and conforming to relevant IS standards and Engineer-in-Charge approval.

## 1.1 Stainless Steel Letters

- Stainless Steel Grade: **SS 304 (AISI 304)** corrosion resistant grade suitable for outdoor exposure.
- Fabrication: **Laser cut / CNC cut SS sheet** forming 3D letters.
- Thickness:
  - Front face: 1.0 mm to 2.0 mm SS sheet (as per design approval)
  - Side return: SS strip of suitable thickness to form depth (25–100 mm typical)
- Letter height: **300 mm to 600 mm (as specified in BOQ)**
- Finish:
  - Mirror polished / matt brushed / satin finish
  - Optional approved color coating (PVD / PU / powder coating)

## 1.2 Fixing Accessories

- Stainless steel studs, threaded rods, spacers and brackets: **SS 304 grade only**
- Chemical anchors / fasteners suitable for RCC / stone / ACP façade
- Silicone sealant (weatherproof, UV resistant grade)

## 1.3 Adhesives & Consumables

- Industrial-grade epoxy / chemical bonding adhesive for studs
- Anti-corrosion treatment at cut edges and weld joints

## 2. WORKMANSHIP

### 2.1 Fabrication

- Letters shall be fabricated as **true 3D hollow raised forms** with uniform depth and smooth edges.
- CNC/laser cutting shall ensure **accurate typography as per approved artwork and drawings**.
- All joints shall be:
  - TIG welded / laser welded
  - Ground smooth and finished without visible weld marks

### 2.2 Finishing

- Surface shall be uniformly finished (mirror or brushed as approved).
- No scratches, dents, waviness or discoloration shall be permitted.
- Colored coating (if any) shall be uniform and UV resistant.

## 2.3 Installation

- Setting out shall be done using approved shop drawings and full-scale marking on façade.
- Each letter shall be fixed using **SS studs anchored into wall/façade with chemical bolts**.
- Alignment shall be ensured using laser level to maintain:
  - Horizontal alignment
  - Uniform spacing between letters
- Installation shall be rigid, vibration-free and weatherproof.

## 2.4 Protection & Cleaning

- Installed letters shall be properly protected from construction damage.
- Final cleaning shall be done using non-abrasive materials after installation.

## 3. MODE OF MEASUREMENT & PAYMENT

### 3.1 Mode of Measurement

- Measurement shall be done in **Smt.**

## **Item No – 89**

**Wooden Flooring :25 mm wooden planking, tongued and grooved in flooring, including fixing with iron screws complete with : Second class teak wood.at all floors / all levels / all heights**

### 1. MATERIALS

#### 1.1 Timber Flooring Planks

- Wood type: **Second class Teak wood**
- Thickness: **25 mm finished thickness**
- Profile: **Tongue and groove (T&G) system on all edges**
- Moisture content: **Seasoned timber, well dried (typically 10–12% moisture content)**
- Quality:
  - Free from cracks, warping, decay, insect attack, or knots affecting strength
  - Uniform colour and grain as far as possible
- Finish condition:
  - Planed, smooth and ready for fixing or final polishing after installation

#### 1.2 Fixing Materials

- Screws: **Mild steel / GI / brass iron screws (as approved)** with countersunk heads

- Adhesive (if specified by engineer): industrial wood adhesive (optional depending on design)
- Underlay (if required by floor system): bitumen paper / vapour barrier / plywood base as specified

### 1.3 Substrate Compatibility

- Flooring shall be fixed over:
  - RCC slab OR
  - Wooden joists / battens OR
  - Plywood sub-base (as per approved drawings)

## 2. WORKMANSHIP

### 2.1 Preparation

- Subfloor shall be:
  - Clean, dry, level and free from dust, oil or loose particles
- Layout marking shall be done to ensure:
  - Proper alignment of boards
  - Minimum wastage and uniform pattern

### 2.2 Fixing of Flooring

- Wooden planks shall be fixed using **tongue and groove interlocking system**
- Each plank shall be:
  - Properly engaged into adjoining plank
  - Fixed firmly to substrate using screws at regular intervals
- Screws shall be:
  - Countersunk and concealed where possible
- Joints:
  - Tight fitting with no gaps or misalignment
  - End joints staggered for structural stability

