



**GOVERNMENT OF GUJARAT
ROADS AND BUILDING DEPARTMENT
Ahmedabad City (R&B) Circle,
Ahmedabad**

**Name of work: Construction of New Building of State Guest House
at Annexe Circuit House Campus, Shahibaug,
Ahmedabad**

VOLUME 5 : TECHNICAL SPECIFICATIONS

ITEM NO – 6

Dismantling aluminium/Gypsum partitions, doors, windows, fixed glazing and false ceiling including disposal of unserviceable material and stacking of serviceable material with in 50 meters lead as directed by Engineer-in-charge

WORKMANSHIP

General

- The work shall be carried out as per instructions of the Engineer-in-Charge.
- Dismantling shall be done carefully to avoid damage to adjacent structures and services.
- Necessary tools, plants, ladders, and scaffolding shall be arranged by the contractor.

Dismantling of Aluminium Partitions / Doors / Windows

- Aluminium frames, shutters, and sections shall be dismantled by removing screws, bolts, and fasteners carefully.
- Frames shall be loosened without damaging surrounding masonry or finishes.

Dismantling of Gypsum Partitions & False Ceiling

- Gypsum boards shall be removed panel by panel.
- Supporting framework such as channels, runners, hangers, and grid systems shall be dismantled systematically.
- False ceiling shall be dismantled starting from edges towards center.

Dismantling of Fixed Glazing

- Glass panels shall be removed carefully to prevent breakage.
- Glazing beads, rubber gaskets, and fixing elements shall be removed systematically.

Segregation

- Serviceable materials shall be separated carefully and kept intact.
- Unserviceable materials shall be collected separately.

Stacking & Disposal

- Serviceable materials shall be stacked properly within 50 meters lead as directed.
- Unserviceable materials shall be disposed of at approved locations.

Protection

- Adjacent work and finishes shall be protected.
- Any damage shall be rectified by the contractor at his own cost.

Safety

- Proper safety measures such as helmets, gloves, barricading, and caution signage shall be provided.
- Work shall comply with safety standards.

MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment in **per square meter (m²)**.
- No deduction shall be made for openings unless specified.
- Rate shall be Including Labour, tools, and plant required for dismantling. Careful removal and handling of materials. Sorting of serviceable and unserviceable materials. Disposal of unserviceable materials. Safety measures and protection of surrounding work. Scaffolding Handling and loading/unloading Sorting and stacking Disposal within specified lead.

ITEM NO – 13

Surface dressing of the ground including removing vegetation and in-equalities not exceeding 15 cm deep and disposal of rubbish, lead upto 50 m and Lift upto 1.5 m. All kind of Soil.

WORKMANSHIP

General

- The work shall be carried out as per the directions of the Engineer-in-Charge.
- The site shall be cleared of all vegetation, grass, roots, bushes, shrubs, and organic matter.

Surface Dressing

- The ground surface shall be dressed to the required level, grade, and slope.
- Uneven surfaces shall be trimmed, and high spots shall be cut down up to 15 cm depth.
- Depressions shall be filled with suitable excavated material if required.

Removal of Vegetation

- All roots, stumps, and organic materials shall be completely removed.
- The area shall be made free from rubbish and objectionable matter.

Excavation and Dressing

- Cutting shall be done carefully to avoid disturbing adjacent ground.
- The final surface shall be properly leveled and dressed true to line and grade.

Disposal

- Excavated material, rubbish, and vegetation shall be disposed of within 50 meters lead and 1.5 meters lift as directed.
- Unserviceable material shall be spread or dumped as instructed.

Finishing

- The dressed surface shall be compacted lightly where required.
- The finished surface shall be neat, even, and ready for further construction work.

Safety & Precautions

- Proper care shall be taken to avoid damage to nearby structures.
- Necessary safety measures shall be followed during execution.

MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment in **per square meters (m²)**. The area shall be measured for the surface actually dressed. No separate measurement shall be made for removal of vegetation or disposal.
- Rate Including Clearing of site and removal of vegetation. Cutting and dressing of ground up to 15 cm depth. Removal of roots and organic matter. Disposal of rubbish within 50 m lead and 1.5 m lift. Labour, tools, and equipment required. Finishing and leveling.

ITEM NO – 21

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

1. MATERIAL

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

Chemical Emulsion (Chlorpyrifos 20 EC): Shall conform to IS 8944 and IS 6313 (Part II) for anti-termite treatment.

2. WORKMANSHIP

General

- The treatment shall be carried out strictly in accordance with IS 6313 (Part II) for post-construction anti-termite treatment.
- Work shall be executed under supervision of the Engineer-in-Charge.

Preparation of Surface

- The plinth area around the building shall be cleared of vegetation, debris, and loose materials.
- Holes shall be drilled along the wall at regular intervals (generally 300 mm c/c) at plinth level.

Preparation of Chemical Emulsion

- Chemical emulsion shall be prepared by mixing:
 - 1 litre of Chlorpyrifos 20 EC with 19 litres of water to obtain 1% concentration.
- The solution shall be mixed thoroughly before application.

Application

- The chemical emulsion shall be applied by spraying or injecting into holes and trenches around the plinth.
- Treatment shall ensure continuous chemical barrier along the plinth.

- Application rate shall be 5 litres of emulsion per square meter of surface.

Method of Treatment

- Holes shall be drilled at plinth level and chemical injected using pressure pump.
- The chemical shall penetrate the soil along the foundation to form a uniform barrier.
- Care shall be taken to avoid damage to structure and services.

Precautions

- Treatment shall not be carried out during rain or when soil is excessively wet.
- All safety precautions shall be followed while handling chemicals.
- Workers shall use protective gear such as gloves, masks, and goggles.

Protection & Completion

- Treated surfaces shall not be disturbed after application.
- Any disturbed area shall be retreated.
- Work shall be completed neatly ensuring no spillage or contamination.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment in **square meters (m²)** of surface treated.
- Rate Including Supply of chemical (Chlorpyrifos 20 EC). Preparation of emulsion.
- Drilling of holes and injection/spraying. Labour, tools, plants, and equipment & Safety measures Lead and lift

ITEM NO – 22

Anti-Termite System: Providing and laying of permanent piping technology anti-termite treatment before flooring work by installing LLDP (Low linear density polyethylene) tube of 8 mm O.D. & 6.4 mm I.D. with inbuilt pressure compensation chip every 30 cm interval in the tube, having working pressure of 2 Kg/cm² and release rate of 1.9 ltr/hour fixed by P-clips and nails. The LLDP pipe shall be installed at the entire periphery of the building and at internal network of building at a depth of 20 to 200 mm under floor at every 2 to 3 mtr. c/c distance (adjusted as per building layout) & Ends of loop pass through a PVC elbow of minimum 32 mm ID at junction box of wall and floor level, entering into a steel reinforced grooved flexible pipe of minimum 22 mm ID leading into junction box and the loops shall terminate in junction boxes & test every junction during injecting chemicals for termite control treatment. The anti termite chemical Imidacloprid 30.5% SC mix as per IS-6313 (part III) shall be injected by the pressure pump diluted with water @ 10.5 ml/5 ltr of water at the rate of 2 Kg/sq.cm @ 5 Ltr/SMT. The contractor shall submit approved line plan for piping system and junction boxes dully approved by Engineer-in-Charge with bond of 5 year warranty.(i)Anti Termite chemical injected area (Chemical injecting incl. labour cost)at all floors / all levels / all heights.

1. MATERIAL

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

LLDP Pipe (Low Linear Density Polyethylene) : Shall conform to relevant IS standards for polyethylene piping systems and shall be of 8 mm OD and 6.4 mm ID with inbuilt pressure compensating emitters at 30 cm interval.

PVC Pipes & Fittings : Shall conform to IS 4985 and IS 7834.

Flexible Reinforced Pipe : Shall conform to relevant IS standards for pressure resistant flexible conduits.

Fixtures and Fastenings : Shall Conform M.43 page no-19 in General Technical Specification Booklet.

Anti-termite Chemical (Imidacloprid 30.5% SC) : Shall conform to IS 6313 (Part III) and relevant pesticide standards.

2. WORKMANSHIP

General

- The work shall be executed strictly as per IS 6313 (Part III) and as directed by the Engineer-in-Charge.
- The contractor shall submit layout drawings of piping network and junction boxes for approval before execution.
- A 5-year guarantee bond for anti-termite treatment shall be provided.

Installation of Piping System

- LLDP pipes of 8 mm OD and 6.4 mm ID with pressure compensating emitters at 300 mm interval shall be used.
- Pipes shall be laid:
 - Along the entire periphery of the building
 - In internal grid network at spacing of 2 to 3 meters c/c (adjusted as per layout)
- Pipes shall be installed at a depth of 20 mm to 200 mm below finished floor level.

Fixing

- Pipes shall be fixed securely using P-clips and nails to maintain alignment and position.
- Care shall be taken to avoid damage during further construction activities.

Looping & Junction Boxes

- Pipe loops shall be routed to junction boxes through:
 - PVC elbows of minimum 32 mm internal diameter
 - Steel reinforced flexible pipes of minimum 22 mm internal diameter
- All loops shall terminate in accessible junction boxes at wall-floor junction.
- Junction boxes shall be properly sealed and accessible for future maintenance.

Testing

- Entire piping system shall be pressure tested before chemical injection.
- Each junction shall be checked for proper flow and leakage.

Preparation of Chemical Solution

- Chemical used: Imidacloprid 30.5% SC
- Dilution:
 - 10.5 ml of chemical mixed with 5 litres of water
- Solution shall be prepared fresh before application.

Injection of Chemical

- Chemical emulsion shall be injected through the piping system using a pressure pump at 2 kg/cm² pressure.
- Application rate:
 - 5 litres per sqm of treated area
- Uniform distribution shall be ensured through emitters.

Precautions

- Pipes shall not be damaged or kinked during installation.
- Chemical handling shall be done with proper safety equipment.
- No untreated gaps shall remain in the system.
- Treated area shall not be disturbed after injection.

Completion

- The system shall be demonstrated to the Engineer-in-Charge.
- All junction boxes shall be properly marked and handed over.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment in per **square meters (m²)** of treated area. Measurement shall include all floors, levels, and heights where treatment is provided.
- Rate Including Supply and laying of LLDP piping system. Supply of all Pipes & fittings, junction boxes, and accessories. Fixing, looping, and installation of complete network. Supply and application of anti-termite chemical. Pressure testing and commissioning. Labour, tools, plants, and equipment Lead, lift, or scaffolding. Preparation and submission of layout drawings. 5-year warranty/guarantee & Maintenance during defect liability period

ITEM NO – 24

Foundation (M-35): Providing and laying in position Ready Mixed M-350 grade concrete for reinforced cement concrete work in Foundations of different types such as isolated footing, strip footing or Raft/mass concrete footing using cement content as per approved Design Mix manufactured in fully automatic batching plant and transported to site of work in transit mixer for a lead up to 10 kms having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, including the cost of centering shuttering finishing and cost of admixtures in recommended proportions as per IS : 9103 to accelerate /retard setting of concrete, improve workability without impairing strength and durability excluding the cost of reinforcement including all led and lift as per direction of the Engineer- in - charge. Without Fly Ash (Min cement level as per latest IS456 shall be maintained) (Cement level 500 kg)

The following grades of concrete adding polyester propylene (PP) fiber of length 10 mm to 14 mm for better compressive and tensile strength and adding water proofing chemical compound to reduce permeability to ensure water tightness, the water proofing compound required dosage is @300 ml /50KG cement bag and confirming to IS- 2645:2003.add curing compound of approved make by EIC at the rate of 0.33 lit/smt for cement to fully hydrate to ensure maximum strength, durability, prevent cracks and surface defects for special large scale project.

1. MATERIAL

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

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

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

Stone Grit (Coarse Aggregate) : Shall Conform M8 page no-10 in General Technical Specification Booklet.

Admixtures : Shall conform to IS 9103.

Coarse Aggregate for Design Mix Concrete : Shall Conform M.13 page no-11 in General Technical Specification Booklet.

Polypropylene (PP) Fibres : Shall conform to relevant ASTM / IS standards, 10 mm to 14 mm length.

Waterproofing Compound : Shall conform to IS 2645:2003.

Curing Compound : Shall conform to relevant IS standards / ASTM C309.

Shuttering Material : Shall Conform M.26 page no-14 in General Technical Specification Booklet.

2. WORKMANSHIP

General

- Concrete shall be Ready Mixed Concrete (RMC) of Grade As per mention in Description produced in an approved automatic batching plant.
- Mix design shall be approved and shall comply with IS 456 and IS 10262.
- Minimum cement content shall be As per mention in Description (kg/m^3) or as per latest IS 456 provisions.

Batching & Transportation

- Concrete shall be batched in a fully automatic batching plant.
- Transportation shall be done using transit mixers with continuous agitation.
- Lead up to 10 km is included.

Admixtures & Additives

- Chemical admixtures shall be used as per IS 9103 to improve workability and control setting time.
- Polypropylene Fibres (10–14 mm length) shall be added to enhance tensile strength and crack resistance.
- Waterproofing compound shall be added @ 300 ml per 50 kg cement bag.
- Curing compound shall be applied @ 0.33 litre per sqm.

Formwork / Centering

- Formwork shall be rigid, watertight, properly aligned and capable of withstanding loads.
- It shall conform to required shape, line, and level.
- Joints shall be tight to prevent leakage of slurry.

Placing of Concrete

- Concrete shall be placed in position within initial setting time.
- Placement shall be done using pumping method.
- Concrete shall be laid in layers and compacted immediately.

Compaction

- Concrete shall be compacted using mechanical vibrators to achieve dense and void-free mass.
- Over-vibration shall be avoided.

Finishing

- Top surface shall be finished smooth and level as per design requirements.

Curing

- Curing shall be done using approved curing compound to ensure full hydration.
- Curing shall prevent cracks, shrinkage, and surface defects.

Precautions

- No segregation or bleeding shall occur.
- Cold joints shall be avoided.
- Concrete shall not be placed during extreme weather conditions without approval.

Quality Control

- Slump test shall be conducted for each batch.
- Cube tests shall be carried out as per IS 516 to ensure strength.
- Records of batching and testing shall be maintained.

3. MODE OF MEASUREMENT & PAYMENT

- Concrete shall be Measuring & Payment in per one **cubic meters (m³)**. Dimensions shall be measured as per drawings.

- Rate Including Supply and laying of RMC concrete. Batching, mixing, and transportation up to 10 km. pumping, placing, compacting, and finishing. Cost of Admixtures and additives, PP fibres, waterproofing compound, and curing compound & Curing arrangements. Centering and shuttering. Labour, tools, plants, and equipment. All leads and lifts.
- Rate Excluding Cost of reinforcement steel (paid separately).

ITEM NO – 25

Column (M-35): Providing and laying in position Ready Mixed M-350 grade concrete for reinforced cement concrete work, using cement content as per approved Design Mix manufactured in fully automatic batching plant and transported to site of work in transit mixer for a lead up to 10 kms having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, including the cost of centering shuttering finishing and cost of admixtures in recommended proportions as per IS : 9103 to accelerate /retard setting of concrete, improve workability without impairing strength and durability excluding the cost of reinforcement for (A) Columns up to first floor including all lead and lift as per direction of the Engineer- in - charge. Without Fly Ash (Min cement level as per latest IS456 shall be maintained) (Cement level 500 kg)

The following grades of concrete adding polyester propylene (PP) fiber of length 10 mm to 14 mm for better compressive and tensile strength and adding water proofing chemical compound to reduce permeability to ensure water tightness, the water proofing compound required dosage is @300 ml /50KG cement bag and confirming to IS- 2645:2003. add curing compound of approved make by EIC at the rate of 0.33 lit/smt for cement to fully hydrate to ensure maximum strength, durability, prevent cracks and surface defects for specially large scale project.

- Relevant to item specification shall be followed **Item No - 24** & Item shall be Measuring & Payment paid a unit per **one cubic meters (m³)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 26

Column (M-30): Providing and laying in position Ready Mixed M-300 grade concrete for reinforced cement concrete work, using cement content as per approved Design Mix manufactured in fully automatic batching plant and transported to site of work in transit mixer for a lead up to 10 kms having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, including the cost of centering shuttering finishing and cost of admixtures in recommended proportions as per IS : 9103 to accelerate /retard setting of concrete, improve workability without impairing strength and durability excluding the cost of reinforcement (B) Columns for above First floor to fourth floor including all lead and lift as per direction of the Engineer- in - charge. Without Fly Ash (Min cement level as per latest IS456 shall be maintained) (Cement level 475 kg)

The following grades of concrete adding polyester propylene (PP) fiber of length 10 mm to 14 mm for better compressive and tensile strength and adding water proofing chemical compound to reduce permeability to ensure water tightness, the water proofing compound required dosage is @300 ml /50KG cement bag and confirming to IS- 2645:2003. add curing compound of approved make by EIC at the rate of 0.33 lit/smt for cement to fully hydrate to ensure maximum strength, durability, prevent cracks and surface defects for specially large scale project.

- Relevant to item specification shall be followed **Item No - 24** & Item shall be Measuring & Payment paid a unit per **one cubic meters (m³)** for completed item.

- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 27

Column (M-25): Providing and laying in position Ready Mixed M-250 grade concrete for reinforced cement concrete work, using cement content as per approved Design Mix manufactured in fully automatic batching plant and transported to site of work in transit mixer for a lead up to 10 kms having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, including the cost of centering shuttering finishing and cost of admixtures in recommended proportions as per IS : 9103 to accelerate /retard setting of concrete, improve workability without impairing strength and durability excluding the cost of reinforcement for (C) Columns for above fourth floor to terrace floor level including all lead and lift. as per direction of the Engineer- in - charge. Without Fly Ash (Min cement level as per latest IS456 shall be maintained) (Cement level 450 kg)

The following grades of concrete adding polyester propylene (PP) fiber of length 10 mm to 14 mm for better compressive and tensile strength and adding water proofing chemical compound to reduce permeability to ensure water tightness, the water proofing compound required dosage is @300 ml /50KG cement bag and confirming to IS- 2645:2003. add curing compound of approved make by EIC at the rate of 0.33 lit/smt for cement to fully hydrate to ensure maximum strength, durability, prevent cracks and surface defects for specially large scale project.

- Relevant to item specification shall be followed **Item No - 24** & Item shall be Measuring & Payment paid a unit per **one cubic meters (m³)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 28

Plinth Beams (M-25): Providing and laying in position Ready Mixed M-250 grade concrete for reinforced cement concrete work, using cement content as per approved Design Mix manufactured in fully automatic batching plant and transported to site of work in transit mixer for a lead up to 10 kms having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, including the cost of centering shuttering finishing and cost of admixtures in recommended proportions as per IS : 9103 to accelerate /retard setting of concrete, improve workability without impairing strength and durability excluding the cost of reinforcement as per direction of the Engineer- in - charge. Without Fly Ash (Min cement level as per latest IS456 shall be maintained) (Cement level 450 kg) (A) Slabs, landing, shelves, Balconies, Lintels, Beams, Girders and Cantilever including all lead and lift

The following grades of concrete adding polyester propylene (PP) fiber of length 10 mm to 14 mm for better compressive and tensile strength and adding water proofing chemical compound to reduce permeability to ensure water tightness, the water proofing compound required dosage is @300 ml /50KG cement bag and confirming to IS- 2645:2003. add curing compound of approved make by EIC at the rate of 0.33 lit/smt for cement to fully hydrate to ensure maximum strength, durability, prevent cracks and surface defects for specially large scale project.

- Relevant to item specification shall be followed **Item No - 24** & Item shall be Measuring & Payment paid a unit per **one cubic meters (m³)** for completed item.

- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 29

Grade Slab (M-25): Providing and laying in position Ready Mixed M-250 grade concrete for reinforced cement concrete work, using cement content as per approved Design Mix manufactured in fully automatic batching plant and transported to site of work in transit mixer for a lead up to 10 kms having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, including the cost of centering shuttering finishing and cost of admixtures in recommended proportions as per IS : 9103 to accelerate /retard setting of concrete, improve workability without impairing strength and durability excluding the cost of reinforcement as per direction of the Engineer- in - charge. Without Fly Ash (Min cement level as per latest IS456 shall be maintained) (Cement level 450 kg) (A) Slabs, landing, shelves, Balconies, Lintels, Beams, Girders and Cantilever including all lead and lift

The following grades of concrete adding polyester propylene (PP) fiber of length 10 mm to 14 mm for better compressive and tensile strength and adding water proofing chemical compound to reduce permeability to ensure water tightness, the water proofing compound required dosage is @300 ml /50KG cement bag and confirming to IS- 2645:2003. also add curing compound of approved make by EIC at the rate of 0.33 lit/smt for cement to fully hydrate to ensure maximum strength, durability, prevent cracks and surface defects for specially large scale project.

- Relevant to item specification shall be followed **Item No - 24** & Item shall be Measuring & Payment paid a unit per **one cubic meters (m³)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 30

Slab (M-25): Providing and laying in position Ready Mixed M-250 grade concrete for reinforced cement concrete work, using cement content as per approved Design Mix manufactured in fully automatic batching plant and transported to site of work in transit mixer for a lead up to 10 kms having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, including the cost of centering shuttering finishing and cost of admixtures in recommended proportions as per IS : 9103 to accelerate /retard setting of concrete, improve workability without impairing strength and durability excluding the cost of reinforcement (A) Slabs, landing, shelves, Balconies, Lintels, Beams, Girders and Cantilever upto any height including all lead and lift as per direction of the Engineer- in - charge. Without Fly Ash (Min cement level as per latest IS456 shall be maintained) (Cement level 450 kg)

The following grades of concrete adding polyester propylene (PP) fiber of length 10 mm to 14 mm for better compressive and tensile strength and adding water proofing chemical compound to reduce permeability to ensure water tightness, the water proofing compound required dosage is @300 ml /50KG cement bag and confirming to IS- 2645:2003. also add curing compound of approved make by EIC at the rate of 0.33 lit/smt for cement to fully hydrate to ensure maximum strength, durability, prevent cracks and surface defects for specially large scale project.

- Relevant to item specification shall be followed **Item No - 24** & Item shall be Measuring & Payment paid a unit per **one cubic meters (m³)** for completed item.

- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 31

Floor Beams (M-25): Providing and laying in position Ready Mixed M-250 grade concrete for reinforced cement concrete work, using cement content as per approved Design Mix manufactured in fully automatic batching plant and transported to site of work in transit mixer for a lead up to 10 kms having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, including the cost of centering shuttering finishing and cost of admixtures in recommended proportions as per IS : 9103 to accelerate /retard setting of concrete, improve workability without impairing strength and durability excluding the cost of reinforcement (A) Slabs, landing, shelves, Balconies, Lintels, Beams, Girders and Cantilever upto any height including all lead and lift as per direction of the Engineer- in - charge. Without Fly Ash (Min cement level as per latest IS456 shall be maintained) (Cement level 450 kg)

The following grades of concrete adding polyester propylene (PP) fiber of length 10 mm to 14 mm for better compressive and tensile strength and adding water proofing chemical compound to reduce permeability to ensure water tightness, the water proofing compound required dosage is @300 ml /50KG cement bag and confirming to IS- 2645:2003.also add curing compound of approved make by EIC at the rate of 0.33 lit/smt for cement to fully hydrate to ensure maximum strength, durability, prevent cracks and surface defects for special large scale project.

- Relevant to item specification shall be followed **Item No - 24** & Item shall be Measuring & Payment paid a unit per **one cubic meters (m³)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 32

RCC Wall (M-35): Providing and laying in position Ready Mixed M-350 grade concrete for reinforced cement concrete work, using cement content as per approved Design Mix manufactured in fully automatic batching plant and transported to site of work in transit mixer for a lead up to 10kms having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, including the cost of centering shuttering finishing and cost of admixtures in recommended proportions as per IS:9103 to accelerate /retard setting of concrete, improve workability without impairing strength and durability excluding the cost of reinforcement for (A) RCC wall upto first floor including all lead and lift as per direction of the Engineer- in- charge. Without FlyAsh (Min cement level as per latest IS 456 shall be maintained) (Cement level 500 kg) The following grades of concrete adding polyester propylene (PP) fiber of length 10 mm to 14 mm for better compressive and tensile strength and adding water proofing chemical compound to reduce permeability to ensure water tightness, the water proofing compound required dosage is @300 ml /50KG cement bag and confirming to IS- 2645:2003.also add curing compound of approved make by EIC at the rate of 0.33 lit/smt for cement to fully hydrate to ensure maximum strength, durability, prevent cracks and surface defects for special large scale project.

- Relevant to item specification shall be followed **Item No - 24** & Item shall be Measuring & Payment paid a unit per **one cubic meters (m³)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 33

RCC Wall (M-30): Providing and laying in position Ready Mixed M-300 grade concrete for reinforced cement concrete work, using cement content as per approved Design Mix manufactured in fully automatic batching plant and transported to site of work in transit mixer for a lead up to 10kms having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, including the cost of centering shuttering finishing and cost of admixtures in recommended proportions as per IS:9103 to accelerate /retard setting of concrete, improve workability without impairing strength and durability excluding the cost of reinforcement (B) RCC wall above first floor to fourth floor including all lead and lift as per direction of the Engineer- in-charge. Without FlyAsh (Min cement level as per latest IS 456 shall be maintained) (Cement level 475 kg)

The following grades of concrete adding polyester propylene (PP) fiber of length 10 mm to 14 mm for better compressive and tensile strength and adding water proofing chemical compound to reduce permeability to ensure water tightness, the water proofing compound required dosage is @300 ml /50KG cement bag and confirming to IS- 2645:2003.also add curing compound of approved make by EIC at the rate of 0.33 lit/smt for cement to fully hydrate to ensure maximum strength, durability, prevent cracks and surface defects for specially large scale project.

- Relevant to item specification shall be followed **Item No - 24** & Item shall be Measuring & Payment paid a unit per **one cubic meters (m³)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 34

RCC Wall (M-25): Providing and laying in position Ready Mixed M-250 grade concrete for reinforced cement concrete work, using cement content as per approved Design Mix manufactured in fully automatic batching plant and transported to site of work in transit mixer for a lead up to 10kms having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, including the cost of centering shuttering finishing and cost of admixtures in recommended proportions as per IS:9103 to accelerate /retard setting of concrete, improve workability without impairing strength and durability excluding the cost of reinforcement for (C) RCC wall above fourth floor to terrace floor level including all lead and lift as per direction of the Engineer- in- charge. Without FlyAsh (Min cement level as per latest IS 456 shall be maintained) (Cement level 450 kg) for above first floor to fourth floor including all lead and lift.

The following grades of concrete adding polyester propylene (PP) fiber of length 10 mm to 14 mm for better compressive and tensile strength and adding water proofing chemical compound to reduce permeability to ensure water tightness, the water proofing compound required dosage is @300 ml /50KG cement bag and confirming to IS- 2645:2003.also add curing compound of approved make by EIC at the rate of 0.33 lit/smt for cement to fully hydrate to ensure maximum strength, durability, prevent cracks and surface defects for specially large scale project.

- Relevant to item specification shall be followed **Item No - 24** & Item shall be Measuring & Payment paid a unit per **one cubic meters (m³)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 35

Staircase (M-25): Providing and laying in position Ready Mixed M-250 grade concrete for reinforced cement concrete work, using cement content as per approved Design Mix manufactured in fully automatic batching plant and transported to site of work in transit mixer for a lead up to 10 kms having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, including the cost of centering shuttering finishing and cost of admixtures in recommended proportions as per IS : 9103 to accelerate /retard setting of concrete, improve workability without impairing strength and durability excluding the cost of reinforcement for (A) Staircase and landing slab upto any height including all lead and lift as per direction of the Engineer- in - charge. Without Fly Ash (Min cement level as per latest IS456 shall be maintained) (Cement level 450 kg) The following grades of concrete adding polyester propylene (PP) fiber of length 10 mm to 14 mm for better compressive and tensile strength and adding water proofing chemical compound to reduce permeability to ensure water tightness, the water proofing compound required dosage is @300 ml /50KG cement bag and confirming to IS- 2645:2003.also add curing compound of approved make by EIC at the rate of 0.33 lit/smt for cement to fully hydrate to ensure maximum strength, durability, prevent cracks and surface defects for specially large scale project.

- Relevant to item specification shall be followed **Item No - 24** & Item shall be Measuring & Payment paid a unit per **one cubic meters (m³)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 40

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.

1. MATERIAL

Fiberglass Mesh : Shall conform to relevant ASTM / EN standards for alkali-resistant glass fiber mesh used in plastering and waterproofing applications, having:

- Mass per unit area: 145 g/m²
- Mesh size: 3.9 × 4.0 mm (±10%)
- Alkali-resistant coating suitable for cementitious environment

Adhesive / Mortar (if used) : Shall Conform M11 page no-11 in General Technical Specification Booklet.

Fixtures and Fastenings : Shall Conform M.43 page no-19 in General Technical Specification Booklet.

2. WORKMANSHIP

General

- Work shall be carried out as per manufacturer's specifications and as directed by the Engineer-in-Charge.
- The mesh shall be used for crack control and reinforcement in plaster, joints, or waterproofing layers.

Surface Preparation

- Surface shall be clean, dry, and free from dust, oil, grease, and loose particles.
- Uneven surfaces shall be properly leveled before application.

Fixing of Fiberglass Mesh

- Fiberglass mesh shall be cut to required size and shape.
- It shall be embedded uniformly in plaster / base coat / adhesive layer.
- Mesh shall be placed in such a way that it remains in the middle layer of plaster.

Lapping

- Adjacent mesh pieces shall be overlapped by minimum 100 mm on all sides.
- Proper alignment shall be maintained to avoid wrinkles or folds.

Fixing Method

- Mesh shall be fixed using:
 - Suitable adhesive / cement mortar, or
 - Mechanical fixing where required
- It shall be stretched properly and fixed tight against the surface.

Finishing

- After embedding mesh, plaster or finishing layer shall be applied uniformly.
- No portion of mesh shall remain exposed.

Precautions

- Mesh shall not be damaged during fixing.
- Proper curing of plaster shall be ensured.
- Work shall be protected from mechanical damage.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (m²)**. Measurement shall be taken for actual area where mesh is provided.
- Rate Including Supply of fiberglass mesh with Cutting, placing, and fixing, Overlaps and wastage of Adhesive or mortar With Labour, tools, and equipment, Scaffolding All leads and lifts Complete installation at all heights and levels.

ITEM NO – 42

TMT Bar(Fe 550 D) : Providing TMT Bar FE 550 D reinforcement for R.C.C. work including bending, binding and placing in position complete up to any floor level including all lead and lift

1. Material

TMT Reinforcement Steel

The reinforcement shall consist of Thermo Mechanically Treated (TMT) high strength deformed steel bars of **Grade Fe 550D** conforming to:

- IS 1786 (Latest Revision)
- IS 456 (Latest Revision)
- IS 2502 – Code of Practice for Bending and Fixing of Bars
- IS 13620 – Ductility Requirements for Reinforcing Steel

The bars shall possess:

- Minimum Yield Strength : 550 N/mm²
- High Ductility (Grade D)
- Excellent Weldability
- Superior Corrosion Resistance
- High Seismic Performance

Steel shall be procured only from approved primary manufacturers such as SAIL, TATA, JSW, Jindal, RINL or equivalent approved make. No re-rolled, re-heated, defective or secondary steel shall be permitted.

Every lot of steel shall be accompanied by:

- Manufacturer's Test Certificate
- Chemical Composition Report
- Mechanical Properties Test Report
- BIS Certification

Bars showing cracks, laminations, excessive rust, bends, twists, scales or other defects shall be rejected. Only new and unused reinforcement steel shall be incorporated in the work. For the purpose of payment, bars shall be measured to the nearest 10 mm and weight calculated as per IS standard unit weight tables.

2. Binding Wire

Binding wire shall be:

- Soft annealed M.S. wire
- Minimum 16 SWG (approximately 1.6 mm dia.) or as approved
- Free from rust, oil and other deleterious substances

Binding wire shall be of approved quality and sufficient strength to maintain reinforcement in proper position during concreting operations. No separate payment shall be made for binding wire.

3. Workmanship

Cleaning of Reinforcement

All reinforcement shall be:

- Clean and free from loose rust
- Free from mill scale
- Free from oil, grease, mud, paint and other foreign materials

before fixing and concreting.

Cutting and Bending

Bars shall be:

- Cut to required lengths as per Bar Bending Schedule (BBS)
- Bent cold only
- Bent using approved bar bending machines

Heating of bars for bending shall not be permitted. Bending dimensions and tolerances shall conform to IS 2502. All bends, hooks, cranks and stirrups shall be formed accurately as shown on approved structural drawings.

Placement of Reinforcement

Reinforcement shall be placed accurately in position as shown on structural drawings and approved Bar Bending Schedules.

Bars shall be securely tied using annealed binding wire at all intersections.

The reinforcement shall be adequately supported using:

- Reinforcement Chairs
- Spacer Bars
- Cover Blocks
- Hangers
- Approved Non-Corrosive Supports

to prevent displacement during concreting.

Broken bricks, stones, wooden blocks or similar materials shall not be used for supporting reinforcement.

Concrete Cover

Minimum clear cover shall be maintained as per structural drawings and IS 456 requirements.

Approved precast concrete cover blocks of equivalent concrete grade shall be used.

Typical cover shall be:

Member	Cover
--------	-------

Slab	20-25 mm
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Beam	25-40 mm
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Column	40 mm
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Footing	50-75 mm
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or as specified in structural drawings.

Lapping of Reinforcement

As far as possible, full-length bars shall be used.

Where laps are unavoidable:

- Lap lengths shall be as per structural drawings and IS 456.
- Laps shall be staggered.
- Laps shall not be provided at sections of maximum stress unless approved.
- Bars in lap locations shall be securely tied.

Lap lengths shall generally be:

- Tension Zone : 50D or as structural designed

- Compression Zone : 50D or a structural designed

where D = Diameter of Bar.

Mechanical Couplers

Where shown on drawings or approved by Engineer-in-Charge, reinforcement bars may be connected using approved mechanical couplers.

Couplers shall:

- Develop 100% strength of parent bar
- Conform to relevant BIS/IRC requirements
- Be installed strictly as per manufacturer's recommendations

No reduction in design strength shall be permitted.

Welding of Reinforcement

Welding shall be carried out only when specifically approved.

Welding shall conform to:

- IS 9417
- IS 2751
- Relevant provisions of IS 1786

Only qualified welders shall be employed.

Suitable precautions shall be taken to avoid metallurgical damage to Fe 550D reinforcement.

Protection of Reinforcement

Bars left exposed for future construction shall be protected by:

- Cement slurry coating
- Approved anti-corrosion coating where specified

until subsequent concreting is completed.

Special care shall be taken to prevent displacement, contamination or corrosion of reinforcement before concrete placement.

4. Mode of Measurement and Payment

Reinforcement shall be measured & payment by weight in **kilograms (Kg)**.

Measurement shall be based on:

- Centre line lengths of bars
- Actual diameter used

- Including hooks, bends, cranks and laps
- Including authorized wastage

Weight shall be calculated from standard theoretical weights specified in IS 1786.

No separate payment shall be made for: Binding wire, Chairs, Spacer bars, Cover blocks, Couplers (unless specifically itemized), Cutting and bending, Lifting and placing, Wastage, Testing charges, Transportation, Loading and unloading, Leads and lifts, Labour and equipment required for fixing

The rate shall include: Supply of Fe 550D TMT bars, Transportation to site, Loading, unloading and stacking, Cutting, straightening and bending, Binding and fixing in position, All leads and lifts, Testing and quality control, Complete execution as per drawings, specifications and direction of Engineer-in-Charge

Rate shall include all materials, labour, tools, machinery, transportation, testing, wastage, handling, cutting, bending, binding, placing in position and all incidental charges complete.

ITEM NO – 43

Epoxy Coating on Reinforcement Bar: Providing fusion bonded Epoxy coating not less than 175 micron thickness and up to 300 micron to reinforcement bars as per IS 13620-1993/ASTM-775 M including testing of coating at plant and all taxes (A) 10mm to 32mm dia bar.

1. MATERIAL

- Reinforcement Steel Bars : Shall conform to IS 1786 for HYSD bars.
- Epoxy Coating Material : Shall conform to IS 13620:1993 and ASTM A775M for fusion bonded epoxy coating, suitable for corrosion protection of reinforcement.

2. WORKMANSHIP

General

- Coating shall be carried out in an approved plant using fusion bonded epoxy process.
- The process shall strictly comply with IS 13620:1993 / ASTM A775M.
- Only approved make and certified coating applicators shall be used.

Surface Preparation

- Reinforcement bars shall be cleaned thoroughly to remove:
 - Mill scale
 - Rust
 - Oil, grease, and dirt
- Cleaning shall be done by abrasive blasting to achieve near white **metal finish.**

Coating Process

- Bars shall be heated to required temperature as per manufacturer's specifications.
- Epoxy powder shall be applied by electrostatic spray method.
- The coating shall be fusion bonded to the steel surface.

Thickness

- Coating thickness shall be:
 - Minimum: 175 microns
 - bMaximum: 300 microns
- Thickness shall be uniform throughout the bar surface.

Curing

- Coated bars shall be properly cured to achieve full bonding and hardness.
- No handling shall be done before curing is complete.

Inspection & Testing

- Coating shall be tested at plant for:
 - Thickness (using coating thickness gauge)
 - Continuity (holiday test)
 - Adhesion and flexibility
- Test certificates shall be submitted for approval.

Handling & Storage

- Coated bars shall be handled carefully to prevent damage to coating.
- Nylon slings or padded supports shall be used.
- Bars shall not be dropped or dragged.
- Damaged coating areas shall be repaired using approved epoxy repair material.

Fixing in Position

- While placing in RCC work:
 - Coated bars shall be tied with GI & coated binding wire.
 - Chairs and spacers shall be of epoxy-coated type.
- Care shall be taken to avoid abrasion of coating.

Precautions

- Bending of bars after coating shall be avoided unless permitted.
- If bending is required, it shall be done before coating or as per guidelines.
- Coating damage shall be rectified before concreting.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit **per kilograms (kg)** of coated reinforcement bars. Measurement shall be based on actual weight of bars coated as per BBS.
- Rate Including Surface preparation and cleaning. Fusion bonded epoxy coating application & Minor repairs of coating. Testing and quality control at plant. Handling, loading, unloading, and transportation. All Handling and storage, labour, tools, plants, and equipment Lead and lift. All taxes and duties.

ITEM NO – 44

Expansion Joints : Providing and fixing in expansion joint 50 mm thick SIL FLEX (Capcell HD 100) expansion joint board of best quality and approved make including cutting to required size and shape at all levels etc. complete as directed.at all floors / all levels / all heights.

1. MATERIAL

- Expansion Joint Filler Board : Shall Conform M.27 page no-15 in General Technical Specification Booklet (Premoulded filler).
- SIL FLEX (Capcell HD 100) Board : Shall be high-density compressible expansion joint filler board, closed cell type, resistant to moisture, chemicals, and weathering, conforming to relevant IS standards (IS 1838).

- Adhesive / Bitumen (if required) : Shall conform to relevant IS standards.
- Fixtures and Fastenings : Shall Conform M.43 page no-19 in General Technical Specification Booklet.

2. WORKMANSHIP

General

- Work shall be executed as per approved drawings and directions of the Engineer-in-Charge.
- Expansion joints shall be provided at specified locations in structural members such as slabs, walls, and foundations.

Preparation

- Joint surfaces shall be cleaned and made free from dust, laitance, oil, and loose materials.
- Edges of concrete shall be true, even, and properly aligned.

Cutting & Placement

- Expansion joint board shall be cut accurately to required size and thickness (50 mm).
- Boards shall be placed vertically or horizontally as required, ensuring full coverage of joint gap.
- The board shall be continuous throughout the joint depth unless otherwise specified.

Fixing

- Boards shall be fixed firmly in position using suitable adhesive, nails, or mechanical supports to prevent displacement during concreting.
- Care shall be taken to maintain correct alignment and thickness of joint.

Joint Continuity

- Joints shall be continuous across the full width and depth of the structure.
- Proper care shall be taken at intersections and corners.

Finishing

- The exposed surface of the joint shall be finished neatly.
- If required, sealing compound or sealant shall be applied over the joint as per specifications.

Precautions

- Board shall not be damaged, crushed, or deformed during handling and fixing.
- Proper gap shall be maintained as per design.
- Joint filler shall not be displaced during concreting.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (m²)** of expansion joint provided. Measurement shall be taken for actual surface area of joint filler installed.
- Rate Including Supply of SIL FLEX (Capcell HD 100) expansion joint board . Cutting to required size and shape with Wastage & Fixing in position. Labour, tools, and equipment All leads and lifts. Complete work at all levels and heights.

ITEM NO – 45

Expansion Joints : Applying and providing Expansion joint sealing System on 100 mm wide joint including cleaning of expansion joint by mechanical means provision of adhesive and flexible membrane with required bond length as per manufacturer specification and 4mm thick aluminium strip covering with one side slotted and bolted with suitable system, inclusive of all manpower, machinery and material as per specification and as directed.at all floors / all levels / all heights.

1. MATERIAL

- Expansion Joint Sealant / Membrane : Shall conform to relevant ASTM / EN standards and manufacturer's specifications for flexible, waterproof expansion joint systems.
- Adhesive / Primer : Shall conform to manufacturer's specifications for bonding of membrane to concrete surface.
- Aluminium Strip : Shall conform to relevant IS standards for aluminium, minimum 4 mm thick, suitable for structural covering applications.
- Fixtures and Fastenings : Shall Conform M.43 page no-19 in General Technical Specification Booklet.

2. WORKMANSHIP

General

- Work shall be carried out as per approved drawings, manufacturer's specifications, and directions of the Engineer-in-Charge.
- Expansion joint sealing system shall ensure watertightness, flexibility, and durability.

Surface Preparation

- Joint surfaces shall be cleaned thoroughly using mechanical means such as wire brushing, grinding, or air blowing.
- All dust, laitance, oil, grease, and loose particles shall be removed.
- Surface shall be dry and sound before application.

Application of Adhesive / Primer

- Suitable primer/adhesive shall be applied on both sides of the joint as per manufacturer's recommendations.
- Adequate curing time shall be allowed before fixing membrane.

Fixing of Flexible Membrane

- Flexible membrane shall be placed centrally over the joint ensuring proper alignment.
- Required bond length on both sides of joint shall be maintained as per manufacturer's specifications.
- Membrane shall be pressed properly to avoid air pockets and ensure full bonding.

Fixing of Aluminium Cover Strip

- A 4 mm thick aluminium strip shall be fixed over the joint.
- One side shall be slotted to accommodate movement.
- Strip shall be fixed using bolts, screws, or approved fastening system.
- Proper spacing and alignment of fasteners shall be maintained.

Joint Movement Provision

- The system shall allow free movement due to expansion and contraction without damage.
- No obstruction shall restrict joint movement.

Finishing

- The installation shall be neat, aligned, and flush with adjacent surfaces.
- All edges shall be properly sealed.

Precautions

- Membrane shall not be damaged during installation.
- Proper curing and bonding shall be ensured.
- Work shall be protected from dust, water, and damage during installation.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **running meters (Rmt)** of expansion joint treated. Measurement shall be taken along the length of joint.

- Rate Including Cleaning of joint by mechanical means. Supply and application of adhesive and membrane. Supply and fixing of aluminium strip Cutting and wastage. All fixtures, fasteners, bolts, and accessories. Labour, tools, plants, and machinery. All leads and lifts with Scaffolding. Complete installation at all levels and heights.

ITEM NO – 46

Expansion Joints: Providing and fixing 25 cm Wide & 3mm thick exterior composite panel on existing expansion joint horizontally & vertically with all material, hardware, accessories & fittings etc completed.at all floors / all levels / all heights

1. MATERIAL

Composite Panel (ACP / Exterior Grade Panel) : Shall conform to relevant IS / ASTM standards for aluminium composite panels, weather-resistant, UV-stable, fire-retardant grade as approved, 3 mm thickness.

Aluminium Sections / Framework (if required) : Shall conform to IS 733 and IS 1285.

Fixtures and Fastenings : Shall Conform M.43 page no-19 in General Technical Specification Booklet.

Sealant (if required) : Shall conform to relevant ASTM standards for exterior grade silicone sealant.

2. WORKMANSHIP

General

- Work shall be carried out as per approved drawings, manufacturer's specifications, and directions of the Engineer-in-Charge.
- The panel shall effectively cover the expansion joint while allowing structural movement.

Surface Preparation

- Existing joint surface shall be cleaned and made free from dust, loose particles, oil, and debris.
- Any unevenness shall be rectified to ensure proper fixing.

Framework (if applicable)

- Aluminium framework shall be provided where required for proper fixing and support.
- Framework shall be aligned true to line, level, and plumb.

Cutting & Fabrication

- Composite panels shall be cut to required size (250 mm width) and shape.
- Edges shall be smooth and properly finished.
- Bending or grooving shall be done carefully without damaging outer surface.

Fixing

- Panels shall be fixed horizontally and vertically over expansion joints.
- Fixing shall be done using approved fasteners, screws, or concealed fixing system.
- Adequate gap shall be maintained behind panel to allow movement of joint.

Joint Treatment

- Edges and joints between panels shall be sealed with approved sealant where required.
- Provision shall be made to accommodate expansion and contraction.

Alignment & Finishing

- Panels shall be installed true to line and level.
- Surface shall be even, clean, and free from dents, scratches, or defects.

Precautions

- Panels shall be handled carefully to avoid damage to surface coating.
- Protective film shall be removed only after completion.
- Proper allowance for thermal movement shall be ensured.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **running meters (Rmt)** of expansion joint covered.
- Rate Includes Supply of composite panels (3 mm thick). Cutting and wastage fabrication, and fixing. Aluminium framework (if required). All hardware, fittings, and accessories. Sealant application. Labour, tools, plants, and equipment Scaffolding. All leads and lifts. Complete installation at all levels and heights.

ITEM NO – 47

Expansion Joints : Providing and filling the Expansion joint by Dow Corning Contractors Concrete Sealant as per required shade and manufacturer specification by making groove of 100 mm x 12.5 mm lather by cutting or by repairing groove and removing mortar drop or any other foreign materials including applying primer and filling required size etc. complete at all floors / all levels / all heights.

1. MATERIAL

Sealant (Concrete Joint Sealant) : Shall conform to relevant ASTM standards (such as ASTM C920) and manufacturer's specifications for exterior grade, elastomeric, weatherproof sealant of approved make and shade.

Primer : Shall conform to manufacturer's specifications compatible with sealant.

Backing Material (if required) : Closed cell polyethylene backer rod conforming to relevant ASTM standards.

Fixtures and Fastenings : Shall Conform M.43 page no-19 in General Technical Specification Booklet.

2. WORKMANSHIP

General

- Work shall be carried out as per manufacturer's specifications and directions of the Engineer-in-Charge.
- Sealant shall provide flexibility, watertightness, and durability in expansion joints.

Preparation of Groove

- Groove of size 100 mm width × 12.5 mm depth shall be formed by:
 - Cutting existing surface, or
 - Repairing existing groove
- All loose mortar, dust, debris, and foreign materials shall be removed.

Cleaning

- Joint surfaces shall be cleaned using mechanical means such as wire brush, air blower, or grinder.
- Surface shall be dry, sound, and free from oil and grease.

Fixing of Backer Rod

- Suitable backer rod shall be placed inside the joint to control sealant depth and prevent three-sided adhesion.
- Backer rod shall be of proper diameter to ensure tight fit.

Application of Primer

- Primer shall be applied uniformly on joint surfaces as per manufacturer's recommendation.
- Adequate drying time shall be allowed.

Application of Sealant

- Sealant shall be applied using appropriate tools (sealant gun).
- Joint shall be filled completely ensuring no voids or air pockets.
- Sealant shall be tooled properly to achieve smooth finish and proper adhesion.

Finishing

- Surface of sealant shall be smooth, uniform, and slightly concave.
- Excess material shall be removed and surface cleaned.

Precautions

- Work shall not be carried out during rain or damp conditions.
- Sealant shall be protected from dust and disturbance until fully cured.
- Proper joint dimensions shall be maintained.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **running meters (Rmt)** of expansion joint sealed. Measurement shall be taken along the length of joint.
- Rate Including Groove cutting / repairing. Cleaning of joint. Supply and application of primer and sealant. Backer rod (if required). Labour, tools, plants, and equipment Scaffolding. All leads and lifts. Complete work at all levels and heights.

ITEM NO – 48

Expansion Joints : Providing and filling the expansion joint by Thioflex 600 polymer or equivalent confirm to BS 4254-1983 as per required shade and manufactured specification by making groove of 50 mm x 12.5 mm lather by cutting or by repairing groove and removing mortar drop or any other foreign materials including applying primer and filling required size (oversize of joint PU foam etc. complete.at all floors / all levels / all heights

1. MATERIAL

Sealant (Polysulphide Sealant – Thioflex 600 or Equivalent) : Shall conform to BS 4254:1983 and manufacturer's specifications, suitable for expansion joints, flexible, weatherproof and durable.

Primer : Shall conform to manufacturer's specifications compatible with sealant.

PU Foam / Backing Rod : Shall be closed cell polyethylene foam or polyurethane foam conforming to relevant ASTM standards, used as joint backing material.

Fixtures and Fastenings : Shall Conform M.43 page no-19 in General Technical Specification Booklet.

2. WORKMANSHIP

General

- Work shall be executed as per manufacturer's specifications and directions of the Engineer-in-Charge.
- Sealant system shall ensure watertightness, flexibility, and long-term durability.

Preparation of Groove

- Groove of size 50 mm width × 12.5 mm depth shall be formed by:
 - Cutting existing surface, or
 - Repairing existing joint groove
- All mortar droppings, loose particles, and foreign materials shall be removed.

Cleaning

- Joint surfaces shall be cleaned thoroughly using mechanical means such as wire brushing, grinding, or air blowing.
- Surface shall be dry, clean, and free from oil, grease, and dust.

Fixing of Backing Material

- PU foam / backer rod shall be inserted into the joint to:
 - Control depth of sealant
 - Avoid three-sided adhesion
- Backing material shall be of appropriate size to ensure tight fit.

Application of Primer

- Primer shall be applied uniformly on joint faces as per manufacturer's recommendations.
- Sufficient drying time shall be allowed before sealant application.

Application of Sealant

- Thioflex 600 sealant shall be applied using suitable tools.
- Joint shall be filled completely ensuring no voids or air pockets.
- Proper bond shall be achieved on both sides of joint.

Finishing

- Sealant surface shall be tooled to a smooth, slightly concave finish.
- Excess sealant shall be removed and surface cleaned.

Precautions

- Work shall not be carried out in wet conditions or during rain.

- Sealant shall be protected until fully cured.
- Joint dimensions and proportions shall be strictly maintained.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **running meters (Rmt)** of expansion joint treated. Measurement shall be taken along the length of the joint.
- Rate Includes Groove cutting or repairing. Cleaning and preparation of joint. Supply and application of primer and sealant. PU foam / backing rod. Labour, tools, and equipment Scaffolding. All leads and lifts. Complete work at all levels and heights.

ITEM NO – 53

Making Grooves in Plaster: Add for plaster drip course/ groove in plastered surface or moulding to R.C.C. projections at all floors / all levels / all heights.

1. WORKMANSHIP

General

- Work shall be carried out as per approved drawings and direction of Engineer-in-Charge.
- Grooves / drip courses shall be provided in plastered surfaces or R.C.C. projections to prevent water ingress and ensure proper drainage.

Preparation

- The plastered surface or R.C.C. surface shall be marked accurately as per required line, level, and pattern.
- Surface shall be free from loose particles, dust, oil, and laitance before starting work.

Making of Groove

- Groove shall be made by cutting in plaster or fresh plaster work to the required size, shape, and profile as per approved design.
- The groove shall be uniform in width and depth, generally 6 mm to 20 mm wide and 6 mm to 12 mm deep or as specified.
- Cutting shall be done carefully using appropriate tools without damaging adjoining surfaces.

Finishing

- The groove shall be finished neatly with smooth edges and proper alignment.
- Internal surfaces of groove shall be finished with cement mortar where required.
- All edges shall be straight, sharp, and true to line and level.

Curing

- The finished groove and surrounding plaster shall be properly cured for minimum 7 days.

Precautions

- Care shall be taken to avoid cracks or damage to plaster during cutting.
- Proper alignment and slope (for drip course) shall be ensured.
- Work shall be protected from damage until completion.

2. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **running meters (Rmt)** of groove provided. Measurement shall be taken along the length of groove.
- Rate Includes Marking, cutting, and forming grooves. Finishing with cement mortar. Labour, tools, and equipment Scaffolding. All leads and lifts. Complete work at all floors, levels, and heights.

ITEM NO – 56

Luxture Texture: Providing and applying 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 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 Paint Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating.

1. MATERIAL

Texture Coating (Luxture Texture or equivalent) : Shall be factory manufactured, exterior/interior grade textured coating material conforming to relevant IS / ASTM standards and as per manufacturer's specifications.

Base Coat (Durabond or equivalent) : Shall be applied in approved proportion (1 bag with 1.5 litre water) or as per manufacturer's recommendation.

Water : Shall Conform M.1 page no-9 in General Technical Specification Booklet

Primer : Shall be compatible with texture system as per manufacturer's specifications.

Paint / Pigment : Shall Conform M.44 page no-21 in General Technical Specification Booklet and shall be Low VOC compliant as per GRIHA 3-Star / IGBC Gold rating requirements.

Fixtures and Fastenings : Shall Conform M.43 page no-19 in General Technical Specification Booklet

2. WORKMANSHIP

General

- Work shall be carried out as per approved sample, design, and direction of Architect / Engineer-in-Charge.
- Texture shall be uniform in pattern, shade, and finish throughout.

Surface Preparation

- Surface shall be thoroughly cleaned of dust, oil, grease, loose particles, and laitance.
- Uneven surfaces shall be made good using cement mortar / putty.
- Surface shall be dry, sound, and properly cured before application.

Application of Primer

- Suitable primer shall be applied uniformly over the surface.
- Primer shall be allowed to dry completely before applying base coat.

Base Coat Application

- Base coat of 2 mm thickness shall be applied using Durabond mixture (1 bag with 1.5 litre water or as per specification).
- The coat shall be applied evenly and allowed to set properly.

Texture / Top Coat Application

- Texture coat up to 5 mm thickness shall be applied over base coat.
- Required pattern (roller, trowel, spray, or designer finish) shall be executed as per approved sample.
- Shade, texture, and finish shall be as per Architect's selection.

Finishing

- Surface shall be even, free from cracks, patches, or irregularities.
- Edges, corners, and junctions shall be finished neatly and in line.

Curing & Protection

- Proper curing shall be carried out as per manufacturer's specifications.
- Finished surface shall be protected from rain, dust, and mechanical damage until fully set.

Scaffolding

- Suitable scaffolding and staging shall be provided for execution at all heights.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (Sqm)** of finished textured surface.
- Rate Includes Sample approval. Surface preparation and cleaning. Primer, base coat, and texture coat Wastage or overlaps. All materials, labour, tools, and equipment. Scaffolding and support system. Transportation, lead, and lift. Complete work at all floors, levels, and heights.

ITEM NO – 58

Providing & applying AQUASTOP FLEX , a liquid applied and Eco rated product, having high adhesion of 1.5 N/mm² with 100% water resistant, laid in two successive coats with consumption not less than 1.15 kg/sqm/mm and to completing the application as per manufacturer 's laying specifications. The item shall include cleaning RCC slab with high pressure water to expose

construction joints, corners & crack i/n complete removal of parting material, laitance etc followed by P/L injection grouting system wherever required using plasticizer mixed with cement slurry to required viscosity & to be injected through nozzles fixed @ 0.75- 1.0 mtr linally ensuring 2.5 to 5kg/cm² pressure consolidating the joints, cracks & honeycomb areas; this will further include repairing & filling of wider cracks, joints with 1:3 cement - sand mortar admixed with Keraplast P6 @10% by weight of cement, sawing out 20mm X 20mm V shaped chase finished & dressed properly & followed by the application of insatallation of angle fillets at all corners.The item shall also include treatment of bore packings, pipe sealing & fixtures.at all floors / all levels / all heights.

1. MATERIAL

Water : Shall Conform M.1 page no-9 in General Technical Specification Booklet

Cement : Shall Conform M.3 page no-9 in General Technical Specification Booklet

Sand : Shall Conform M.6 page no-10 in General Technical Specification Booklet

Cement Mortar : Shall Conform M.11 page no-11 in General Technical Specification Booklet

Waterproofing Compound (AQUASTOP FLEX or equivalent) : Shall be liquid applied, eco-rated waterproofing system having minimum adhesion of 1.5 N/mm², 100% water resistance, and conforming to relevant IS / ASTM standards and manufacturer's specifications.

Admixture (Keraplast P6 or equivalent) : Shall conform to IS: 9103 and manufacturer's specifications.

Injection Grouting Material : Cement slurry with plasticizer conforming to relevant IS standards.

Fixtures and Fastenings : Shall Conform M.43 page no-19 in General Technical Specification Booklet

2. WORKMANSHIP

General

- Work shall be executed strictly as per manufacturer's specifications and direction of Engineer-in-Charge.
- The system shall ensure complete waterproofing, crack sealing, and durability.

Surface Preparation

- RCC surface shall be cleaned using high-pressure water jet to remove dust, laitance, oil, grease, and loose materials.
- Construction joints, cracks, and honeycombed areas shall be exposed and properly identified.

Injection Grouting

- Injection grouting shall be carried out wherever required using cement slurry mixed with plasticizer.
- Nozzles shall be fixed at 0.75 m to 1.0 m c/c.

- Grouting shall be done under pressure of 2.5 to 5 kg/cm² to consolidate cracks, joints, and honeycombed areas.

Crack & Joint Repair

- Wider cracks and joints shall be repaired using 1:3 cement sand mortar admixed with Keraplast P6 @ 10% by weight of cement.
- 20 mm × 20 mm V-shaped grooves shall be cut, cleaned, and properly filled.

Formation of Fillets

- Angle fillets shall be formed at all junctions of slab and wall to avoid stress concentration and leakage.

Treatment of Penetrations

- Bore packings, pipe entries, and fixtures shall be properly sealed and treated to ensure watertightness.

Application of Waterproofing Coating

- AQUASTOP FLEX shall be applied in two successive coats.
- Each coat shall be applied uniformly using brush/roller/trowel as per manufacturer's recommendation.
- Total consumption shall not be less than 1.15 kg/sqm/mm.
- Second coat shall be applied after the first coat has set adequately.

Finishing & Curing

- Coated surface shall be uniform, free from pinholes, cracks, or defects.
- Proper curing shall be carried out as per manufacturer's guidelines.
- Surface shall be protected from damage, dust, and rain during application and curing period.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (Sqm)** of treated surface area. Rate Includes Surface cleaning by high-pressure water. Injection grouting and crack treatment. Repair of joints and formation of grooves. Application of waterproofing coating (two coats). Treatment of pipe penetrations and fixtures. All materials, labour, tools, curing and equipment. Scaffolding, leads and lifts. Complete work at all floors, levels, and heights.

ITEM NO – 59

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. at all floors / all levels / all heights.

1. MATERIAL

Water : Shall Conform M.1 page no-9 in General Technical Specification Booklet

Cement : Shall Conform M.3 page no-9 in General Technical Specification Booklet

Waterproofing Compound : Shall conform to IS: 2645 and approved by Engineer-in-Charge

Cement Mortar : Shall Conform M.11 page no-11 in General Technical Specification Booklet

Sand : Shall Conform M.6 page no-10 in General Technical Specification Booklet

Polymer / Additive (if used) : Shall conform to relevant IS standards and manufacturer's specifications

2. WORKMANSHIP

General

- Work shall be carried out as per specifications and direction of Engineer-in-Charge.
- Waterproofing treatment shall ensure complete watertightness in sunken portions of WCs and bathrooms.

Surface Preparation

- Surface shall be thoroughly cleaned to remove dust, dirt, oil, grease, laitance, and loose particles.
- All joints, cracks, honeycombs, and pipe entries shall be identified and treated.
- Surface shall be made sound and properly prepared before application.

Treatment of Joints & Corners

- All junctions of slab and wall shall be treated with polymer modified cement slurry.
- Proper sealing shall be done around pipe penetrations and outlets.
- Small cracks shall be filled with suitable mortar or slurry.

Application of Waterproofing Treatment

(a) First Coat

- Cement slurry shall be prepared using:
 - Cement @ 0.488 kg/sqm
 - Waterproofing compound @ 0.253 kg/sqm
- The slurry shall be applied uniformly over the prepared surface.
- The layer shall be allowed to air cure for 4 hours.

(b) Second Coat

- Second layer of slurry shall be prepared using:

- Cement @ 0.242 kg/sqm
- Waterproofing compound @ 0.126 kg/sqm
- The slurry shall be applied uniformly over the first coat.
- The layer shall be allowed to air cure for 4 hours.

Curing

- After application of both coats, the treated surface shall be water cured for minimum 48 hours.

Finishing & Protection

- Surface shall be uniform, continuous, and free from cracks or pinholes.
- Waterproofed surface shall be protected from damage until further work is carried out.

Precautions

- Application shall not be carried out on wet or waterlogged surfaces.
- Proper curing shall be ensured for durability.
- All corners and junctions shall be properly sealed.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (Sqm)** of treated surface area.
- Rate Includes Surface preparation and cleaning. Treatment of joints, cracks, and pipe entries. Application of both slurry coats. Curing. Labour, materials, tools, Scaffolding and equipment. All leads and lifts. Complete work at all floors, levels, and heights.

ITEM NO – 60

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.at all floors / all levels / all heights.

1. MATERIAL

Water : Shall Conform M.1 page no-9 in General Technical Specification Booklet

Cement : Shall Conform M.3 page no-9 in General Technical Specification Booklet

Polymer Modified Waterproofing Compound (Two Component System) :

- Part A : Crystalline whitish grey powder (cement based)
 - Part B : Syrupy white milky liquid (polymer)
- Shall conform to relevant IS / ASTM standards and manufacturer's specifications.

SBR Primer : Shall conform to relevant IS standards and manufacturer's specifications.

Sand (if required for surface repair) : Shall Conform M.6 page no-10 in General Technical Specification Booklet

Cement Mortar : Shall Conform M.11 page no-11 in General Technical Specification Booklet

2. WORKMANSHIP

General

- Work shall be carried out as per manufacturer's specifications and direction of Engineer-in-Charge.
- The system shall provide flexible, crack-bridging, and waterproof coating.

Surface Preparation

- Surface shall be cleaned thoroughly to remove dust, oil, grease, laitance, and loose particles.
- All cracks, honeycombs, and surface defects shall be repaired using suitable cement mortar.
- Surface shall be sound, slightly damp but free from standing water.

Application of Primer

- One coat of SBR primer shall be applied uniformly over the prepared surface.
- Primer shall be allowed to dry before application of waterproofing layer.

Mixing

- Part A (powder) and Part B (liquid) shall be mixed in 1:1 ratio by weight.
- Mixing shall be done thoroughly to obtain uniform, lump-free consistency.

Application of Waterproofing Coating

First Coat

- First coat shall be applied using brush or trowel to achieve uniform coverage.
- Care shall be taken to cover all pores and voids.

Second Coat

- Second coat shall be applied after the first coat has set adequately.
- Application shall be in perpendicular direction to first coat to ensure proper coverage.

Consumption

- The total consumption shall be 20–22 sq.ft per 2 kg unit to achieve uniform film thickness.

Drying & Curing

- Surface drying time shall be 1 to 2 hours depending on site conditions.
- Final curing shall be carried out for minimum 3 days.

Finishing & Protection

- Coated surface shall be uniform, continuous, and free from cracks, pinholes, or defects.
- Surface shall be protected from damage, dust, and water during curing period.

Precautions

- Application shall not be carried out during rain or extreme weather conditions.
- Proper mixing ratio shall be strictly maintained.
- Coating shall not be applied on dry and highly absorbent surfaces without priming.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (Sqm)** of treated surface area.
- Rate Includes Surface preparation and cleaning. Crack and defect repair. Application of primer and waterproofing coating (two coats). Labour, materials, tools, Scaffolding and equipment. Curing, leads, and lifts. Complete work at all floors, levels, and heights.

ITEM NO – 61

WATER PROOFING: (for terrace , Garden, water bodies)Providing & applying a liquid applied and Eco rated product, having high adhesion of >2N/mm² and breathability >1 billion/cm² with 100% water resistant, laid in two successive coats of approx. 1mm thk each with consumption NO'St less than 1.15 KG/sqm/mm of coat and AR1, an anti alkali glass-fiber reinforcement mesh embedded between the coats, to completing the application as per manufacturer 's laying specifications. The item shall include cleaning RCC slab with high pressure water to expose construction joints, corners & crack i/n complete removal of parting material, laitance etc followed by P/L injection grouting system wherever required using plasticizer mixed with cement slurry to required viscosity & to be injected through NO'Szzles fixed @ 0.75- 1.0 mtr linally ensuring 2.5 to 5KG/cm² pressure consolidating the joints, cracks & honeycomb areas; this may include repairing & filling of wider cracks, joints with 1:3 cement - sand mortar admixed with Keraplast P6 @10% by weight of cement, sawing out 20mm X 20mm V shaped chase finished & dressed properly & followed by application of Kerakoll's Aquastop 120, a flexible, UV & Alkali resistane NBR based tape to be fixed firmly with NaNO'Sflex water proofing compound on all repaired joints, cracks and corners. The item shall also include treatment of bore packings, pipe sealing & fixtures wherever required as described in specifications. Preparation of substrate includes joint repairs, cracks, addressing honycomb etc. at all floors / all levels / all heights.

1. MATERIAL

Water : Shall Conform M.1 page no-9 in General Technical Specification Booklet

Cement : Shall Conform M.3 page no-9 in General Technical Specification Booklet

Sand : Shall Conform M.6 page no-10 in General Technical Specification Booklet

Cement Mortar : Shall Conform M.11 page no-11 in General Technical Specification Booklet

Waterproofing Compound (Liquid Applied Eco-rated System) :
Shall be high-performance waterproofing material having:

- Adhesion > 2 N/mm²
- Breathability > 1 billion/cm²
- 100% water resistance
- Conforming to relevant IS / ASTM standards and manufacturer's specifications

Anti-Alkali Glass Fiber Mesh (AR1) : Shall be alkali resistant, compatible with waterproofing system and conform to relevant standards

Admixture (Keraplast P6 or equivalent) : Shall conform to IS: 9103

Waterproofing Tape (Aquastop 120 or equivalent) : Flexible, UV and alkali resistant NBR based tape as per manufacturer's specifications

Injection Grouting Material : Cement slurry with plasticizer conforming to relevant IS standards

Fixtures and Fastenings : Shall Conform M.43 page no-19 in General Technical Specification Booklet

2. WORKMANSHIP

General

- Work shall be executed strictly as per manufacturer's specifications and direction of Engineer-in-Charge.
- The system shall provide complete waterproofing, crack-bridging, and long-term durability.

Surface Preparation

- RCC slab shall be cleaned using high-pressure water jet to remove dust, laitance, oil, grease, and loose materials.
- Construction joints, cracks, and honeycombed areas shall be exposed and properly prepared.

Injection Grouting

- Injection grouting shall be carried out where required using cement slurry mixed with plasticizer.
- Nozzles shall be fixed at 0.75 m to 1.0 m c/c.
- Grouting shall be done under pressure of 2.5 to 5 kg/cm² to consolidate joints, cracks, and honeycombs.

Crack & Joint Repair

- Wider cracks and joints shall be repaired using 1:3 cement sand mortar admixed with Keraplast P6 @ 10% by weight of cement.
- 20 mm × 20 mm V-shaped grooves shall be cut, cleaned, and filled properly.

Application of Waterproofing Tape

- Flexible NBR-based waterproofing tape shall be applied over all repaired cracks, joints, and corners.
- Tape shall be fixed firmly using compatible waterproofing compound ensuring proper bonding.

Treatment of Penetrations

- Bore packings, pipe entries, and fixtures shall be sealed properly to ensure watertightness.

Application of Waterproofing System

First Coat

- Liquid waterproofing compound shall be applied uniformly to a thickness of approximately 1 mm.

Reinforcement Layer

- Anti-alkali glass fiber mesh (AR1) shall be embedded over the first coat while it is still wet.
- Mesh shall be properly pressed to avoid air gaps and ensure full bonding.

Second Coat

- Second coat shall be applied over the embedded mesh to achieve required thickness and uniform coverage.

Consumption

- Total consumption shall not be less than 1.15 kg/sqm/mm per coat.

Curing & Protection

- Coated surface shall be protected from mechanical damage, dust, and rain.
- Curing shall be done as per manufacturer's specifications.

Finishing

- Final surface shall be uniform, seamless, and free from cracks, pinholes, or defects.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (Sqm)** of treated surface area.
- Rate Includes Surface preparation and cleaning. Injection grouting and crack repairs. Groove cutting and sealing. Application of waterproofing tape and mesh. Application of waterproofing coating (two coats). Treatment of pipe penetrations and fixtures. Labour, materials, tools, equipment, scaffolding, curing. All leads and lifts. Complete work at all floors, levels, and heights.

ITEM NO – 62

Waterproofing & I-Piece Flooring On Terrace : Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces etc. consisting of following operations. (a) Applying a slurry coat of neat cement using 2.75kg/Sq.M of cement admixed with water proofing compound confirming to IS: 2645 and approved by Engineer-in-charge over the RCC slab including adjoining walls upto 300mm height including cleaning the surface before treatment. (b) Laying brick bats with mortar using broken bricks/brick bats 25mm to 115mm size with 50% of cement mortar 1:5 (1 cement: 5 coarse sand) admixed with water proofing compound confirming to IS: 2645 and approved by Engineer-in-charge over 20mm thick layer of cement mortar of mix 1:5 (1 cement: 5 coarse sand) admixed with water proofing compound confirming to IS : 2645 and approved by Engineer-in-charge to required slope and treating similarly the adjoining walls upto 300mm height including rounding of junctions of walls and slabs. (C) After two days of proper curing applying a second coat of cement slurry using 2.75kg/sq.M of cement admixed with water proofing compound confirming to IS: 2645 and approved by Engineer -in-charge. (d) Finishing the surface with 20mm thick jointless cement mortar of mix 1:4 (1 cement: 4 coarse sand) admixed with water proofing compound confirming to IS: 2645 and approved by Engineer-in -charge including laying glass fiber cloth of approved quality in top layer of plaster and finally finishing the surface with trowel with neat cement slurry and making pattern of 300mm x 300mm square 3 mm deep. (e) The whole terrace so finished shall be flooded with water for a minimum period of two weeks of curing and for final test. " all above operations to be done in order and as directed and specified by Engineer-in-charge." with average thickness of 20mm and minimum thickness at khurra as 65mm.at all floors / all levels / all height.

1. MATERIAL

Water : Shall Conform M.1 page no-9 in General Technical Specification Booklet

Cement : Shall Conform M.3 page no-9 in General Technical Specification Booklet

Sand : Shall Conform M.6 page no-10 in General Technical Specification Booklet

Bricks / Brick Bats : Shall Conform M.15 page no-12 in General Technical Specification Booklet

Cement Mortar : Shall Conform M.11 page no-11 in General Technical Specification Booklet

Waterproofing Compound : Shall conform to IS: 2645 and approved by Engineer-in-Charge

Glass Fiber Cloth : Shall be of approved quality conforming to relevant IS standards

2. WORKMANSHIP

General

- Work shall be carried out as per specifications and direction of Engineer-in-Charge.
- All operations shall be executed in proper sequence to ensure complete waterproofing and durability.

Surface Preparation

- RCC slab surface shall be cleaned thoroughly to remove dust, dirt, laitance, oil, grease, and loose materials.
- Surface shall be made sound and wetted before application.
- Junctions of slab and wall shall be properly prepared.

(a) First Slurry Coat

- Apply cement slurry using:
 - Cement @ 2.75 kg/sqm
 - Waterproofing compound as per IS: 2645
- Slurry shall be applied uniformly over slab and adjoining walls up to 300 mm height.

(b) Laying Brick Bat Coba

- Brick bats (25 mm to 115 mm size) shall be laid over a 20 mm thick cement mortar bed (1:5) admixed with waterproofing compound.
- Brick bats shall be properly packed with 50% cement mortar (1:5) to achieve dense mass.
- Required slope towards drainage points shall be provided.
- Junctions between slab and wall shall be rounded properly.
- Treatment shall continue on adjoining walls up to 300 mm height.

(c) Second Slurry Coat

- After 2 days of curing, apply second coat of cement slurry using:
 - Cement @ 2.75 kg/sqm
 - Waterproofing compound as per IS: 2645

(d) I-Piece Flooring / Final Finish

- Apply 20 mm thick cement mortar (1:4) admixed with waterproofing compound.
- Glass fiber cloth shall be embedded in the top layer.
- Surface shall be finished smooth using trowel with neat cement slurry.
- 300 mm × 300 mm grid pattern with 3 mm deep grooves shall be formed.

(e) Curing & Testing

- The finished terrace shall be flooded with water for minimum 14 days for curing and watertightness testing.
- Any leakage observed shall be rectified at contractor's cost.

Thickness

- Average thickness of treatment: 20 mm
- Minimum thickness at khurra: 65 mm

Precautions

- Proper slope shall be ensured to avoid water stagnation.
- All joints, corners, and outlets shall be treated carefully.
- Waterproofing compound dosage shall be strictly maintained.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (Sqm)** of finished terrace area.
- Rate Includes Surface preparation and cleaning. Application of slurry coats. Brick bat coba work including Waterproofing compound slope formation. Final I-piece flooring with grooves. Supply and embedding of glass fiber cloth. Curing and flood testing. Labour, materials, tools, equipment, scaffolding. All leads and lifts. Complete work at all floors, levels, and heights.

ITEM NO – 73

Kitchen Platform : Providing and fixing sandwich platform with kota & granite sandwich top, granite vertical support at ends, and kota supports below top, granite patti, and front top edge moulded including finishing etc. complete as per detailed drawing and as instruction by Engineer In charge/ Architect. at all floors / all levels / all heights.

1. MATERIAL

Water : Shall Conform M.1 page no-9 in General Technical Specification Booklet

Cement : Shall Conform M.3 page no-9 in General Technical Specification Booklet

Sand : Shall Conform M.6 page no-10 in General Technical Specification Booklet

Cement Mortar : Shall Conform M.11 page no-11 in General Technical Specification Booklet

Polished Kota Stone : Shall Conform M.49 page no-23 in General Technical Specification Booklet

Granite Stone Slab : Shall Conform M.52 page no-23 in General Technical Specification Booklet

Fixtures and Fastenings : Shall Conform M.43 page no-19 in General Technical Specification Booklet

2. WORKMANSHIP

General

- Work shall be carried out as per approved drawings, design, and instructions of Engineer-in-Charge / Architect.
- All materials shall be of approved quality, shade, texture, and finish.

Base Preparation

- The supporting structure shall be prepared true to line, level, and plumb.
- Masonry or RCC supports shall be completed before fixing the platform.
- Surface shall be cleaned and wetted prior to laying.

Providing Sandwich Platform

- Platform shall consist of Kota stone base layer and granite top layer forming a sandwich system.
- Kota stone supports shall be provided below the platform top at required spacing for structural stability.
- Granite vertical supports shall be provided at ends and wherever required.

Fixing of Kota Stone

- Kota stone slabs shall be laid in cement mortar (1:4) to proper line, level, and slope (if required).
- Joints shall be thin and filled with cement slurry of matching shade.

Fixing of Granite Top

- Granite slab shall be fixed over the Kota base using cement mortar or approved adhesive.
- Surface shall be finished smooth, even, and true to level.

Granite Patti & Edge Moulding

- Granite patti shall be provided along exposed edges as per design.
- Front edge of platform shall be moulded, chamfered or rounded as per approved detail.
- All edges shall be machine polished to smooth finish.

Jointing & Finishing

- Joints shall be finished with matching pigment cement slurry.
- Surface shall be polished and cleaned properly.
- Alignment, level, and finish shall be checked and approved.

Protection

- Finished surface shall be protected from damage, stains, and scratches until handover.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (Sqm)** of finished platform surface area.
- Rate Includes Supply and fixing of Kota and granite stone. Providing supports (Kota and granite vertical supports). Granite patti and edge moulding. Mortar, adhesives, polishing, and finishing. Labour, tools, and equipment. Scaffolding, leads, and lifts. Complete work as per drawings at all floors, levels, and heights.

ITEM NO – 74

Wash basin table top counter : Providing & fixing two layers of wash basin counter, first layer using 18 mm thick both side Mirror finish Granite (Of Texture, shed, Colour and pattern as approved by EIC), joined together with 1:4 Cement mortar bedding / approved tile adhesive , to true plane & level or to slopes, or close jointed with cement slurry with pigment of matching shade and colour

and finishing with the same, including dedo 2'6" ht , cutting kotah & tile as per required shape & size to fit Wash basin, & 3" to 9" facia with moulding, nosing, chamfered front edges, fixing, disposal of debris etc. finished as per design in detail drawing and instruction of Architect / EIC. The sample mock shall be approved from Architect / EIC. at all floors / all levels / all heights.

1. MATERIAL

Water : Shall Conform M.1 page no-9 in General Technical Specification Booklet

Cement : Shall Conform M.3 page no-9 in General Technical Specification Booklet

Sand : Shall Conform M.6 page no-10 in General Technical Specification Booklet

Cement Mortar : Shall Conform M.11 page no-11 in General Technical Specification Booklet

Granite Stone Slab : Shall Conform M.52 page no-23 in General Technical Specification Booklet

Polished Kota Stone (if used for backing/support) : Shall Conform M.49 page no-23 in General Technical Specification Booklet

Facing Tiles / Dado Tiles : Shall Conform M.54 page no-24 in General Technical Specification Booklet

Tile Adhesive (if used) : Shall conform to relevant IS standards and manufacturer's specifications

Pigment for Joint Filling : Shall be of approved quality and matching shade

Fixtures and Fastenings : Shall Conform M.43 page no-19 in General Technical Specification Booklet

2. WORKMANSHIP

General

- Work shall be carried out as per approved drawings and instructions of Engineer-in-Charge / Architect.
- Sample mock-up shall be prepared and approved before execution.

Base Preparation

- Supporting surface shall be true to line, level, and plumb.
- Surface shall be cleaned, wetted, and prepared prior to laying.

Providing Two-Layer Counter

- Counter shall be constructed using two layers of 18 mm thick granite slabs (both side mirror finish).
- Granite shall be of approved texture, shade, colour, and pattern.

Fixing of Granite

- Granite slabs shall be fixed using cement mortar (1:4) or approved tile adhesive.
- Slabs shall be laid to proper line, level, or slope as required.
- Joints shall be close, even, and filled with cement slurry mixed with matching pigment.

Cutting & Shaping

- Openings for wash basin shall be accurately cut to required shape and size.
- All cuts shall be smooth and machine finished.

Dado Work

- Dado shall be provided up to 750 mm (2'-6") height above counter.
- Tiles or stone shall be fixed true to line and level with proper jointing and finishing.

Facia & Edge Finishing

- 3" to 9" facia shall be provided as per design.
- Edges shall be moulded, chamfered, or nosed as per approved details.
- All exposed edges shall be machine polished.

Jointing & Finishing

- Joints shall be filled with matching colour cement slurry.
- Surface shall be cleaned, polished, and finished to smooth appearance.
- Proper alignment and finish shall be ensured.

Disposal & Cleaning

- All debris and waste materials generated during work shall be removed from site.
- Final surface shall be cleaned and handed over in perfect condition.

Protection

- Finished counter shall be protected from damage, stains, or scratches until completion.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (Sqm)** of finished counter surface area.
- Rate Includes Supply and fixing of granite slabs (two layers). Dado work up to specified height. Cutting, shaping, and fixing for wash basin. Facia, moulding, nosing, and edge finishing. Joint filling, polishing, and finishing. Labour, materials, tools, and equipment. Disposal of debris. Scaffolding, leads, and lifts. Complete work at all floors, levels, and heights.

ITEM NO – 75

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. MATERIAL

Cement Sheet (SuperHD Cement Board) :

Shall conform to IS 14862: Type A – Category IV, size 2440 × 1220 × 12 mm, of approved make, design and pattern.

Structural Steel (GI Frame) : Shall Conform M.22 page no-14 in General Technical Specification Booklet

Mild Steel (for fabrication, hinges, supports) : Shall Conform M.18 page no-13 in General Technical Specification Booklet

Fixtures and Fastenings : Shall Conform M.43 page no-19 in General Technical Specification Booklet

Paints (Red Oxide Primer & Synthetic Enamel Paint) : Shall Conform M.44 page no-21 in General Technical Specification Booklet

2. WORKMANSHIP

General

- Work shall be carried out as per approved drawings, design patterns, and instructions of Engineer-in-Charge.
- Cement board panels shall be of approved quality, free from cracks, warping, or defects.

GI Steel Frame Fabrication

- Frame shall be fabricated using galvanized steel sections of approved size and thickness.
- Frame shall be true to line, level, and plumb, ensuring rigidity and proper support.
- All joints shall be properly welded, ground smooth, and finished.

CNC Cutting of Cement Board

- Cement boards shall be cut using CNC-controlled water jet cutting to achieve precise design and patterns.
- Edges shall be smooth, accurate, and free from chipping or damage.

Fixing of Cement Board

- Cement boards shall be fixed securely to GI frame using suitable fasteners, screws, or clips.
- Proper spacing and alignment shall be maintained.
- Joints between boards shall be neat and uniform.

Hinges & Locking Arrangement

- Where required, panels shall be provided with hinges and locking system of approved quality.

- Fixing shall ensure smooth operation and proper alignment.

Surface Preparation & Painting

- Steel frame shall be cleaned and applied with one coat of red oxide primer.
- Final finish shall consist of two coats of synthetic enamel paint of approved shade.
- Paint shall be applied uniformly without streaks or patches.

Finishing

- Completed work shall be true to line, level, and design.
- All edges and joints shall be properly finished.
- Surface shall be cleaned and free from defects.

Protection

- Finished panels shall be protected from damage during and after installation.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (Sqm)** of finished surface area.
- Rate Includes Supply of cement board panels. GI steel frame fabrication and installation. CNC cutting and design execution. Hinges, locking arrangement, and all fittings. Primer and painting work. Labour, tools, and equipment. Scaffolding, leads, and lifts. Complete work as per approved design at all floors, levels, and heights.

ITEM NO – 76

Anti skid Tape: Providing Roughened strip 2.5 cm. wide to form antiskid surface on floors & treads as per design, including forming straight deep curved gishi (groove), 6mm. Wide & 4mm deep on two sides of the roughened area, chiseling, polishing the edges, sides and bottom of gishis etc. complete as per sample approved. One time length of steps / treads shall be considered for payment.at all floors / all levels / all heights.

1. MATERIAL

Polishing Material / Abrasives : Shall be of approved quality conforming to relevant standards

2. WORKMANSHIP

General

- Work shall be executed as per approved design, drawings, and sample.
- The anti-skid strip shall provide effective slip resistance on steps, treads, and floor surfaces.

Marking

- Location and alignment of anti-skid strips shall be marked accurately on floor or stair treads as per design and approval of Engineer-in-Charge.
- Strip width shall be 25 mm (2.5 cm).

Formation of Grooves (Gishi)

- Two grooves shall be formed on either side of the strip.
- Each groove shall be:
 - 6 mm wide
 - 4 mm deep
- Grooves shall be straight or curved as per design requirement.

Roughening of Surface

- The surface between grooves shall be roughened by chiseling to form anti-skid texture.
- Roughening shall be uniform and consistent throughout the strip length.

Chiseling & Finishing

- Edges, sides, and bottom of grooves shall be neatly finished.
- All loose particles shall be removed.
- Surface shall be dressed properly to achieve clean appearance.

Polishing

- Adjacent surfaces shall be polished carefully without damaging the anti-skid strip.
- Edges of grooves shall be smooth and properly finished.

Cleaning

- Completed surface shall be cleaned and made free from dust, slurry, and debris.

Quality Requirements

- Grooves shall be uniform in width and depth.
- Strip alignment shall be straight and consistent.
- Work shall match approved sample.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **running meters (Rmt)** of anti-skid strip.
- Rate Includes Marking and layout. Cutting and forming grooves. Roughening of strip surface. Chiseling, finishing, and polishing. Labour, tools, and equipment Scaffolding. Cleaning and disposal of debris. All leads and lifts. Complete work at all floors, levels, and heights.

ITEM NO – 77

Aluminium Sliding Door/ Window in SGU:

Providing and fixing aluminium sliding Door/ Window of approved make with heavy-duty powder coated / anodized aluminium sections, comprising outer frame of size 125/100 × 50 × 2/1.6 mm thick (approx.) and sliding shutter frame of size 90/60 × 45/30 × 1.8/1.6 mm thick (approx.) and the window shall be fitted with SGU (Sealed Glazed Unit) glass 24 mm thick (6 mm clear toughened + 12 mm air gap + 6 mm clear toughened glass as approved with necessary interlocks, glazing beads, rollers, handles, locking arrangement, screws, cleats, and EPDM rubber gaskets, etc

Including all fittings, fixtures, sealant, labour, scaffolding, transportation, cutting and making good the jambs complete as per approved drawings and direction of Engineer-in-charge upto all floor level and including all lead and lift.

1. MATERIAL

Aluminium Sections : Shall Conform M.31 page no-17 in General Technical Specification Booklet

Glass (Toughened for SGU) : Shall Conform M.38 page no-18 in General Technical Specification Booklet

Fixtures and Fastenings : Shall Conform M.43 page no-19 in General Technical Specification Booklet

Sealant : Shall be of approved make conforming to relevant IS standards

EPDM Rubber Gaskets : Shall conform to relevant IS standards and approved specifications

2. WORKMANSHIP

General

- Work shall be executed as per approved drawings and instructions of Engineer-in-Charge.
- Aluminium sections shall be of approved make, finish, and free from defects.

Aluminium Frame

- Outer frame shall be made of aluminium sections of size approximately 125/100 × 50 × 2/1.6 mm thickness.
- Sliding shutter frame shall be of size approximately 90/60 × 45/30 × 1.8/1.6 mm thickness.
- Sections shall be powder coated or anodized as approved.

Fabrication & Assembly

- Aluminium members shall be cut, machined, and assembled with precision.
- Corners shall be joined using suitable cleats and fasteners.
- Frames shall be true to line, level, and plumb.

Fixing of Frame

- Frame shall be fixed in position with suitable fasteners, screws, and cleats.
- Proper alignment shall be ensured.
- Gaps between frame and wall shall be filled with sealant or mortar and finished neatly.

Glazing (SGU)

- Window/door shall be fitted with 24 mm thick SGU glass comprising:
 - 6 mm clear toughened glass
 - 12 mm air gap
 - 6 mm clear toughened glass

- Glass shall be fixed using glazing beads and EPDM rubber gaskets ensuring airtight and watertight sealing.

Hardware & Accessories

- Sliding shutters shall be provided with:
 - Rollers
 - Interlocks
 - Handles
 - Locking arrangement
- All hardware shall be of approved quality and properly installed.

Sealing & Finishing

- All joints shall be sealed with approved sealant.
- Exposed surfaces shall be clean and free from scratches or dents.
- Smooth sliding operation shall be ensured.