### 2.3 Finishing

- Surface shall be:
  - Even, smooth and flush without projections or gaps
- After installation:
  - Sanding / polishing / sealing shall be done as per finishing specification (if included elsewhere in BOQ)
- Edges and corners shall be neatly finished with skirting if specified

## 2.4 Installation Conditions

- Work shall be executed at:
  - All floors / levels / heights including scaffolding where required
- Care shall be taken to avoid damage to finished wood during installation

## 3. MODE OF MEASUREMENT & PAYMENT

### 3.1 Mode of Measurement

- Measurement shall be in **square metre (m<sup>2</sup>)** of finished flooring area.

### **Item No – 90**

**Providing and fixing 6 mm thick clear toughened glass of approved quality and make, including cutting to required size, edge polishing, necessary SS-304 clamps/fittings, rubber gaskets, silicone sealant, fixing accessories, labour, tools and tackles, complete in all respects as per approved drawings and directions of the Engineer-in-Charge.**

#### 1. MATERIALS

##### 1.1 Toughened Glass

- Type: **Clear toughened (tempered) safety glass**
- Thickness: **6 mm**
- Quality: **Float glass processed by thermal toughening**
- Make: Approved manufacturer as per Engineer-in-Charge
- Properties:
  - High impact resistance (approx. 4–5 times stronger than annealed glass)
  - Breaks into small granular pieces (safety feature)
  - Optical clarity without distortion or bubbles
- Cutting:
  - Shall be cut to exact required sizes before toughening process (no site cutting allowed after toughening)

##### 1.2 Edge Finishing

- All edges shall be:
  - Machine polished (flat polish / pencil polish as approved)
  - Smooth and free from sharpness or micro-cracks

##### 1.3 Fixing Accessories

- Stainless Steel fittings: **SS 304 grade only**

- Glass clamps / patch fittings / spider fittings (as applicable)
- Rubber components:
  - EPDM / neoprene gaskets for cushioning and vibration control
- Sealant:
  - Neutral cure **silicone sealant (weatherproof, UV resistant, non-staining type)**

#### 1.4 Supporting Structure (if applicable)

- Glass may be fixed to:
  - RCC wall / masonry
  - Steel frame / aluminium framing system
  - Glazing partitions or façades as per drawings

## 2. WORKMANSHIP

### 2.1 Preparation

- All shop drawings and fixing details shall be approved before execution
- Measurement and marking shall be done accurately at site
- Substrate shall be:
  - Clean, level, structurally sound and free from dust/oil

### 2.2 Fabrication & Handling

- Glass shall be:
  - Manufactured as per final approved dimensions
  - Properly labelled and packed for transport
- Handling:
  - Shall be done using suction pads and protective packing
  - No edge impact or scratching shall be permitted

### 2.3 Installation

- Glass panels shall be fixed using:
  - SS-304 clamps / patch fittings / structural glazing system as specified
- Rubber gaskets shall be provided at all contact points to avoid direct glass-to-metal contact
- Alignment:
  - Panels shall be installed perfectly plumb, level and in correct line
- Joints:
  - Uniform spacing shall be maintained as per approved design
  - Sealing shall be done with silicone sealant for waterproofing and finishing



## 2.4 Sealing & Finishing

- All joints between glass and supporting structure shall be:
  - Neatly sealed with silicone
  - Smooth, uniform and watertight
- No visible gaps, stains, or excess sealant shall be permitted
- Final cleaning shall be done using non-abrasive materials

## 2.5 Safety & Protection

- Installation shall be done with proper safety measures:
  - PPE for workers
  - Scaffolding or access systems where required
- Installed glass shall be protected from construction damage until completion

## 3. MODE OF MEASUREMENT & PAYMENT

### 3.1 Mode of Measurement

- Measurement shall be in **square metre (m<sup>2</sup>)** of installed glass area

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

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