Making Good

- Jambs, sills, and surrounding surfaces disturbed during installation shall be repaired and finished neatly.

Protection

- Aluminium and glass surfaces shall be protected until completion of work.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (Sqm)** of finished door/window area.
- Rate Includes Supply and fixing of aluminium sections. SGU glass supply and fixing. All fittings, hardware, rollers, locks, gaskets, and sealant. Fabrication, installation, and alignment. Making good of jambs and finishes. Labour, tools, equipment, scaffolding. Transportation, leads, and lifts. Complete work at all floors, levels, and heights.

ITEM NO – 78

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 glass panes with sealed 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. MATERIAL

uPVC Profiles : Shall be lead-free and cadmium-free, multi-chambered sections of minimum 75 mm depth, conforming to relevant IS/EN standards and approved make.

Glass (DGU) : Shall Conform M.38 page no-18 in General Technical Specification Booklet

- DGU shall consist of 24 mm thick unit (6 mm Toughened Glass + 12 mm Argon + 6 mm Toughened Glass) or as approved.
- Both glass panes shall be Toughened (Tuffen) safety glass conforming to relevant IS standards.

Fixtures and Fastenings : Shall Conform M.43 page no-19 in General Technical Specification Booklet

EPDM Rubber Gaskets : Shall conform to relevant IS standards

Sealant : Shall conform to relevant IS standards and manufacturer's specifications

2. WORKMANSHIP

General

- Work shall be carried out as per approved drawings and instructions of Engineer-in-Charge.
- uPVC sections shall be of approved make, free from defects.

uPVC Frame & Shutter

- Frame and shutter shall be made from multi-chambered uPVC profiles (minimum 75 mm depth).
- Profiles shall be reinforced with GI insert (minimum 1.2 mm thick).

Fabrication & Installation

- Frames shall be fabricated with proper mullions and transoms.
- Installed true to line, level, and plumb with proper anchoring.

Glazing (DGU with Toughened Glass)

- DGU shall be factory sealed and installed properly.
- Glass shall be 6 mm thick Toughened (Tuffen) glass on both sides.
- Fixing shall be done using glazing beads and EPDM gaskets ensuring airtight and watertight performance.

Hardware & Accessories

- Includes rollers, handles, locking system, friction hinges (if required), weather strips, etc.
- All hardware shall be corrosion resistant and approved make.

Finishing

- Smooth operation of shutters ensured.
- All joints sealed properly.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (Sqm)** of finished door/window area.
- Rate Includes uPVC profiles with reinforcement DGU with 6 mm Toughened glass on both sides All fittings accessories like gaskets, sealants Fabrication, fixing, scaffolding, labour All leads and lifts

ITEM NO – 82

Ventilation : Providing and fixing standard extruded of aluminium section of size 63 mm x 38.10 mm x 1.2 mm, @ Wt. 0.643Kg / mt with colour Powder Coated aluminium frame for ventilation with 5 mm thick frosted glass as details etc complete for Ventilation.at all floors / all levels / all heights including all lead and lift.

1. MATERIAL

Aluminium Sections : Shall Conform M.31 page no-17 in General Technical Specification Booklet

- Standard extruded aluminium section of size 63 mm × 38.10 mm × 1.2 mm thickness
- Weight not less than 0.643 kg/m
- Sections shall be free from defects and of approved make

Glass : Shall Conform M.38 page no-18 in General Technical Specification Booklet

- 5 mm thick frosted (obscured) glass of approved quality

Fixtures and Fastenings : Shall Conform M.43 page no-19 in General Technical Specification Booklet

Paints (Powder Coating) : Shall Conform M.44 page no-21 in General Technical Specification Booklet

- Aluminium sections shall be colour powder coated of approved shade and thickness

Sealant : Shall conform to relevant IS standards

2. WORKMANSHIP

General

- Work shall be carried out as per approved drawings and instructions of Engineer-in-Charge.
- Aluminium sections shall be properly cut, fabricated, and assembled without distortion.

Frame Fabrication

- Aluminium frame shall be fabricated using standard extruded sections (63 × 38.10 × 1.2 mm).
- Joints shall be mechanically fixed or mitred and properly sealed.
- Frame shall be rigid, true to shape, and free from warping.

Surface Finish

- Aluminium sections shall be powder coated in approved colour and finish.
- Coating shall be uniform, smooth, and free from defects like peeling, blistering, or scratches.

Fixing

- Frame shall be fixed in position true to line, level, and plumb using suitable fasteners.
- Proper anchoring shall be ensured to avoid loosening.

Glazing

- 5 mm thick frosted glass shall be fixed in aluminium frame.
- Glass shall be properly seated using EPDM / rubber gaskets or approved beading system.
- All edges shall be protected to avoid breakage.

Sealing

- All joints between frame and wall shall be sealed with approved sealant to ensure airtightness.

Finishing

- Ventilation unit shall be properly aligned and finished.
- Surface shall be clean and free from damages or stains.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (Sqm)** of finished ventilation area.
- Rate Includes Aluminium sections and fabrication. Powder coating finish 5 mm frosted glass All fittings, fixtures, and fasteners Labour, scaffolding, tools, and equipment Transportation, lead, and lift Complete installation at all levels

ITEM NO – 84

S.S Railing for Staircase: Providing and Fixing S.S. Railing for staircase made from S.S 304 Grade 1.8 mm wall thickness matt finish , 50mm Top hand rail, 38mm Vertical Balustrade fixing at 1.2 mt C/C with anchor fastner 75 mm dia 8 mm thick flange and shoe cap, with 3 nos of 16 mm Horizontal pipe fotting with L and Key , modular knob system. Balustrade top modular "T" fixing support to 50 mm hand rail and turning fixed with modular bend. including accessories as per detailed drawing as directed etc. complete.at all floors / all levels / all heights including all lead and lift.

1. MATERIAL

Stainless Steel : Shall conform to relevant IS standards for S.S. 304 Grade

- Wall thickness: 1.8 mm (minimum)
- Finish: Matt (satin) finish

Structural Steel (if used in supports) : Shall Conform M.22 page no-14 in General Technical Specification Booklet

Fixtures and Fastenings : Shall Conform M.43 page no-19 in General Technical Specification Booklet

2. WORKMANSHIP

General

- Work shall be executed as per approved drawings and instructions of Engineer-in-Charge.
- All stainless steel components shall be of S.S. 304 grade, free from defects, dents, or surface irregularities.

Railing Components

- Top Hand Rail:
 - 50 mm diameter S.S. pipe, continuous along the staircase.
- Vertical Balustrade:
 - 38 mm diameter S.S. pipe fixed at 1.2 m center-to-center spacing.
- Horizontal Members:
 - 3 numbers of 16 mm diameter S.S. horizontal pipes provided between balustrades.

Fixing Arrangement

- Balustrades shall be fixed with:
 - Anchor fasteners
 - Base flange of 75 mm diameter and 8 mm thickness
 - Covered with S.S. shoe caps for neat finish
- Proper alignment, verticality, and rigidity shall be ensured.

Connections & Accessories

- Horizontal pipes shall be fixed using modular L and Key system.
- Balustrade top shall be connected to handrail using modular "T" fittings.
- Handrail bends and turns shall be executed using factory-made modular bends ensuring smooth continuity.

Fabrication & Installation

- All joints shall be neatly finished, properly aligned, and rigid.
- Welding (if required) shall be ground smooth and polished to match finish.
- Entire railing shall be erected true to line, level, and plumb.

Finish

- Final finish shall be uniform matt (satin) finish.
- Surface shall be free from scratches, stains, or welding marks.
- Protective coating/film shall be removed after completion and cleaning done.

Safety & Protection

- Railing shall be firm, stable, and capable of resisting lateral loads.
- Care shall be taken to prevent damage during execution.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **running meter (Rmt)** of completed railing.
- Rate Includes Supply of S.S. 304 grade materials Handrail, balustrades, and horizontal members All fittings: modular “T”, L-key system, bends, flanges, shoe caps Anchor fasteners and fixing accessories Fabrication, installation, and finishing Labour, tools, scaffolding Transportation, lead, and lift Complete work at all floors and heights

ITEM NO – 85

Flexstone Wall Panelling : Supply and Installation of Customised FEFS Mural Wall over the Protruding +10mm post the stone thickness on Rough plaster wall with the help of 10mm thick cement mortar 1:3 (1 cement : 3 coarse sand) or adhesive and Top Coat sealer which is included with all required accessories and all scaffolding and support system. The Design will be as per Architect 's Selection and as per direction of Engineer in charge. at all floors / all levels / all heights including all lead and lift.

1. MATERIAL

Cement : Shall Conform M.3 page no-9 in General Technical Specification Booklet

Sand : Shall Conform M.6 page no-10 in General Technical Specification Booklet

Cement Mortar : Shall Conform M.11 page no-11 in General Technical Specification Booklet

Stone / Flexstone Panel : Shall Conform M.16 page no-12 in General Technical Specification Booklet

- Flexible engineered stone (Flexstone / FEFS mural panels) of approved make, thickness, texture and design as selected by Architect

Adhesive (if used) : Shall conform to relevant IS standards and manufacturer's specifications

Sealant / Top Coat Sealer : Shall conform to relevant IS standards and manufacturer's specifications

Fixtures and Fastenings : Shall Conform M.43 page no-19 in General Technical Specification Booklet

2. WORKMANSHIP

General

- Work shall be carried out as per approved drawings, design, and instructions of Engineer-in-Charge.
- Design, pattern, texture, shade, and finish shall be as per Architect's selection.

Surface Preparation

- Base surface shall be rough plastered, clean, dry, and free from dust, oil, laitance, or loose particles.
- Any undulations shall be corrected before fixing panels.
- Proper alignment and marking shall be done prior to installation.

Fixing of Panels

- Flexstone / FEFS mural panels shall be fixed:
 - Using 10 mm thick cement mortar (1:3) OR
 - Approved adhesive as per manufacturer's specification
- Panels shall be installed with projection of +10 mm beyond stone thickness as specified.
- Panels shall be pressed firmly to ensure proper bonding without voids.

Jointing

- Joints between panels shall be minimal and uniform.
- Any gaps shall be filled with suitable filler/adhesive to match finish.

Top Coat Sealer

- After installation, top coat sealer shall be applied uniformly.
- Sealer shall provide protection, enhance durability, and improve finish.

Alignment & Finish

- Panels shall be fixed true to line, level, and plumb.
- Finished surface shall be smooth, even, and free from cracks, undulations, or visible defects.

Scaffolding & Protection

- Suitable scaffolding and support system shall be provided.
- Completed work shall be protected from damage until handover.

2. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (Sqm)** of finished wall panelling area.
- Rate Includes Supply of Flexstone / FEFS mural panels Cement mortar / adhesive fixing Top coat sealer application Surface preparation and alignment All fittings, accessories Labour, tools, scaffolding, and support system Transportation, lead, and lift Complete work at all floors and heights

ITEM NO – 86

Common Area Natural Stone with CNC Work: Supply, fabrication, and installation of high-quality natural stone with precision CNC-carved patterns as per approved design and drawings. Work includes cutting, shaping, CNC engraving, finishing, polishing, and fixing in position with proper alignment, jointing, and grouting as required including 10mm thick cement mortar 1:3 (1 cement : 3 coarse sand) or Fixing with cement based high polymer modified quick-set tile adhesive (Water based). Rate includes supply of stone, CNC work, transportation, handling, and complete installation including all necessary hardware and accessories, complete in all respects, as directed by the Architect / Engineer-in-Charge.at all floors / all levels / all heights including all lead and lift.

1. MATERIAL

Cement : Shall Conform M.3 page no-9 in General Technical Specification Booklet

Sand : Shall Conform M.6 page no-10 in General Technical Specification Booklet

Cement Mortar : Shall Conform M.11 page no-11 in General Technical Specification Booklet

Stone : Shall Conform M.16 page no-12 in General Technical Specification Booklet

- Natural stone of approved quality, size, thickness, colour and texture as per Architect's selection

Adhesive (Polymer Modified) : Shall conform to relevant IS standards and manufacturer's specifications

- Cement based, high polymer modified, quick-set tile adhesive (water based)

Fixtures and Fastenings : Shall Conform M.43 page no-19 in General Technical Specification Booklet

2. WORKMANSHIP

General

- Work shall be carried out as per approved drawings and instructions of the Architect / Engineer-in-Charge.
- CNC design, pattern, depth of carving, and finish shall be as per approved shop drawings.

Stone Selection & Preparation

- Natural stone shall be uniform in colour, texture, and free from cracks, flaws, or defects.
- Stone slabs shall be accurately cut to required size and thickness.
- CNC engraving shall be carried out using precision machines to achieve fine detailing and consistent pattern.

Surface Preparation

- Base surface shall be properly prepared, cleaned, and made level.
- Loose material, dust, oil, or laitance shall be removed before fixing.

Fixing of Stone

- Stone shall be fixed using:
 - 10 mm thick cement mortar (1:3) OR
 - Approved polymer modified tile adhesive as per specification
- Proper bedding shall be ensured without voids.
- Stone shall be aligned true to line, level, and plumb.

Jointing & Grouting

- Joints shall be uniform and as per design requirements.
- Grouting shall be carried out using suitable grout matching the stone colour.
- Excess mortar or grout shall be cleaned immediately.

Finishing & Polishing

- Exposed surfaces shall be finished and polished as per approved finish (matte / glossy / honed).
- CNC carved surfaces shall be cleaned carefully without damaging detailing.

Handling & Installation

- Proper handling during transportation and installation shall be ensured to avoid breakage.
- Edges and corners shall be protected during work.

Scaffolding & Protection

- Suitable scaffolding and support system shall be provided.
- Completed work shall be protected from damage and staining.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (Sqm)** of finished stone surface.
- Rate Includes Supply of natural stone CNC cutting, carving, and engraving work Mortar or adhesive fixing Jointing and grouting Finishing and polishing All fittings, accessories, and hardware Labour, tools, equipment, scaffolding Transportation, lead, and lift Complete work at all floors / levels / heights

ITEM NO – 87

V.VIP Room Natural Stone with CNC Work: Supply, fabrication, and installation of high-quality natural stone with precision CNC-carved patterns and fixing with another stone in the matching CNC work as per approved design and drawings. Work includes cutting, shaping, CNC engraving, finishing, polishing, and fixing in position with proper alignment, jointing, and grouting as required including 10mm thick cement mortar 1:3 (1 cement : 3 coarse sand) or Fixing with cement based high polymer modified quick-set tile adhesive (Water based). Rate includes supply of stone, CNC work, transportation, handling, and complete installation including all necessary hardware and accessories, complete in all respects, as directed by the Architect / Engineer-in-Charge.at all floors / all levels / all heights including all lead and lift.

- Relevant to item specification shall be followed Item No - 86 & Item shall be Measuring & Payment paid a unit per one **square meter (Sqm)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 88

GRC WORK : Providing & fixing architectural moldings profiles and other decorative elements made out of GRC (Glass Fibre reinforced Cement) in required shape, size & thickness all as per

manufacturers specifications, such as all decorative articles should be made by using high power spray machine, using AR Glass fiber with minimum ZrO₂ 16% including necessary scaffoldings for all heights, as per approved drawings and reference images. GRC elements thickness shall be 25-30 mm. fixing edges will be GRC Elements shall be fixed on RCC Structure/Brick Work/ Primary Steel Structure min 13kg/smt (MS with protective coat of Red oxide/Zinc Primer Shall be Used). Hilti make GI Screw Fastners or equivalent, GI Thread Rods and MS cleats shall be used for fixing of GRC elements on RCC/MS Primary fabricated structure. Joints shall be filled with PU sealants/ base material of GRC as and where required. The quote rate shall be inclusive of all design, & shop drawing and sample mock of all elements approval from Architect & consultant. The quote rate shall include all Taxes, duties, statutory obligations and safety code compliance as per client. Rate shall be inclusive of all required fabrication work for fixing only primary structure shall be provided as base structure only as per requirement. Mode and method of measurement shall be in accordance with IS: 1200.a) GRC Columns: as per specification work (Elevation area- At any height) (Elevation area) at all floors / all levels / all heights including all lead and lift.

1. MATERIAL

Steel (MS for cleats / supports) : Shall Conform M.22 page no-14 in General Technical Specification Booklet

Fixtures and Fastenings : Shall Conform M.43 page no-19 in General Technical Specification Booklet

GRC (Glass Fibre Reinforced Cement) :

- Manufactured using alkali resistant (AR) glass fibre with minimum ZrO₂ content 16%
- Produced by high pressure spray machine process
- Thickness of GRC elements: 25 mm to 30 mm
- Density and strength as per manufacturer's specification

GI Screws / Thread Rods / Fasteners : Shall conform to relevant IS standards (Hilti or equivalent approved make)

Sealant (PU Sealant) : Shall conform to relevant IS standards and manufacturer's specifications

Primer (Red Oxide / Zinc Primer) : Shall Conform M.44 page no-21 in General Technical Specification Booklet

2. WORKMANSHIP

General

- Work shall be executed as per approved drawings, shop drawings, and reference images.
- All designs, profiles, shapes, and architectural elements shall be as per Architect's approval.
- Contractor shall submit shop drawings and mock-up samples for approval before execution.

Manufacturing of GRC Elements

- GRC elements shall be manufactured using spray technique with AR glass fibre reinforcement.
- Mix design, fibre content, and curing shall be controlled to achieve required strength and durability.
- Elements shall be cast to required shape, size, thickness (25–30 mm) with smooth finish.

Primary Support & Fixing System

- GRC elements shall be fixed on RCC / Brickwork / MS primary steel structure.
- Minimum 13 kg/sqm MS support framework shall be used (with protective coating).
- MS components shall be coated with red oxide or zinc primer before installation.

Fixing Method

- Fixing shall be done using:
 - GI screws (Hilti or equivalent)
 - GI threaded rods
 - MS cleats and brackets
- Proper alignment, spacing, and anchoring shall be ensured.
- Fixing shall be rigid, secure, and capable of resisting wind and dead loads.

Joint Treatment

- All joints shall be properly finished and sealed using:
 - PU sealant, or
 - Matching GRC base material
- Joints shall be neat, watertight, and aesthetically uniform.

Erection & Alignment

- GRC elements shall be installed true to line, level, and plumb.
- Special care shall be taken to maintain continuity of patterns and profiles.

Surface Finish

- Finished surface shall be smooth, free from cracks, blowholes, or defects.
- Edges and corners shall be sharp and well-defined.

Scaffolding & Safety

- Adequate scaffolding and support system shall be provided for all heights.
- All safety measures and statutory requirements shall be strictly followed.

Protection

- Completed work shall be protected from damage, impact, and weather effects until handover.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (Sqm)** based on elevation area of GRC columns.
- Rate Includes Supply and manufacturing of GRC elements AR glass fibre and complete casting process CNC / mould preparation and detailing MS support framework (minimum 13 kg/sqm) with primer GI fasteners, threaded rods, cleats, brackets Fixing, alignment, and installation Joint filling and sealing Shop drawings, design, and mock-up approval Labour, tools, scaffolding, safety measures Transportation, lead, and lift All taxes, duties, and statutory compliance

ITEM NO – 89

SS Kitchen rack(1800x750x750) : Supply, fabrication, and installation of high-quality stainless steel (SS) kitchen racks as per approved drawings and specifications. Work includes cutting, shaping, welding, polishing, and fixing in position with proper alignment, including all necessary hardware, supports, brackets, and accessories for complete installation. Rate includes supply of SS material, fabrication, transportation, handling, and installation.

1. MATERIAL

Stainless Steel :

Shall conform to relevant IS standards for S.S. 304 Grade

- Thickness shall be 1.0 mm to 1.5 mm (minimum) or as per approved drawing
- Finish: Matt / Satin or Mirror finish as approved

Structural Steel (if used for support) : Shall Conform M.22 page no-14 in General Technical Specification Booklet

Fixtures and Fastenings : Shall Conform M.43 page no-19 in General Technical Specification Booklet

2. WORKMANSHIP

General

- Work shall be carried out as per approved drawings and instructions of Engineer-in-Charge.
- Stainless steel material shall be of S.S. 304 grade, corrosion resistant, and free from defects.

Fabrication

- Rack shall be fabricated to size 1800 mm × 750 mm × 750 mm (L × W × H) or as specified.
- Cutting, bending, and forming shall be done accurately to achieve proper dimensions.
- Welding shall be done neatly with smooth joints; welds shall be ground and finished to match surface.

Structural Arrangement

- Rack shall consist of:
 - Horizontal shelves / working platform
 - Vertical supports / legs
 - Required stiffeners for strength and stability
- Structure shall be rigid and capable of carrying kitchen loads.

Fixing & Installation

- Rack shall be installed in position true to line, level, and plumb.
- Fixing shall be done using suitable SS brackets, anchors, or supports as required.
- Proper anchoring to wall or floor shall be ensured wherever necessary.

Accessories

- All required accessories such as brackets, supports, stiffeners, fasteners, and fittings shall be provided.
- Edges shall be smooth, rounded, and safe for use.

Finishing

- Surface shall be properly polished (matt / mirror finish) as approved.
- Finished work shall be free from dents, scratches, sharp edges, or welding marks.

Protection

- Protective film shall be maintained during installation and removed after completion.
- Finished rack shall be cleaned and handed over in proper condition.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **numbers (Nos.)** of complete kitchen rack units.
- Rate Includes Supply of S.S. 304 material Fabrication, cutting, bending, welding Polishing and finishing All fittings, brackets, and accessories Installation and fixing Labour, tools, equipment Transportation, lead, and lift Complete work in all respects

ITEM NO – 90

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 incharge etc compete. Measurement shall be taken for the depth of holes in running meter for specified diameter. Holes shall made by authorized approved agency. Scanning of reinforcement shall be carried out before core cutting if required and as suggested by Engineer incharge. Location of core cutting shall be approved by Engineer in charge.(i) beyond 52mm dia to 77mm dia.

1. MATERIAL

Cement : Shall Conform M.3 page no-9 in General Technical Specification Booklet

Sand : Shall Conform M.6 page no-10 in General Technical Specification Booklet

Cement Mortar : Shall Conform M.11 page no-11 in General Technical Specification Booklet

Micro Concrete / Epoxy Mortar : Shall conform to relevant IS standards and manufacturer's specifications

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

2. WORKMANSHIP

General

- Work shall be carried out by authorized and approved specialized agency using diamond core cutting machine of approved make.
- All locations shall be approved by Engineer-in-Charge prior to execution.

Preliminary Checks

- Reinforcement scanning (using rebar scanner) shall be carried out wherever required to avoid cutting of reinforcement.
- Necessary precautions shall be taken to ensure structural safety of RCC member.

Core Cutting Operation

- Holes of 52 mm to 77 mm diameter shall be drilled using wet diamond core cutting method.
- Drilling shall be carried out without vibration, shock, or damage to surrounding structure.
- Machine shall be properly anchored to ensure accuracy and alignment.

Execution

- Drilling shall be done to required depth and alignment as per service requirements.
- Continuous water supply shall be maintained for cooling and dust suppression.
- Edges of hole shall be smooth, clean, and free from cracks or spalling.

Post Cutting Work

- Debris and slurry generated during cutting shall be collected and disposed properly.
- Area shall be cleaned after completion of work.

Making Good

- After installation of service lines, the annular gap around pipe shall be filled using:
 - Epoxy mortar / Micro concrete / Polymer modified mortar
- Proper compaction and finishing shall be done to restore the surface.

Safety Measures

- Proper scaffolding and safety arrangements shall be provided.
- Care shall be taken to prevent damage to existing structure and services.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **running meter (Rmt)**
- Rate Includes Core cutting using diamond drilling machine Labour, tools, and equipment
Reinforcement scanning (if required) Water for wet drilling Scaffolding and safety
measures Disposal of debris and cleaning Making good with epoxy mortar / micro concrete
All leads and lifts Complete work in all respects

ITEM NO – 91

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 incharge etc compete. Measurement shall be taken for the depth of holes in running meter for specified diameter. Holes shall made by authorized approved agency. Scanning of reinforcement shall be carried out before core cutting if required and as suggested by Engineer incharge. Location of core cutting shall be approved by Engineer in charge.(ii) Beyond 77mm dia to 102mm dia.

- Relevant to item specification shall be followed **Item No - 90** & Item shall be Measuring & Payment paid a unit per one **Running meter (Rmt)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 92

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 incharge etc compete. Measurement shall be taken for the depth of holes in running meter for specified diameter. Holes shall made by authorized approved agency. Scanning of reinforcement shall be carried out before core cutting if required and as suggested by Engineer incharge. Location of core cutting shall be approved by Engineer in charge. Beyond 102mm dia to 152mm dia.

- Relevant to item specification shall be followed **Item No - 90** & Item shall be Measuring & Payment paid a unit per one **Running meter (Rmt)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 93

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 incharge etc compete. Measurement shall be taken for the depth of holes in

running meter for specified diameter. Holes shall made by authorized approved agency. Scanning of reinforcement shall be carried out before core cutting if required and as suggested by Engineer incharge. Location of core cutting shall be approved by Engineer in charge.(iv) Beyond 152mm dia to 202mm dia.

- Relevant to item specification shall be followed **Item No - 90** & Item shall be Measuring & Payment paid a unit per one **Running meter (Rmt)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 94

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. MATERIAL

Steel Bars (Reinforcement) : Shall Conform M.19 page no-13 in General Technical Specification Booklet

Chemical Adhesive (Rebaring Compound) :

- Hilti HY-200 / Fischer / Fosroc or equivalent approved make
- Shall conform to relevant IS standards and manufacturer's specifications

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

2. WORKMANSHIP

General

- Work shall be carried out as per approved structural drawings and instructions of Engineer-in-Charge.
- Rebaring shall be executed by skilled and experienced personnel using approved materials and equipment.

Drilling of Holes

- Holes of required diameter shall be drilled using rotary/hammer drill machine at specified locations.
- Depth of hole shall be as per design, minimum embedment depth 150 mm.
- Drilling shall be done without causing cracks or damage to existing structure.

Cleaning of Holes

- Holes shall be thoroughly cleaned using:
 - Air blower
 - Wire brush
- Cleaning shall ensure removal of dust, debris, oil, or moisture for proper bonding.

Application of Chemical Adhesive

- Approved chemical anchoring system (Hilti HY-200 / Fischer / Fosroc or equivalent) shall be used.

- Adhesive shall be injected into the hole using proper dispensing equipment as per manufacturer's recommendations.
- Quantity and method of application shall strictly follow manufacturer's specifications.

Fixing of Reinforcement

- Reinforcement bars of 10 mm to 25 mm diameter shall be inserted into filled holes immediately after injection.
- Bars shall be rotated slightly to ensure proper bonding and full contact with adhesive.
- Alignment shall be maintained true to line and level.

Curing & Setting

- Adequate setting time shall be allowed before applying load, as per manufacturer's specifications.
- No disturbance shall be caused during curing period.

Quality Control

- Pull-out tests may be conducted if required by Engineer-in-Charge.
- All works shall comply with structural safety requirements.

Safety

- Proper safety precautions shall be taken during drilling and chemical application.
- Personal protective equipment (PPE) shall be used.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **number (Nos.)** of rebars fixed for specified diameter range (10 mm to 25 mm).
- Rate Includes Drilling of holes Cleaning of holes Supply and fixing of reinforcement bars Chemical adhesive (Hilti / equivalent) Labour, tools, and equipment Alignment and fixing All leads and lifts Complete work in all respects Testing or curing

ITEM NO – 95

Pile Work : Providing and laying in position Ready Mixed M-300 grade concrete for reinforced cement concrete work, using cement content as per approved Design Mix manufactured in fully automatic batching plant and transported to site of work in transit mixer for a lead up to 10 kms having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, including the cost of centering shuttering finishing and excluding the cost of reinforcement including cost of admixtures in recommended proportions as per IS : 9103 to accelerate /retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer- in - charge. Without Fly Ash (Min cement level as per latest IS 456 shall be maintained) (Cement level 475 kg) including Boring holes deep in ordinary soil (for cast in situ piles) and getting out the soil and disposal of the surplus excavated soil as directed within a lead of 50 Meter for following diameter of pipes.

(iii) 300 mm.

1. MATERIALS

- Water : Shall Conform to M1 Page no-9 in General Technical Specification Booklet.
- Cement : Shall Conform to M3 Page no-9 in General Technical Specification Booklet.
- Sand : Shall Conform to M6 Page no-10 in General Technical Specification Booklet.
- Stone Grit (Coarse Aggregate) : Shall Conform to M8 Page no-10 in General Technical Specification Booklet.

Additional Materials:

- Admixtures: Shall conform to IS: 9103 and shall be of approved make to improve workability, control setting time, and enhance durability without affecting strength.
- Ready Mix Concrete (RMC): Shall conform to IS: 4926 and IS: 456 with design mix of M-30 grade and minimum cement content of 475 kg/m³ (without fly ash).
- Boring Equipment & Casing Pipes: Steel casing pipes, drilling rigs, and accessories shall be of suitable capacity and approved make.

2. WORKMANSHIP

2.1 General

- The work shall be carried out as per IS: 2911 (Part-1) for pile foundations and IS: 456 for concrete work.
- Layout of piles shall be marked accurately as per approved drawings and verified by Engineer-in-Charge before commencement.

2.2 Boring of Pile

- Boring shall be done in ordinary soil using approved rotary / percussion drilling rigs up to required depth.
- Diameter of pile shall be 300 mm and shall be maintained throughout the depth.
- Necessary temporary casing shall be provided to prevent collapse of bore sides wherever required.
- Excavated soil shall be removed and disposed within 50 m lead as directed.

2.3 Cleaning of Bore Hole

- After reaching the required depth, the bore hole shall be cleaned thoroughly to remove loose soil, slurry, and debris.
- Bottom of bore shall be checked for cleanliness before concreting.

2.4 Reinforcement Cage

- Reinforcement cage (if applicable) shall be lowered carefully into the bore hole ensuring proper cover blocks and alignment.
- Care shall be taken to avoid displacement during lowering and concreting.

2.5 Concreting

- Concrete shall be Ready Mixed Concrete (M-30 grade) supplied from batching plant.
- Concrete shall be poured immediately after boring and cleaning to avoid collapse.
- Tremie method shall be adopted where water or slurry is present.

- Continuous concreting shall be ensured to avoid cold joints.
- Concrete shall be placed without segregation and with minimum free fall.

2.6 Compaction & Finishing

- Concrete shall be compacted adequately by tremie flow or suitable methods without disturbing bore walls.
- Top of pile shall be finished to required cut-off level.

2.7 Quality Control

- Slump test shall be carried out for each batch of concrete.
- Cube samples shall be taken and tested as per IS: 516.
- Concrete shall achieve specified characteristic strength of M-30 grade.

2.8 Safety & Precautions

- Proper barricading and safety measures shall be provided around bore locations.
- Drilling shall be carried out without causing vibration to adjacent structures.
- All works shall be executed under supervision of qualified personnel.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **running meter (Rmt)** for the specified diameter of pile (300 mm), from cut-off level to bottom of pile.
- Rate shall include: Boring in ordinary soil Disposal of excavated material within 50 m lead Providing and placing RMC (M-30) All labour, machinery, tools, plant, casing (if required), and incidental charges All leads and lifts
- Rate shall exclude reinforcement steel, which shall be measured and paid separately.
- Payment shall be made for completed work as per approved drawings and directions of Engineer-in-Charge.

ITEM NO – 96

Pile Work: Providing, driving with hydraulic piling rigs with power units and installing driven cast-in-situ reinforced cement concrete piles of grade M-25 of specified diameter and length below the pile cap, to carry safe working load not less than specified, excluding the cost of steel reinforcement but including the cost of shoe and the length of pile to be embedded in the pile cap etc. all complete. (Length of pile for payment shall be measured from top of shoe to the bottom of pile cap): 450 mm dia piles.

1. MATERIALS

- Water : Shall Conform to M1 Page no-9 in General Technical Specification Booklet.
- Cement : Shall Conform to M3 Page no-9 in General Technical Specification Booklet.
- Sand : Shall Conform to M6 Page no-10 in General Technical Specification Booklet.
- Stone Grit (Coarse Aggregate) : Shall Conform to M8 Page no-10 in General Technical Specification Booklet.

Additional Materials:

- Coarse Aggregate for Concrete : Shall conform to IS: 383.

- Concrete (M-25 Grade) : Shall conform to IS: 456 and IS: 2911 (Part-1) with design mix to achieve required strength.
- Admixtures : Shall conform to IS: 9103 and shall be used as approved to improve workability and durability.
- Pile Shoe : Cast iron/steel shoe of approved design and quality to suit pile diameter and driving conditions.
- Casing Pipe : Steel casing of adequate thickness and strength suitable for driven cast-in-situ piling.

2. WORKMANSHIP

2.1 General

- Work shall be executed as per IS: 2911 (Part-1, Section 2) for driven cast-in-situ piles.
- Pile layout and positions shall be marked accurately and approved by Engineer-in-Charge before commencement.

2.2 Driving of Pile

- Driving shall be carried out using hydraulic piling rigs with power units of adequate capacity.
- A suitable pile shoe shall be fixed at the bottom of casing to facilitate penetration and protect pile toe.
- The casing pipe shall be driven into the ground to the required depth or refusal criteria as specified.
- Driving shall be continuous to avoid soil relaxation and ensure proper load transfer.

2.3 Boring / Formation

- In driven cast-in-situ piles, soil is displaced by driving casing; any required boring inside casing shall be done carefully.
- Loose soil inside casing shall be removed before placing reinforcement and concrete.

2.4 Reinforcement

- Reinforcement cage (if specified) shall be lowered centrally inside casing with proper cover using spacers.
- Care shall be taken to maintain alignment and avoid distortion during insertion.

2.5 Concreting

- Concrete of M-25 grade shall be placed immediately after cleaning the bore.
- Concrete shall be poured in one continuous operation to avoid cold joints.
- The casing shall be gradually withdrawn while concreting, ensuring no necking or voids occur.
- Adequate head of concrete shall be maintained during withdrawal of casing.

2.6 Pile Cut-Off

- Top of pile shall be brought up to required level and cut to specified cut-off level after setting.
- Proper embedment length into pile cap shall be ensured as per drawings.

2.7 Quality Control

- Concrete shall be tested for slump and compressive strength as per IS: 516.
- Verticality and alignment of piles shall be checked during installation.
- Load test on piles shall be conducted if specified.

2.8 Safety Precautions

- Adequate safety measures shall be taken during pile driving operations.
- Surrounding structures shall be monitored for vibration effects.
- All equipment shall be operated by trained personnel.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **running meter (Rmt)** from top of pile shoe to bottom of pile cap. Diameter of pile shall be 450 mm.
- The rate shall include Providing and driving casing with hydraulic piling rigs Cost of pile shoe Concrete (M-25 grade) Labour, machinery, tools, plant, and all incidental charges Withdrawal of casing and finishing All leads and lifts
- The rate shall exclude reinforcement steel, which shall be measured and paid separately.
- Payment shall be made for completed piles as per approved drawings and direction of Engineer-in-Charge.

ITEM NO – 97

GRANITE STONE EDGE POLISHING: All expose edges for granite stone with 18mm to 25 mm thickness, shall be champhered or half mould and mirror polished. For jamb,sill, litel, locations like nosing of treads,door, window, ventilation,opening,vertical division paradi, any platform and location mentioned in detailed drawing for respective items.Rate shall be inclusive of chasing, cutting, edge champhering, edge polishing, making holes (if required), curing, finishing, maintaining upto handling ovre the project etc complete for all height. The work shall be carried out as per the approval of Engineer-in-charge. Only finished granite work shall be measured.For all floors and all heights.

1. MATERIALS

- Granite Stone Slab : Shall Conform to M52 Page no-23 in General Technical Specification Booklet.
- Water : Shall Conform to M1 Page no-9 in General Technical Specification Booklet.

Additional Materials:

- Abrasives / Polishing Compounds: Carborundum stones, diamond pads, polishing powders and compounds of approved make suitable for granite polishing.
- Adhesives / Epoxy (if required): Shall conform to relevant IS standards and approved by Engineer-in-Charge.

2. WORKMANSHIP

2.1 General

- The work shall be carried out at all exposed edges of granite slabs of thickness 18 mm to 25 mm as shown in drawings or as directed.

- Locations include jambs, sills, lintels, treads nosing, doors, windows, ventilations, openings, vertical divisions (partitions), platforms and other specified areas.

2.2 Edge Preparation

- Edges shall be machine cut true to line, level and dimensions.
- Required chamfering or half round moulding shall be carried out uniformly using appropriate cutting tools.
- Chasing and minor cutting required for proper alignment shall be done carefully without damaging adjoining surfaces.

2.3 Polishing

- Polishing shall be done using machine polishing with graded abrasives to achieve smooth and even finish.
- Final finish shall be mirror polish, free from scratches, undulations, edge chipping or dull patches.
- Edges shall be uniformly finished to match the surface polish of granite.

2.4 Finishing & Detailing

- Holes (if required) for fixtures shall be neatly drilled with proper tools.
- All edges shall be smooth, rounded or chamfered as specified and free from sharpness.
- Proper care shall be taken to protect finished edges during further construction activities.

2.5 Curing & Protection

- Finished surfaces shall be cleaned and protected from stains, dust, and damage until handing over.
- Necessary curing/cleaning shall be done where applicable.

2.6 Quality Control

- Edges shall be checked for uniformity, alignment, smoothness and finish.
- No broken edges, cracks or uneven polishing shall be accepted.
- Work shall be executed strictly as per approval of Engineer-in-Charge.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **running meter (Rmt)** of polished edges.
- The rate shall include Cutting, chasing and edge preparation Chamfering / moulding Machine polishing to mirror finish Making holes (if required) Labour, tools, plant, abrasives, and all materials Protection, curing, finishing and cleaning All leads and lifts
- Payment shall be made for completed work at all floors and heights as directed by Engineer-in-Charge.

ITEM NO – 98

Guniting work :Providing, drilling, installing and grouting soil nails to stabilize excavated faces up to a depth of 5.0 m from existing ground level, comprising of drilling holes of required diameter and inclination in soil/soft rock strata, inserting high yield deformed steel bars (Fe 500 or as

specified) with centralizersfixing mesh, and pressure grouting with cement slurry of of specified thickness, complete in all respects as per drawings and technical specifications.

1. MATERIALS

- Water : Shall Conform to M1 Page no-9 in General Technical Specification Booklet.
- Cement : Shall Conform to M3 Page no-9 in General Technical Specification Booklet.
- Sand : Shall Conform to M6 Page no-10 in General Technical Specification Booklet.
- High Yield Strength Deformed Bars (Reinforcement) : Shall Conform to M19 Page no-13 in General Technical Specification Booklet.
- Welded Steel Wire Fabric / Mesh : Shall Conform to M34 Page no-17 in General Technical Specification Booklet.

Additional Materials:

- Coarse Aggregate (for Shotcrete/Guniting): Shall conform to IS: 383.
- Admixtures: Shall conform to IS: 9103 for improving workability and early strength of shotcrete.
- Grouting Material: Cement slurry of approved mix proportion suitable for pressure grouting.
- Centralizers / Spacers: PVC or steel centralizers to maintain proper cover to soil nails.

2. WORKMANSHIP

2.1 General

- Work shall be carried out as per relevant provisions of IS: 456, IS: 15086 (Shotcrete), and standard soil nailing practices.
- Excavated faces up to 5.0 m depth shall be stabilized in stages as per approved drawings and sequence.

2.2 Drilling of Holes

- Holes of required diameter, depth and inclination shall be drilled in soil/soft rock using rotary/percussion drilling equipment.
- Drilling shall be carried out carefully to avoid collapse of sides and maintain alignment.
- Loose material and debris shall be removed from the hole before insertion of reinforcement.

2.3 Installation of Soil Nails

- High Yield Strength Deformed Steel Bars (Fe-500 or as specified) shall be inserted into drilled holes.
- Centralizers shall be provided at regular intervals to maintain uniform grout cover around the bar.
- Bars shall be of required length and properly aligned.

2.4 Grouting

- Pressure grouting shall be carried out using cement slurry of approved mix.
- Grouting shall be done from bottom to top to ensure full encapsulation of the bar and eliminate voids.

- Required pressure shall be maintained to ensure proper bonding with surrounding soil.

2.5 Fixing of Wire Mesh

- After installation of soil nails, welded wire mesh shall be fixed over the excavated surface.
- Mesh shall be properly anchored to soil nails using bearing plates, nuts, and washers.

2.6 Guniting / Shotcrete

- Cement mortar/concrete shall be applied by guniting (shotcrete) process over the prepared surface.
- Thickness of guniting layer shall be as specified in drawings.
- Application shall be done uniformly to ensure proper bonding with surface and mesh.
- Rebound material shall be removed and surface shall be finished smooth.

2.7 Curing

- Guniting surface shall be kept moist and cured properly for at least 7 days.

2.8 Quality Control

- Alignment, depth, and inclination of soil nails shall be checked.
- Grouting shall be inspected to ensure full filling without voids.
- Thickness and strength of shotcrete shall be tested as per relevant IS codes.

2.9 Safety Measures

- Adequate safety arrangements shall be made during excavation, drilling and guniting.
- Protective gear shall be used by workers during shotcrete application.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meter (Sqm)**
- The rate shall include: Drilling of holes Supply and installation of soil nails with centralizers Pressure grouting with cement slurry Providing and fixing welded wire mesh Guniting/shotcrete application Labour, machinery, tools, plant, scaffolding, curing All leads and lifts
- Payment shall be made for completed work as per drawings and directions of Engineer-in-Charge.

ITEM NO – 99

Providing and fixing C.I. Manhole cover 0.60 M. x 0.45M. size having weight not less than 35Kg.

1. MATERIALS

- Cast Iron (C.I.): Shall conform to IS: 210 / IS: 1726 for manhole covers and frames.
- Cement, Sand & Mortar: For bedding/fixing shall conform to standard specifications (M3, M6).

2. WORKMANSHIP

1. Excavation / Preparation:
 - Excavate area around manhole opening as required for fixing the cover.

- Ensure base and frame seating is firm, level, and clean.
- 2. Fixing the C.I. Cover:
 - Place the C.I. manhole cover over the frame or recess.
 - Ensure the cover sits properly and levelled with surrounding surface.
 - Bedding may be provided using cement mortar 1:4 (1 cement : 4 coarse sand) to fix the frame firmly.
- 3. Alignment and Adjustment:
 - Adjust the frame and cover so that it is flush with finished surface (road, flooring, or platform).
 - Ensure proper opening and closing without obstruction.
- 4. Finishing:
 - Clean the surrounding area.
- 3. Remove all debris, and ensure proper finishing around the frame.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit **per Nos** piece
- The rate includes Supply of C.I. cover (≥ 35 kg) Bedding / fixing in cement mortar Labour, tools, equipment Cleaning and making good the surrounding area All lead and lift

ITEM NO – 100

Providing and laying S&S centrifugally Cast (Spun) iron pipes (Class LA) confirming to IS: 1536: (150mm).

1. MATERIALS

- Centrifugally Cast Iron Pipes:
 - Class: LA (Light Duty)
 - Diameter: 150 mm
 - Conformance: IS: 1536
 - Pipes shall be free from cracks, blowholes, or other defects.
- Jointing Material:
 - Use lead and spun yarn / approved rubber gasket for socketed joints.
- Bedding Material:
 - Coarse sand / granular soil for pipe bedding and cushioning as per specifications.

2. WORKMANSHIP

1. Excavation:
 - Excavate trench to proper line, level, and gradient.
 - Ensure trench width allows proper laying and jointing of pipes.
2. Pipe Laying:
 - Lay pipes true to line and level.
 - Socket shall face upstream / as per design.
 - Pipes shall be joined using lead & spun yarn or approved rubber gasket, ensuring water-tight joints.
3. Bedding & Backfilling:
 - Provide minimum 75 mm bedding of coarse sand below pipe.
 - Backfill around pipe up to spring line in layers with suitable material, compacted properly to avoid settlement.

4. Testing:
 - Carry out hydraulic test at pressure as per IS: 1536 to check joint tightness and leaks.
5. Surface Restoration:
 - Make good all disturbed surfaces, including roads or pavements, after completion.

3. MOD OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **running meter** of pipe laid including bends, fittings, and joints.
- The rate includes Supply and transportation of spun iron pipes Excavation, bedding, jointing, and laying Lead/rubber gasket for joints Testing and surface restoration Labour, scaffolding, and equipment

ITEM NO – 101

Providing and Laying S&S C.I. standard specials such as tees,bends,collars,tapers,caps etc. suitable for flanges jointing as per IS: 1583 : Upto 300 mm dia.

1. MATERIALS

- Centrifugally Cast Iron (CI) Specials:
 - Conformance: IS: 1583
 - Types: Tees, Bends, Collars, Tapers, Caps
 - Diameter: Upto 300 mm
 - Free from cracks, blowholes, or casting defects.
- Jointing Material:
 - Lead & spun yarn or approved rubber gaskets for socket/flange joints.
- Bedding Material:
 - Coarse sand / granular soil as per specifications for cushioning and support.

2. WORKMANSHIP

1. Excavation:
 - Excavate trench to required line, level, and width to accommodate specials.
2. Laying & Jointing:
 - Install specials (tees, bends, collars, tapers, caps) at required locations.
 - Socket direction must face upstream as per layout.
 - Joint using lead & spun yarn or approved rubber gasket to achieve water-tight connection.
3. Bedding & Backfilling:
 - Provide 75 mm minimum coarse sand bedding below the special.
 - Backfill around the special in layers, compacted properly to avoid settlement.
4. Flange Jointing:
 - Where flanged joints are used, ensure proper bolting and sealing with gaskets.
5. Testing:
 - Conduct hydraulic or air pressure tests to ensure joint integrity and leak-free connections.
6. Surface Restoration:
 - Restore all disturbed surfaces including roads and pavements after installation.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Running Meter (RMT)** special supplied, laid, and tested.
- Rate includes Supply and transportation of CI specials Excavation, bedding, jointing, and laying Lead/rubber gaskets and flange fittings Testing and making good surface Labour, scaffolding, and necessary accessories

ITEM NO – 102

Providing and fixing C.I sluice valves (with cap) complete with bolts,nuts,rubber insertions etc (the tail pieces if required will be paid seperately. Class II.

1. MATERIALS

- Valve Body:
 - Material: Cast Iron, Class II as per IS standards.
 - Complete with cap, bolts, nuts, and rubber seat/insertions.
 - Valve to provide smooth operation and watertight sealing.
- Tail Pieces (if required):
 - Paid separately.
 - Material: Suitable C.I. or ductile iron pipe with proper socket/spigot ends.
- Fasteners:
 - Bolts & nuts: corrosion-resistant, suitable for valve pressure rating.
 - Gaskets / Rubber insertions: EPDM or approved rubber.

2. WORKMANSHIP

1. Preparation:
 - Ensure proper alignment with the pipeline.
 - Clean all connecting surfaces to remove debris and foreign matter.
2. Installation:
 - Position valve with correct orientation.
 - Connect using bolts and nuts, ensuring proper torque.
 - Fit rubber insertions or gaskets for watertight sealing.
 - Tail pieces, if needed, to be installed separately and aligned properly.
3. Testing:
 - Conduct pressure testing for valve operation and leak-tight performance as per IS/approved standards.
4. Final Adjustments:
 - Ensure valve opens/closes smoothly.
 - Provide lubrication if required for operation.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **NOs pieces.**
- Rate includes Supply of C.I. sluice valve (Class II) Bolts, nuts, rubber insertions, and other accessories Complete fixing and testing Labour, scaffolding, and handling

ITEM NO – 105

Providing and fixing rolling shutters of approved make made of 80 mm wide M.S. laths inter-locked together through their entire length and jointed together at the ends by end locks mounted on specially designed pipe shaft with bracket plates, guide channels and arrangements for inside and outside locking with push-pull operation including the cost of hood cover and spring etc. complete.(A) Shutters having width below 3.5 M.

1. MATERIALS

- Laths: Mild Steel (MS), 80 mm wide, interlocked.
- End Locks: MS, corrosion-protected.
- Pipe Shaft: MS, designed to carry the shutter weight.
- Guide Channels & Brackets: MS, designed for smooth operation.
- Springs: Pre-tensioned for smooth rolling.
- Hood Cover: MS sheet to protect rolling mechanism.
- Locks: Suitable push-pull type for inside/outside operation.

2. WORKMANSHIP

1. Preparation:
 - Verify opening dimensions and ensure straight vertical alignment of guides.
2. Installation:
 - Mount shutters on shaft and fix guide channels & brackets.
 - Install springs and hood cover.
 - Fit end locks and test push-pull operation.
3. Testing & Commissioning:
 - Check smooth rolling, locking mechanism, and spring tension.
 - Ensure shutters operate freely without jerks.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (NOS)**
- Rate includes Supply of all materials (MS laths, shaft, guides, springs, hood, locks) Fabrication, installation, and alignment Testing and commissioning Labour, scaffolding, and handling

ITEM NO – 106

Wall holes, cracks filler (PU sealant);

Providing and supplying and applying the PU sealant of approved and appropriate grade and foam as per the manufacturer specification for , Minor holes and cracks are to be filled and making surface workable and free from holes and cracks. Filling holes and cracks, small air blower to be used for cleaning hole and cracks dust free and visible. Widening cracks to 5 to 10 mm and having depth upto 20 mm for easy and making material flowable in the crack. Once the crack or hole is filled, it is to be cleaned with wire brush and chisel to remove excess material and making surface even. Scaffolding and props are to be provided for accessibility of the desired location specified by the engineer incharge.at all floors / all levels / all heights.

1. MATERIALS

- PU Sealant: Approved grade, compatible with substrate.
- Foam / Backer Rod: As per manufacturer's recommendation for deep cracks.

2. WORKMANSHIP

1. Surface Preparation:
 - Clean cracks and holes using small air blower to remove dust and debris.
 - Widen cracks to 5–10 mm width and up to 20 mm depth for proper sealant application.
2. Filling:
 - Inject PU sealant ensuring complete filling of cracks and holes.
 - Allow the material to settle and cure as per manufacturer's instructions.
3. Finishing:
 - Remove excess material using wire brush and chisel.
 - Ensure surface is smooth, level, and uniform.
4. Accessibility & Safety:
 - Provide scaffolding and props to access all required locations safely.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meter**
- Rate includes Supply of PU sealant and foam Cleaning, preparation, and widening cracks Application, curing, and finishing Labour, scaffolding, and all accessories Making surface ready for further finishes

ITEM NO – 107

Wall holes, cracks filler (Foam);

Providing and supplying and applying the PU foam of approved and appropriate grade and foam as per the manufacturer specification for , Minor holes and cracks are to be filled and making surface workable and free from holes and cracks. Foring holes and cracks , small air blower to be used for cleaning hole and cracks dust free and visible . Widening cracks to 10 mm and more and having depth upto 20 mm for easy and making material flowable in the crack. Once the crack or hole is filled , it is to be cleaned with wire brush and chisel to remove excess material and making surface even. scaffolding and props are to be provided for accessibility of the desired location specified by the engineer incharge.at all floors / all levels / all heights.

1. MATERIALS

- PU Foam: Approved grade, suitable for cracks and holes in masonry/concrete surfaces.
- Accessories: Backer rods or fillers as required for deep cracks.

2. WORKMANSHIP

1. Surface Preparation:
 - Clean cracks and holes using a small air blower to remove dust and debris.
 - Widen cracks to 10 mm or more width and up to 20 mm depth for proper foam penetration.
2. Filling:
 - Inject PU foam to completely fill cracks and holes.
 - Ensure proper flow of material to all voids.
3. Finishing:
 - After curing, remove excess foam using wire brush and chisel.
 - Ensure surface is smooth, level, and even, ready for subsequent finishes.
4. Accessibility & Safety:

- Provide scaffolding and props for access to all specified locations safely.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meter**
- Rate includes Supply of PU foam and accessories Cleaning, preparation, and widening cracks Application, curing, and finishing Labour, scaffolding, and all required accessories Making the surface ready for further finishes

ITEM NO – 108

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. MATERIAL

Door Shutter: 35 mm thick flush door shutter with both sides veneer finish (approved design and shade).

Frame: Indian teak wood, seasoned and chemically treated for termite and moisture resistance.

Hardware & Fixtures:

- Hinges, mortice lock, handles, door stopper, door closer.
- Black enamelled iron oxidized fastenings.
- All hardware to be of approved make and quality.

Finish: PU polish of approved quality for all exposed wooden surfaces.

2. WORKMANSHIP

General

- Doors shall be fabricated and installed strictly in accordance with approved drawings.
- Only skilled carpenters and trained personnel shall carry out the installation.

Frame Installation

- Frames shall be fixed in true line and level using approved fastenings.
- Ensure correct alignment and plumb to allow smooth door operation.

Shutter Fixing

- Doors shall be hung on pre-installed hinges, ensuring smooth operation without gaps.
- All hardware shall be fixed in approved positions.

Finishing

- Apply PU polish on all exposed surfaces to achieve uniform sheen and smooth finish.
- Edges, corners, and joints to be perfectly finished.

Quality Checks

- Doors shall operate smoothly without obstruction.
- Hardware and fixtures shall function properly.
- Surface shall be free from scratches, dents, or blemishes.

Handling & Storage

- Doors and shutters to be stored in a dry, covered area before installation.
- Care shall be taken to avoid scratches, warping, or moisture damage.

Fixing in Position

- Shutters to be fixed to frames with approved hinges and hardware.
- Ensure level, plumb, and flush alignment with surrounding surfaces.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meter (m²)** of shutter area or per door set (single/double) as specified.
- Rate Includes Supply of all materials (shutter, frame, veneer, hardware). PU polish finish. Labour for fabrication, installation, and finishing. Transportation, handling, scaffolding, lead, and lift. All applicable taxes, duties, and statutory obligations.

ITEM NO – 109

Wooden sliding door : This premium veneer-finished sliding door features a BWP-grade core with natural wood veneers, finished in high-quality PU or Melamine polish. It operates on a heavy-duty top-hung aluminium track with precision ball-bearing rollers, floor guides, and soft-close dampers, ensuring a silent, space-saving, and aesthetically superior architectural solution.at all floors / all levels / all heights.

1. MATERIAL

Door Shutter:

- BWP (Boiling Water Proof) grade flush core with natural wood veneer finish.
- Thickness as per approved drawings (typically 35–40 mm).
- Finished with high-quality PU or Melamine polish, uniform and scratch-resistant.

Track & Roller System:

- Heavy-duty top-hung aluminium track of approved make.
- Precision ball-bearing rollers for smooth and silent operation.
- Floor guide to ensure linear motion and stability.
- Soft-close dampers for controlled closing.

Hardware & Accessories:

- Handles, locks, stoppers, and all necessary fittings as per approved design.

- All hardware shall be corrosion-resistant and of approved quality.

2. WORKMANSHIP

General

- Doors shall be fabricated, finished, and installed as per approved design drawings.
- Only skilled carpenters and trained installation personnel shall execute the work.

Frame & Track Installation

- Aluminium track shall be fixed in true line and level using approved anchors and fasteners.
- Floor guides shall be aligned with the track to ensure smooth movement of the door.

Shutter Fixing

- Door shutters shall be hung on top-hung rollers with precision alignment.
- Soft-close dampers shall be adjusted to ensure controlled, silent closing.
- Door operation shall be smooth without derailing or scraping.

Finishing

- All exposed surfaces to be finished with uniform PU or Melamine polish.
- Edges, corners, and veneer joints shall be seamless and free of defects.

Handling & Storage

- Door shutters shall be stored in a dry, dust-free area prior to installation.
- Handle carefully to prevent scratches, dents, or warping.

Quality Checks

- Sliding operation must be smooth, silent, and aligned.
- Soft-close dampers to function correctly.
- All hardware to be secure and operational.
- Surface free of scratches, stains, or polish defects.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meter** of door shutter area or per sliding door unit, as specified.
- Rate Includes Supply of all materials (shutter, veneer, PU/Melamine polish, aluminium track, rollers, dampers, floor guides, hardware). Fabrication, finishing, and installation. Transportation, handling, scaffolding, lead, and lift. All applicable taxes, duties, and statutory obligations.

ITEM NO – 110

ARABIAN CURTAIN : providing and fixing areabian curtain including installation, fabric, operation system complete. Arabian curtains as per given size on a heavy-duty channel with fabric weighing 250 GSM in mix of cotton/polyester 55% with different designs and colours available to choose from with Blackout fabric in Lining material.at all floors / all levels / all heights.

1. MATERIAL

Fabric:

- Heavy-duty curtain fabric, 250 GSM, blend of 55% cotton and 45% polyester.
- Available in different designs, shades, and colours as per approved sample.
- Blackout lining fabric included for full opacity and light control.

Channel / Track System:

- Heavy-duty aluminium or stainless-steel curtain track suitable for the specified curtain size.
- Smooth gliding system with durable rollers or carriers for long-lasting operation.

Operation System:

- Manual pull cord / draw rod or motorized system (as specified) for smooth opening and closing.
- All components corrosion-resistant and of approved quality.

Accessories:

- End stops, brackets, hooks, rings, and tiebacks as required for proper installation.
- Mounting hardware suitable for wall/ceiling fixing.

2. WORKMANSHIP

General

- Curtains shall be supplied and installed as per approved drawings and dimensions.
- Skilled personnel shall carry out precise measurement, cutting, and fixing.

Fabric Preparation & Installation

- Fabric shall be cut and hemmed neatly according to the curtain size.
- Lining fabric shall be attached to main curtain for blackout effect.
- Curtains shall hang straight and evenly with no wrinkles or uneven folds.

Track & Operation System

- Tracks shall be fixed in true line and level using appropriate brackets and fasteners.
- Roller or carrier system to allow smooth movement of curtain along entire length.
- Motorized or manual operation to function silently and reliably.

Finishing

- Curtain folds, pleats, and edges shall be uniform and aesthetically pleasing.
- Tiebacks and accessories installed as per design.
- Final adjustment to ensure free movement and correct alignment.

Handling & Storage

- Curtains and hardware shall be stored in clean, dry conditions prior to installation.

- Fabric shall be protected from stains, dust, and moisture during handling.

Quality Checks

- Track and hardware securely fixed.
- Smooth operation of curtain without snagging or obstruction.
- Fabric free from stains, tears, or defects.
- Correct alignment of blackout lining for full opacity.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meter** of curtain fabric or per curtain unit, as specified.
- Rate Includes Supply of fabric (including blackout lining). Aluminium/stainless steel track and carriers. Manual or motorized operation system. Installation including brackets, accessories, tiebacks, and hardware. Transportation, handling, scaffolding, lead, and lift. All applicable taxes, duties, and statutory obligations.

ITEM NO – 111

SHEER CURTAIN : providing and fixing sheer curtain including installation, fabric, operation system complete. Sheer curtains stitched in Arabian style/Box pleat or as required by architect as per given size on heavy duty channel with fabric weighing more than 100 GSM with range of colours and textures to choose from. all item shall be done as per approved sample.at all floors / all levels / all heights.

1. MATERIAL

Fabric: Sheer curtain fabric with weight ≥ 100 GSM.

- Fabric to be available in a range of approved colours, textures, and patterns.
- Fabric shall be light, semi-transparent, and suitable for soft drape effect.

Style & Pleating:

- Curtains shall be stitched in Arabian style, box pleat, or as per architect's direction.
- Stitching shall be neat and uniform for aesthetic appeal.

Track / Channel System:

- Heavy-duty aluminium or stainless-steel track suitable for the curtain size.
- Smooth gliding system with durable carriers/rollers for easy operation.

Operation System:

- Manual pull cord/draw rod or motorized operation (as approved).
- Operation components to be corrosion-resistant and approved quality.

Accessories:

- End stops, brackets, hooks, rings, tiebacks, and mounting hardware as required.

2. WORKMANSHIP

General

- Precise measurement of window/opening size prior to fabrication.
- Curtains shall be supplied, cut, stitched, and installed as per approved sample and drawings.

Fabric Preparation & Installation

- Fabric shall be hemmed and stitched neatly according to pleat style approved by architect.
- Curtains shall hang evenly and drape softly with no wrinkles or puckering.
- Pleats shall be uniform in size and spacing, and aligned horizontally.

Track & Operation System

- Tracks to be fixed in true line and level using appropriate brackets and fasteners.
- Rollers or carriers shall allow smooth and silent movement of curtains.
- Motorized or manual operation system to function reliably as approved.

Finishing

- Tiebacks and accessories installed as per design.
- Final adjustment to ensure free movement, proper pleat formation, and correct alignment.

Handling & Storage

- Fabric and hardware to be stored in dry, clean conditions before installation.
- Fabric shall be protected from stains, dust, moisture, and damage during handling.

Quality Checks

- Track and hardware securely fixed and functioning.
- Curtains aligned correctly and free from defects in fabric or stitching.
- Smooth operation of manual/motorized system.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meter** of curtain fabric or per curtain unit, as specified.
- Rate Includes Supply of fabric. Heavy-duty aluminium/stainless steel track and carriers. Manual or motorized operation system. Installation including brackets, accessories, tiebacks, and hardware. Transportation, handling, scaffolding, lead, and lift. All applicable taxes, duties, and statutory obligations.

ITEM NO – 112

Drywall Partition of 100mm : Providing and fixing Dry wall partition of 100 mm thick Gypsteel Ultra™ stud partition which includes one layer of tapered edge 12.5 mm thick Gyproc® Duraline (Conforming to EN 520:2004, Type D,F, I & R) is screw fixed with drywall Screws of 25 mm at 300mm Centers to either side of 70 mm Gypsteel Ultra™ C stud (0.5mm thick having one flange of 34 mm and another flange of 36mm made of GI steel) placed at 610 mm center to in 72 mm Gypsteel Ultra™ floor and ceiling channel (0.5 mm thick have equal flanges of 32 mm made of GI

steel). which is anchored to the floor & ture ceiling using suitable anchor fasteners or metal screws with nylon plugs. The boards are to be fixed to the frame work with joints staggered to avoid leakage through joints. A rockwool of good quality is provided between the two boards. Finally square and tapered edges of the boards are to be jointed and finished so as to have flush look which includes filling and finishing with Gyproc jointing compound and Gyproc joint paper tape (as per recommended practices of saint-Gobain Gyproc India). at all floors / all levels / all heights.

1. MATERIAL

Gyproc® Duraline Board:

- Tapered edge, 12.5 mm thick.
- Conforms to EN 520:2004, Type D, F, I & R.
- Fire, water, and impact resistant as required.

Gypsteel Ultra™ Studs & Channels:

- C Studs: 70 mm width, 0.5 mm thick, flanges 34 mm & 36 mm.
- Floor & Ceiling Channels: 72 mm width, 0.5 mm thick, equal flanges of 32 mm, made of GI steel.
- Placed at 610 mm centers vertically.

Fixing Accessories:

- Drywall screws 25 mm at 300 mm centers.
- Anchor fasteners / metal screws with nylon plugs for floor and ceiling anchoring.

Insulation:

- Rockwool of approved quality, suitable for thermal and acoustic insulation.

Jointing Materials:

- Gyproc jointing compound and Gyproc joint paper tape, as per Saint-Gobain Gyproc India recommended practices.

2. WORKMANSHIP

Framework Installation

- Floor and ceiling channels are securely anchored with suitable fasteners.
- C studs are fixed into channels at 610 mm centers.
- Joints in the frame are properly aligned and leveled.

Board Fixing

- Gyproc boards fixed to both sides of studs using 25 mm drywall screws at 300 mm centers.
- Board joints staggered to avoid through-joints.

Insulation

- Rockwool insulation inserted between boards before finishing.

Joint Finishing

- Square and tapered edges jointed using Gyproc jointing compound.
- Joint paper tape embedded to ensure flush and smooth finish.
- All surfaces finished to a flush, smooth appearance, ready for painting or further decoration.

General Requirements

- Work shall comply with Saint-Gobain Gyproc India guidelines.
- All materials and workmanship must conform to approved samples and drawings.
- All scaffolding, props, and lead/lift requirements are included.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (m²)** of finished partition surface.
- Measurement includes both sides of the partition, including insulation and finished joints.
- Rate Includes Supply of Gyproc boards, Gypsteel Ultra™ framework, rockwool insulation, screws, fasteners, and jointing materials. Anchoring, alignment, leveling, and installation. Jointing, filling, sanding, and finishing to flush surface. Scaffolding, transport, handling, and all lead/lift. All labour, taxes, and statutory obligations.

ITEM NO – 113

Providing and fixing Wooden Partition with using aluminium Pipe 50 x 25mm framing, 12mm Plywood, 3-5 mm thick VENEER with solid wood moulding etc. Completed. All work includes required all necessary hardware and labour. Work includes cost of site installation complete as directed by architect and concern engineer in charge. at all floors / all levels / all heights.

1. MATERIAL

Aluminium Frame:

- Extruded aluminium pipe, 50 × 25 mm section.
- Shall be anodized or powder-coated as per approved sample.
- Suitable for load-bearing partition framing.

Plywood:

- 12 mm thick BWP / BWR grade plywood, moisture-resistant.
- Conforms to IS 303: Part 1 / IS 710:2009 or equivalent.

Veneer:

- Natural wood veneer, thickness 3–5 mm, of approved shade and pattern.
- Bonded to plywood with adhesive conforming to IS 848.

Solid Wood Moulding:

- Approved hardwood species, finished and polished as per architect's design.

Fixing Accessories:

- Screws, fasteners, brackets, clips, and other necessary hardware for assembly and installation.

Finishes:

- PU / Melamine polish or approved lacquer finish.

2. WORKMANSHIP

Framework Installation

- Aluminium pipe frame to be aligned, leveled, and anchored securely at floor and ceiling.
- Vertical and horizontal members placed as per approved shop drawings.

Panel Fixing

- 12 mm plywood panels fixed on aluminium frame using screws or approved mechanical fasteners.
- Veneer applied to plywood panels with adhesive and pressed for uniform bonding.

Moulding & Detailing

- Solid wood moulding fixed at edges, corners, and junctions as per design.
- All joints and edges finished flush, neat, and smooth.

General Requirements

- Work to be executed as per approved architectural drawings and directions of Engineer-in-Charge.
- All scaffolding, props, and accessibility requirements are included.
- Partition shall be free of gaps, warping, or defects, and ready for final finish.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (m²)** of finished surface. Includes aluminium framing, plywood, veneer, moulding, and all necessary hardware.
- Rate Includes Supply of all materials: aluminium frame, plywood, veneer, solid wood moulding, fasteners, and adhesive. Cutting, shaping, fixing, and finishing. Labour for assembly and site installation. Scaffolding, transportation, handling, and lead/lift. All taxes and statutory obligations.

ITEM NO – 114

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. MATERIAL

Framing System:

- Close stud type wall panelling framing of approved make (e.g., Gypsteel ULTRA Closed Stud, Saint-Gobain)
- Stud Size: 48 × 0.6 mm, spaced at 600 mm c/c
- Floor & Ceiling Channels: 50 × 0.5 mm
- Bracing, noggin channels, and necessary accessories such as rawl plugs, angle cleats, SS 304 fasteners as per vendor specifications.

Plywood:

- 12 mm thick water-resistant BWR/BWP grade plywood conforming to IS 303
- Fixing with SS 304 screws as suggested by framing vendor.

Veneer:

- Thickness: 3.5–4 mm
- Approved make, uniform straight lines, light-colored from matching lot
- Applied over plywood or other panelling surfaces, including fixed partitions and ceilings
- Fixed using nails, screws, adhesives, or bonding agents as per approved design.

Polish / Finish:

- High-quality PU or Melamine polish
- Approved shade, texture, and finish as per architect's sample

False Ceiling Accessories:

- Screws, adhesives, and bonding agents suitable for gypsum surfaces
- Supports for veneer panels over gypsum false ceiling

2. WORKMANSHIP

Framing Installation

- Close stud framing installed plumb, leveled, and aligned at specified spacing
- Studs fixed to floor and ceiling channels with angle cleats, SS 304 fasteners, and bracing
- Noggin channels installed at intermediate points for rigidity

Plywood Installation

- 12 mm BWR plywood fixed to framing using SS 304 screws
- Joints staggered and properly aligned for flush surface

Veneer Application

- Veneer selected for uniform color and straight grain
- Applied over plywood panels with adhesive / bonding agent
- Fixed using nails, screws, or approved fasteners
- Edges and joints finished neatly to avoid gaps or misalignment

Polishing

- PU / Melamine polish applied to veneer surface
- Finished as per approved shade, texture, and gloss

False Ceiling Work

- Veneer applied over gypsum ceiling panels using screws or adhesive
- Panels fixed as per drawings, with uniform alignment and smooth surface
- Polishing completed as per wall panelling specification

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (m²)** of finished veneer area Actual laid area shall be measured without accounting for wastage
- Rate Includes Supply of all materials: framing, plywood, veneer, fasteners, adhesives, polish Cutting, fixing, finishing, and polishing Labour, scaffolding, props, and lead/lift All hardware and accessories for both wall and ceiling work Complete execution at all floors, levels, and heights

ITEM NO – 115

Providing and laying tactile tile (for vision impaired persons as per standards) of size 300x300x9.8mm having with water absorption less than 0.5% and conforming to IS: 15622 of all colours and shades in for outdoor floors laid on 20mm thick base of cement mortar 1:4 (1 cement : 4 coarse sand) in all shapes & patterns including grouting the 1061 sub head : 16- road work joints with white cement mixed with matching pigments etc. complete All the work shall be done as per instruction given by EIC at all floors / all levels / all heights.

1. MATERIAL

Tactile Tile:

- Size: 300 × 300 × 9.8 mm
- Water absorption: ≤ 0.5%
- Conformance: IS: 15622
- Colours & Shades: As approved by Engineer-in-Charge

Cement Mortar Base:

- Mix: 1:4 (1 cement : 4 coarse sand)
- Thickness: 20 mm

Grouting Material:

- White cement mixed with pigment to match tile colour

2. WORKMANSHIP

Surface Preparation

- Existing surface cleaned and leveled to receive tactile tiles
- Ensure proper drainage slope and flatness as per design

Laying Tiles

- Tiles laid on 20 mm thick cement mortar bed (1:4)
- Tiles to be properly aligned, leveled, and spaced as per approved pattern
- Shapes and patterns executed according to design drawings and standards for visually impaired accessibility

Grouting

- All joints grouted using white cement mixed with pigment
- Ensure joints are flush and free from voids or excess grout

Finishing

- Tiles cleaned after grouting
- Edges and surfaces checked for proper adhesion and alignment
- Any damaged or misaligned tiles replaced before final acceptance

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (m²)** of finished laid tiles
- Rate Includes Supply of all tactile tiles of approved size, colour, and make Cement, sand, white cement, and pigment for mortar and grouting Labour for laying, alignment, grouting, and finishing Scaffolding, props, lead and lift, and all accessories required for completion Execution as per IS: 15622 and instructions of Engineer-in-Charge

ITEM NO – 116

Granite ANCHOR Fastner: Providing and supplying Threaded Rod of suitable grade (5.8/8.8) of sizes ranging from M8 to M30. Design of Anchor should be done as per IS 1946 using PROFIS Engineering Software as per actual load data (for special cases it shall be done as per EC2 Part-4) and site conditions as provided by structural consultant and the report to be submitted to the project manager/ design engineer for approval. The Anchor should possess ETA Certificate for use in Cracked Concrete, approved as per Seismic Condition (equivalent to C2 Category of ETA). The product should be approved by ICC, CSTB, COLA, BZS with Shock approval, Fatigue and Fire Approvals. The chemical should have an ETA approval for 100 years age testing. Drilling hole with appropriate drill bits to the required depth by rotary hammer drill, cleaning with brush and jet of clean air to ensure dust-free clean holes and proper bonding of chemical, filling resin and hardener using serrated nozzle to eliminate mixing error with standard HDE A22 battery dispenser along with piston plug. Scanning before drilling to be done with Hilti PS Scanning tool to avoid rebar hits.at all floors / all levels / all heights.

1. MATERIAL

Threaded Rod:

- Grade: 5.8 / 8.8 (as per design load)
- Diameter: M8 to M30, as per site requirement and structural calculation

Anchor Design:

- Designed as per IS 1946 using PROFIS Engineering Software
- For special cases, design as per EC2 Part-4
- Site conditions and actual load data to be considered
- Design report to be submitted to Project Manager / Design Engineer for approval

Chemical Anchor Resin & Hardener:

- ETA Certified for use in cracked concrete (C2 Category equivalent for seismic conditions)
- Approved by ICC, CSTB, COLA, BZS
- Shock, fatigue, and fire resistant
- 100-year age testing ETA certified

Accessories:

- Serrated nozzle to ensure proper resin-hardener mixing
- Piston plug, HDE A22 battery dispenser

2. WORKMANSHIP

Surface Preparation & Drilling

- Scan the area before drilling with Hilti PS Scanning Tool to avoid rebar hits
- Drill hole to required depth using rotary hammer drill and appropriate drill bits
- Clean drilled hole thoroughly using brush and compressed air to remove dust and debris

Chemical Injection & Anchor Fixing

- Inject chemical resin and hardener through serrated nozzle using HDE A22 battery dispenser
- Ensure proper mixing and avoid any voids
- Insert threaded rod into prepared hole
- Maintain proper alignment and embedment as per approved design

Curing & Testing

- Allow chemical to cure as per manufacturer's instructions
- Check for proper bonding and load-bearing capacity
- Anchors to resist shear, tensile, and seismic loads as per design

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **number** of anchors installed
- Measurement based on approved design load, diameter, and embedment depth
- Rate Includes Supply of threaded rods of required grade and diameter Design and approval using PROFIS / EC2 methodology Chemical resin, hardener, nozzles, piston plug, and dispenser usage Drilling, cleaning, insertion, curing, and alignment Site verification, testing, and approvals Scaffolding, props, lead and lift

ITEM NO – 117

Double Leaf Glass Door with floor Spring Pivot : Providing and fixing in position full height 12 mm thick toughened glass door with all necessary accessories as per approved selection by Architect / Engineer in charge. 12 mm thick make customized clear toughened glass, edge polished prepared with stainless steel patch fittings with locking arrangement / fixing Each glass panel secured to the floor by stainless steel patch fittings with locking arrangement/ fixing Each glass panel secured to the floor by stainless steel patch fitting item includes all necessary fitting/ fixing , fixtures like Hardware system like (Corner hinges with pivot, Glasklar Lock, Door Handle, key, round shape lock with aluminium cover , Door stop) complete as per Specification drawing approval and instructions of the Architect / Engineer in charge. Rate shall be inclusive of all material loading unloading at all height and all floor sample mock shall be approved from Architect / Engineer in charge. Provide floor spring .at all floors / all levels / all heights.

1. MATERIAL

Glass Panel:

- 12 mm thick fully toughened clear glass, manufactured to IS 2553 / EN 12150 standards
- Edge polished, defect-free, and heat-strengthened for safety
- Customized as per approved design and dimensions

Patch Fittings & Hardware:

- Stainless Steel Patch Fittings for floor and glass fixing
- Corner Hinges with Pivot, floor spring, door stops, locks, handles
- Glasklar Lock / Round Shape Lock with aluminum cover
- All fittings to be of approved make, corrosion-resistant and heavy-duty

Floor Spring:

- Heavy-duty, suitable for double leaf pivot doors, certified for minimum 100,000 cycles
- Adjustable closing and hold-open mechanism

2. WORKMANSHIP

General

- Doors to be installed plumb, level, and square
- Glass panels to be handled with care to avoid scratches or breakage
- Floor spring and pivot system to be installed as per manufacturer's instructions
- All fixtures and fittings shall be fixed rigidly and aligned for smooth operation

Installation Process

1. Prepare Floor & Frame:
 - Ensure the floor is leveled and prepared for floor spring installation
 - Mark exact pivot and hinge points
2. Floor Spring & Patch Fittings Installation:
 - Install floor spring and stainless steel patch fittings per approved layout
 - Secure all fixing screws and anchors
3. Glass Panel Fixing:
 - Carefully lift and position each 12 mm toughened glass panel
 - Fix panels into patch fittings, ensuring proper alignment and clearance
 - Tighten locking mechanisms without over-stressing glass
4. Hardware Installation:
 - Install door handles, corner hinges, locks, and door stops
 - Check smooth operation of double leaf opening and closing
 - Adjust floor spring tension and closing speed

FINISH & QUALITY CONTROL

- Glass shall be free from bubbles, scratches, or cracks
- All stainless steel accessories shall be mirror / satin polished as per approved finish
- Door operation shall be smooth, silent, and stable, with proper closing and locking function
- Sample mock-up approval required from Architect / Engineer-in-Charge before full installation

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (sqm)** of glass door area
- Includes glass panel, hardware, floor spring, and all accessories Supply and installation of 12 mm toughened glass panels Stainless steel patch fittings, floor spring, locks, handles, corner hinges, door stops Cutting, edge polishing, fixing, leveling, and alignment Transportation, loading, unloading, scaffolding, and handling at all floors / heights Sample mock approval from Architect / Engineer-in-Charge

ITEM NO – 118

Gypsum Ceiling: Pro. And fixing single layer water 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 x 3 mm with intermediate channel of 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 soffit cleat, anchor fastener, scotch bolt connecting cleat, joining compound top coat on ceiling incl. making necessary opening for light fitting, diffuser etc. comp. as per detail drawing as directed at all floors / all levels / all heights.

1. MATERIAL

Gypsum Board:

- 12.5 mm thick, waterproof gypsum board, size 1220 mm × 1830 mm × 8.0 mm
- Conforming to IS 2095 / ASTM C1396 standards for ceiling use
- Fire retardant and moisture resistant

Suspension System:

- Main Channel / Section: GI channel, 40 mm × 35 mm × 0.55 mm, spaced at 457 mm c/c
- Intermediate Channel: 18 mm × 40 mm × 0.8 mm, spaced at 1220 mm c/c
- Perimeter / Edge Channel: 20 mm × 27 mm × 30 mm × 0.5 mm
- Suspender / Hanger: GI suspender channel, 25 mm × 3 mm

Accessories:

- Paper tape for joint finishing
- Screws, soffit cleats, anchor fasteners, scotch bolts
- Gypsum jointing compound and finishing coat

2. WORKMANSHIP

Framework Installation

1. Install perimeter channels along walls and edges at required heights using anchor fasteners.
2. Fix suspender channels from RCC slab/ceiling at approved spacing, ensuring level and plumb alignment.
3. Install main and intermediate channels between suspender channels, ensuring proper interlocking and stability.

Board Fixing

1. Gypsum boards are screwed to the framework using appropriate screws at recommended spacing.
2. Joints between boards are staggered to avoid leakage lines.
3. Paper tape is applied over joints, and gypsum joint compound applied and finished smooth.

Openings

- Necessary cutouts shall be provided for lights, diffusers, air-conditioning vents, and other services
- Openings to be neat, aligned, and reinforced at edges as required

Finishing

- Ceiling surface shall be smooth, even, and free from cracks
- All joints and corners finished with Gypsum joint compound
- Top coat applied as per approved sample

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (sqm)** of ceiling area actually laid
- Includes framework, gypsum boards, accessories, finishing, and openings Supply and installation of waterproof gypsum board GI framing channels, hangers, cleats, fasteners, and bolts Paper tape, jointing compound, and finishing top coat Making openings for lights, diffusers, and other services All scaffolding, lead, lift, and labour

ITEM NO – 119

Calcium Silicate Ceiling: Providing and fixing eco-friendly light weight calcium silicate false ceiling tiles having Tegular edge & 15mm Thick Densified edges on the Tile Periphery for Extra Strength

The Lightweight calcium silicate ceiling tiles shall have, light reflection 85% non combustible as per B.S. 476 part IV, 100% humidity resistance and also having thermal conductivity 0.043^{°w/mK} for the best thermal Insulation . The Lightweight calcium Silicate tile shall be of approved texture Fine fissured/Spintone/Cosmos having NRC value of 0.5 & Globe having NRC value of 0.75 NRC or equivalent of size 595X595mm to be laid on true horizontal level suspended inter locking metal grid of hot dipped galvanized steel sections (galvanizing @120 grams per sqm including both side) consisting of main 'T' runner suitably spaced at joints to get required length and size of 24X38mm made from 0.30mm thick (minimum) sheet, 1200mm centre to centre, and cross 'T' of size 24 X 28mm made out of 0.33mm (Minimum) sheet spaced 1200mm along space etc. An additional 4mm thick PVC strip of 40mm width is to be stuck on the interior side of the C channel using PVC solvent adhesive complete as per direction of Engineer in charge, manufactures. at the back sides so that 'L' shape outer PVC beading can be removed when required for replacement of broken glass etc. complete as per direction of etc. complete as per direction of Engineer in charge and manufacture's specification. centre with 25mm long drywall screws @230mm interval and laying 15mm thick Densified edges light weight calcium silicate ceiling tiles of approved texture (Fine Fissured/Cosmos/Spintone) in the grid including, cutting /making opening for services like diffusers, grills, light fittings, fixtures, smoke detectors etc., wherever required, Main 'T' runners to be suspended from ceiling using G.I. slotted cleats of size 25X35X1.6mm fixed to ceiling with 12.5mm dia and 50mm long dash fasteners, 4mm G.I. adjustable rods with galvanized steel level clip of size 85X30X0.8mm, spaced at 1200mm centre to centre long main 'T' bottom exposed with 24mm of all T-sections shall be pre-painted with polyester baked paint, for all heights, as per specifications, drawings and as directed by engineer-in charge. Note:- Only calcium silicate false ceiling area will be measured from wall to wall. No deduction shall be made for exposed frames/opening (cutouts) having area less than 0.30 sqm. The calcium silicate ceiling tiles shall have NRC. Value of 0.50 (Minimum) for Fine fissured/Spintone/Cosmos and 0.75 NRC for Globe, light reflection 85% non-combustible as per

B.S.476 part IV, 100% humidity resistance and also having thermal conductivity. 0.043° w/m KC.for the best thermal Insulation .at all floors / all levels / all heights.

1. MATERIAL

Calcium Silicate Tiles:

- Thickness: 15 mm, with densified edges for extra strength
- Size: 595 mm × 595 mm
- Approved textures: Fine Fissured / Spintone / Cosmos / Globe
- Light reflection: ≥ 85%
- Fire rating: Non-combustible, as per BS 476 Part IV
- Humidity resistance: 100%
- Thermal conductivity: 0.043 W/m·K
- Noise Reduction Coefficient (NRC):

Texture	NRC Value
Fine Fissured / Spintone / Cosmos	0.50
Globe	0.75

Suspension System / Grid:

- Main 'T' runner: 24 mm × 38 mm, GI sheet, 0.30 mm thick, spaced 1200 mm c/c
- Cross 'T': 24 mm × 28 mm, GI sheet, 0.33 mm thick, spaced 1200 mm along main T
- Galvanization: Hot-dipped GI, ≥ 120 g/m² both sides
- PVC Strip: 4 mm thick × 40 mm width, stuck on interior of C-channel with PVC solvent adhesive for easy replacement

Accessories:

- GI slotted cleats: 25 mm × 35 mm × 1.6 mm
- Dash fasteners: 12.5 mm dia × 50 mm long
- GI adjustable rods with galvanized steel level clips: 85 mm × 30 mm × 0.8 mm
- Drywall screws: 25 mm long, spaced @ 230 mm

2. WORKMANSHIP

Framework Installation

1. Perimeter channels fixed to wall/ceiling using anchor fasteners.
2. Main 'T' runners suspended using GI adjustable rods and slotted cleats.
3. Cross 'T' runners interlocked with main runners at proper spacing.
4. All T-sections pre-painted with polyester baked paint on exposed faces.

Tile Installation

1. Tiles laid on true horizontal level within interlocking grid.
2. Densified edges allow snug fit and flush finish.
3. Tiles cut to accommodate services: diffusers, grills, light fittings, fixtures, smoke detectors, etc.

4. PVC beading removable for maintenance and replacement of tiles.

Alignment & Finishing

- Ensure tiles are level, straight, and flush across ceiling
- Openings $\leq 0.30 \text{ m}^2$ do not reduce measured area
- Complete cleaning of dust, adhesives, and cutting debris after installation

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (sqm)** of laid calcium silicate false ceiling
- Measurement wall-to-wall, without deductions for cutouts $< 0.30 \text{ m}^2$
- Rate Including Supply and installation of 15 mm calcium silicate tiles GI grid framework, T-sections, slotted cleats, fasteners, rods, and PVC strips Cutting, making openings for services, and finishing Pre-painted exposed T-sections All scaffolding, lead, lift, and labour

ITEM NO – 121

Hot dip GI pipe bracket holder with u bolt holder

The hot-dip galvanized (GI) pipe bracket holder 1/2 inch Galvanized Iron slotted Z-Patti with Heavy Duty U clamp with bolt 8mm is a durable and corrosion-resistant mounting solution designed for secure pipe support. Its robust construction ensures stability and long-lasting performance in various industrial and construction applications. The U-bolt holder provides a firm grip, preventing pipe movement and vibrations. Ideal for both indoor and outdoor use, this bracket offers easy installation and reliable strength, making it perfect for plumbing, electrical conduit, and mechanical piping systems. Its hot-dip galvanization guarantees enhanced rust protection in harsh environments.at all floors / all levels / all heights.

1. MATERIAL

Galvanized Iron (GI) Bracket / Z-Patti

- Shall be made from mild steel conforming to relevant IS standards.
- Size: Suitable for 1/2" pipe support.
- Thickness: Minimum 2 mm or as approved.
- Finish: Hot-dip galvanized conforming to IS 4759.
- Zinc coating: Minimum 80–120 microns or as specified.

U-Bolt Clamp with Nuts & Washers

- Material: Mild steel, hot-dip galvanized.
- Diameter: 8 mm
- Complete with nuts, washers, and threads.
- Shall provide firm grip and proper anchorage to pipe.

Fasteners / Anchors

- Anchor fasteners / rawl bolts of approved make.
- Suitable for fixing in RCC / brick masonry.
- All fasteners shall be corrosion resistant (GI / SS as approved).

2. WORKMANSHIP

Preparation

- Surface shall be checked for line, level, and fixing positions.
- Marking shall be done as per approved drawings/services layout.

Fixing of Bracket

- GI bracket (Z-patti) shall be fixed to RCC/brick surface using approved anchor fasteners.
- Proper alignment, spacing, and level shall be maintained.

Installation of U-Bolt Clamp

- Pipe shall be placed in position and secured using U-bolt clamp.
- Nuts shall be tightened uniformly to avoid pipe deformation.
- Ensure firm grip to prevent vibration and movement.

Alignment & Spacing

- Brackets shall be installed at regular intervals as per pipe size and standard practice.
- Pipes shall be properly aligned, levelled, and supported.

Protection & Finish

- Damaged galvanization (if any) shall be repaired with zinc-rich paint.
- All components shall be clean and free from rust, oil, or defects.

Quality & Safety

- Installation shall ensure:
 - No vibration or looseness
 - Proper load transfer
 - Safe and rigid support
- Work shall be executed with proper scaffolding and safety measures.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Numbers (Nos.)** of bracket assemblies installed.
- Each unit includes Supply of GI bracket, U-bolt, nuts, washers fasteners Hot-dip galvanization. Anchor fasteners and fixing accessories. Drilling, fixing, alignment, and installation. Labour, tools, plants, scaffolding. Transportation, lead, and lift.

ITEM NO – 122

PVC WATER STOP: Providing and fixing PVC water stop of approved make, 230/250/300 mm wide centre bulb or ribbed type,thickness range from 6 mm to 10mm, made of virgin flexible PVC, conforming to IS 12200, at all construction and expansion joints in underground RCC water storage tank, including cutting, heat welding of joints, fixing to reinforcement, proper alignment, embedding in concrete, complete as per drawings and directions of Engineer-in-Charge.Rate

includes for all levels and for all horizontal and vertical and inclined joints formed between old and new concrete pouring.

1. MATERIAL

PVC Water Stop

- Shall be made from virgin flexible PVC.
- Width: 230 mm / 250 mm / 300 mm (as specified).
- Thickness: 6 mm to 10 mm.
- Type:
 - Centre bulb type (for expansion joints)
 - Ribbed/dumbbell type (for construction joints)
- Shall conform to IS 12200.
- Shall be homogeneous, free from cracks, holes, or surface defects.

Accessories

- Binding wire for fixing to reinforcement.
- GI clamps / clips (if required).
- Heat welding equipment for joints.

2. WORKMANSHIP

Preparation

- Location of joints shall be identified as per drawings.
- Reinforcement shall be checked before placing water stop.

Fixing in Position

- Water stop shall be placed centrally in the joint such that:
 - Half width is embedded in first pour
 - Remaining half in second pour
- It shall be firmly tied to reinforcement using binding wire/clips at regular intervals.
- Proper alignment shall be ensured along the full length of joint.

Jointing / Welding

- Joints in water stop shall be made by heat welding.
- Welding shall ensure:
 - Continuity of profile
 - Watertight joint
- Site-made joints shall be tested visually for uniform fusion.

Concreting

- Concrete shall be placed carefully to avoid displacement or folding of water stop.
- Adequate compaction shall be ensured around the water stop.
- Care shall be taken to prevent honeycombing near joints.

Alignment & Protection

- Water stop shall be kept straight, without twisting or bending.
- During concreting, proper supports shall be provided to maintain position.

Application Area

- Suitable for:
 - Underground water tanks
 - Retaining structures
 - Basements
 - Water retaining RCC structures
- Applicable for horizontal, vertical and inclined joints.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **running meter (Rmt)** of PVC water stop fixed in position.
- Length shall be measured along the centerline of joints.
- Rate Includes Supply of PVC water stop. Cutting, placing, and fixing to reinforcement. Heat welding of joints. Labour, tools, and equipment. All lead, lift, scaffolding, and handling.

ITEM NO – 123

Providing and laying Heat resistance waterproof tiles on terrace level of approved make and shade including 200mm vata with matching pattern, with surface preparation, cleaning of existing terrace surface, applying cement mortar/adhesive as per manufacturer's specifications, laying tiles to proper line, level and slope towards rainwater outlets, cutting tiles to required size and shape, grouting joints with suitable material, curing complete, including all labour, materials, tools, complete as per drawings, specifications and directions of Engineer-in-Charge.

1. MATERIAL

Heat Resistant Tiles

- Shall be of approved make, colour, shade, and pattern.
- Type: Heat resistant / cool roof / reflective tiles.
- Thickness: Minimum 8–10 mm or as approved.
- Water absorption: $\leq 0.5\%$.
- Surface: Anti-skid and weather resistant.
- Shall withstand thermal variation and UV exposure.

Adhesive / Bedding Mortar

- Cement mortar: 1:4 (1 cement : 4 coarse sand) OR
- Polymer modified tile adhesive of approved make.
- Adhesive shall be suitable for exterior terrace application.

Jointing Material

- White/grey cement grout with matching pigment or

- Polymer-based tile grout.
- Waterproof and crack-resistant.

Waterproofing Layer (if applicable)

- Existing waterproofing surface shall be intact and approved before tile laying.
- Any damage shall be repaired prior to installation.

2. WORKMANSHIP

Surface Preparation

- Terrace surface shall be cleaned thoroughly:
 - Removal of dust, laitance, oil, loose particles.
- Surface shall be checked for slope and drainage.
- Repairs to cracks and undulations shall be carried out.

Laying of Tiles

- Tiles shall be laid to proper line, level, and slope towards rainwater outlets.
- Bedding:
 - 20–25 mm thick cement mortar OR adhesive layer as per manufacturer.
- Tiles shall be pressed and tapped gently to ensure proper bonding.
- Proper spacing shall be maintained for joints.

Cutting & Fitting

- Tiles shall be cut neatly to required size using tile cutter.
- Edges shall be smooth and properly aligned.

Jointing

- Joints shall be filled with approved grout.
- Excess grout shall be cleaned immediately.
- Joints shall be watertight and uniform.

Vata (Skirting)

- 200 mm high vata shall be provided along parapet/walls.
- Tiles shall be fixed vertically with proper alignment and matching pattern.
- Junctions between floor and vata shall be properly sealed.

Curing

- Curing shall be done for minimum 7 days (if cement mortar used).
- Area shall be protected from traffic during curing.

Finishing

- Final surface shall be:
 - Even and level
 - Free from lippage
 - Properly sloped for drainage

- Surface shall be cleaned and handed over in finished condition.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (sqm)** of finished tile surface with vata (skirting).
- Rate Includes Supply of tiles, adhesive/mortar, grout. Surface preparation and cleaning. Laying, cutting, fixing, and jointing. Providing 200 mm vata. Curing, finishing, scaffolding. Labour, tools, transportation, lead and lift.

ITEM NO – 124

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

1. MATERIAL

Base Material

- Stainless Steel (SS 304 Grade):
 - Thickness: 1.5 mm
 - Finish: Brush / matt finish or as approved
- Plywood / MDF:
 - Plywood: BWR/BWP grade conforming to IS 303 / IS 710
 - MDF: Interior/exterior grade as per requirement
 - Thickness: As per approved design

Lettering / Graphics

- Letters, numbers, logos, and symbols shall be:
 - Acid etched OR
 - CNC / laser cut
- Shall be sharp, uniform, and as per approved artwork.

Finish

- Duco paint / powder coating of approved shade and texture.
- Finish shall be smooth, uniform, and durable.

Fixing Accessories

- SS studs, screws, and fasteners (SS 304).
- Adhesives / double-sided industrial tape (where required).
- Spacers, brackets, or mounting systems as per design.

2. WORKMANSHIP

Fabrication

- Signage shall be fabricated strictly as per approved drawings and artwork.
- CNC / laser cutting shall ensure precision and clean edges.
- Acid etching shall be uniform with proper depth and clarity.

Surface Finishing

- All edges shall be smooth and burr-free.
- Painting / coating shall be done in controlled conditions.
- No visible defects such as scratches, bubbles, or uneven coating.

Fixing in Position

- Signage shall be fixed on:
 - RCC wall / brick masonry
 - Plywood / cement board / furniture / doors
- Proper alignment, level, and positioning shall be ensured.
- Fixing shall be:
 - Mechanical (SS studs/fasteners) OR
 - Adhesive-based as per requirement

Installation

- Marking shall be done before fixing.
- Holes shall be drilled neatly without damaging the surface.
- All signage shall be firmly fixed and stable.

Protection & Maintenance

- Protective film shall be removed after installation.
- Signage shall be kept clean and in good condition until project handover.
- Any damage during execution shall be rectified.

Quality Control

- Sample signage shall be approved before bulk production.
- Work shall match approved design, colour, font, and finish.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **square meters (sqm)** Area shall be measured based on overall size of signage panel.
- Rate Includes Design development (if required), fabrication, and supply. SS / plywood / MDF base material. CNC cutting / laser cutting / acid etching. Painting / powder coating / finishing. Fixing hardware, adhesives, and accessories. Installation, alignment, and finishing. Labour, tools, scaffolding, transportation, lead, and lift. Maintenance until project completion.

ITEM NO – 128

Delux/VIP :Provide and install a health faucet (bidet spray) set in polished chrome finish, including a durable trigger-operated ABS spray handset, a 1.2-meter flexible hose, and a matching wall-mounting bracket. The handset shall feature an anti-bacterial single-spray face for hygienic, efficient personal cleaning. Designed for durability, ease of operation, and reliable performance, the work shall include supply, wall fixing, water connection, and testing, with all necessary connectors, fittings, washers, wall fixings, and accessories to ensure a complete and fully functional installation at all floors, levels, and heights.

1. MATERIAL

Health Faucet (Hand Spray)

- Material: High-quality ABS plastic with chrome plated finish.
- Type: Trigger-operated.
- Spray: Single spray, anti-bacterial nozzle.
- Finish: Polished chrome.
- Shall be durable, corrosion-resistant, and leak-proof.

Flexible Hose

- Length: 1.2 meters (minimum).
- Material: PVC / stainless steel braided / reinforced hose of approved make.
- Shall be flexible, kink-resistant, and suitable for water pressure.

Wall Mounting Bracket

- Material: ABS / stainless steel.
- Finish: Chrome plated.
- Design: Suitable to hold spray firmly and safely.

Connection Accessories

- Angle valve / stop cock (if included in BOQ).
- Nipples, connectors, PTFE tape, washers, etc.
- All accessories shall be of approved make and compatible with system.

2. WORKMANSHIP

Preparation

- Location shall be as per approved plumbing layout and drawings.
- Wall surface shall be checked before fixing.

Fixing of Bracket

- Wall bracket shall be fixed firmly using screws and suitable plugs.
- Alignment and height shall be as per standard practice.

Installation of Faucet Set

- Flexible hose shall be connected securely to:

- Hand spray
 - Angle valve / water supply point
- Connections shall be properly tightened to avoid leakage.

Testing & Commissioning

- Water supply shall be turned on and tested.
- Check for:
 - Leakage at joints
 - Smooth trigger operation
 - Proper spray function

Finishing

- Installation area shall be cleaned after fixing.
- All fittings shall be free from scratches, stains, or defects.

Quality Requirements

- Operation shall be smooth and user-friendly.
- Spray shall be uniform and efficient.
- Product shall be durable and suitable for frequent use.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Numbers (Nos.)** of complete installed health faucet sets.
- Rate Includes Supply of health faucet, hose, and bracket. All connectors, fittings, washers, and accessories. Fixing, installation, and connection to water supply. Testing and commissioning. Labour, tools, transportation, lead, and lift.

ITEM NO – 129

VVIP: 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.

- Relevant to item specification shall be followed Item No - 128 & Item shall be Measuring & Payment paid a unit per **one Number (Nos)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 130

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. MATERIAL

Bib Tap Body

- Material: Brass / corrosion-resistant metal of approved make.
- Type: Wall-mounted 2-way bib cock.
- Finish: High-quality chrome plating (mirror/polished finish).
- Shall be heavy-duty, durable, and corrosion resistant.

Operating Mechanism

- Type: Quarter-turn lever control (2 separate controls).
- Cartridge: Ceramic disc cartridge for smooth, drip-free operation.
- Operation shall be smooth and leak-proof.

Outlets

- Dual outlet provision for simultaneous or independent usage.
- Outlet threads shall be standard size and compatible with accessories.

Accessories

- Wall flanges, washers, PTFE tape, connectors, etc.
- Angle valve / nipple (if required).
- All accessories shall be of approved make and compatible.

2. WORKMANSHIP

Preparation

- Location shall be marked as per plumbing drawings.
- Wall surface and pipeline alignment shall be checked.

Fixing in Position

- Bib tap shall be fixed to the wall outlet using proper threading and sealing.
- PTFE tape shall be used to ensure leak-proof joints.
- Tap shall be properly aligned and levelled.

Connection

- Connections shall be made to water supply line with proper fittings.
- Ensure tight and secure fixing without damaging threads.

Testing & Commissioning

- Tap shall be tested under working water pressure.
- Check for:
 - Smooth operation of both levers

- Proper functioning of both outlets
- No leakage at joints or body

Finishing

- All exposed surfaces shall be cleaned.
- Chrome finish shall be free from scratches, stains, or defects.

Quality Requirements

- Operation shall be smooth and effortless.
- No dripping or leakage permitted.
- Product shall be suitable for long-term use.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Numbers (Nos.)** of complete installed bib taps.
- Rate Includes Supply of bib tap with ceramic cartridge. All accessories, connectors, and fittings. Fixing, installation, and water connection. Testing and commissioning. Labour, tools, transportation, lead, and lift.

ITEM NO – 134

Delux/VIP: Provide and install a single-control tall basin mixer faucet in polished chrome finish for countertop or vessel washbasins. The faucet shall feature a high-arc spout and single lever control for smooth adjustment of water flow and temperature, with durable ceramic disc cartridges for drip-free performance. Installation shall include flexible hot and cold hoses and all necessary mounting hardware. Scope includes supply, fixing, water connections, sealing, alignment, testing, and commissioning, with all required connectors, washers, gaskets, and accessories at all floors, levels, and heights.

1. MATERIAL

Basin Mixer Body

- Material: High-quality brass / corrosion-resistant metal.
- Type: Single lever tall basin mixer.
- Design: High-arc spout suitable for vessel/countertop basins.
- Finish: Polished chrome plated (mirror finish).
- Shall be durable, rust-resistant, and aesthetically superior.

Operating Mechanism

- Type: Single lever control for hot and cold water mixing.
- Cartridge: Ceramic disc cartridge for smooth and drip-free operation.
- Operation shall be precise and long-lasting.

Spout

- High-arc spout providing adequate clearance for vessel basin use.
- Smooth internal flow with no splashing.

Flexible Connections

- Hot and cold flexible hoses (SS braided / reinforced).
- Length: Suitable for connection to supply lines.
- Shall be pressure resistant and leak-proof.

Mounting Accessories

- Fixing rods, nuts, washers, rubber gaskets, and base flange.
- All accessories shall be corrosion resistant.

2. WORKMANSHIP

Preparation

- Location shall be as per approved plumbing layout and basin position.
- Countertop opening shall be checked for correct size and alignment.

Fixing of Mixer

- Mixer shall be fixed vertically on basin/countertop using approved fittings.
- Proper tightening shall be ensured without damaging threads.

Water Connection

- Flexible hoses shall be connected to:
 - Hot water line
 - Cold water line
- PTFE tape / sealing material shall be used for leak-proof joints.

Alignment

- Mixer shall be properly aligned with basin center.
- Spout direction and height shall be adjusted correctly.

Testing & Commissioning

- System shall be tested under working pressure.
- Check for:
 - Smooth lever movement
 - Proper mixing of hot and cold water
 - No leakage at joints or body
 - Uniform flow without splashing

Finishing

- All exposed surfaces shall be cleaned and polished.
- Chrome finish shall be free from scratches or defects.

Quality Requirements

- Operation shall be smooth and noiseless.

- No dripping or leakage permitted.
- Suitable for premium/VIP installations.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Numbers (Nos.)** of complete installed basin mixer.
- Rate Includes Supply of basin mixer with ceramic cartridge. Flexible hoses, mounting hardware, and accessories. Fixing, installation, and connection to water supply. Sealing, alignment, testing, and commissioning. Labour, tools, transportation, lead, and lift.

ITEM NO – 135

VVIP: 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.

- Relevant to item specification shall be followed **Item No - 134** & Item shall be Measuring & Payment paid a unit per **one Number (Nos)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 137

Kitchen Sink Cock with Extended Swinging Spout: Providing and Fixing Single lever Deck Mount Kitchen Sink Cock with Extended Swinging Spout (Wall Mounted Model) With Wall Flange, in Polished Chrome of approved make and conforming to Manufacturers Standards.at all floors / all levels / all heights.

1. MATERIAL

Kitchen Sink Cock Body

- Material: High-quality brass / corrosion-resistant metal.
- Type: Single lever wall-mounted sink mixer.
- Finish: Polished chrome plated (mirror finish).
- Shall be durable, rust-resistant, and suitable for kitchen use.

Operating Mechanism

- Type: Single lever control for flow and temperature adjustment.
- Cartridge: Ceramic disc cartridge for smooth, drip-free operation.
- Operation shall be precise and long-lasting.

Spout

- Type: Extended swinging (rotatable) spout.

- Rotation: Minimum 180° or more for operational flexibility.
- Designed to cover larger sink area and facilitate ease of washing.

Wall Flange

- Material: Stainless steel / chrome plated.
- Finish: Matching with faucet.
- Shall provide neat and aesthetic finish at wall junction.

Accessories

- Eccentric nipples / connectors (if required).
- PTFE tape, washers, gaskets.
- All accessories shall be of approved make and compatible.

2. WORKMANSHIP

Preparation

- Location shall be marked as per kitchen layout drawings.
- Wall outlet alignment and level shall be checked.

Fixing in Position

- Sink cock shall be fixed to wall outlet using proper threading.
- PTFE tape shall be used to ensure leak-proof joints.
- Wall flange shall be fixed flush to wall surface.

Installation

- Spout shall be properly assembled and aligned.
- Ensure free and smooth rotation of swinging spout.

Alignment

- Tap shall be levelled and aligned with sink center.
- Spout direction shall be properly adjusted.

Testing & Commissioning

- Tap shall be tested under working water pressure.
- Check for:
 - Smooth lever operation
 - Proper mixing of hot and cold water (if applicable)
 - Free rotation of spout
 - No leakage at joints or body

Finishing

- All exposed parts shall be cleaned and polished.
- Chrome finish shall be free from scratches or defects.

Quality Requirements

- Operation shall be smooth and noiseless.
- No dripping or leakage permitted.
- Spout movement shall be flexible without looseness.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Numbers (Nos.)** of complete installed sink cock.
- Rate Includes Supply of sink cock with swinging spout. Wall flange, connectors, and accessories. Fixing, installation, and water connection. Sealing, alignment, testing, and commissioning. Labour, tools, transportation, lead, and lift.

ITEM NO – 139

Waterless and Odourless Urinal Kit : Providing & Fixing Waterless and Odourless Urinal kit in Urinal Poat including all material, labour etc. complete. The material grade of the same should be SS 304 with height of 90 mm and diameter of 39 mm along with membrane flap technology made with respect to IS-2963:1979. It should be assembled and fixed as per the direction of the Engineer-in-Charge.at all floors / all levels / all heights.

1. MATERIAL

Urinal Kit Housing

- Material: Stainless Steel (SS 304 Grade).
- Height: 90 mm.
- Diameter: 39 mm.
- Finish: Smooth, corrosion-resistant, and durable.

Membrane Flap System

- Type: Waterless membrane trap technology.
- Function: Allows urine to pass while preventing backflow of foul gases.
- Shall be replaceable and long-lasting.
- Designed for odour control without water usage.

Standards

- Shall conform to IS 2963:1979 (where applicable).
- Product shall be hygienic, non-corrosive, and suitable for sanitation use.

Accessories

- Sealing rings, washers, gaskets.
- Fixing components compatible with urinal outlet.
- All accessories shall be of approved make.

2. WORKMANSHIP

Preparation

- Urinal outlet shall be cleaned and checked before installation.
- Ensure proper alignment and compatibility with existing trap system.

Fixing in Position

- SS housing shall be inserted and fixed securely in urinal outlet.
- Proper sealing shall be ensured to avoid leakage.

Installation of Membrane System

- Membrane cartridge shall be installed as per manufacturer's instructions.
- Ensure correct positioning for proper functioning.

Testing & Commissioning

- System shall be tested to ensure:
 - Smooth flow of liquid
 - No leakage at joints
 - Effective odour control (no backflow of gases)

Finishing

- All exposed parts shall be cleaned and free from stains or damage.
- Installation shall be neat and properly aligned.

Maintenance Requirement

- Membrane cartridge shall be periodically checked and replaced as per usage.
- Cleaning shall be done using recommended cleaning agents only.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Numbers (Nos.)** of complete installed urinal kits.
- Rate Includes Supply of SS 304 urinal kit with membrane system. All fixing accessories, gaskets, and sealants. Installation, fixing, and sealing. Testing and commissioning. Labour, tools, transportation, lead, and lift.

ITEM NO – 140

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. MATERIAL

Soap Dispenser Bottle

- Material: Frosted glass of superior quality.
- Capacity: As per approved make (generally 250–300 ml).
- Finish: Smooth, uniform, and free from defects.

Holder / Bracket

- Material: Brass / Stainless Steel (SS 304) / chrome plated metal.
- Finish: Polished chrome to match bathroom fittings.
- Design: Suitable to securely hold glass bottle.

Pump Mechanism

- Type: Manual push-type dispenser.
- Material: Corrosion-resistant plastic / metal with chrome finish.
- Operation: Smooth and leak-proof.

Fixing Accessories

- Screws, wall plugs, anchor fasteners.
- All accessories shall be rust-resistant and of approved make.

2. WORKMANSHIP

Preparation

- Location shall be marked as per approved layout (generally near wash basin).
- Wall surface shall be checked for suitability.

Fixing of Holder

- Holder shall be fixed to wall using screws and suitable wall plugs.
- Proper alignment, level, and height shall be maintained.

Installation of Bottle

- Frosted glass bottle shall be placed securely in holder.
- Pump shall be fitted properly and tightened.

Testing

- Dispenser shall be tested for:
 - Smooth pump operation
 - Proper dispensing of liquid soap
 - No leakage from bottle or pump

Finishing

- All surfaces shall be cleaned after installation.
- Chrome finish shall be free from scratches or stains.

Quality Requirements

- Holder shall be firm and stable.
- Bottle shall fit properly without looseness.
- Operation shall be smooth and user-friendly.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Numbers (Nos.)** of complete installed soap dispensers.
- Rate Includes Supply of frosted glass bottle, holder, and pump. All fixing accessories and hardware. Installation, alignment, and fixing. Testing and commissioning. Labour, tools, transportation, lead, and lift.

ITEM NO – 141

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. MATERIAL

Soap Dish

- Type: Square wall-mounted soap dish.
- Material: Frosted glass / ceramic / stainless steel (SS 304) as approved.
- Shape: Square, with smooth edges and proper drainage slots.
- Finish: Uniform, free from cracks, chips, or defects.

Holder / Bracket

- Material: Brass / SS 304 / chrome plated metal.
- Finish: Polished chrome.
- Design: Suitable to firmly hold soap dish in position.

Fixing Accessories

- Screws, wall plugs, anchor fasteners.
- All accessories shall be rust-resistant and of approved make.

2. WORKMANSHIP

Preparation

- Location shall be marked as per approved layout (near wash basin/bath area).
- Wall surface shall be checked and made suitable for fixing.

Fixing of Holder

- Holder shall be fixed using suitable screws and wall plugs.
- Proper alignment, level, and height shall be maintained.

Installation of Soap Dish

- Soap dish shall be placed securely in the holder.
- Ensure proper seating and stability.

Sealing

- Joints between holder and wall shall be sealed using suitable sealant to prevent moisture ingress.

Testing

- Check for:
 - Stability and firmness of fixing
 - Proper placement without wobbling

Finishing

- All exposed surfaces shall be cleaned.
- Chrome finish shall be free from scratches, stains, or damage.

Quality Requirements

- Soap dish shall be properly aligned and level.
- Holder shall be rigid and durable.
- Installation shall be neat and aesthetically acceptable.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Numbers (Nos.)** of complete installed soap dish units.
- Rate Includes Supply of soap dish and holder. All fixing accessories and hardware. Installation, sealing, and alignment. Labour, tools, transportation, lead, and lift.

ITEM NO – 143

Delux/VIP :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.

- Relevant to item specification shall be followed **Item No - 144** & Item shall be Measuring & Payment paid a unit per **one Number (Nos)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 144

VVIP: Supply and install a premium recessed thermostatic shower system in polished chrome finish with MasterClean™ surfaces. The system includes a thermostatic trim and 4-outlet valve for precise temperature and flow control, a 330x230 mm single-function rainhead with wall arm, three adjustable square body sprays, a hand shower with hose and bracket, a wall-mounted bath spout, and a hidden linear floor drain. Installation shall include internal components, plumbing connections, sealing, and testing to ensure a leak-proof, fully functional luxury shower at all floors, levels, and heights.

1. MATERIAL

Thermostatic Control Valve & Trim

- Type: Concealed thermostatic mixer with 4-outlet diverter.
- Material: Brass (heavy-duty, corrosion-resistant).
- Finish: Polished chrome plated.
- Feature:
 - Precise temperature control
 - Anti-scald safety mechanism
 - Smooth lever/diverter operation
- Cartridge: High-performance thermostatic cartridge.

Rain Shower Head

- Size: 330 mm × 230 mm.
- Type: Single-function rain spray.
- Material: SS 304 / brass with chrome finish.
- Feature: MasterClean™ anti-limescale nozzles.
- Mounting: Wall-mounted with shower arm.

Body Sprays

- Quantity: 3 Nos.
- Type: Square adjustable body jets.
- Material: SS 304 / brass with chrome finish.
- Feature:
 - Adjustable direction
 - Anti-clog nozzles

Hand Shower Set

- Hand shower: Ergonomic design, single/multi-function.
- Hose: 1.2 m to 1.5 m flexible hose (SS braided/PVC).
- Bracket: Adjustable wall-mounted holder.
- Finish: Chrome plated.

Bath Spout

- Type: Wall-mounted spout.
- Material: Brass with chrome finish.
- Flow: Smooth discharge with proper projection.

Linear Floor Drain

- Type: Concealed / hidden linear drain.
- Material: SS 304.
- Feature:
 - Removable grating
 - Anti-odour trap
 - Easy maintenance
- Size: As per approved drawing.

Piping & Internal Components

- Pipes: CPVC / PPR / GI suitable for hot & cold water.
- Fittings: Elbows, tees, connectors, unions of approved make.
- All components shall withstand required pressure and temperature.

Accessories

- Wall flanges, brackets, fasteners.
- PTFE tape, sealants, gaskets.
- All accessories shall be corrosion-resistant and approved.

2. WORKMANSHIP

Preparation

- Marking of all fixture locations as per approved drawings.
- Ensure coordination with plumbing and finishing works.

Concealed Installation

- Thermostatic valve body and piping shall be fixed inside wall.
- Proper alignment and embedment depth shall be maintained.
- Pressure testing of concealed piping shall be done before closing.

Fixing of Fixtures

- Installation of:
 - Rainhead with arm
 - Body sprays at designated height
 - Hand shower with bracket
 - Bath spout
 - Linear drain with proper slope

Alignment & Positioning

- All fixtures shall be aligned true to line, level, and plumb.
- Body sprays and rainhead shall be positioned for effective coverage.

Sealing

- All threaded joints shall be sealed using PTFE tape/sealant.

- Wall penetrations shall be properly sealed to prevent leakage.

Testing & Commissioning

- System shall be tested for:
 - Leak-proof operation
 - Proper functioning of all 4 outlets
 - Accurate temperature control
 - Smooth diverter operation
- Drain shall be checked for proper flow and no stagnation.

Finishing

- Chrome surfaces shall be cleaned and polished.
- Installation shall be neat, aesthetic, and damage-free.

Quality Requirements

- No leakage, dripping, or vibration.
- Smooth operation of controls.
- Uniform water flow from all outlets.
- All components securely fixed.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Numbers (Nos.)** of complete installed system.
- Rate Includes Supply of complete shower system and all components. Concealed piping and internal fittings. Linear drain installation. Fixing, sealing, and alignment. Testing and commissioning. Labour, tools, transport, lead, and lift.

ITEM NO – 146

Provide and install a 6L step-on waste bin in stainless steel finish, including all necessary fixings and accessories, complete for all floors, levels, and heights as per project requirements.

1. MATERIAL

Outer Body

- Material: Stainless Steel (SS 202 / SS 304 as approved).
- Finish: Brushed / polished stainless steel finish.
- Capacity: 6 Litres.
- Surface: Smooth, corrosion-resistant, dent-free.

Inner Bucket

- Material: High-quality plastic (HDPE/PP).
- Type: Removable inner container with handle for easy cleaning.
- Capacity: Compatible with outer bin (approx. 6L).

Lid & Mechanism

- Type: Step-on pedal operated lid.
- Material: Stainless steel / ABS with soft-close mechanism (if specified).
- Operation: Smooth, noiseless opening and closing.

Pedal Assembly

- Material: Durable metal / heavy-duty plastic.
- Mechanism: Strong linkage system ensuring long life and repeated use.

Base

- Provided with anti-skid rubber base ring to prevent slipping and protect floor.

Accessories

- All internal linkages, hinges, and connectors.
- All components shall be rust-resistant and of approved make.

2. WORKMANSHIP

Preparation

- Location shall be as per approved layout (generally near wash basin/toilet area).
- Surface shall be clean and level.

Installation

- Bin shall be placed in designated location.
- No permanent fixing required unless specified.

Testing

- Check for:
 - Smooth pedal operation
 - Proper opening/closing of lid
 - Stability of bin on floor
 - Easy removal and placement of inner bucket

Finishing

- Surface shall be cleaned and free from scratches, dents, or stains.
- Protective covering (if any) shall be removed after installation.

Quality Requirements

- Pedal mechanism shall function smoothly without jamming.
- Lid shall close properly without noise.
- Bin shall be stable and aesthetically acceptable.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Numbers (Nos.)** of complete supplied and installed waste bins.
- Rate Includes Supply of stainless steel waste bin with inner bucket. All accessories and components. Placement/installation at site. Labour, handling, transportation, lead, and lift.

ITEM NO – 148

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. MATERIAL

Towel Ring

- Material: Brass / Stainless Steel (SS 304).
- Finish: Polished chrome plated.
- Shape: Circular / square (as per approved design).
- Surface: Smooth, corrosion-resistant, and free from defects.

Bracket / Holder

- Material: Brass (chrome plated).
- Finish: Matching polished chrome.
- Design: Strong and suitable to hold towel ring firmly.

Fixing Accessories

- Wooden plugs, screws, fasteners.
- Screws shall be rust-resistant (SS / coated steel).
- All accessories shall be of approved make.

2. WORKMANSHIP

Preparation

- Location shall be marked as per approved drawings (generally near wash basin or shower area).
- Wall surface shall be checked for proper fixing.

Fixing in Position

- Holes shall be drilled at required locations.
- Wooden plugs shall be inserted firmly.
- Brackets shall be fixed using screws ensuring tight and secure fixing.

Installation

- Towel ring shall be assembled and fixed to the bracket.

- Ensure free movement (if applicable) without looseness.

Alignment

- Towel ring shall be installed true to line and level.
- Proper height and position shall be maintained.

Testing

- Check for:
 - Firmness and stability
 - Proper fixing without wobbling

Finishing

- All exposed surfaces shall be cleaned.
- Chrome finish shall be free from scratches, stains, or damage.

Quality Requirements

- Towel ring shall be rigid and durable.
- Fixing shall be secure and aesthetically neat.
- No sharp edges or defects shall be present.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Numbers (Nos.)** of complete installed towel rings.
- Rate Includes Supply of towel ring and bracket. Wooden plugs, screws, and fixing accessories. Installation, alignment, and fixing. Labour, tools, transportation, lead, and lift.

ITEM NO – 162

PVC Cowl: Providing & fixing PVC Cowl on PVC ventilating pipes and verticals for soil and waste Pipes & Rain water pipes at top level/ terrace level, as specified and required, etc. complete. (B) 110 mm diameter

1. MATERIAL

PVC Cowl

- Material: Unplasticized Polyvinyl Chloride (uPVC).
- Diameter: 110 mm.
- Type: Dome / hood type cowl with proper vent openings.
- Finish: Smooth, uniform, and free from cracks, warping, or defects.
- Colour: As per approved make (generally white/grey).

Standards

- Shall conform to relevant IS standards for uPVC pipes and fittings (IS 13592 / IS 4985 as applicable).

- Material shall be UV resistant and suitable for outdoor exposure.

Fixing Accessories

- Solvent cement for uPVC joints.
- Clamps, screws, or fastening arrangements (if required).
- All accessories shall be weather-resistant.

2. WORKMANSHIP

Preparation

- Ensure pipe top is clean, dry, and free from dust or debris.
- Check alignment and verticality of pipe before fixing.

Fixing in Position

- PVC cowl shall be fixed on top of 110 mm pipe using solvent cement / push-fit joint.
- Ensure tight and leak-proof connection.
- Proper seating shall be ensured to avoid dislodging due to wind.

Alignment

- Cowl shall be fixed centrally and in vertical alignment with pipe.

Function Check

- Ensure:
 - Free passage of air
 - Prevention of entry of rainwater, birds, or debris

Finishing

- All joints shall be neat and properly sealed.
- Excess adhesive shall be removed.

Quality Requirements

- Cowl shall be firm, stable, and weather-resistant.
- No cracks or loose fittings allowed.
- Proper ventilation function shall be ensured.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit **per Numbers (Nos.)** of PVC cowls fixed.
- Rate Includes Supply of PVC cowl. Solvent cement and fixing materials. Installation and fixing at required height. Labour, tools, scaffolding, transportation, lead, and lift.

ITEM NO – 167

Cement-Lime 2:1(2-cement : 1-Hydraulic lime) mortar 1:1.5(1-Cement-Lime pozzolana with hydraulic Lime : 1.5 sand) mortar for plaster, bedding mortar, masonry mortar.at all floors / all levels / all heights.

1. MATERIAL

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

Lime : Shall Conform to M2 Page no-9 in General Technical Specification Booklet

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

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

2. WORKMANSHIP

The work shall be carried out strictly as per R & B Specifications and as directed by the Engineer-in-Charge.

Cement–lime mortar shall be prepared by mixing cement and hydraulic lime in the ratio of 2:1 and sand in proportion 1:1.5 (1 part cement-lime binder to 1.5 parts sand) by volume using approved gauge boxes.

All materials shall be dry mixed on a clean, watertight platform or in an approved mechanical mixer until a uniform colour is achieved. Water shall then be added gradually and mixing continued to obtain a homogeneous, plastic, and workable mortar.

Only required quantity of mortar shall be prepared and it shall be used within the initial setting time of cement. Re-tempering of mortar shall not be permitted.

Masonry Work

Mortar shall be spread evenly on the full bed of masonry units and all joints shall be completely filled. Masonry shall be carried out true to line, level and plumb. Joint thickness shall be uniform and as per standard practice.

Plaster Work

The surface shall be thoroughly cleaned of dust, loose particles, oil, grease, and efflorescence and properly wetted before application.

Mortar shall be applied uniformly to the specified thickness and finished to true line, level and plumb. The surface shall be smooth or rough as directed without cracks or waviness.

Bedding Work

Mortar shall be spread evenly to required thickness for bedding purposes. Proper levels, slopes and alignment shall be maintained. Units shall be firmly embedded without disturbing the base.

Curing

All works shall be cured for a minimum period of 7 days by keeping the surface continuously moist or as directed by the Engineer-in-Charge.

Scaffolding

Suitable scaffolding and staging shall be provided for execution at all heights and locations.

Quality Control

- Mortar shall be homogeneous and free from segregation.
- Proper bonding with substrate shall be ensured.
- No cracks, shrinkage or debonding shall be allowed.
- Work shall be true to line, level and plumb.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Cubic meter (cum)**
- The rate shall include Cost of cement, lime, sand and water Mixing, transporting and placing mortar Labour, tools and plants Surface preparation and finishing Curing Scaffolding and staging All leads and lifts

ITEM NO – 168

Providing and fixing approved make water saving low flow aerator of chrome plated brass / ABS plastic, screw-on type, suitable for fixing to standard wash basin, sink and bib taps, capable of limiting water flow to 8.0 litres per minute at normal working pressure, including necessary adapters, washers and sealing arrangements, testing for leakage and satisfactory performance, complete as per relevant Indian Standards, manufacturer's specifications and directions of Engineer-in-Charge.at all floors / all levels / all heights

1. MATERIAL

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

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

Aerator

- Material: Chrome plated brass / high-quality ABS plastic
- Type: Screw-on type (male/female thread as required)
- Flow Rate: Maximum 8 litres per minute at normal pressure
- Finish: Smooth, corrosion-resistant chrome finish
- Feature: Anti-splash, flow regulating, water saving type
- Make: Approved make conforming to relevant Indian Standards

Accessories

- Rubber washers / gaskets

- Thread adapters (if required)
- Sealing tape / compound

2. WORKMANSHIP

Preparation

- Existing tap outlet threads shall be cleaned and checked.
- Ensure compatibility of aerator threads with fixture.

Fixing

- Aerator shall be fixed by screwing on the tap outlet with proper washer.
- PTFE tape or approved sealant shall be used to ensure leak-proof joint.
- Care shall be taken to avoid damage to chrome finish during fixing.

Alignment

- Aerator shall be properly aligned and tightened without over-tightening.

Testing

- After installation, aerator shall be tested for:
 - Leakage
 - Smooth and uniform flow
 - Flow rate compliance (approx. 8 LPM)
 - Splash-free performance

Finishing

- Surface shall be cleaned and kept free from stains and scratches.
- All fittings shall be properly tightened and finished neatly.

Quality Control

- Aerator shall function efficiently for water saving.
- No leakage or dripping shall be permitted.
- Finish shall be uniform and free from defects.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit **per Numbers (Nos.)** of aerators fixed.
- Rate Includes Supply of aerator and accessories Fixing, installation and testing Labour, tools and plants Sealing materials and minor fittings All leads and lifts

ITEM NO – 169

Provide and install a deck-mounted single-control bathroom sink faucet in chrome finish with soft-press operation and a maximum flow rate of 5.7 L/min. Includes flexible hoses, washers, mounting hardware, and fittings, with testing for leakage, smooth operation, and performance, at all floors, levels, and heights.

1. MATERIAL

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

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

Faucet (Basin Mixer)

- Type: Deck mounted, single lever / single control mixer
- Material: Brass body (chrome plated) / approved equivalent
- Finish: Polished chrome finish
- Operation: Soft-press / smooth lever operation
- Cartridge: Ceramic disc cartridge for drip-free performance
- Flow Rate: Maximum 5.7 litres per minute (water saving type)
- Spout: Suitable for wash basin use with anti-splash flow

Flexible Connections

- Flexible braided hoses for hot and cold water connection
- Corrosion-resistant, high pressure resistant

Accessories

- Rubber washers, gaskets, O-rings
- Fixing nuts, bolts, and mounting hardware
- PTFE tape / sealing compound

2. WORKMANSHIP

Preparation

- Ensure deck/countertop hole is properly sized and clean.
- Check alignment and condition of inlet connections.

Installation

- Faucet shall be fixed on basin/countertop using provided mounting hardware.
- Flexible hoses shall be connected to water supply lines (hot and cold).
- All connections shall be properly tightened using suitable tools without damaging finish.

Sealing

- All joints shall be made leak-proof using PTFE tape or approved sealing material.
- Base of faucet shall be properly seated to avoid water seepage.

Alignment

- Faucet shall be fixed true to line and level.
- Spout shall be properly oriented over the basin.

Testing

- After installation, the system shall be tested for:
 - Leakage at all joints
 - Smooth lever operation
 - Proper mixing of hot and cold water
 - Flow rate (approx. 5.7 LPM)
 - Splash-free and uniform flow

Finishing

- Chrome surface shall be cleaned and free from stains, scratches, or damage.
- Work area shall be cleaned after installation.

Quality Control

- Faucet shall operate smoothly without jerks or noise.
- No leakage or dripping shall be permitted.
- Finish shall be uniform and aesthetically acceptable.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Numbers (Nos.)** of complete installed faucet units.
- Rate Includes Supply of faucet, flexible hoses, and all accessories Fixing, installation, and connection to water supply Testing and commissioning Labour, tools, and equipment All leads and lifts

ITEM NO – 170

Providing and fixing Disabled toilet Hand Rail Set Grab bar of approved quality as per IS and shall be approved by Engineer In Charge.at all floors / all levels / all heights.

1. MATERIAL

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

Grab Bar / Hand Rail

- Material: Stainless Steel (SS 304)
- Finish: Satin / matte / chrome finish (as approved)
- Type: Straight / L-shape / U-shape / foldable (as per drawing)
- Diameter: 32 mm to 38 mm (standard ergonomic grip)
- Wall Thickness: Minimum 1.2 mm
- Surface: Smooth, non-slip, corrosion-resistant

Flanges / Mounting Plates

- Material: Stainless steel
- Provided with concealed fixing arrangement

- Adequate size for firm anchorage

Fixing Accessories

- Stainless steel screws, anchor fasteners
- Nylon/HDPE wall plugs
- Cover plates for aesthetic finish

2. WORKMANSHIP

Preparation

- Location and height shall be marked as per approved drawings / accessibility standards.
- Wall surface shall be checked for strength and suitability for fixing.

Fixing

- Holes shall be drilled at required positions using suitable drill machine.
- Approved anchor fasteners / plugs shall be fixed firmly into wall.
- Grab bar shall be fixed securely with stainless steel screws ensuring rigid support.

Alignment

- Hand rail shall be installed true to line and level.
- Proper height and position shall be maintained for user convenience.

Testing

- After fixing, grab bar shall be tested for:
 - Load bearing capacity
 - Firmness and rigidity
 - No looseness or movement

Finishing

- All exposed surfaces shall be cleaned and free from scratches.
- Cover plates shall be fixed to conceal screws and provide neat appearance.

Quality Requirements

- Grab bar shall be capable of supporting user load safely.
- Fixing shall be strong, durable, and vibration-free.
- No sharp edges or defects shall be present.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Numbers (Nos.)** of complete installed hand rail sets.
- Rate Includes Supply of grab bar and all accessories Drilling, fixing, and installation Anchor fasteners, screws, and cover plates Labour, tools, and equipment All leads and lifts

ITEM NO – 171

Extra and over for providing richer RMC and change of concrete grade for any Component of Building in M-30/M-35 grade cement concrete instead of M25 (Note :- M25 Cement content considered in this item is @ 450 kg/cum as per showing minimum cement content.).

1. MATERIAL

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

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

Stone Grit : Shall Conform to M8 Page no-10 in General Technical Specification Booklet

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

Coarse Aggregate (Design Mix Concrete) : Shall Conform to M13 Page no-11 in General Technical Specification Booklet

Admixtures

- Chemical admixtures shall conform to relevant IS standards (IS 9103).
- Shall be used as per approved mix design to improve workability, strength, and durability.

2. WORKMANSHIP

General

- This item is applicable as extra over M-25 grade concrete for using higher grade M-30 / M-35 RMC.
- Concrete shall be design mix concrete produced in an approved batching plant.

Mix Design

- Mix design shall be carried out in an approved laboratory.
- Cement content, water-cement ratio, and admixture dosage shall be adjusted to achieve required strength.
- Minimum cement content for M-25 is considered as 450 kg/cum, and extra cement required for higher grades shall be accounted in this item.

Batching & Mixing

- Concrete shall be machine batched in automatic batching plant.
- Mixing shall be done in transit mixer ensuring uniformity and consistency.

Transportation

- Concrete shall be transported in transit mixers without segregation or loss of workability.
- Time between batching and placing shall be within permissible limits.

Placing

- Concrete shall be placed in position as per specified procedures.

- Proper compaction shall be done using mechanical vibrators.

Finishing

- Surface shall be finished to required line, level, and slope.

Curing

- Concrete shall be cured for a minimum period of 7 to 14 days as per specifications.

Quality Control

- Slump test shall be conducted at site.
- Cube strength tests shall be carried out as per IS 516.
- Concrete shall achieve required characteristic strength (M-30 / M-35).

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Cubic Meter (cum)** of concrete.
- Quantity shall be measured as per actual volume of higher grade concrete used.
- Rate Includes Cost of extra cement over M-25 grade Additional material required for higher grade Mix design, batching, transportation Labour, tools, plants, and equipment
Admixtures All leads and lifts

ITEM NO – 172

Conveyance charges of any types building materials like lime murrum building rubbish earth, manuar of sludge and excavated rock,fly ash & surplus excavated earth from site as directed by etc. complete as directed by EIC. A) Upto 25.00 Km.

1. MATERIAL

Lime : Shall Conform to M2 Page no-9 in General Technical Specification Booklet

Selected Earth : Shall Conform to M77 Page no-28 in General Technical Specification Booklet

Stone / Excavated Rock : Shall Conform to M16 Page no-12 in General Technical Specification Booklet

Fly Ash : Shall conform to relevant IS specifications and approved by Engineer-in-Charge

Building Rubbish / Murrum / Sludge : Shall be as obtained from site or approved source and as directed by Engineer-in-Charge

2. WORKMANSHIP

General

- The item includes collection, loading, transportation, unloading and stacking/disposal of materials.
- Materials may be transported from site to disposal location or vice versa as instructed.

Loading

- Materials shall be properly loaded manually or mechanically into trucks/tractors/tippers.
- Care shall be taken to avoid spillage and wastage during loading.

Transportation

- Suitable vehicles such as trucks, dumpers, tractors with trolleys shall be used.
- Lead shall be measured along the shortest motorable route.
- Transportation shall comply with local traffic rules and safety regulations.

Unloading & Disposal

- Materials shall be unloaded at designated location as directed by Engineer-in-Charge.
- Disposal shall be done in approved dumping yards without causing environmental nuisance.
- Stacking shall be done properly if required for reuse.

Safety & Precautions

- Vehicles shall be properly covered during transport to prevent dust pollution.
- No overloading of vehicles shall be permitted.
- Safety measures shall be followed during loading and unloading operations.

Quality Requirements

- No loss, theft or damage to materials shall be permitted.
- Proper accounting of material movement shall be maintained.
- Work shall be executed efficiently within specified lead distance.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Cubic Meter (cum)**.
- Lead shall be measured up to 25 km along the shortest practicable route.
- Rate Includes Loading and unloading of materials Transportation up to 25 km lead Labour, vehicles, fuel, and equipment Tools and plants All leads and lifts Compliance with safety and statutory requirements

ITEM NO – 173

Barricading the site: Providing & Erecting and maintaining temporary protective barricading as per given design and drawing of 2.4m high. Item includes taking pits of size 300 mmx 300 mmx 450 mm, Concreting in pits with 1:2:4 concrete, embedding Structural vertical member MS angle posts of size (50x50x6mm) at 2.5m centers, Providing horizontal steel tube 50 × 50 × 4 mm and 40 × 40 × 5 mm angle bracing structural members for barricades includes All necessary hardware complete. Item include providing and fixing 0.8 mm thick pre-coated galvalume corrugated sheet of approved make.

1. MATERIAL

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

Cement : Shall Conform M3 Page no-9 in General Technical Specification Booklet

Sand : Shall Conform M6 Page no-10 in General Technical Specification Booklet

Stone Grit (Coarse Aggregate) : Shall Conform M8 Page no-10 in General Technical Specification Booklet

Structural Steel (MS Angles, Tubes, Bracing Members) : Shall Conform M22 Page no-14 in General Technical Specification Booklet

Paints (if applied for steel protection) : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Galvalume Corrugated Sheets (0.8 mm thick) :

Shall be factory pre-coated galvalume steel sheets conforming to IS 15965 / IS 277 with minimum coating AZ150 or equivalent. Sheets shall be of approved make, corrosion resistant, and suitable for outdoor exposure.

Concrete (1:2:4) :

Materials shall conform to relevant IS codes. Mix shall be nominal mix 1:2:4 using 20 mm graded aggregate as per IS 456.

Fasteners & Fixtures :

Nuts, bolts, washers, self-drilling screws, clamps, etc. shall be of approved quality conforming to relevant IS standards and shall be galvanized.

2. WORKMANSHIP

2.1 General

- The barricading shall be provided strictly as per approved drawings, alignment, and site requirements.
- It shall be stable, rigid, and capable of withstanding wind loads and site disturbances.
- The height of barricading shall be 2.40 meters from ground level.

2.2 Setting Out

- Barricading line shall be marked accurately as per site layout.
- Post locations shall be marked at 2.5 m center-to-center spacing.

2.3 Excavation for Pits

- Pits of size 300 mm × 300 mm × 450 mm depth shall be excavated true to line and level.
- Bottom of pits shall be compacted properly.

2.4 Fixing of Vertical Members

- Vertical members shall be MS Angles 50×50×6 mm.
- Posts shall be erected truly vertical using plumb.
- Posts shall be embedded centrally in pits.

2.5 Concreting

- Concrete of mix 1:2:4 shall be used for fixing posts.
- Concrete shall be properly compacted using rods.
- Top surface shall be finished neatly with slight slope for drainage.
- Minimum curing of 7 days shall be ensured.

2.6 Horizontal & Bracing Members

- Horizontal members using:
 - 50 × 50 × 4 mm steel tubes
 - 40 × 40 × 5 mm angle bracing
- Members shall be properly aligned and welded/bolted firmly.
- Bracing shall be provided to ensure rigidity and stability.

2.7 Fixing of Galvalume Sheets

- 0.8 mm thick pre-coated galvalume corrugated sheets shall be fixed on outer face.
- Sheets shall be fixed with self-drilling screws with washers.
- Proper overlapping (minimum one corrugation) shall be maintained.
- Sheets shall be fixed without gaps to ensure full enclosure.
- Edges shall be properly aligned for neat appearance.

2.8 Finishing & Protection

- All steel members shall be cleaned of rust, oil, and dirt.
- One coat of primer and two coats of paint shall be applied where specified.
- Sharp edges shall be removed to avoid injury.

2.9 Maintenance During Contract

- Barricading shall be maintained in good condition throughout the contract period.
- Any damage, deformation, or loosening shall be repaired immediately.
- Contractor shall ensure barricading remains safe and intact at all times.

2.10 Dismantling (if required)

- On completion, barricading shall be dismantled carefully.
- Materials shall be stacked or disposed as directed by Engineer-in-Charge.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Running Meter (Rmt)** along the center line of barricading.
- Height shall be considered as specified (2.4 m), no separate measurement for height.
- The rate shall include Excavation of pits Providing and fixing MS angle posts Concrete (1:2:4) in foundation Horizontal members and bracing Supply and fixing of galvalume sheets All welding, cutting, drilling, and fabrication All fasteners, fixtures, and hardware Painting/primer Erection, alignment, and finishing Maintenance during contract period All leads, lifts, tools, plants, and labour

ITEM NO – 174

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. MATERIAL

Plywood (if used as backing / framework) : Shall Conform M37 Page no-18 in General Technical Specification Booklet

Paints (if any surface finishing involved) : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Glass Fibre Acoustic Core Panel (25 mm thick) :

Shall be high-density fibre glass acoustic board having minimum thickness 25 mm, factory manufactured, dimensionally stable, termite and vermin resistant. The panel shall have minimum NRC (Noise Reduction Coefficient) of 0.90 tested as per ASTM C423 / ISO 354.

Acoustic Fabric Finish :

Shall be acoustically transparent fabric, fire-retardant and classified as Class B-s1, d1 as per EN 13501-1. Fabric shall be anti-fungal, colorfast, and available in approved shades such as Ivory, Autumn Orange, Pista Green, Straw Gold, Rustic Green, Burgundy, Rust, Peacock Blue, Ash Grey, Mocha or as approved by the Architect.

Adhesive (Low VOC) :

Silica-based construction adhesive with Low VOC content, conforming to GRIHA 3 Star / IGBC Gold requirements, suitable for bonding acoustic panels.

Wall Panel Impalers :

Galvanized steel impalers with spikes, designed for mechanical fixing of acoustic panels. Shall be rust-resistant and of approved make.

Fasteners & Fixtures :

Self-tapping screws, nylon plugs, washers, etc., shall conform to relevant IS standards and shall be corrosion resistant.

2. WORKMANSHIP

2.1 General

- Work shall be executed as per approved drawings, layout, and instructions of the Engineer-in-Charge.
- Installation shall be carried out by trained and experienced personnel as per manufacturer's recommendations.
- Panels shall be installed true to line, level, and plumb.

2.2 Surface Preparation

- Wall surface shall be cleaned of dust, grease, loose particles, and irregularities.
- Surface shall be dry, level, and ready to receive panels.
- Any undulations shall be corrected prior to installation.

2.3 Setting Out

- Grid layout shall be marked on wall based on panel size 600 × 1200 mm.
- Proper alignment shall be ensured to maintain uniform joints and pattern.

2.4 Fixing of Impalers

- Minimum 4 nos. of wall panel impalers per panel shall be fixed.
- Impalers shall be fixed using self-tapping screws with plugs.
- Fixing shall ensure firm anchorage to wall.

2.5 Application of Adhesive

- Low VOC silica-based adhesive shall be applied on spikes/projections of impalers.
- Adhesive shall be applied uniformly to ensure proper bonding.

2.6 Fixing of Acoustic Panels

- Panels shall be carefully aligned and pressed onto impalers.
- Panels shall be pierced through spikes ensuring:
 - Proper alignment
 - Tight joints
 - Uniform level
- Care shall be taken to avoid damage to fabric surface.

2.7 Finishing

- Panels shall be installed without visible gaps or misalignment.
- Edges shall be straight and corners neatly finished.
- Damaged or stained panels shall be replaced.

2.8 Performance Requirements

- Minimum NRC = 0.90 shall be achieved.
- Fire rating shall comply with Class B-s1, d1 (EN 13501-1).
- Panels shall comply with Low VOC requirements for green building ratings (GRIHA / IGBC).

2.9 Quality Control

- Manufacturer's test certificates for NRC and fire rating shall be submitted.
- Warranty certificate shall be provided by supplier.
- Mock-up panel may be installed for approval before full execution.

2.10 Protection

- Installed panels shall be protected from:
 - Dust
 - Moisture
 - Mechanical damage
- Final cleaning shall be done after completion.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Square Meter (Sqm)**.
- The rate shall include Supply of acoustic panels (25 mm thick) Acoustic fabric finish Impalers and fixing system Adhesive (Low VOC) All fasteners and fixtures Surface preparation Installation by trained personnel Testing certificates and warranty All leads, lifts, labour, tools, and plants

ITEM NO – 175

Slatted Panelling :

Manufacturing, supply, arrangement and keeping in good condition until project completion slatted panels which have Low VOC and formaldehyde free content as per the GRIHA 3star/IGBC gold rating of 12 mm thickness of any height as required to be fitted at all heights/all levels with necessary arrangement like plywood which have Low VOC and formaldehyde free content as per the GRIHA 3star/IGBC gold rating or similar etc with the help of fixtures such as bonding agents such as fevicol which have LOW-VOC content as per the GRIHA 3star/IGBC gold rating, screws of any diameter or similar complete of design provided by the architect and should be installed as per the directions provided by the Engineer-in-Charge. at all floors / all levels / all heights.

1. MATERIAL

Plywood : Shall Conform M37 Page no-18 in General Technical Specification Booklet

Paints (if polishing/finishing involved) : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Slatted Panels (12 mm thick) :

Shall be factory manufactured decorative slatted panels of approved make, minimum 12 mm thickness, made from engineered wood/MDF/HDHMR or equivalent substrate. Panels shall be Low VOC and formaldehyde-free, conforming to GRIHA 3 Star / IGBC Gold rating requirements. Panels shall be dimensionally stable, termite resistant, and suitable for interior applications.

Backing Framework (if required) :

Shall consist of plywood or approved equivalent substrate having Low VOC and formaldehyde-free properties, fixed securely to wall/ceiling to receive slatted panels.

Adhesive (Bonding Agent) :

Shall be synthetic resin adhesive (e.g., Fevicol or equivalent) having Low VOC content, conforming to relevant IS standards and green building requirements.

Fasteners & Fixtures :

Screws, nails, anchors, clamps, etc. shall be of approved make, corrosion-resistant, and conforming to relevant IS standards.

Polish / Laminate / Finish (if specified) :

Shall be of approved shade and finish as per Architect's design and shall comply with Low VOC requirements.

2. WORKMANSHIP

2.1 General

- Work shall be executed strictly as per approved drawings, architectural details, and instructions of Engineer-in-Charge.
- Panels shall be installed at all heights, levels, and locations as specified.
- Installation shall be done by skilled and experienced carpenters.

2.2 Surface Preparation

- Wall/ceiling surface shall be cleaned, dry, and level.
- Any undulations shall be rectified before fixing framework.
- Necessary marking and layout shall be done as per approved design.

2.3 Framework / Backing

- Plywood backing or suitable framework shall be fixed securely to wall/ceiling using screws and anchors.
- Framework shall be aligned properly to ensure level and plumb surface.
- Spacing and fixing pattern shall be as per manufacturer's recommendation.

2.4 Fixing of Slatted Panels

- Slatted panels of 12 mm thickness shall be cut to required size and pattern.
- Panels shall be fixed over backing using:
 - Adhesive (Low VOC bonding agent)
 - Screws / mechanical fasteners
- Proper spacing, alignment, and pattern shall be maintained as per design.
- Joints shall be uniform and visually consistent.

2.5 Finishing

- Exposed surfaces shall be finished with approved polish/laminate/veneer as specified.
- Edges shall be smooth and neatly finished.
- No visible gaps, warping, or misalignment shall be permitted.

2.6 Quality Requirements

- Panels shall be:

- Low VOC compliant
- Formaldehyde-free
- Free from cracks, bends, or surface defects
- Work shall match approved sample/mock-up.

2.7 Protection

- Installed panels shall be protected from:
 - Moisture
 - Mechanical damage
 - Stains
- Any damaged panel shall be replaced without extra cost.

2.8 Maintenance

- Contractor shall maintain paneling in good condition until project completion.
- Cleaning and minor rectifications shall be carried out as required.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Square Meter (Sqm)**.
- The rate shall include Supply of slatted panels (12 mm thick) Plywood backing/framework Adhesives (Low VOC) Screws, fasteners, fixtures Cutting, fabrication, and fixing Finishing (polish/laminate if specified) All labour, tools, plants, leads, and lifts Maintenance till completion

ITEM NO – 176

Cane Panelling: Manufacturing, supply, arrangement and keeping in good condition until project completion Cane sheet which have Low VOC and formaldehyde free containt as per the GRIHA 3star/IGBC gold rating of any height as required to be fitted at all heights/all levels in Wall panelling as per design & drawing with necessary arrangement like plywood or similar etc with the help of fixtures such as bonding agents such as fevicol which have the LOW-VOC containt as per the GRIHA 3star/IGBC gold rating , screws and framing with of any diameter or similar complete of design provided by the architect and should be installed as per the directions provided by the Engineer-in-Charge. at all floors / all levels / all heights.

1. MATERIAL

Plywood : Shall Conform M37 Page no-18 in General Technical Specification Booklet

Paints (if polishing/finishing involved) : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Cane Sheet (Natural / Synthetic) :

Shall be high-quality natural cane or approved synthetic cane sheet, uniform in weave, free from defects, cracks, fungus, and discoloration. The material shall be Low VOC and formaldehyde-free, complying with GRIHA 3 Star / IGBC Gold rating requirements. Cane shall be properly seasoned and treated against termite and moisture.

Backing Material (Plywood / Equivalent) :

Shall be plywood or approved equivalent substrate having Low VOC and formaldehyde-free properties, providing firm and even base for cane fixing.

Adhesive (Bonding Agent) :

Shall be synthetic resin adhesive (e.g., Fevicol or equivalent) with Low VOC content, conforming to relevant IS standards and suitable for wood and cane bonding.

Framework / Supporting Members :

Shall be wooden battens / framing sections or equivalent, properly seasoned and treated, used for fixing and supporting the paneling system.

Fasteners & Fixtures :

Screws, nails, clamps, etc. shall be of approved quality, corrosion-resistant, and conforming to relevant IS standards.

Polish / Protective Coating (if specified) :

Shall be clear polish, melamine, PU coating, or equivalent, of approved make and shade, complying with Low VOC requirements.

2. WORKMANSHIP

2.1 General

- Work shall be carried out as per approved drawings, design, and instructions of Engineer-in-Charge.
- Cane paneling shall be installed at all heights, levels, and locations as required.
- Work shall be executed by skilled craftsmen experienced in cane work.

2.2 Surface Preparation

- Wall surface shall be cleaned, dry, and level.
- Any unevenness shall be corrected before fixing the backing/framework.
- Layout marking shall be done as per approved design.

2.3 Framework / Backing Preparation

- Wooden battens or suitable framework shall be fixed securely to wall using screws and plugs.
- Plywood backing shall be fixed over framework ensuring:
 - Proper alignment
 - Level and plumb surface
 - Adequate rigidity

2.4 Fixing of Cane Sheet

- Cane sheet shall be cut to required size and pattern as per design.
- Cane shall be stretched properly to avoid sagging or wrinkles.
- Fixing shall be done using:
 - Adhesive (Low VOC bonding agent)
 - Nails / screws / staples (as required)
- Edges shall be properly tucked, fixed, or covered with beading/frame.

2.5 Finishing

- Surface shall be finished smoothly without undulations.
- Joints shall be neat and invisible as far as possible.
- Protective polish or coating shall be applied if specified.
- Final finish shall match approved sample.

2.6 Quality Requirements

- Cane shall be:
 - Uniform in pattern
 - Free from defects
 - Properly stretched and fixed
- Entire work shall comply with Low VOC and formaldehyde-free requirements.

2.7 Protection

- Cane paneling shall be protected from:
 - Moisture
 - Physical damage
 - Dust accumulation
- Any damaged or loosened portion shall be replaced or repaired.

2.8 Maintenance

- Contractor shall maintain paneling in good condition until completion of project.
- Necessary cleaning and minor repairs shall be carried out.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Square Meter (Sqm)**.
- The rate shall include Supply of cane sheets Plywood backing and framework Adhesives (Low VOC) Screws, nails, and fixtures Cutting, stretching, and fixing Finishing and polishing All labour, tools, plants, leads, and lifts Maintenance till completion

ITEM NO – 177

Cane Panelling in Glass Sandwich : Manufacturing, supply, arrangement and keeping in good condition until project completion Cane sheet which have Low VOC and formaldehyde free containt as per the GRIHA 3star/IGBC gold rating of any height as required to be fitted at all heights/all levels in Wall panelling and false ceiling work as per design & drawing with necessary arrangement like plywood which have Low VOC and formaldehyde free containt as per the GRIHA 3star/IGBC gold rating or similar etc with the help of fixtures such as bonding agents such as fevicol LOW-VOC containt as per the GRIHA 3star/IGBC gold rating , screws and framing with of any diameter or similar complete of design provided by the architect and should be installed as per the directions provided by the Engineer-in-Charge. at all floors / all levels / all heights

1. MATERIAL

Plywood : Shall Conform M37 Page no-18 in General Technical Specification Booklet

Glass : Shall Conform M38 Page no-18 in General Technical Specification Booklet

Paints (if finishing involved) : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Cane Sheet (Natural / Synthetic) :

Shall be high-quality natural or synthetic cane sheet, uniform in weave, free from defects, fungus, and discoloration. Cane shall be Low VOC and formaldehyde-free, complying with GRIHA 3 Star / IGBC Gold rating requirements and properly treated against termite and moisture.

Glass Panels (Sandwich Layers) :

Shall be clear/extra clear/tempered glass panels of required thickness (generally 5–8 mm each layer or as approved), forming a sandwich with cane layer in between. Glass shall be free from distortions, bubbles, and scratches, conforming to relevant IS standards.

Backing Material (if required) :

Shall be plywood or equivalent substrate having Low VOC and formaldehyde-free properties, providing necessary support where required.

Adhesive / Bonding Agent :

Shall be synthetic resin adhesive (Fevicol or equivalent) and/or silicone sealant compatible with glass and cane, having Low VOC content and suitable for sandwich panel application.

Framework / Framing Members :

Shall be wooden, aluminium, or MS framework sections as per approved design, properly treated/finished and suitable to hold glass sandwich panels rigidly.

Fasteners & Fixtures :

Screws, bolts, clamps, glass holders, beading, etc. shall be of approved make, corrosion-resistant, and conforming to relevant IS standards.

2. WORKMANSHIP

2.1 General

- Work shall be carried out as per approved architectural drawings and instructions of Engineer-in-Charge.
- Paneling shall be installed at all heights, levels, walls, and false ceiling locations as required.
- Installation shall be executed by skilled personnel with experience in glass and decorative paneling works.

2.2 Surface Preparation

- Supporting surface/framework shall be clean, dry, level, and structurally sound.
- Layout and panel positioning shall be marked accurately.

2.3 Framework / Support System

- Framework shall be fixed securely to wall/ceiling using suitable anchors and fasteners.
- Framework shall be aligned properly ensuring:
 - Line and level
 - Adequate rigidity
 - Proper support for glass panels

2.4 Preparation of Glass Sandwich Panels

- Cane sheet shall be cut to required size and properly stretched.
- Cane shall be placed between two glass sheets forming a sandwich panel.
- Edges shall be sealed using silicone or approved sealant to prevent dust/moisture ingress.
- Proper care shall be taken to avoid wrinkles, folds, or misalignment of cane.

2.5 Fixing of Panels

- Glass sandwich panels shall be fixed in position using:
 - Mechanical clamps / channels / beading
 - Adhesive or sealant where required
- Panels shall be aligned properly ensuring uniform joints.
- Adequate spacing for thermal movement shall be maintained.

2.6 Finishing

- All edges shall be neatly finished with beading or framing sections.
- Joints shall be clean and uniform.
- Glass shall be cleaned and free from stains, scratches, or adhesive marks.

2.7 Quality Requirements

- Cane shall be:
 - Uniform in weave
 - Properly stretched
 - Free from defects
- Glass panels shall be:
 - Clear and distortion-free
 - Properly aligned
 - Securely fixed
- Entire system shall comply with Low VOC and formaldehyde-free requirements.

2.8 Protection

- Installed panels shall be protected from:
 - Breakage
 - Scratches
 - Dust and moisture
- Protective film shall be retained on glass till completion.

2.9 Maintenance

- Contractor shall maintain the paneling in good condition until completion of project.
- Any damaged glass or cane shall be replaced without extra cost.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Square Meter (Sqm)**.
- The rate shall include Supply of cane sheets Supply of glass panels Fabrication of glass sandwich panels Framework and supports Adhesives and sealants (Low VOC) All fasteners,

clamps, and fixtures Cutting, assembling, and fixing Finishing and cleaning All labour, tools, plants, leads, and lifts Maintenance till completion

ITEM NO – 178

Carpet & Rug Paelling : Manufacturing, supply, arrangement and keeping in good condition until project completion Carpet and Rug Panelling of any height as required to be fitted at all height/all levels in wall panellig as per design & drawing with necessary arrangement like plywood or similar etc. with the help of Fixtures such as bonding agents such as fevicols which have Low VOC and formaldehyde free containt as per the GRIHA 3star/IGBC gold rating, screws and framing with of any diameter or similar complete of design provided by Architect and should be installed as per directions provided by the Engineer-in-charge. at all floors / all levels / all heights.

1. MATERIAL

Plywood : Shall Conform M37 Page no-18 in General Technical Specification Booklet

Paints (if any finishing involved) : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Carpet / Rug Material :

Shall be high-quality carpet or rug of approved make, design, color, and texture as per Architect's selection. Material shall be durable, colorfast, resistant to wear and tear, and suitable for vertical application. Carpet/rug shall be Low VOC and formaldehyde-free, complying with GRIHA 3 Star / IGBC Gold rating requirements.

Backing Material (Plywood / Equivalent) :

Shall be plywood or approved equivalent substrate having Low VOC and formaldehyde-free properties, providing a firm and even base for fixing carpet/rug.

Adhesive (Bonding Agent) :

Shall be synthetic resin adhesive (Fevicol or equivalent) with Low VOC and formaldehyde-free content, suitable for bonding carpet/rug to substrate.

Framework / Supporting Members :

Shall be wooden battens or equivalent framework, properly seasoned and treated, to support the paneling system.

Fasteners & Fixtures :

Screws, nails, clamps, etc. shall be of approved make, corrosion-resistant, and conforming to relevant IS standards.

Edge Finishing Materials (if required) :

Wooden/metal/PVC beading, trims, or profiles shall be used for finishing edges neatly as per approved design.

2. WORKMANSHIP

2.1 General

- Work shall be carried out as per approved drawings, design, and instructions of Engineer-in-Charge.

- Paneling shall be installed at all heights, levels, and locations as required.
- Work shall be executed by skilled and experienced personnel.

2.2 Surface Preparation

- Wall surface shall be cleaned, dry, and free from dust, grease, or loose particles.
- Any unevenness shall be corrected before fixing framework/backing.
- Layout marking shall be done as per approved design.

2.3 Framework / Backing Preparation

- Wooden battens or suitable framework shall be fixed securely to wall using screws and plugs.
- Plywood backing shall be fixed over framework ensuring:
 - Proper alignment
 - Level and plumb surface
 - Adequate rigidity

2.4 Fixing of Carpet / Rug

- Carpet/rug shall be cut to required size and pattern as per design.
- Adhesive shall be applied uniformly on backing surface.
- Carpet/rug shall be pressed firmly to ensure proper bonding without air pockets.
- Mechanical fixing (staples/screws) may be used additionally if required.
- Care shall be taken to maintain:
 - Proper alignment
 - Pattern continuity
 - Smooth surface without wrinkles

2.5 Finishing

- Edges shall be neatly finished with beading or trims.
- Surface shall be smooth, wrinkle-free, and uniformly fixed.
- Joints (if any) shall be properly aligned and minimized.

2.6 Quality Requirements

- Carpet/rug shall be:
 - Free from defects
 - Uniform in texture and color
 - Properly stretched and bonded
- Entire system shall comply with Low VOC and formaldehyde-free requirements.

2.7 Protection

- Installed paneling shall be protected from:
 - Dust
 - Moisture
 - Mechanical damage
- Any damaged or stained portion shall be replaced.

2.8 Maintenance

- Contractor shall maintain paneling in good condition until project completion.
- Necessary cleaning and minor repairs shall be carried out.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Square Meter (Sqm)**.
- The rate shall include Supply of carpet/rug material Plywood backing and framework Adhesives (Low VOC) Screws, fasteners, fixtures Cutting, shaping, and fixing Edge finishing with trims/beading All labour, tools, plants, leads, and lifts Maintenance till completion

ITEM NO – 179

Interior Texture special for VVIP room : Providing and applying Luxury / Art Finishes Luxtire Texture with basecoat 2 mm thick with durabond 1 bag 1.5 litre and top coat upto 3 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. MATERIAL

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

Cement (if used in surface preparation/repair) : Shall Conform M3 Page no-9 in General Technical Specification Booklet

Sand (if used in base repair/plaster) : Shall Conform M6 Page no-10 in General Technical Specification Booklet

Paints : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Texture Base Coat Material (Durabond or Equivalent) :

Shall be ready-mix or site-mix texture base material of approved make. Mix proportion shall be 1 bag Durabond with 1.5 litres of water or as per manufacturer's specification. Material shall have good adhesion, workability, and durability suitable for interior/exterior application.

Texture Finish (Luxury / Art Finish Coating) :

Shall be premium quality decorative texture coating of approved make, capable of producing various finishes such as stucco, rustic, metallic, abstract, or designer patterns. The finish shall be weather-resistant (for exterior use), crack-resistant, and durable.

Pigments / Colorants :

Shall be compatible with texture system, UV stable, and as per approved shades selected by Architect.

Primer / Sealer :

Shall be acrylic or suitable primer compatible with substrate and texture system to ensure proper bonding.

Additives / Sealers (if required) :

Protective coatings, sealers, or top protective coats shall be used as per manufacturer's recommendation.

2. WORKMANSHIP

2.1 General

- Work shall be carried out as per approved design, pattern, and instructions of Engineer-in-Charge.
- Texture finish shall be applied at all heights, levels, interior and exterior locations as specified.
- Work shall be executed by skilled applicators experienced in decorative finishes.

2.2 Surface Preparation

- Surface shall be:
 - Clean, dry, and free from dust, oil, grease
 - Structurally sound and level
- Loose plaster, cracks, or undulations shall be repaired.
- Surface shall be properly cured and dried before application.

2.3 Application of Primer

- Suitable primer shall be applied uniformly over surface.
- Primer shall be allowed to dry completely before further application.

2.4 Base Coat Application

- Base coat of approx. 2 mm thickness shall be applied using Durabond mix.
- Mix proportion: 1 bag Durabond with 1.5 litre water (or as per manufacturer).
- Base coat shall be applied evenly using trowel/putty knife.
- Surface shall be leveled and allowed to set properly.

2.5 Texture / Top Coat Application

- Texture coat of up to 3 mm thickness shall be applied over base coat.
- Various decorative finishes shall be created as per approved sample/design.
- Application tools may include:
 - Trowels
 - Rollers
 - Sponges
 - Texture tools
- Finish shall be:
 - Uniform
 - Free from cracks and patches
 - Matching approved sample

2.6 Finishing & Curing

- Final finish shall be smooth/rough/patterned as per design intent.
- Surface shall be protected from dust and damage during curing.
- Protective sealer/top coat shall be applied if specified.

2.7 Scaffolding & Safety

- Proper scaffolding and working platforms shall be provided for all heights.
- Safety measures shall be followed during execution.

2.8 Quality Requirements

- Texture finish shall:
 - Be uniform in thickness and pattern
 - Have strong adhesion to substrate
 - Be durable and weather-resistant (for exterior)
- Sample panel shall be approved before full execution.

2.9 Protection & Maintenance

- Finished surface shall be protected from:
 - Mechanical damage
 - Rain (for exterior)
 - Dust and stains
- Any defective work shall be rectified.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Square Meter (Sqm)**.
- The rate shall include Surface preparation Primer application Base coat (2 mm thick) Texture/top coat (up to 3 mm thick) All materials including Durabond, pigments, additives All tools, plants, labour Scaffolding and support system All leads and lifts Finishing and protection

ITEM NO – 180

Interior Texture for VIP & Delux room : 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.

- Relevant to item specification shall be followed **Item No - 179** & Item shall be Measuring & Payment paid a unit per one **Square Meter (Sqm)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 181

Aluminum Work :Providing and fixing aluminium work for doors, fixed or openable windows, ventilators and partitions with extruded built up standard tubular sections/ appropriate Z sections and other sections of approved make conforming to IS: 733 and IS: 1285, fixing with dash fasteners of required dia and size, including glazing with 6 mm toughened glass, necessary filling up the gaps at junctions, i.e. at top, bottom and sides with required EPDM rubber/ neoprene gasket etc., Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing / paneling, C.P. brass / stainless

steel screws,including frame, mullions, transoms, glazing beads, cleats, brackets, screws, fasteners, handles, locks, hinges, floor spring, tower bolts, rubber gaskets and all necessary hardware all complete as per architectural drawings and the directions of Engineer-in-charge.For fixed portion - Powder coated aluminium (minimum thickness of powder coating 50 micron).at all floors / all levels / all heights

1. MATERIAL

Aluminium Doors, Windows, Holdfasts : Shall Conform M31 Page no-17 in General Technical Specification Booklet

Glass : Shall Conform M38 Page no-18 in General Technical Specification Booklet

Fixtures and Fastenings : Shall Conform M43 Page no-19 in General Technical Specification Booklet

Aluminium Sections :

Shall be extruded aluminium sections conforming to IS: 733 and IS: 1285, of approved make. Sections shall be tubular/Z/other suitable shapes, smooth, straight, free from defects, and of required thickness.

Powder Coating :

Aluminium sections shall be powder coated with minimum 50 micron thickness, uniform in finish, colour as approved, and resistant to corrosion and weathering.

Toughened Glass (6 mm thick) :

Shall be clear/approved glass conforming to relevant IS standards, toughened for safety, free from bubbles, waves, or distortions.

Gaskets (EPDM / Neoprene) :

Shall be of approved quality, durable, weather-resistant, and suitable for proper sealing of glass.

Hardware Fittings :

Handles, locks, hinges, floor springs, tower bolts, etc. shall be of CP brass / stainless steel, of approved make and quality.

Fasteners :

Dash fasteners, screws, bolts, nuts, washers, etc. shall be corrosion-resistant and conform to relevant IS standards.

2. WORKMANSHIP

2.1 General

- Work shall be carried out as per approved architectural drawings and instructions of Engineer-in-Charge.
- Aluminium work shall be executed at all floors, levels, and heights as required.
- Fabrication and installation shall be done by skilled and experienced personnel.

2.2 Fabrication of Aluminium Sections

- Sections shall be cut, machined, and fabricated to required size and shape.

- Joints shall be:
 - Mitred
 - Mechanically fastened
 - Properly aligned
- Mullions and transoms shall be provided as per design requirements.

2.3 Fixing of Frames

- Frames shall be fixed in position using dash fasteners of required diameter and size.
- Frames shall be:
 - True to line and level
 - Properly aligned and plumb
- Necessary packing and shimming shall be done to ensure stability.

2.4 Glazing

- 6 mm thick toughened glass shall be fixed in aluminium frames.
- Glass shall be secured using:
 - Aluminium snap beading
 - EPDM / neoprene gaskets
- Proper care shall be taken to avoid breakage and ensure tight fit.

2.5 Sealing & Finishing

- Gaps at junctions (top, bottom, sides) shall be filled with:
 - EPDM / neoprene gaskets
 - Suitable sealant where required
- All joints shall be:
 - Watertight
 - Airtight
 - Neatly finished

2.6 Fixing of Hardware

- Hardware such as:
 - Handles
 - Locks
 - Hinges
 - Floor springs
 - Tower bolts

shall be fixed securely and tested for proper operation.

2.7 Quality Requirements

- Aluminium sections shall be:
 - Smooth and defect-free
 - Properly powder coated (minimum 50 micron)
- Glass shall be:
 - Clear and undamaged
 - Properly aligned
- Entire assembly shall be:

- Rigid
- Functional
- Weather-resistant

2.8 Protection

- Protective film on aluminium and glass shall be retained during installation.
- Finished work shall be protected from damage until handover.

2.9 Cleaning

- Final cleaning shall be carried out to remove dust, stains, and marks.
- Glass and aluminium surfaces shall be spotless at the time of handing over.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Square Meter (Sqm)**.
- The rate shall include Supply of aluminium sections Fabrication and erection Powder coating (minimum 50 micron) Supply and fixing of 6 mm toughened glass All gaskets, sealants, and snap beading All hardware fittings (locks, handles, hinges, etc.) Fasteners, screws, cleats, brackets All labour, tools, plants, leads, and lifts Complete installation and finishing

ITEM NO – 182

Wooden ceiling with carving : Supply, fabrication, and installation of high-quality wooden carved ceiling which have as per approved design and drawings. Work includes selection of wood which have Low VOC and formaldehyde free containt as per the GRIHA 3star/IGBC gold rating, precise carving, finishing, polishing LOW-VOC containt as per the GRIHA 3star/IGBC gold rating, and fixing the panels with proper alignment and support system. Rate includes supply of wood, carving, finishing materials, labor, transportation, handling, and complete installation including all necessary hardware and accessories.at all floors / all levels / all heights

1. MATERIAL

Plywood (if used as backing) : Shall Conform M37 Page no-18 in General Technical Specification Booklet

Paints / Polish : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Wood (Natural Timber for Carving) :

Shall be high-quality, well-seasoned natural timber such as teak wood or approved equivalent, free from knots, cracks, warping, insect attack, and other defects. Wood shall be Low VOC and formaldehyde-free, complying with GRIHA 3 Star / IGBC Gold rating requirements. Timber shall be properly treated against termite and moisture.

Carved Wooden Panels :

Shall be manufactured from selected timber as per approved design and drawings. Carving shall be done with high precision using CNC/manual techniques to achieve desired patterns and depth.

Backing Framework / Support System :

Shall consist of wooden battens / MS framework / aluminium sections as required, designed to safely support carved ceiling panels and ensure rigidity.

Adhesive (Bonding Agent) :

Shall be synthetic resin adhesive (Fevicol or equivalent) with Low VOC content, suitable for wood bonding.

Fasteners & Fixtures :

Screws, bolts, clamps, hangers, brackets, etc. shall be of approved make, corrosion-resistant, and conforming to relevant IS standards.

Finishing Materials :

Melamine polish / PU polish / lacquer or equivalent, having Low VOC content, providing smooth, durable, and aesthetic finish.

2. WORKMANSHIP

2.1 General

- Work shall be executed as per approved architectural drawings and design details.
- Ceiling shall be installed at all heights and levels as specified.
- Work shall be carried out by skilled carpenters/artisans experienced in carved woodwork.

2.2 Selection & Preparation of Wood

- Timber shall be properly seasoned to required moisture content.
- Wood shall be treated with anti-termite and preservative solutions.
- Only defect-free timber shall be used.

2.3 Fabrication & Carving

- Wooden panels shall be cut and shaped to required sizes.
- Carving shall be done as per approved design using:
 - CNC machining and/or
 - Skilled manual craftsmanship
- Patterns shall be:
 - Sharp and well-defined
 - Consistent throughout

2.4 Framework / Support System

- Supporting framework shall be fixed securely to structural ceiling using suitable anchors.
- Framework shall be aligned to ensure:
 - Level surface
 - Adequate load-bearing capacity
 - Proper spacing

2.5 Fixing of Wooden Panels

- Carved panels shall be fixed to framework using:
 - Screws / mechanical fasteners

- Adhesive where required
- Panels shall be aligned properly ensuring:
 - Uniform joints
 - Proper level and line
 - Secure fixing

2.6 Finishing

- Surface shall be sanded smoothly before finishing.
- Polish/finish (melamine/PU/lacquer) shall be applied in multiple coats.
- Final finish shall be:
 - Smooth and uniform
 - Free from stains, scratches, or unevenness
 - As per approved sample

2.7 Quality Requirements

- Carving shall be:
 - Accurate and consistent
 - Free from defects
- Wood shall be:
 - Crack-free
 - Properly treated
- Entire work shall comply with Low VOC and formaldehyde-free requirements.

2.8 Protection

- Finished ceiling shall be protected from:
 - Moisture
 - Dust
 - Mechanical damage
- Any damaged panel shall be replaced.

2.9 Maintenance

- Contractor shall maintain the ceiling in good condition until project completion.
- Minor repairs and cleaning shall be carried out as required.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Square Meter (Sqm)**.
- The rate shall include Supply of timber Carving work (CNC/manual) Framework/support system Adhesives (Low VOC) Fasteners and fixtures Polishing/finishing materials Fabrication, transportation, and installation All labour, tools, plants, leads, and lifts Maintenance till completion

ITEM NO – 183

Cane Panelled Ceiling: Manufacturing, supply, arrangement and keeping in good condition until project completion Cane sheet which have Low VOC and formaldehyde free containt as per the GRIHA 3star/IGBC gold rating ceiling as required to be fitted with the help of G.I framing at all heights/all levels in false ceiling work as per design & drawing with necessary arrangement like

plywood which have Low VOC and formaldehyde free content as per the GRIHA 3star/IGBC gold rating or similar etc with the help of fixtures such as bonding agents such as fevicol which have Low VOC content as per the GRIHA 3star/IGBC gold rating, screws and framing with of any diameter or similar complete of design provided by the architect and should be installed as per the directions provided by the Engineer-in-Charge. at all floors / all levels / all heights.

1. MATERIAL

Plywood : Shall Conform M37 Page no-18 in General Technical Specification Booklet

Paints (if finishing involved) : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Cane Sheet (Natural / Synthetic) :

Shall be high-quality natural or synthetic cane sheet, uniform in weave, free from defects, cracks, fungus, and discoloration. Cane shall be Low VOC and formaldehyde-free, complying with GRIHA 3 Star / IGBC Gold rating requirements and treated against termite and moisture.

G.I. Framework :

Shall consist of galvanized iron sections (channels, angles, or equivalent) of approved size and thickness, properly galvanized and conforming to relevant IS standards. Framework shall be rigid, level, and capable of supporting ceiling loads.

Backing Material (Plywood / Equivalent) :

Shall be plywood or approved equivalent substrate having Low VOC and formaldehyde-free properties, providing firm support for cane fixing.

Adhesive (Bonding Agent) :

Shall be synthetic resin adhesive (Fevicol or equivalent) having Low VOC content, suitable for bonding cane to backing surface.

Fasteners & Fixtures :

Screws, nuts, bolts, hangers, anchor fasteners, etc. shall be of approved make, corrosion-resistant, and conforming to relevant IS standards.

Ceiling Suspension System :

GI rods, hangers, cleats, and brackets shall be used to suspend the framework securely from structural ceiling.

2. WORKMANSHIP

2.1 General

- Work shall be carried out as per approved drawings, design, and instructions of Engineer-in-Charge.
- Ceiling shall be installed at all heights and levels as required.
- Work shall be executed by skilled and experienced personnel.

2.2 Setting Out

- Ceiling layout shall be marked as per design and drawings.
- Levels shall be established using appropriate leveling instruments.

2.3 Fixing of G.I. Framework

- GI framework shall be suspended from structural ceiling using:
 - GI rods / hangers
 - Anchor fasteners
- Framework shall be:
 - Properly aligned
 - Level and rigid
 - Spaced as per design and load requirement

2.4 Fixing of Backing (Plywood)

- Plywood sheets shall be fixed over GI framework using screws.
- Joints shall be staggered and properly aligned.
- Surface shall be even and ready for cane fixing.

2.5 Fixing of Cane Sheet

- Cane sheet shall be cut to required size and pattern.
- Cane shall be properly stretched to avoid sagging.
- Fixing shall be done using:
 - Adhesive (Low VOC bonding agent)
 - Staples / screws (if required)
- Edges shall be neatly finished with beading or frame.

2.6 Finishing

- Surface shall be smooth, tight, and wrinkle-free.
- Joints shall be neat and properly aligned.
- Final appearance shall match approved sample/design.

2.7 Quality Requirements

- Cane shall be:
 - Uniform in pattern
 - Properly stretched
 - Free from defects
- Framework shall be:
 - Rigid and stable
 - Properly aligned
- Entire system shall comply with Low VOC and formaldehyde-free requirements.

2.8 Protection

- Completed ceiling shall be protected from:
 - Moisture
 - Dust
 - Mechanical damage
- Any damaged portion shall be replaced.

2.9 Maintenance

- Contractor shall maintain ceiling in good condition until completion of project.
- Cleaning and minor repairs shall be carried out as required.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Square Meter (Sqm)**.
- The rate shall include Supply of cane sheets G.I. framework and suspension system Plywood backing Adhesives (Low VOC) Screws, fasteners, hangers, fixtures Cutting, stretching, and fixing Edge finishing All labour, tools, plants, leads, and lifts Maintenance till completion

ITEM NO – 184

Solid Wood Rafters ceiling: Providing and Installing Solid Wooden Rafters of size 75mmx 75mm thickness with PU Polish with all required knees, Screwing etc. with all labour , material, transportation, and all scaffolding, support system. As per Design of Architect's selection and as per direction of Engineer-in-charge. (Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating)at all floors / all levels / all heights.

1. MATERIAL

Plywood (if used as backing / support) : Shall Conform M37 Page no-18 in General Technical Specification Booklet

Paints / Polish : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Solid Wood Rafters :

Shall be high-quality, well-seasoned natural timber of approved species (teak wood or equivalent), free from knots, cracks, warping, and defects. Size shall be 75 mm × 75 mm or as specified. Timber shall be Low VOC and formaldehyde-free, complying with GRIHA 3 Star / IGBC Gold rating requirements, and treated against termite and moisture.

Supporting Framework / Base Structure :

Shall consist of wooden battens / MS framework / aluminium sections as required to support rafters securely. Framework shall be rigid, properly aligned, and capable of carrying loads safely.

Adhesive (if used) :

Shall be synthetic resin adhesive (Fevicol or equivalent) having Low VOC content, suitable for wood applications.

Fasteners & Fixtures :

Screws, bolts, brackets, cleats, knees (wooden/metal supports), etc. shall be of approved make, corrosion-resistant, and conforming to relevant IS standards.

PU Polish / Finish :

Shall be high-quality Polyurethane (PU) polish of approved make, Low VOC content, providing smooth, durable, and aesthetic finish resistant to wear and moisture.

2. WORKMANSHIP

2.1 General

- Work shall be executed as per approved architectural drawings and instructions of Engineer-in-Charge.
- Rafters shall be installed at all heights and levels as required.
- Work shall be carried out by skilled carpenters experienced in ceiling and timber works.

2.2 Preparation of Timber

- Timber shall be properly seasoned to required moisture content.
- Wood shall be treated with anti-termite and preservative chemicals.
- Surfaces shall be planed and finished smooth before installation.

2.3 Setting Out

- Layout of rafters shall be marked as per approved design.
- Spacing, alignment, and pattern shall be checked prior to fixing.

2.4 Framework / Support System

- Supporting framework shall be fixed securely to structural ceiling using suitable anchors.
- Framework shall ensure:
 - Proper alignment and level
 - Adequate strength and rigidity

2.5 Fixing of Wooden Rafters

- Rafters of size 75 mm × 75 mm shall be fixed to framework using:
 - Screws / bolts
 - Kneels / brackets
- Rafters shall be:
 - Properly aligned
 - Fixed firmly without movement
 - Installed as per specified spacing and pattern

2.6 Finishing

- Surface shall be sanded smoothly before application of polish.
- PU polish shall be applied in multiple coats as per manufacturer's specification.
- Finish shall be:
 - Smooth and uniform
 - Free from brush marks, stains, or unevenness
 - Matching approved sample

2.7 Quality Requirements

- Timber shall be:
 - Free from defects
 - Properly seasoned and treated
- Rafters shall be:

- Straight and properly aligned
- Securely fixed
- Entire system shall comply with Low VOC and formaldehyde-free requirements.

2.8 Scaffolding & Safety

- Proper scaffolding and working platforms shall be provided for ceiling work.
- Safety precautions shall be strictly followed.

2.9 Protection

- Installed rafters shall be protected from:
 - Moisture
 - Dust
 - Mechanical damage
- Any damaged member shall be replaced.

2.10 Maintenance

- Contractor shall maintain the ceiling in good condition until project completion.
- Minor repairs and cleaning shall be carried out as required.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Running Meter (Rmt)**
- The rate shall include Supply of timber rafters (75×75 mm) Framework/support system Adhesives Screws, bolts, knees, brackets PU polish (Low VOC) Fabrication, cutting, and fixing All labour, tools, plants, leads, and lifts Scaffolding and support system Maintenance till completion

ITEM NO – 185

Carpet & Ceiling : Providing and Fixing Carpet of size 900mm x 900mm in Gypsum Ceiling fixed with the help of using screw fixing on the wall and fixing with the help of Clip/screw and where ever required and using Vinyl Grippers of etocone make Griper system using track(perimeter track, Half wrap, Mid seam whatever is required). Vinyl Grippers must have base tapes for better grip. Carpet cut into required size and shape and streached , inserted inside the Gripper by using tools recommended by manufacturer, Streaching, Supplying and laying as per Architect's selection and as per direction of Engineer-in-charge. As specified including all accessories, material, & Labour complete as directed by Architect/ Engineer-in-charge. at all floors / all levels / all heights (Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating).

1. MATERIAL

Plywood (if used as backing/support) : Shall Conform M37 Page no-18 in General Technical Specification Booklet

Paints / Adhesives : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Carpet Tiles (900 mm × 900 mm) :

Shall be high-quality carpet tiles of approved make, size 900 × 900 mm, color, pattern, and texture as per Architect's selection. Carpet shall be durable, anti-static, and suitable for ceiling application. Material shall be Low VOC and formaldehyde-free, complying with GRIHA 3 Star / IGBC Gold rating requirements.

Gypsum Ceiling (Base Surface) :

Shall be properly installed gypsum board ceiling of approved thickness, fixed over GI framework, providing a level and stable base for carpet fixing.

Vinyl Gripper System (EtoCone or Equivalent) :

Shall consist of PVC/vinyl gripper strips including:

- Perimeter track
- Half wrap
- Mid seam

Grippers shall have base tapes for better adhesion and grip.

Adhesive (Low VOC) :

Shall be suitable bonding agent (Fevicol or equivalent) with Low VOC content, compatible with carpet and gypsum surface.

Fasteners & Fixtures :

Screws, clips, anchors, etc. shall be of approved make and corrosion-resistant.

Tools & Accessories :

Stretching tools, insertion tools, and accessories as recommended by manufacturer shall be used.

2. WORKMANSHIP

2.1 General

- Work shall be carried out as per approved design, drawings, and instructions of Engineer-in-Charge.
- Installation shall be done at all heights and levels as specified.
- Work shall be executed by trained personnel experienced in carpet fixing systems.

2.2 Surface Preparation

- Gypsum ceiling shall be:
 - Properly fixed and stable
 - Clean, dry, and level
- Any irregularities shall be corrected before installation.

2.3 Fixing of Gripper System

- Vinyl grippers shall be fixed along:
 - Perimeter edges
 - Mid seams
 - Required junctions
- Fixing shall be done using screws/clips as required.

- Grippers shall be aligned properly to maintain uniform pattern.

2.4 Cutting & Preparation of Carpet

- Carpet tiles shall be cut into required sizes and shapes.
- Edges shall be clean and accurate.
- Pattern alignment shall be ensured as per design.

2.5 Fixing of Carpet

- Carpet shall be stretched using appropriate tools.
- Carpet edges shall be inserted into grippers securely.
- Adhesive shall be used where required for additional bonding.
- Installation shall ensure:
 - No wrinkles or sagging
 - Proper tension and alignment
 - Clean joints and edges

2.6 Finishing

- Surface shall be smooth and uniform.
- Joints shall be neat and properly aligned.
- Final finish shall match approved sample/design.

2.7 Quality Requirements

- Carpet shall be:
 - Properly stretched
 - Firmly fixed
 - Free from wrinkles and defects
- Entire system shall comply with Low VOC and formaldehyde-free requirements.

2.8 Scaffolding & Safety

- Suitable scaffolding and working platforms shall be provided.
- Safety precautions shall be followed during installation.

2.9 Protection

- Installed ceiling shall be protected from:
 - Dust
 - Moisture
 - Mechanical damage
- Any damaged portion shall be replaced.

2.10 Maintenance

- Contractor shall maintain the work in good condition until project completion.
- Cleaning and minor repairs shall be carried out as required.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Square Meter (Sqm)**.

- The rate shall include Supply of carpet tiles (900×900 mm) Vinyl gripper system (tracks, seams, accessories) Adhesives (Low VOC) Screws, clips, fasteners Cutting, stretching, and fixing All labour, tools, and equipment Scaffolding, leads, and lifts Complete installation and finishing

ITEM NO – 186

Acoustic Baffle ceiling:

Providing and fixing hexa by using aluminium 2mm thick pipe of size 25 X 50mm and fixing 9mm marco polyester fiber acoustic panel finishing with NRC upto 0.90 and it should meet the safety requirements of EN 14190 with size of 80mm X 80mm width with the height of 300mm by using 3mm thick hanging rod (6 nos hanging rod in 1 baffle) with top using fastener as approved by Architect and as specified including all accessories, material and labour complete as directed by Architect/Engineer-in-charge at all floors / all levels / all heights (Composite Wood products like MDF, Plywood etc Should be Low VOC and formaldehyde free content, Polish/Paint/adhesive Should be Low VOC content as per the GRIHA 3star/IGBC gold rating and All Fabric used should be IFR (Inherently fire retardant)).

1. MATERIAL

Aluminium Doors, Windows, Holdfasts : Shall Conform M31 Page no-17 in General Technical Specification Booklet

Fixtures and Fastenings : Shall Conform M43 Page no-19 in General Technical Specification Booklet

Paints / Coating (if applied) : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Aluminium Frame (Baffle Structure) :

Shall be fabricated from 2 mm thick aluminium pipe sections of size 25 × 50 mm, forming hexa/rectangular baffle frames as per approved design. Sections shall be straight, smooth, corrosion-resistant, and free from defects.

Polyester Fiber Acoustic Panel (9 mm thick) :

Shall be high-density polyester fiber acoustic panel of 9 mm thickness, providing minimum NRC up to 0.90, tested as per relevant standards. Panel shall comply with EN 14190 and shall be dimensionally stable, moisture resistant, and durable.

Fabric Finish (if applicable) :

Shall be acoustically transparent IFR (Inherently Fire Retardant) fabric of approved shade and texture, complying with fire safety norms and Low VOC requirements.

Hanging System (Suspension Rods) :

Shall consist of 3 mm thick MS/SS rods, minimum 6 rods per baffle, properly anchored to structural ceiling.

Fasteners & Connectors :

Nuts, bolts, screws, clamps, brackets, and connectors shall be of approved make, corrosion-resistant, and conforming to relevant IS standards.

Adhesive (if used) :

Shall be bonding agent with Low VOC content, complying with GRIHA / IGBC requirements.

2. WORKMANSHIP

2.1 General

- Work shall be carried out as per approved drawings, layout, and instructions of Engineer-in-Charge.
- Installation shall be done at all heights and levels as required.
- Work shall be executed by trained and skilled personnel.

2.2 Setting Out

- Layout of baffles shall be marked as per design pattern and spacing.
- Position of suspension rods shall be marked accurately.

2.3 Fabrication of Baffle Units

- Aluminium sections (25 × 50 mm, 2 mm thick) shall be cut and fabricated into required hexa/baffle shapes.
- Joints shall be properly welded or mechanically fastened.
- Frames shall be rigid, true to shape, and dimensionally accurate.

2.4 Fixing of Acoustic Panels

- 9 mm polyester fiber panels shall be cut and fixed within aluminium frames.
- Fixing shall be done using:
 - Adhesive (if required)
 - Mechanical fixing
- Panels shall be securely fixed without gaps or looseness.

2.5 Suspension System

- Each baffle shall be suspended using minimum 6 nos. of 3 mm thick rods.
- Rods shall be anchored to structural ceiling using suitable fasteners.
- Height of baffle shall be 300 mm or as specified.
- Alignment and level shall be ensured during installation.

2.6 Installation of Baffles

- Baffles of size approximately 80 mm × 80 mm width × 300 mm height shall be installed.
- Proper spacing and pattern shall be maintained as per design.
- Baffles shall be fixed securely to avoid movement or vibration.

2.7 Finishing

- All edges shall be smooth and properly finished.
- Fabric (if used) shall be wrinkle-free and neatly fixed.
- Final appearance shall be uniform and aesthetically aligned.

2.8 Quality Requirements

- Acoustic panels shall achieve NRC up to 0.90.
- Materials shall comply with:
 - Low VOC and formaldehyde-free requirements

- Fire safety standards (IFR fabric)
- Entire system shall be stable, durable, and defect-free.

2.9 Scaffolding & Safety

- Suitable scaffolding and working platforms shall be provided.
- Safety measures shall be strictly followed during installation.

2.10 Protection

- Installed baffles shall be protected from:
 - Dust
 - Damage
 - Moisture
- Any damaged component shall be replaced.

2.11 Maintenance

- Contractor shall maintain the ceiling system in good condition until project completion.
- Cleaning and minor adjustments shall be carried out as required.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Square Meter (Sqm)**
- The rate shall include Aluminium frame fabrication (2 mm thick sections) Polyester acoustic panels (9 mm thick) Fabric finish Suspension rods and fixing system All fasteners, connectors, and adhesives Cutting, fabrication, and installation All labour, tools, plants, leads, and lifts Scaffolding and support system Maintenance till completion

ITEM NO – 187

TOUGHENED GLASS PARTITION : Providing and fixing Frameless glass partition with 12 mm toughened Glass / 12 mm compact sheet in multi parts also can be use with party glazed partly panalled with 12 mm compact sheet with EPDM gasket , Silicon approved make and color Dow corning / GE must be use with backer rod, Fitting Screw stainless Steel.at all floors / all levels / all heights.

1. MATERIAL

Glass : Shall Conform M38 Page no-18 in General Technical Specification Booklet

Fixtures and Fastenings : Shall Conform M43 Page no-19 in General Technical Specification Booklet

Toughened Glass (12 mm thick) :

Shall be clear/ultra-clear toughened safety glass of 12 mm thickness, conforming to relevant IS standards. Glass shall be free from bubbles, waves, scratches, and other defects, and shall have smooth polished edges.

Compact Sheet (12 mm thick) :

Shall be high-density compact laminate sheet (HPL) of 12 mm thickness, of approved make, color, and finish. Sheet shall be moisture resistant, termite proof, and suitable for partitioning.

EPDM Gasket :

Shall be high-quality EPDM rubber gasket, flexible, durable, and weather-resistant, used for proper sealing between glass panels and joints.

Silicone Sealant :

Shall be structural grade silicone sealant (Dow Corning / GE or equivalent approved make) of approved color, used along with backer rod for joint sealing.

Backer Rod :

Shall be closed-cell polyethylene foam backer rod, compatible with sealant and used to control sealant depth and ensure proper joint performance.

Stainless Steel Fittings :

All screws, bolts, patch fittings, connectors, clamps, etc. shall be made of stainless steel of approved grade and finish.

2. WORKMANSHIP

2.1 General

- Work shall be carried out as per approved architectural drawings and instructions of Engineer-in-Charge.
- Partition shall be installed at all floors, levels, and heights as required.
- Work shall be executed by skilled and experienced personnel in glass installation.

2.2 Surface Preparation

- Floor, wall, and ceiling surfaces shall be checked for level and alignment.
- Supporting surfaces shall be clean and ready for installation.

2.3 Setting Out

- Layout of partition shall be marked accurately as per design.
- Position of glass panels and compact sheet panels shall be finalized.

2.4 Fixing of Glass Panels

- 12 mm toughened glass panels shall be erected in position using suitable supports and fittings.
- Panels shall be aligned vertically and horizontally.
- Proper spacing shall be maintained between panels for sealant joints.

2.5 Fixing of Compact Sheets (if applicable)

- Compact sheets shall be fixed where specified (partly panelled areas).
- Fixing shall be done using mechanical fasteners or framing system as required.
- Alignment with glass panels shall be maintained.

2.6 Jointing & Sealing

- EPDM gaskets shall be provided at joints where required.
- Backer rod shall be inserted in joints before sealant application.
- Silicone sealant (Dow Corning / GE) shall be applied neatly to ensure:

- Airtight and watertight joints
- Clean and uniform finish

2.7 Fixing of Hardware

- Stainless steel fittings such as:
 - Screws
 - Connectors
 - Patch fittings

shall be fixed securely and accurately.

2.8 Finishing

- All glass edges shall be properly aligned and joints finished neatly.
- Sealant shall be smooth and free from air bubbles or gaps.
- Final appearance shall be clean, transparent, and aesthetically pleasing.

2.9 Quality Requirements

- Glass shall be:
 - Free from defects
 - Properly aligned
 - Securely fixed
- Sealant joints shall be:
 - Uniform
 - Durable
 - Properly cured

2.10 Protection

- Protective film on glass shall be retained during installation.
- Glass shall be protected from scratches, stains, and breakage.

2.11 Cleaning

- Final cleaning shall be done using approved materials.
- Glass surface shall be free from stains, adhesive marks, and dust.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Square Meter (Sqm)**.
- The rate shall include Supply of 12 mm toughened glass Supply of compact sheet EPDM gaskets, silicone sealant, and backer rod Stainless steel fittings and hardware Cutting, polishing, and installation All labour, tools, plants, leads, and lifts Jointing and finishing

ITEM NO – 188

Corner Table : Providing & Placing in position Corner table of size 600 X 600 X 450 mm made from Solid teakwood with varnish polish and Table Top made from laminet finish/Glass complete as per instruction given by engineer in charge/Architect. at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating).

- Relevant to item specification shall be followed **Item No - 190** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 189

VIP Corner Table : Providing & Placing in position Corner table of size 600 X 600 X 450 mm made from Solid teakwood with varnish polish finish and Table Top made from veneer wih pu polish/ Glass complete as per instruction given by engineer in charge/Architect. at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating).

- Relevant to item specification shall be followed **Item No - 190** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 190

V.VIP Brass top Corner Table : Providing & Placing in position Corner table of size 600 X 600 X 450 mm made from Solid teakwood with varnish polish and Table Top being made from 1 mm decorative brass plate with lacqured polish finish as per the design and instruction given by engineer in charge/Architect.at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating).

1. MATERIAL

Plywood (if used internally) : Shall Conform M37 Page no-18 in General Technical Specification Booklet

Paints / Polish : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Solid Teak Wood :

Shall be high-quality, well-seasoned teak wood, free from knots, cracks, warping, and other defects. Wood shall be properly treated against termite and moisture. Timber shall comply with Low VOC and formaldehyde-free requirements as per GRIHA 3 Star / IGBC Gold rating.

Decorative Brass Sheet (1 mm thick) :

Shall be high-quality brass plate of 1 mm thickness, smooth, uniform, and free from dents, scratches, or surface defects. Brass shall be suitable for decorative applications and capable of taking polish and lacquer finish.

Adhesive (Bonding Agent) :

Shall be synthetic resin adhesive (Fevicol or equivalent) with Low VOC content, suitable for bonding wood and metal surfaces.

Fasteners & Fixtures :

Screws, nails, brackets, etc. shall be of approved make, corrosion-resistant, and conforming to relevant IS standards.

Lacquer / Protective Coating (for Brass) :

Shall be clear lacquer coating to protect brass surface from tarnishing, of approved make and Low VOC content.

Varnish / Polish (for Wood) :

Shall be melamine/PU/varnish polish of approved make, providing smooth, durable finish with Low VOC content.

2. WORKMANSHIP

2.1 General

- Work shall be carried out as per approved design, drawings, and instructions of Engineer-in-Charge/Architect.
- Table shall be fabricated and installed at all floors, levels, and locations as required.
- Work shall be executed by skilled carpenters and craftsmen.

2.2 Preparation of Wood

- Teak wood shall be properly seasoned to required moisture content.
- Wood shall be planed, cut, and shaped to required dimensions.
- Anti-termite treatment shall be applied before fabrication.

2.3 Fabrication of Table Structure

- Table of size 600 × 600 × 450 mm height shall be fabricated.
- Joints shall be:
 - Properly cut and fitted
 - Strong and durable
 - Neatly finished
- Structure shall be rigid and stable.

2.4 Fixing of Brass Top

- 1 mm thick brass sheet shall be cut to required size.
- Brass sheet shall be fixed over table top using:
 - Adhesive
 - Mechanical fixing (if required)
- Surface shall be:
 - Even and properly bonded
 - Free from air gaps or undulations

2.5 Finishing

- Wooden surfaces shall be sanded smoothly.
- Varnish/PU polish shall be applied in multiple coats.
- Brass surface shall be polished and finished with lacquer coating.
- Final finish shall be:
 - Smooth and uniform
 - Free from scratches, stains, or defects

2.6 Quality Requirements

- Wood shall be:
 - Defect-free and properly seasoned
- Brass sheet shall be:
 - Smooth and properly fixed
 - Well polished and protected
- Entire product shall comply with Low VOC and formaldehyde-free requirements.

2.7 Protection

- Finished table shall be protected from:
 - Scratches
 - Moisture
 - Damage during handling

2.8 Placement

- Table shall be placed in position as per approved layout.
- Alignment and stability shall be ensured.

2.9 Maintenance

- Contractor shall maintain the table in good condition until project completion.
- Any damage shall be rectified or replaced.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (Nos.)**.
- The rate shall include Supply of teak wood Supply of brass sheet (1 mm thick) Adhesives (Low VOC) Fasteners and fixtures Fabrication and polishing Lacquer coating on brass Transportation, handling, and placement All labour, tools, plants, leads, and lifts

ITEM NO – 191

Center Table : Providing & Placing in position Center table of size 900 X 600 X 450 mm made from Solid teakwood with Varnish Polish finish and Table Top made from laminet finish/Glass complete as per instruction given by engineer in charge/Architect.at all floors / all levels / all heights (Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating).

- Relevant to item specification shall be followed **Item No - 193** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 192

VIP Center Table : Providing & Placing in position Center table of size 900 X 600 X 450 mm made from Solid teakwood with Varnish Polish finish Table Top made from veneer with Pu polish/Glass complete as per instruction given by engineer in charge/Architect.at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating).

- Relevant to item specification shall be followed **Item No - 193** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 193

V.VIP Center Table : Providing and placing custom-made 1000mm dia and 450mm height centre table with solid teak wood legs and frame, finished in natural polish, complete with handcrafted brass top (minimum 3–4 mm thick) with brushed / antique finish, including all necessary joinery, fixing hardware, levelling, polishing, and finishing as approved by Architect / EIC.

The item shall include carpentry work, brass fabrication, surface finishing, edge detailing, transportation, and installation at site, complete in all respects, as directed by the Architect / Engineer-in-Charge.at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating)

1. MATERIAL

Plywood (if used internally) : Shall Conform M37 Page no-18 in General Technical Specification Booklet

Paints / Polish : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Solid Teak Wood :

Shall be high-quality, well-seasoned teak wood, free from knots, cracks, warping, and defects.

Wood shall be properly treated against termite and moisture. Timber shall comply with Low VOC and formaldehyde-free requirements as per GRIHA 3 Star / IGBC Gold rating.

Handcrafted Brass Top (3–4 mm thick) :

Shall be high-quality brass plate of minimum 3–4 mm thickness, handcrafted with brushed/antique finish as approved by Architect. Brass shall be uniform, free from dents, scratches, and surface imperfections.

Adhesive (Bonding Agent) :

Shall be synthetic resin adhesive (Fevicol or equivalent) with Low VOC content, suitable for bonding wood and metal.

Fasteners & Fixtures :

Screws, bolts, brackets, inserts, etc. shall be of approved make, corrosion-resistant, and conforming to relevant IS standards.

Protective Coating for Brass :

Shall be clear lacquer or protective coating of approved make with Low VOC content, to prevent tarnishing and maintain finish.

Wood Finish (Natural Polish) :

Shall be melamine/PU/natural polish of approved make, providing smooth, durable finish with Low VOC content.

2. WORKMANSHIP

2.1 General

- Work shall be executed as per approved design, drawings, and instructions of Architect/Engineer-in-Charge.
- Table shall be supplied and placed at all floors, levels, and locations as required.
- Work shall be carried out by skilled carpenters and metal craftsmen.

2.2 Preparation of Wood

- Teak wood shall be properly seasoned and moisture controlled.
- Timber shall be cut, shaped, and finished to required dimensions.
- Anti-termite treatment shall be applied prior to fabrication.

2.3 Fabrication of Wooden Frame & Legs

- Table frame and legs shall be fabricated from solid teak wood.
- Table size:
 - 1000 mm diameter
 - 450 mm height
- Joinery shall be:
 - Strong and durable
 - Properly aligned
 - Neatly finished
- Structure shall be rigid and stable.

2.4 Fabrication of Brass Top

- Brass plate of 3–4 mm thickness shall be cut to circular shape.
- Surface shall be finished in:
 - Brushed finish / Antique finish as approved
- Edges shall be properly finished and smooth.

2.5 Fixing of Brass Top

- Brass top shall be fixed over wooden frame using:
 - Adhesive
 - Mechanical fixing (where required)
- Proper care shall be taken to ensure:
 - Uniform seating
 - No undulations or gaps

2.6 Finishing

- Wooden surfaces shall be sanded smoothly.
- Natural polish / PU polish shall be applied in multiple coats.
- Brass surface shall be cleaned and protected with lacquer coating.
- Final finish shall be:
 - Smooth and uniform
 - Free from scratches, dents, or defects

2.7 Edge Detailing

- Edges of brass and wood shall be neatly finished as per design.
- No sharp edges shall be left.

2.8 Quality Requirements

- Wood shall be:
 - Defect-free
 - Properly treated and seasoned
- Brass shall be:
 - Uniform in thickness
 - Properly finished and fixed
- Entire item shall comply with Low VOC and formaldehyde-free requirements.

2.9 Protection

- Finished table shall be protected from:
 - Scratches
 - Moisture
 - Handling damage

2.10 Placement

- Table shall be placed in position as per layout.
- Proper leveling shall be ensured.

2.11 Maintenance

- Contractor shall maintain the table in good condition until project completion.
- Any defects shall be rectified or replaced.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (Nos.)**.
- The rate shall include Supply of teak wood Supply of brass plate (3–4 mm thick) Adhesives (Low VOC) Fasteners and hardware Carpentry and brass fabrication Polishing and finishing Edge detailing Transportation, handling, and placement All labour, tools, plants, leads, and lifts

ITEM NO – 194

Drawer Unit: Providing and fixing Drawer unit, size 450x600x600mm as per design provided by the architect with drawer with lock of size 450x600x200mm and shutter made from 18 mm calibrated plywood of standard make having 0.8mm thick laminate finish with drawer channel including all assecaries like lock, handles, etc. complet as per instruction given by engineer in charge/Architect.at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating).

- Relevant to item specification shall be followed **Item No - 196** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 195

Drawer Unit: Providing and fixing Drawer unit, size 450x600x600mm as per design provided by the architect with drawer with lock of size 450x600x200mm and shutter made from 18 mm calibrated plywood of standard make having 3-5mm thick veneer with pu polish finish with drawer channel including all assecaries like lock, handles, etc. complet as per instruction given by engineer in charge/Architect.at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating)

- Relevant to item specification shall be followed **Item No - 196** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 196

V.VIP Drawer Unit (With brass top): Providing and fixing Drawer unit with 1 mm decorative brass plate with lacqured polish finish, size 450x600x600mm as per design provided by the architect with drawer with lock of size 450x600x200mm and shutter made from 18 mm calibrated plywood of standard make having 3-5mm thick veneer with pu polish finish and top made from 1 mm decorative brass plate with lacqured polish finish with drawer channel including all assecaries like lock, handles, etc. complet as per instruction given by engineer in charge/Architect.at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating)

1. MATERIAL

Plywood : Shall Conform M37 Page no-18 in General Technical Specification Booklet

Paints / Polish : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Decorative Brass Sheet (1 mm thick) : Shall be high-quality brass plate of 1 mm thickness, smooth, uniform, and free from dents or scratches. Brass shall be suitable for decorative use and finished with lacquer coating to prevent tarnishing.

Veneer (3–5 mm thick) : Shall be natural wood veneer of approved make and shade, free from defects, properly seasoned, and suitable for polishing.

Calibrated Plywood (18 mm thick) : Shall be high-quality calibrated plywood of 18 mm thickness, dimensionally stable, termite resistant, and complying with Low VOC and formaldehyde-free requirements as per GRIHA 3 Star / IGBC Gold rating.

Drawer Channels : Shall be telescopic drawer channels of approved make, smooth functioning, heavy-duty, and corrosion-resistant.

Hardware Fittings : Locks, handles, knobs, hinges, etc. shall be of approved make, durable, and corrosion-resistant.

Adhesive (Bonding Agent) : Shall be synthetic resin adhesive (Fevicol or equivalent) having Low VOC content, suitable for wood and veneer bonding.

Lacquer / Protective Coating (for Brass) : Shall be clear lacquer coating of approved make with Low VOC content.

PU Polish / Finish : Shall be high-quality PU polish with Low VOC content, providing smooth and durable finish to veneer surface.

2. WORKMANSHIP

2.1 General

- Work shall be executed as per approved design, drawings, and instructions of Architect/Engineer-in-Charge.
- Unit shall be installed at all floors, levels, and locations as required.
- Work shall be carried out by skilled carpenters and craftsmen.

2.2 Fabrication of Cabinet Structure

- Cabinet of size 450 × 600 × 600 mm shall be fabricated using 18 mm calibrated plywood.
- Joints shall be:
 - Strong and durable
 - Properly aligned
 - Neatly finished
- Structure shall be rigid and square.

2.3 Drawer Fabrication

- Drawer of size 450 × 600 × 200 mm shall be fabricated.
- Drawer shall be fitted with:
 - Telescopic channels
 - Locking system
- Drawer movement shall be smooth and noise-free.

2.4 Shutter / Front Panel

- Shutter/front shall be made using plywood with 3–5 mm thick veneer.
- Veneer shall be properly pasted and pressed to avoid bubbles or gaps.

- Surface shall be prepared for polishing.

2.5 Fixing of Brass Top

- 1 mm decorative brass sheet shall be cut to required size.
- Brass sheet shall be fixed over top surface using:
 - Adhesive
 - Mechanical fixing if required
- Surface shall be even and properly bonded without undulations.

2.6 Finishing

- Veneer surface shall be sanded smoothly.
- PU polish shall be applied in multiple coats.
- Brass surface shall be finished with lacquer coating.
- Final finish shall be:
 - Smooth and uniform
 - Free from scratches and defects

2.7 Fixing of Hardware

- Hardware fittings such as:
 - Locks
 - Handles
 - Channels

shall be fixed properly and tested for smooth operation.

2.8 Quality Requirements

- Plywood shall be:
 - Dimensionally stable
 - Free from defects
- Veneer shall be:
 - Properly bonded
 - Uniform in appearance
- Brass shall be:
 - Smooth and properly fixed
- Entire item shall comply with Low VOC and formaldehyde-free requirements.

2.9 Protection

- Finished unit shall be protected from:
 - Scratches
 - Moisture
 - Handling damage

2.10 Placement

- Drawer unit shall be placed/fixed in position as per layout.
- Proper leveling and alignment shall be ensured.

2.11 Maintenance

- Contractor shall maintain the unit in good condition until project completion.
- Any defects shall be rectified or replaced.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (Nos.)**.
- The rate shall include Supply of plywood, veneer, and brass sheet Drawer channels and hardware fittings Adhesives (Low VOC) Fabrication and carpentry work Brass fixing and lacquer finish PU polishing Transportation, handling, and installation All labour, tools, plants, leads, and lifts

ITEM NO – 197

Low Height Storage(LHS) : Providing & fixing in position Low Height Storage (LHS) Unit of size having Height - 750mm and Depth - 450mm with 0.8mm thick laminate finish made from 18mm BWR Calibrated Plywood of standard make along with batten patti at sides and edge with polish and MS legs complete as per instruction given by engineer in charge/Architect. at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating).

- Relevant to item specification shall be followed Item No - 198 & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 198

V.VIP Low Height Storage with carving brass top (LHS) : Providing, fabricating, and fixing custom-designed storage size having size Height - 750mm and Depth - 450mm console / sideboard unit comprising a brass-clad front and top surface with decorative embossed / radial carved pattern panels, fixed over a seasoned plywood / MDF backing, finished in antique brushed brass finish as approved by the Architect.

The unit shall be supported on solid teak wood legs, duly seasoned and treated, finished with natural / matching polish.at all floors / all levels / all heights

The item includes internal carcass in BWP plywood, soft-close drawers / shutters (as per design), concealed hardware, hinges, drawer channels, handles (integrated / concealed), all joinery, polishing, protection, transportation, and installation complete in all respects, as directed by the Architect / Engineer-in-Charge.

1. MATERIAL

Plywood : Shall Conform M37 Page no-18 in General Technical Specification Booklet

Paints / Polish : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Solid Teak Wood (Legs & Supports) : Shall be high-quality, well-seasoned teak wood, free from defects such as knots, cracks, warping, and insect attack. Timber shall be treated against termite and moisture and shall comply with Low VOC and formaldehyde-free requirements as per GRIHA 3 Star / IGBC Gold rating.

Decorative Brass Cladding (Front & Top Panels) : Shall be high-quality brass sheets of approved thickness, embossed / radial carved pattern as per design. Brass shall be finished in antique brushed finish, uniform in texture, and free from dents, scratches, or defects.

Backing Material (Plywood / MDF) : Shall be BWP grade plywood or approved MDF backing, Low VOC and formaldehyde-free, providing stable support for brass cladding.

Internal Carcass (BWP Plywood) : Shall be made from Boiling Water Proof (BWP) plywood, dimensionally stable, termite resistant, and suitable for furniture-grade construction.

Veneer / Finish (if applicable) : Shall be natural veneer or equivalent finish, properly bonded and finished with approved polish.

Adhesive (Bonding Agent) : Shall be synthetic resin adhesive (Fevicol or equivalent) with Low VOC content, suitable for wood and metal bonding.

Hardware & Fittings :

- Soft-close hinges
- Telescopic drawer channels
- Handles (concealed / integrated)
- Locks (if required)

All fittings shall be of approved make, durable, and corrosion-resistant.

Protective Coating for Brass : Shall be clear lacquer coating with Low VOC content, to prevent tarnishing and maintain finish.

Wood Polish / Finish : Shall be melamine / PU / natural polish with Low VOC content, providing smooth and durable finish.

2. WORKMANSHIP

2.1 General

- Work shall be executed as per approved design, drawings, and instructions of Architect/Engineer-in-Charge.
- Unit shall be installed at all floors, levels, and heights as required.
- Work shall be carried out by skilled carpenters and metal craftsmen.

2.2 Fabrication of Internal Carcass

- Carcass shall be made using BWP plywood.
- Structure shall be:
 - Rigid and stable
 - Properly aligned and square
- All joints shall be:
 - Strong and durable
 - Neatly finished

2.3 Fabrication of Brass-Clad Panels

- Brass sheets shall be:
 - Cut to required size
 - Embossed / carved in radial or decorative patterns
- Brass shall be fixed over backing board using:
 - Adhesive
 - Mechanical fixing where required
- Surface shall be even, without undulations or gaps.

2.4 Fabrication of Drawers / Shutters

- Drawers and shutters shall be fabricated as per design.
- Soft-close channels and hinges shall be provided.
- Operation shall be smooth and noise-free.

2.5 Fixing of Brass Top

- Brass sheet shall be fixed over top surface with proper bonding.
- Top shall be:
 - Even and level
 - Properly aligned with body

2.6 Fixing of Teak Wood Legs

- Solid teak wood legs shall be fixed securely to the base.
- Legs shall be:
 - Properly aligned
 - Capable of supporting full load
- Finish shall match overall design.

2.7 Finishing

- Wooden surfaces shall be sanded and polished.
- Brass surfaces shall be finished in antique brushed finish.
- Protective lacquer coating shall be applied on brass.
- Final finish shall be:
 - Smooth and uniform
 - Free from scratches or defects

2.8 Hardware Fixing

- All hardware shall be fixed properly and tested.
- Concealed fittings shall be aligned and functional.

2.9 Quality Requirements

- Plywood and MDF shall be:
 - Low VOC and formaldehyde-free
- Brass shall be:
 - Uniform in finish
 - Properly bonded
- Entire unit shall be:
 - Structurally sound
 - Aesthetically finished

2.10 Protection

- Finished unit shall be protected from:
 - Scratches
 - Moisture
 - Damage during handling

2.11 Installation

- Unit shall be placed/fixed in position as per layout.
- Proper leveling and alignment shall be ensured.

2.12 Maintenance

- Contractor shall maintain the unit in good condition until project completion.
- Any defects shall be rectified or replaced.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (Nos.)**
- The rate shall include Supply of BWP plywood and backing materials Brass sheets and decorative carving work Teak wood legs Adhesives (Low VOC) Hardware fittings (soft-close channels, hinges, handles) Fabrication and carpentry work Brass finishing and lacquer coating Polishing and finishing Transportation, handling, and installation All labour, tools, plants, leads, and lifts

ITEM NO – 199

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 conforming 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 HCFC free suitable adhesive. External facia of plywood to be covered with 4 mm thick decorative veneer 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 tongue 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

(Composite Wood products like MDF, Plywood etc Should be Low VOC and formaldehyde free containt, Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating)

1. MATERIAL

Plywood : Shall Conform M37 Page no-18 in General Technical Specification Booklet

Paints / Polish : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Aluminium Doors, Windows, Holdfasts : Shall Conform M31 Page no-17 in General Technical Specification Booklet

Fixtures and Fastenings : Shall Conform M43 Page no-19 in General Technical Specification Booklet
Block Board / Plywood (8 / 12 / 18 / 25 mm thick) :

Shall be MR/BWP grade decorative plywood/block board, Urea formaldehyde-free, conforming to relevant IS codes. Material shall be Low VOC and formaldehyde-free as per GRIHA 3 Star / IGBC Gold rating.

Solid Wood (Indian Teak Wood for External Members) : Shall be well-seasoned Indian teak wood, free from defects, treated against termite and moisture. Used for external members, lipping, and exposed framework.

Solid Wood Lipping (9 mm thick) : Shall be fixed on all exposed edges of plywood, properly seasoned and finished to match veneer.

Decorative Veneer (4 mm thick) : Shall be high-quality natural veneer of approved shade, grain, and texture as selected by Architect.

Laminate (0.8 mm thick) : Shall be of approved make and shade, used for internal surfaces of shutters, drawers, and shelves.

Adhesive (Low VOC) : Shall be synthetic resin adhesive (Fevicol or equivalent) with Low VOC content, suitable for woodwork.

Hardware & Fittings :

- Telescopic drawer channels
- Sliding channels (if required)
- Hinges
- Handles (SS / wooden / concealed)
- Locks
- Clips, braces, fasteners

All hardware shall be of approved make, durable, and corrosion-resistant.

Aluminium Pipe Framing (for shutters if specified) : Shall be of approved section and thickness, properly fabricated and fixed.

Termite Treatment Chemical : Shall be wood preservative (Pidilite Terminator or equivalent), applied to all wooden components.

Polish System (Low VOC PU Polish) :

Shall consist of:

- Epoxy insulator (1:1 mix with hardener)
- Wood sealer
- Wood stain
- Water-based PU polish (Low VOC)

2. WORKMANSHIP

2.1 General

- Work shall be executed as per approved drawings, design, and instructions of Engineer-in-Charge/Architect.
- Wardrobe shall be installed at all floors, levels, and heights.
- Work shall be carried out by skilled carpenters.

2.2 Preparation of Material

- Plywood/block board shall be cut to required sizes.
- Timber shall be seasoned and treated with anti-termite solution.
- All materials shall be stored properly to avoid damage.

2.3 Fabrication of Carcass

- Carcass shall be fabricated using 18/25 mm thick plywood/block board.
- Structure shall be:
 - Rigid and square
 - Properly aligned
- Joints shall be executed using:
 - Tongue and groove joints
 - Dovetail joints
 - Pocket screw joinery
 - Screws, nails, and braces

2.4 Shelves, Drawers & Compartments

- Shelves shall be fixed at required spacing.
- Drawers shall be fabricated and fitted with telescopic channels.
- Internal surfaces shall be finished with 0.8 mm laminate.

2.5 Shutters

- Shutters shall be fabricated using plywood/block board.
- External face shall be finished with 4 mm veneer.
- Aluminium framing (if required) shall be fixed properly.
- Shutters shall be fitted with hinges and aligned properly.

2.6 Lipping & Edge Treatment

- All exposed edges shall be provided with 9 mm solid wood lipping.
- Lipping shall be properly finished and flush with surface.

2.7 Fixing of Hardware

- Hardware fittings shall be fixed properly and tested.
- Drawer movement and shutter operation shall be smooth.

2.8 Polishing & Finishing

- Surface preparation shall include sanding and cleaning.
- Application sequence:
 1. Termite treatment
 2. Wood sealer
 3. Epoxy insulator (2 coats, 1:1 mix)
 4. Putty filling
 5. Sanding
 6. Wood staining
 7. Final water-based PU polish (Low VOC)
- Finish shall be:
 - Smooth and uniform
 - Free from defects

2.9 Installation

- Wardrobe shall be:
 - Fixed to wall/floor where required
 - Properly aligned and leveled

2.10 Quality Requirements

- All materials shall be:
 - Low VOC
 - Formaldehyde-free
- Joinery shall be:
 - Strong and durable
- Finish shall be:
 - Uniform and aesthetically pleasing

2.11 Protection

- Finished surfaces shall be protected from:
 - Scratches
 - Moisture
 - Damage

2.12 Maintenance

- Contractor shall maintain the wardrobe in good condition until project completion.
- Any defects shall be rectified.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Square Meter (Sqm)**.
- The rate shall include Supply of plywood/block board and teak wood Veneer and laminate Adhesives (Low VOC) Hardware fittings and channels Aluminium framing (if applicable) Termite treatment Polishing system (PU finish) Fabrication and installation All labour, tools, plants, leads, and lifts

ITEM NO – 200

Puffy: Providing and Laying Puffy of Size 600x600 with all transportation, Labour, Material and Scaffolding etc. Design as per architecture selection and as per instruction given by engineer incharge .at all floors / all levels / all heights.

- Relevant to item specification shall be followed **Item No - 202** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 201

VIP Puffy: Providing, fabricating, and placing custom-made upholstered puffy / ottoman of overall size 600 × 600 mm, comprising an internal hardwood / BWP plywood frame, upholstered with high-density foam cushioning (minimum 40–50 mm thick) and finished with premium fabric / PU

leather upholstery in approved colour and texture, with vertical channel stitching / fluted pattern as per design.

The item shall include proper padding, neat tailoring, concealed stitching, firm base support with anti-skid / felt pads, and complete finishing.

Rate shall include all materials, labour, upholstery work, stitching, adhesives, transportation, and placement at site, complete in all respects, as directed by the Architect / Engineer-in-Charge.at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating and All Fabric used should be IFR(Inherently fire retardant)

- Relevant to item specification shall be followed **Item No - 202** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 202

V.VIP Puffy: Providing, fabricating, and placing custom-made upholstered puffy / bench ottoman of overall size 1500 × 750 mm, comprising a solid hardwood / BWP plywood internal frame with turned wooden legs and moulded base profile, finished in approved polish / paint finish.

The top seating surface shall be upholstered with high-density PU foam cushioning (minimum 75–100 mm thick) and finished with premium fabric / velvet / PU leather upholstery in approved colour, featuring deep button tufting and neat stitching as per design.at all floors / all levels / all heights

The item includes all upholstery work, padding, buttons, polishing, joinery, protective base pads, transportation, and placement at site complete in all respects, as directed by the Architect / Engineer-in-Charge.

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating and All Fabric used should be IFR(Inherently fire retardant)

1. MATERIAL

Plywood : Shall Conform M37 Page no-18 in General Technical Specification Booklet

Paints / Polish : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Solid Hardwood / Teak Wood (Legs & Base Frame) : Shall be well-seasoned hardwood/teak wood, free from defects such as knots, cracks, warping, and insect attack. Timber shall be treated against termite and moisture and shall comply with Low VOC and formaldehyde-free requirements as per GRIHA 3 Star / IGBC Gold rating.

BWP Plywood (Internal Frame) : Shall be Boiling Water Proof (BWP) plywood, dimensionally stable, termite resistant, and Low VOC / formaldehyde-free.

High Density PU Foam Cushioning : Shall be high-density polyurethane foam of minimum 75–100 mm thickness, uniform density, resilient, and suitable for seating comfort.

Upholstery Fabric / Velvet / PU Leather : Shall be premium quality upholstery material of approved colour, texture, and pattern. Fabric shall be IFR (Inherently Fire Retardant) and Low VOC, complying with GRIHA / IGBC requirements.

Buttons for Tufting : Shall be matching upholstery buttons, properly covered and fixed for deep button tufting.

Adhesive (Low VOC) : Shall be synthetic resin adhesive (Fevicol or equivalent) with Low VOC content, suitable for upholstery and wood bonding.

Fasteners & Fixtures : Screws, nails, clamps, brackets, etc. shall be of approved make and corrosion-resistant.

Protective Pads (Base) : Shall be rubber/nylon pads fixed at bottom of legs to prevent floor damage.

Polish / Paint Finish : Shall be PU/melamine/paint finish of approved shade with Low VOC content.

2. WORKMANSHIP

2.1 General

- Work shall be executed as per approved design, drawings, and instructions of Architect/Engineer-in-Charge.
- Item shall be placed at all floors, levels, and locations as required.
- Work shall be carried out by skilled carpenters and upholstery craftsmen.

2.2 Fabrication of Frame

- Internal frame shall be fabricated using BWP plywood and hardwood members.
- Frame shall be:
 - Rigid and stable
 - Properly aligned
- Joints shall be:
 - Strong and durable
 - Executed using proper joinery techniques

2.3 Fabrication of Legs & Base

- Legs shall be made of solid wood (turned/moulded as per design).
- Base profile shall be shaped and finished as per approved design.
- Legs shall be fixed securely to frame.

2.4 Cushioning Work

- PU foam of 75–100 mm thickness shall be fixed over seating surface.
- Foam shall be:
 - Properly bonded
 - Evenly spread
- Additional padding layers (if required) shall be provided.

2.5 Upholstery Work

- Upholstery material shall be cut to required size.
- Fabric shall be stretched and fixed over foam.
- Deep button tufting shall be carried out as per design:
 - Uniform depth
 - Proper alignment
- Stitching shall be:
 - Neat and consistent
 - Free from wrinkles

2.6 Finishing of Wooden Parts

- Wooden parts shall be sanded smooth.

- Polish/paint shall be applied in multiple coats.
- Finish shall be:
 - Smooth and uniform
 - Free from defects

2.7 Fixing of Accessories

- Buttons, fasteners, and upholstery elements shall be securely fixed.
- Protective pads shall be fixed at bottom of legs.

2.8 Quality Requirements

- Foam shall be:
 - Uniform and resilient
- Upholstery shall be:
 - Tight and wrinkle-free
 - IFR compliant
- Frame shall be:
 - Strong and durable
- Entire item shall comply with Low VOC and formaldehyde-free requirements.

2.9 Protection

- Finished unit shall be protected from:
 - Dust
 - Moisture
 - Damage during handling

2.10 Placement

- Puffy shall be placed in position as per layout.
- Stability and leveling shall be ensured.

2.11 Maintenance

- Contractor shall maintain the item in good condition until project completion.
- Any damage shall be repaired or replaced.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (Nos.)**.
- The rate shall include Supply of plywood and hardwood PU foam cushioning Upholstery material (fabric / velvet / PU leather) Buttons and tufting work Adhesives (Low VOC) Fasteners and fixtures Polishing/painting of wooden parts Fabrication, transportation, and placement All labour, tools, plants, leads, and lifts

ITEM NO – 203

STUDY Table with WOODEN CHAIR : Providing, fabricating, and fixing custom-made wall-mounted study table with integrated drawers, and a matching study chair, complete in all respects.

The study table shall be made from BWP grade plywood / MDF, finished with laminate on top surface and laminet finish to drawer fronts, comprising a smooth working surface, floating

drawers with concealed soft-close channels, and a continuous wooden back ledge. The table shall be securely fixed to the wall with concealed MS brackets / supports, complete with edge banding and finishing.

The study chair shall be provided with a solid wood / metal frame, upholstered cushioned seat, finished in approved fabric and polish, complete with floor protection pads.

The item includes all carpentry, metal work, hardware, polishing, upholstery, transportation, and installation, complete in all respects, as directed by the Architect / Engineer-in-Charge.at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating).

- Relevant to item specification shall be followed **Item No - 205** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 204

VIP STUDY table with WOODEN CHAIR : Providing, fabricating, and fixing custom-made wall-mounted study table with integrated drawers, and a matching study chair, complete in all respects. The study table shall be made from BWP grade plywood / MDF, finished with natural wood veneer with pu poish on top surface and PU-painted finish to drawer fronts, comprising a smooth working surface, floating drawers with concealed soft-close channels, and a continuous wooden back ledge. The table shall be securely fixed to the wall with concealed MS brackets / supports, complete with edge banding and finishing.

The study chair shall be provided with a solid wood / metal frame, upholstered cushioned seat, finished in approved fabric and polish, complete with floor protection pads.

The item includes all carpentry, metal work, hardware, polishing, upholstery, transportation, and installation, complete in all respects, as directed by the Architect / Engineer-in-Charge.at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating).

- Relevant to item specification shall be followed **Item No - 205** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 205

V.VIP STUDY table WOODEN CHAIR : Providing, fabricating, and fixing custom-made wall-mounted study table with integrated drawers along with a matching study chair, complete in all respects. The study table shall be made from BWP grade plywood / solid wood, finished with natural wood veneer / polish, comprising a smooth working top with 6 mm corian sheet of white color glossy finish, multiple drawers with decorative wooden knobs, concealed runners, and ornamental edge detailing as per approved design. The table shall be securely fixed to the wall with concealed brackets and supports.

The overhead cabinet shall be constructed from BWP plywood with wooden framing, provided with glass-fronted shutter panels, clear / frosted glass as approved, wooden knobs, internal shelving, concealed hinges, and finished to match the study table.

The study chair shall be provided with a solid wood frame with upholstered seat and backrest, finished in approved leather upholster finish and polish, complete with padding and floor protection pads.

The item includes all carpentry, glass work, hardware, fittings, polishing, upholstery, transportation, and installation, complete in all respects, as directed by the Architect / Engineer-in-Charge.at all floors / all levels / all heights

(Composite Wood products like MDF, Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating).

1. MATERIAL

Plywood : Shall Conform M37 Page no-18 in General Technical Specification Booklet

Paints / Polish : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Glass : Shall Conform M38 Page no-18 in General Technical Specification Booklet

Fixtures and Fastenings : Shall Conform M43 Page no-19 in General Technical Specification Booklet

BWP Grade Plywood / Solid Wood : Shall be well-seasoned, Low VOC and formaldehyde-free, compliant with GRIHA 3 Star / IGBC Gold rating, free from cracks, knots, warping, and termite resistant. Used for table carcass, drawers, overhead cabinet, and chair frame.

Veneer / Wooden Finish : Natural veneer / solid wood finish for all exposed surfaces, uniform in color and grain, properly bonded to plywood or solid wood.

Corian Sheet (6 mm thick, White Glossy Finish) : Shall be high-quality, smooth, durable, and resistant to staining and scratching for the table working surface.

Glass for Cabinet Doors : Clear / frosted glass of approved thickness for overhead cabinet doors.

Glass shall be tempered / toughened if required, free from defects.

Upholstery Material for Chair : Premium leather / approved fabric with padding, Low VOC and IFR compliant, smooth, wrinkle-free, and durable.

Cushioning / Padding : High-density PU foam or equivalent for upholstered chair seat and backrest.

Adhesive (Low VOC) : Synthetic resin adhesive suitable for bonding wood, veneer, and plywood.

Hardware & Fittings :

- Concealed drawer runners
- Hinges for shutters
- Wooden knobs
- Brackets and supports (concealed for wall-mounting)
- Screws, fasteners, and clamps

All hardware shall be corrosion-resistant and of approved make.

Polish / Finish : Water-based PU / natural polish, Low VOC content, applied on all wooden surfaces, ensuring smooth, durable, and aesthetically uniform finish.

Protective Pads (Chair Feet) : Rubber / nylon pads to prevent floor scratching.

2. WORKMANSHIP

2.1 General

- Work to be executed as per approved drawings, Architect/Engineer-in-Charge instructions.
- Installation at all floors, levels, and heights.
- Skilled carpentry and upholstery craftsmen shall execute the work.

2.2 Study Table Carcass

- Fabricated using BWP plywood / solid wood, rigid, square, and stable.

- Wall-mounted units to be supported with concealed brackets and proper fixing hardware.
- Table top shall be bonded with 6 mm corian sheet, perfectly aligned and smooth.

2.3 Drawers and Storage

- Drawers fabricated with BWP plywood, smooth edges, using concealed telescopic runners.
- Wooden knobs shall be fixed properly.
- Overhead cabinet shall have framed plywood structure with glass-fronted shutters.
- Shelves and compartments to be properly aligned and reinforced.

2.4 Chair Fabrication

- Chair frame in solid wood / plywood, properly seasoned.
- Upholstered seat and backrest with high-density PU foam padding.
- Covering shall be leather / approved fabric, taut, smooth, and securely fixed.
- Chair legs to have protective pads.

2.5 Finishing

- Wooden surfaces: fine sanding, sealer coat, termite treatment, and water-based PU polish.
- Corian sheet: smooth, glossy, clean.
- Glass: cleaned, free from defects.
- Upholstery: neatly stitched, tufted or smooth as per design.

2.6 Hardware Installation

- Concealed drawer runners, hinges, brackets, and knobs to be installed securely.
- Functionality checked for smooth operation.

2.7 Quality Checks

- Carpentry work: joints strong, surfaces flat, edges straight.
- Upholstery: firm, smooth, and comfortable.
- Corian: level and scratch-free.
- Glass: defect-free and properly fixed.

2.8 Protection & Maintenance

- Units protected from moisture, dust, scratches until handover.
- Contractor responsible for rectification of defects prior to handover.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (Nos.)**.
- Rate Includes Supply of BWP plywood / solid wood / veneer Corian top and glass
Hardware: hinges, brackets, drawer runners, knobs Polishing / finishing with low VOC PU
Upholstery and padding for chair Carpentry, assembly, and installation Transportation,
scaffolding, and labor

ITEM NO – 206

Single Seater Sofa: Providing & Fixing Single Seated sofa of size 900x610x770mm having artificial leather upholster finish using tropical seasoned hardwood and partical board legs material comes in Ply wood facia with melemine coating comes in synthetic leather with nylon polyster stiching seat and back foam come in 28d polyurithine slab stock foam with 1" recron layer and bonding solution will be bolting glue. at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating and All Fabric used should be IFR(Inherently fire retardant)).

- Relevant to item specification shall be followed **Item No - 208** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 207

VIP Single Seater fabric Sofa: Providing, fabricating, and placing custom-made single-seater upholstered sofa of overall size 900 × 610 × 770 mm, comprising a solid hardwood (teak wood / equivalent approved) exposed structural frame with curved armrests and legs, machine-finished and polished in approved natural finish.

The seating and backrest shall be provided with high-density PU foam cushioning with fibre wrap, upholstered in premium fabric / linen upholstery in approved colour and texture, including loose / fixed back cushions as per design.

Item includes complete carpentry, joinery, upholstery, cushioning, polishing, floor protection pads, transportation, and placement at site, complete in all respects, as directed by the Architect / Engineer-in-Charge.at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating and All Fabric used should be IFR(Inherently fire retardant)).

- Relevant to item specification shall be followed **Item No - 208** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 208

V.VIP Single Seater premium fabric Sofa: Providing, fabricating, and placing premium custom-made single-seater upholstered sofa of overall size 900 × 610 × 770 mm, comprising a solid seasoned teak wood / approved hardwood exposed structural frame, featuring continuous rounded edge armrests, back support rails, and legs, machine-crafted and hand-finished for a seamless designer appearance.

Seat and back cushions shall be made of multi-layer high-resilience PU foam (40–45 density) with soft fibre wrap, providing superior comfort and shape retention, upholstered in premium imported / upholstery-grade fabric or linen blend, stain-resistant and abrasion-tested, in approved colour and texture.

All wooden members shall be smoothly polished with premium PU / oil-based natural finish, highlighting wood grain.

Item includes complete carpentry, upholstery, cushioning, polishing, anti-skid floor pads, transportation, positioning at site, complete in all respects, as directed by the Architect / Engineer-in-Charge.at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating and All Fabric used should be IFR(Inherently fire retardant))

1. MATERIAL

Plywood: Shall Conform M37 Page no-18 in General Technical Specification Booklet

Paints / Polish: Shall Conform M44 Page no-21 in General Technical Specification Booklet

Solid Hardwood / Teak Wood (Frame & Legs) :

- Well-seasoned, defect-free (no cracks, knots, warping), termite and moisture resistant.
- All exposed wood shall comply with Low VOC and formaldehyde-free requirements as per GRIHA 3 Star / IGBC Gold rating.

BWP Plywood (if internal frame used) :

- Boiling Water Proof grade, dimensionally stable, termite resistant, and Low VOC / formaldehyde-free.

High-Resilience PU Foam (Seat & Back Cushions) :

- Multi-layer foam with 40–45 density, wrapped with soft fibre padding for comfort, support, and shape retention.

Upholstery Fabric / Linen Blend :

- Premium imported / upholstery-grade, stain-resistant, abrasion-tested, approved colour and texture.
- IFR (Inherently Fire Retardant) and Low VOC compliant.

Adhesives (Low VOC) :

- Synthetic resin adhesives suitable for bonding wood, plywood, and upholstery components.

Hardware / Fixtures :

- Screws, nails, brackets, fasteners, anti-skid pads.
- All hardware corrosion-resistant and of approved make.

Polish / Finish :

- Water-based PU or oil-based natural finish, Low VOC, applied on all exposed wooden surfaces.

Protective Pads / Floor Glides :

- Rubber / nylon anti-skid pads fixed under legs.

2. WORKMANSHIP

2.1 General

- Work shall be executed as per approved design, drawings, and instructions of Architect / Engineer-in-Charge.
- Item shall be placed at all floors, levels, and heights.
- Skilled carpentry and upholstery craftsmen shall execute the work.

2.2 Wooden Frame

- Solid teak / hardwood frame shall include:
 - Continuous rounded-edge armrests
 - Back support rails
 - Legs properly aligned and level
- Frame shall be rigid, seamless, and defect-free.
- All joints secured using appropriate joinery and corrosion-resistant fasteners.

2.3 Cushioning

- Seat and back cushions shall be multi-layer high-resilience PU foam with fibre wrap.
- Foam shall be cut and shaped to fit frame dimensions.
- Cushion shall maintain shape, provide comfort, and allow proper seating posture.

2.4 Upholstery

- Fabric / linen blend shall be carefully cut, stretched, and fixed over foam and frame.
- Stitching shall be neat, straight, and uniform.
- Upholstery shall conform to approved colour, texture, and tufting pattern if specified.

2.5 Polishing & Finish

- Exposed wooden surfaces shall be sanded smooth.
- Application of water-based PU / oil-based natural polish (Low VOC) to achieve uniform finish.
- Wood grain should be highlighted without blotches or defects.

2.6 Hardware Installation

- Anti-skid pads / floor glides to be fixed on legs.
- All fasteners, screws, and brackets properly installed and concealed.

2.7 Quality Checks

- Frame: rigid, square, seamless joints.
- Cushioning: resilient, uniform density, comfort tested.
- Upholstery: tight, smooth, defect-free.
- Finish: uniform, scratch-free, smooth.

2.8 Protection & Maintenance

- Sofa shall be protected from moisture, dust, and scratches until handover.
- Any defects in upholstery, foam, or woodwork shall be rectified by the contractor prior to final acceptance.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (Nos.)**.
- Rate Includes Supply of plywood / hardwood / veneer Foam and fibre wrap Upholstery fabric / linen Hardware and anti-skid pads Polishing / finishing Carpentry, joinery, upholstery, assembly, and installation Transportation, lifting, and labor

ITEM NO – 209

Two Seater Sofa : Providing & Fixing Two Seated sofa of size 1500x610x770mm having artificial leather upholster finish using tropical seasoned hardwood and partical board legs material comes in MDF wooden facia with melemine coating comes in synthetic leather with nylon polyster stiching seat and back foam come in 28d polyurithine slab stock foam with 1" recron layer and bonding solution will be bolting glue. at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating and All Fabric used should be IFR(Inherently fire retardant)

- Relevant to item specification shall be followed **Item No - 208** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 210

VIP Two Seater fabric Sofa: Providing, fabricating, and placing custom-made double-seater upholstered sofa of overall size 1500 × 610 × 770 mm, comprising a solid hardwood exposed frame with continuous armrest profile and legs, finished in approved natural wood polish.

The sofa shall be provided with high-density PU foam seat and back cushions with fibre wrap, upholstered in premium fabric / linen upholstery, with neat tailoring and concealed stitching, suitable for residential / hospitality use.

Item includes all materials, carpentry, upholstery, polishing, accessories, transportation, and placement at site, complete in all respects, as directed by the Architect / Engineer-in-Charge.at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating and All Fabric used should be IFR(Inherently fire retardant)

- Relevant to item specification shall be followed **Item No - 208** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 211

V.VIP Two Seater premium fabric Sofa : Providing, fabricating, and placing custom-made double-seater upholstered sofa of overall size 1500 × 610 × 770 mm, comprising a solid seasoned teak wood / approved hardwood exposed structural frame, featuring continuous rounded edge armrests, back support rails, and legs, machine-crafted and hand-finished for a seamless designer appearance.

Seat and back cushions shall be made of multi-layer high-resilience PU foam (40–45 density) with soft fibre wrap, providing superior comfort and shape retention, upholstered in premium imported / upholstery-grade fabric or linen blend, stain-resistant and abrasion-tested, in approved colour and texture.

Item includes all materials, carpentry, upholstery, polishing, accessories, transportation, and placement at site, complete in all respects, as directed by the Architect / Engineer-in-Charge.at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating and All Fabric used should be IFR(Inherently fire retardant)

- Relevant to item specification shall be followed **Item No - 208** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 212

Three Seater Sofa : Providing & Fixing Three Seated sofa of size 2100 x 610 x 770mm having artificial leather upholster finish using tropical seasoned hardwood and partical board legs material comes in MDF wooden facia with melemine coating comes in synthetic leather with nylon polyster stiching seat and back foam come in 28d polyurithine slab stock foam with 1" recron layer and bonding solution will be bolting glue. at all floors / all levels / all heights(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating and All Fabric used should be IFR(Inherently fire retardant)

- Relevant to item specification shall be followed **Item No - 208** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 213

VIP Three Seater fabric Sofa : Providing, fabricating, and placing custom-made three-seater upholstered sofa of overall size 2100 × 610 × 770 mm, comprising a solid hardwood structural frame with exposed armrests and legs, finished in approved natural wood polish / PU finish. Seating and back cushions shall be made of high-density PU foam with fibre wrap, upholstered in premium fabric / linen upholstery, ensuring comfort, durability, and uniform finish suitable for heavy-use areas.

Item includes full carpentry, upholstery, cushioning, polishing, accessories, transportation, and placement at site, complete in all respects, as directed by the Architect / Engineer-in-Charge.at all floors / all levels / all heights(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating and All Fabric used should be IFR(Inherently fire retardant)

- Relevant to item specification shall be followed **Item No - 208** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 214

V.VIP Three Seater premium fabric Sofa : Providing, fabricating, and placing custom-made three-seater upholstered sofa of overall size 2100 × 610 × 770 mm, featuring continuous rounded edge armrests, back support rails, and legs, machine-crafted and hand-finished for a seamless designer appearance.

Seat and back cushions shall be made of multi-layer high-resilience PU foam (40–45 density) with soft fibre wrap, providing superior comfort and shape retention, upholstered in premium imported / upholstery-grade fabric or linen blend, stain-resistant and abrasion-tested, in approved colour and texture.

Item includes full carpentry, upholstery, cushioning, polishing, accessories, transportation, and placement at site, complete in all respects, as directed by the Architect / Engineer-in-Charge.at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating and All Fabric used should be IFR(Inherently fire retardant)

- Relevant to item specification shall be followed **Item No - 208** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 215

Deluxe Balcony Premium Chair :Providing and placing deluxe balcony premium Chair made from seasoned hard wood/engineered wood, smoothly finished and weather-resistant, with ergonomically designed seat and back, cushioned upholstery, complete with fittings, fixing, all materials and labour, as per specifications and directions of Engineer-in-Charge.at all floors / all levels / all heights

1. MATERIAL

Plywood : Shall Conform M37 Page no-18 in General Technical Specification Booklet

Paints / Polish : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Solid Hardwood / Engineered Wood (Frame & Legs) :

- Well-seasoned, smooth, durable, defect-free (no cracks, knots, warping).
- Compliant with Low VOC and formaldehyde-free requirements as per GRIHA 3 Star / IGBC Gold rating.
- Treated for weather resistance and termite protection.

Cushioning / Upholstery :

- High-density PU foam or equivalent, resilient and comfortable.
- Upholstery fabric / leather of approved quality and colour.
- Low VOC and IFR (Inherently Fire Retardant) compliant.

Adhesives / Bonding Agents :

- Low VOC synthetic resin adhesives suitable for wood and upholstery bonding.

Hardware / Fasteners :

- Screws, brackets, clamps, and fixing hardware of approved make, corrosion-resistant.

Polish / Finish :

- Water-based PU or oil-based natural finish, Low VOC, smooth, uniform, and durable.

Protective Pads (Floor) :

- Rubber / nylon pads to prevent floor damage.

2. WORKMANSHIP

2.1 General

- Work to be executed as per approved drawings, design, and instructions of Architect / Engineer-in-Charge.
- Installation at all floors, levels, and heights.
- Skilled carpenters and upholsterers to carry out fabrication and finishing.

2.2 Chair Frame

- Ergonomically designed frame for comfort and proper posture.
- Frame joints strong and durable using proper joinery and fasteners.
- Smooth edges and rounded corners as per design.
- Legs and armrests aligned and leveled.

2.3 Cushioning and Upholstery

- Seat and backrest cushioned with high-density PU foam.

- Upholstery material stretched, neatly stitched, and securely fixed.
- Upholstery free from wrinkles, sagging, or defects.

2.4 Polishing / Finishing

- Wooden surfaces sanded smooth.
- Finish applied using water-based PU / oil-based natural polish, uniform and free from defects.
- Highlight wood grain while ensuring weather resistance.

2.5 Hardware & Accessories

- All screws, fasteners, brackets, and fittings fixed securely.
- Protective floor pads installed to prevent scratching.

2.6 Quality Checks

- Frame: strong, square, and stable.
- Cushions: uniform, resilient, and comfortable.
- Upholstery: neat, taut, IFR compliant.
- Finish: smooth, defect-free, weather-resistant.

2.7 Protection & Maintenance

- Chairs protected from dust, moisture, and damage until handover.
- Any defects in wood, upholstery, or cushioning rectified by contractor.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (Nos.)**.
- Rate Includes Supply of hardwood / engineered wood Cushions and upholstery Hardware and protective pads Polishing / finishing Carpentry, upholstery, assembly, and installation Transportation, lifting, and labour

ITEM NO – 216

VIP Lounge Seating Set : Providing, fabricating, supplying, and placing premium outdoor rattan lounge seating set, comprising two (2) single lounge chairs and one (1) center side table, made from high-quality synthetic rattan / PE wicker handwoven on powder-coated MS / aluminium / seasoned hardwood frame, suitable for outdoor and semi-outdoor use.

Each lounge chair shall be ergonomically designed with curved woven backrest and arm support, mounted on sturdy tapered legs, complete with loose seat and back cushions made from high-resilience PU foam, upholstered in outdoor-grade, water-resistant, UV-stable fabric in approved colour.at all floors / all levels / all heights

Center table shall be circular in shape with woven rattan base structure and solid top (wood / WPC / exterior-grade laminate), stable and weather-resistant, matching the chair finish and design language. complete in all respects, as directed by the Architect / Engineer-in-Charge.

- Relevant to item specification shall be followed **Item No - 217** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 217

V.VIP Lounge Seating Set : Supply, Installation & Placement of Premium Handcrafted Outdoor Seating Set

Providing and placing premium-quality handcrafted natural rattan/cane outdoor seating furniture set, comprising two (2) lounge chairs with ergonomically curved backrests, one (1) central round coffee table, and one (1) matching side table, suitable for verandah, balcony, lounge, or semi-open spaces.

The furniture shall be manufactured from seasoned, treated natural rattan/cane, handwoven by skilled craftsmen, ensuring high durability, structural stability, and superior finish. All joints shall be securely fixed and reinforced. The surface shall be smooth, splinter-free, and uniformly finished in a natural matte tone.

Lounge chairs shall be provided with high-density foam seat and back cushions, upholstered in premium, removable, and washable fabric, suitable for indoor and covered outdoor use. Cushions shall be neatly tailored with concealed stitching for a refined appearance. at all floors / all levels / all heights

The coffee table and side table shall be matching in material, texture, and finish, with a sturdy woven top and stable base, designed to complement the seating aesthetically and functionally. Item includes all materials, labour, tools, handling, transportation, installation, and positioning, complete in all respects, as directed by the Architect / Engineer-in-Charge.

1. MATERIAL

Plywood : Shall Conform M37 Page no-18 in General Technical Specification Booklet

Paints / Polish : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Natural Rattan / Cane :

- Seasoned, treated, defect-free, and handwoven by skilled craftsmen.
- All materials shall be Low VOC and formaldehyde-free where adhesives or binding agents are used, complying with GRIHA 3 Star / IGBC Gold rating.
- Structural stability, durability, and splinter-free surfaces ensured.

Cushioning :

- High-density PU foam or equivalent for seat and back cushions.
- Foam shall provide comfort, shape retention, and resilience.

Upholstery Fabric :

- Premium fabric, removable, washable, IFR (Inherently Fire Retardant), Low VOC compliant.
- Concealed stitching for refined appearance.

Adhesives / Bonding Agents :

- Low VOC synthetic resin adhesives suitable for rattan/cane furniture.

Polish / Finish :

- Natural matte / water-based PU finish, Low VOC, smooth, uniform, and weather-resistant for covered outdoor use.

Fasteners / Hardware :

- Screws, brackets, joints, and fittings of corrosion-resistant and approved make.
- All joints reinforced for stability.

2. WORKMANSHIP

2.1 General

- Work executed as per approved drawings, design, and instructions of Architect / Engineer-in-Charge.

- Installation at all floors, levels, and heights, including verandah, lounge, and semi-open spaces.
- Skilled craftsmen to execute weaving, carpentry, and upholstery work.

2.2 Chairs

- Two lounge chairs with ergonomically curved backrests.
- Handwoven rattan/cane frame, smooth and splinter-free.
- High-density foam cushions for seat and backrest.
- Fabric covering neatly tailored, removable, and washable.
- Joints reinforced and securely fixed.

2.3 Tables

- One round central coffee table and one matching side table.
- Matching material, texture, and finish.
- Woven top surface, smooth and level.
- Sturdy base providing stability and aesthetic alignment with seating.

2.4 Finish

- Surfaces polished or treated for durability, weather resistance, and uniform matte appearance.
- Edges smooth and free from splinters.
- Low VOC finish to meet environmental standards.

2.5 Quality Checks

- Frame: strong, durable, and defect-free.
- Cushioning: resilient and comfortable.
- Upholstery: neat, IFR compliant, removable.
- Finish: smooth, uniform, splinter-free.

2.6 Protection & Maintenance

- Furniture shall be protected from dust, moisture, and handling damage until installation.
- Contractor responsible for rectifying defects in frame, weaving, upholstery, or finishing.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Set (Nos.)**, including all chairs and tables supplied, installed, and positioned.
- Rate Includes Supply of rattan/cane, plywood, hardwood components Foam and upholstery fabrics Handwoven workmanship Hardware, joints, and reinforcements Polishing / finishing Carpentry, assembly, installation, and handling Transportation, lifting, and labor

ITEM NO – 218

VIP Dining Table : Supply, installation and placing of premium round dining table, 1000 mm diameter, designed in contemporary style, suitable for residential, hospitality or office pantry use.

The table shall be manufactured from high-quality engineered wood / solid wood (as approved) with veneered / laminate finished top, supported on a central pedestal base ensuring structural stability and adequate legroom. The tabletop shall have smooth rounded edges, uniform grain pattern, and a scratch-resistant, moisture-resistant polished finish. All surfaces shall be factory finished with approved shade and texture.

The item shall include all materials, fittings, labour, handling, transportation, installation, and positioning, complete in all respects, as directed by the Architect / Engineer-in-Charge.at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating),

- Relevant to item specification shall be followed **Item No - 219** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 219

V.VIP Dining Table (Solid Wooden marble inlay) : Supply, installation and placing of premium VVIP dining table, size 2100 × 900 × 750 mm (L × W × H), designed in classical-luxury style.

The dining table shall be constructed with a high-strength internal framework of seasoned solid wood / marine-grade plywood, finished with premium stone / composite stone / marble-finish top (as approved) incorporating decorative inlay / CNC patterned border work in contrasting tone. The tabletop shall have polished, stain-resistant, scratch-resistant finish with smooth chamfered edges.

The table base shall be robust pedestal type, finished with PU / enamel paint and gold-tone accent detailing, providing high load-bearing capacity and long-term stability. All visible surfaces shall be factory finished, uniform in shade, free from warping, cracks or blemishes.

The item shall include all materials, inlay work, surface finishing, hardware, labour, handling, transportation, installation and positioning, complete in all respects, as approved by the Engineer-in-Charge.at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating)

1. MATERIAL

Plywood : Shall Conform M37 Page no-18 in General Technical Specification Booklet

Paints / Polish : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Stone / Marble : Shall be high-quality, approved make, smooth and free from cracks / chips

Adhesives / Bonding Agents : Low VOC, suitable for bonding wood, plywood, and stone inlays

Fixtures and Fastenings : Shall Conform M43 Page no-19 in General Technical Specification Booklet

Solid Wood / Marine-Grade Plywood (Internal Framework & Pedestal Base) :

- Seasoned, defect-free (no cracks, knots, or warping), termite-resistant, and compliant with Low VOC and formaldehyde-free requirements per GRIHA 3 Star / IGBC Gold rating.
- Framework designed for high-strength support of stone / marble top.

Stone / Marble Top :

- Premium natural stone / marble / approved composite stone.
- Smooth, polished, scratch-resistant, stain-resistant surface.
- Chamfered edges, decorative inlay / CNC patterned borders in contrasting tone.
- Factory finished and uniform in shade.

PU / Enamel Finish (Pedestal Base & Accents) :

- Low VOC compliant, uniform, durable, and scratch-resistant.
- Gold-tone accent detailing as per design.

Adhesives :

- Low VOC adhesives suitable for bonding wood and stone inlay.

Hardware / Fixtures :

- Fasteners, brackets, and supports of corrosion-resistant, approved make.

2. WORKMANSHIP

2.1 General

- Work executed as per approved drawings, design, and instructions of Architect / Engineer-in-Charge.
- Installation at all floors, levels, and heights.
- Skilled carpenters and stone inlay craftsmen to execute the work.

2.2 Framework

- Solid wood / marine plywood internal framework for robust support.
- Pedestal-type base properly aligned, leveled, and secured for high load-bearing capacity.
- All joints strong, square, and free of defects.

2.3 Marble / Stone Top

- Stone / marble top with polished finish, chamfered edges, and decorative inlay.
- Surface smooth, uniform, free of cracks, chips, or blemishes.
- CNC pattern work precise and aligned to design.
- Tabletop securely bonded to internal framework.

2.4 Finish

- Pedestal base and accents finished with PU / enamel paint (low VOC), uniform and smooth.
- Gold-tone detailing applied neatly, free from streaks or defects.
- Overall table aligned, stable, and aesthetically consistent.

2.5 Quality Checks

- Structural stability: Table should bear loads without deflection or wobble.
- Surface: Smooth, polished, scratch and stain-resistant.
- Finish: Uniform, defect-free, color consistent.
- Inlay work: Precise, well-bonded, no gaps.

2.6 Protection & Maintenance

- Table shall be protected from dust, moisture, and scratches until installation.
- Any defects in stone, woodwork, or finishing shall be rectified by contractor prior to handover.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (Nos.)**.

- Rate Includes Supply of solid wood / marine plywood and stone / marble Decorative inlay and CNC pattern work PU / enamel finish, gold-tone accents Hardware, fasteners, and support brackets Carpentry, stone work, assembly, installation Transportation, lifting, and labour

ITEM NO – 220

VIP Dining Chair : Supply, installation and placing of premium upholstered dining chair, designed to complement the VIP dining table.

The chair shall have a solid wood / engineered wood frame with ergonomically designed curved backrest and arm support, finished in approved polish. Seating and backrest shall be provided with high-density foam cushioning, upholstered in premium fabric / leatherette, neatly stitched and firmly fixed. Legs shall be fitted with floor-protecting bushes to prevent damage to flooring.at all floors / all levels / all heights

The item shall include all materials, fittings, labour, transportation, installation and positioning, complete in all respects, as directed by the Architect / Engineer-in-Charge.

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating)

- Relevant to item specification shall be followed **Item No - 221** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 221

V.VIP Dining Chair : Supply, installation and placing of premium upholstered dining chair, suitable for use with the above VVIP dining table.

The chair shall be manufactured with a solid wood / engineered wood frame, ergonomically shaped high backrest with arm support, and finished in approved polish / PU finish. Seat and backrest shall be provided with high-density foam cushioning, upholstered in premium fabric / velvet / leatherette, neatly tailored with concealed stitching.

Chair legs shall be provided with metal / solid wood supports, finished with gold-tone / polished accents, and fitted with floor-protecting bushes to avoid damage to flooring.

The item shall include all materials, upholstery, hardware, labour, transportation, installation and positioning, complete in all respects, as directed by the Architect / Engineer-in-Charge.at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating)

1. MATERIAL

Plywood : Shall Conform M37 Page no-18 in General Technical Specification Booklet

Paints / Polish : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Adhesives / Bonding Agents : Low VOC, suitable for wood and upholstery applications

Hardware / Fixtures : Shall Conform M43 Page no-19 in General Technical Specification Booklet

Solid Wood / Engineered Wood (Frame & Legs) :

- Well-seasoned, defect-free, termite-resistant.
- Compliant with Low VOC and formaldehyde-free requirements as per GRIHA 3 Star / IGBC Gold rating.

High-Density Foam (Seat & Back Cushions) :

- Minimum 40–45 density, resilient, providing comfort and shape retention.

Upholstery Fabric / Velvet / Leatherette :

- Premium, neatly tailored, removable where possible.
- Concealed stitching for refined appearance.
- IFR (Inherently Fire Retardant) and Low VOC compliant.

Polish / PU Finish :

- Water-based PU or oil-based natural finish, Low VOC, smooth, and uniform.

Metal / Wooden Supports (Legs & Accents) :

- Solid wood or metal supports with gold-tone or polished finish.
- Fitted with floor-protecting bushes / pads to avoid floor damage.

2. WORKMANSHIP

2.1 General

- Work executed as per approved drawings, design, and instructions of Architect / Engineer-in-Charge.
- Installation at all floors, levels, and heights.
- Skilled carpentry and upholstery team to execute fabrication and finishing.

2.2 Chair Frame

- Ergonomically shaped frame with high backrest and arm support.
- Strong and durable joints, reinforced with screws, brackets, or appropriate fasteners.
- Smooth, defect-free edges and surfaces.

2.3 Cushioning & Upholstery

- Seat and backrest cushions cut and shaped to frame dimensions.
- Cushions upholstered in premium fabric / velvet / leatherette.
- Fabric stretched neatly with concealed stitching.
- Upholstery free from wrinkles, sagging, or defects.

2.4 Finish

- Wooden / metal surfaces polished uniformly with PU / natural oil-based finish.
- Gold-tone or polished accents applied neatly.
- Legs and supports aligned and level, with floor-protecting pads installed.

2.5 Quality Checks

- Frame: stable, strong, and ergonomically shaped.
- Cushioning: resilient, uniform, comfortable.
- Upholstery: neat, IFR compliant, defect-free.
- Finish: smooth, uniform, free of scratches or blemishes.

2.6 Protection & Maintenance

- Chairs shall be protected from dust, moisture, and handling damage until installation.
- Contractor shall rectify any defects in wood, upholstery, finish, or cushioning prior to handover.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (Nos.)**.
- Rate Includes Supply of solid / engineered wood, plywood, and upholstery materials Foam and fabric / leatherette Hardware, fasteners, and floor pads Polishing / finishing Carpentry, upholstery, assembly, installation, handling, and transportation

ITEM NO – 222

Console: Providing and Laying Wooden Console unit of size 0.9 m(L) x 0.45m(B) x 0.75 m(H). Design as per Selection of Architect and as per direction of Engineer in charge.at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt, as per the GRIHA 3star/IGBC gold rating)

- Relevant to item specification shall be followed **Item No - 224** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 223

VIP Console: Supply, installation and placing of premium designer console / sideboard unit, size 1600 × 450 × 900 mm (L × W × H), finished in contemporary luxury style.

The console shall be fabricated with a high-quality internal framework of seasoned solid wood / BWP grade plywood, externally finished with premium natural veneer in approved shade. The front elevation shall feature vertical fluted / ribbed decorative panels, precision-crafted to achieve uniform grooves and a refined three-dimensional texture.

The top surface shall be finished in matching veneer / solid wood, with smooth rounded edges and protective clear PU coating for durability. The unit shall be fitted with soft-close concealed hinges and premium hardware of approved make, ensuring smooth and silent operation. Internal storage (shelves / compartments) shall be neatly finished and properly aligned.

All exposed surfaces shall be warp-free, smooth, and factory finished, with consistent grain pattern and superior workmanship. The item shall include all materials, veneer work, hardware, labour, handling, transportation, installation and positioning, complete in all respects, as approved by the Engineer-in-Charge.at all floors / all levels / all heights

- Relevant to item specification shall be followed **Item No - 224** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 224

V.VIP Console: Supply, installation and placing of premium designer console / sideboard unit, size 1600 × 450 × 900 mm (L × W × H), finished in contemporary-luxury style.

The console shall be manufactured using a high-quality internal framework of seasoned solid wood / BWP grade plywood, finished externally with premium veneer / PU finish in approved shade. The front shall feature decorative CNC-crafted panelled shutters, providing a refined three-dimensional texture and uniform alignment.

The unit shall be supported on metal / solid wood legs with anti-corrosive finish and floor-protecting bushes. All shutters shall be fitted with soft-close concealed hinges / hardware of

approved make, ensuring smooth and silent operation. Internal shelving (if any) shall be neatly finished and properly aligned.

All exposed surfaces shall be smooth, warp-free, and factory finished, with consistent colour, sharp edges, and premium workmanship. The item shall include all materials, fittings, hardware, labour, handling, transportation, installation and positioning, complete in all respects, as directed by the Architect / Engineer-in-Charge.at all floors / all levels / all heights

1. MATERIAL

Plywood : Shall Conform M37 Page no-18 in General Technical Specification Booklet

Paints / Polish : Shall Conform M44 Page no-21 in General Technical Specification Booklet

Adhesives / Bonding Agents : Low VOC, suitable for wood and veneer application

Hardware / Fixtures : Shall Conform M43 Page no-19 in General Technical Specification Booklet

Metal Supports / Legs : Anti-corrosive, approved make

Solid Wood / BWP Grade Plywood (Framework & Internal Structure) :

- Seasoned, defect-free, termite-resistant.
- Compliant with Low VOC and formaldehyde-free requirements per GRIHA 3 Star / IGBC Gold rating.

Veneer / PU Finish (External Surfaces) :

- Premium veneer or PU finish, uniform, smooth, and consistent shade.
- Low VOC compliant.

Decorative Panel Shutters (CNC-crafted) :

- Precision-cut paneling providing three-dimensional texture and uniform alignment.
- Finished to match veneer / PU surface, smooth, and defect-free.

Hardware / Fittings :

- Soft-close concealed hinges, approved make, corrosion-resistant.
- Handles, drawer channels, and brackets of approved make.

Metal / Solid Wood Legs :

- Sturdy, anti-corrosive finish, with floor-protecting bushes / pads.

Adhesives :

- Low VOC, suitable for bonding wood, plywood, and veneers.

2. WORKMANSHIP

2.1 General

- Work executed as per approved drawings, design, and instructions of Architect / Engineer-in-Charge.
- Installation at all floors, levels, and heights.
- Skilled carpentry team to execute fabrication, CNC paneling, finishing, and assembly.

2.2 Framework & Structure

- Solid wood / BWP plywood internal framework for strength and durability.
- All joints properly secured, aligned, and stable.
- Internal shelving (if any) neatly finished, leveled, and aligned.

2.3 Decorative Shutters

- CNC panelled shutters with precise patterns and consistent three-dimensional texture.
- Shutters fitted with soft-close concealed hinges, aligned and level.
- Surfaces smooth, free from defects, warp, or blemishes.

2.4 Finish

- Exposed surfaces polished with PU / veneer finish (Low VOC).
- Metal / solid wood legs with anti-corrosive finish.
- Floor-protecting pads installed to prevent flooring damage.

2.5 Quality Checks

- Framework: strong, square, and stable.
- Paneling: aligned, defect-free, CNC-precision.
- Finish: smooth, uniform, consistent shade.
- Hinges & hardware: soft-close, functional, corrosion-resistant.

2.6 Protection & Maintenance

- Unit protected from dust, moisture, and handling damage until installation.
- Contractor responsible for rectifying defects in wood, paneling, finishing, or hardware prior to handover.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (Nos.)**.
- Rate Includes Supply of solid wood / BWP plywood framework Veneer / PU finish and CNC paneling Hardware, hinges, brackets, and metal / wooden legs Carpentry, assembly, finishing, installation, and handling Transportation and labour

ITEM NO – 225

DISPLAY PANELS : Manufacturing, supply, arrangement and keeping in good condition until project completion digitally printed canvas display having 1) Canvas - 100% cotton, biodegradable 0.45 mm thick and weight of 200 GSM canvas having tensile strength warp: 400N / weft:500N with pretreated prime coat. 2) Digital high-definition colour printing using non-fading eco-friendly ink. 3) Pasting canvas on Single layer of 9mm thick Heavy Duty Compressed (High Pressure Steam Cured) WPC Board conforming to as per relevant IS . 4) WPC board pasted canvas shall be fixed on MS frame made of 25X 25X 2 mm thick MS frame powder coated with 50 micron epoxy powder coating using SS 304 SS Studs with caps or high strength fasteners as per drawings and instruction by architect. The MS frame shall be fixed on wall/ partition using high strength fasteners and other hardware as required. 5) Including all hardware, ABS parts and all labour etc. 6) The high resolution graphic shall be supplied by architect in appropriate digital format. 6) metal work shall be paid separately in relevant tender item.at all floors / all levels / all heights

1. MATERIAL

Canvas : 100% cotton, biodegradable, 0.45 mm thick, 200 GSM, tensile strength warp: 400N / weft: 500N, pretreated with prime coat

WPC Board : Single layer, 9 mm thick, heavy-duty compressed, high-pressure steam cured, conforming to relevant IS standards

Ink : Eco-friendly, non-fading, high-definition digital printing ink

MS Frame : 25 × 25 × 2 mm thick, powder coated with 50-micron epoxy coating

SS Hardware : Stainless Steel 304 studs with caps or high-strength fasteners

Adhesives / Bonding Agents : Low VOC, suitable for canvas to WPC bonding

ABS / Other Hardware : As required for fixing and support

2. WORKMANSHIP

2.1 General

- Panels fabricated, supplied, and installed as per approved drawings and instructions of Architect / Engineer-in-Charge.
- Installation at all floors, levels, and heights.
- Workmanship to ensure smooth, taut, and wrinkle-free canvas surface.

2.2 Canvas Printing & Preparation

- High-resolution digital graphics provided by Architect.
- Canvas coated with primer and printed with eco-friendly, non-fading ink.
- Canvas carefully cut, stretched, and bonded to WPC board.
- Edges neatly finished with no visible peeling or loose surfaces.

2.3 WPC Board & Frame

- WPC board of 9 mm thickness, smooth and defect-free, to act as substrate.
- Canvas pasted on WPC board using appropriate Low VOC adhesive.
- WPC board fixed onto MS frame (25 × 25 × 2 mm), powder-coated 50 microns.
- MS frame securely fixed on wall / partition with high-strength fasteners as per approved drawings.
- All hardware (ABS parts, fasteners) installed neatly, concealed where possible.

2.4 Quality Checks

- Canvas: smooth, taut, defect-free, and true to digital print.
- WPC board: straight, smooth, no warping.
- MS frame: aligned, square, stable, powder-coated uniformly.
- Hardware: firmly fixed, corrosion-resistant.

2.5 Protection & Maintenance

- Panels to be protected from moisture, dust, scratches, and impact until installation is complete.
- Any defects in canvas, printing, WPC, or hardware shall be rectified by the contractor prior to handover.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (Nos.)**.
- Rate Includes Supply and digital printing of canvas WPC board and bonding materials MS frame powder coating Hardware, ABS parts, adhesives, and fasteners Carpentry / metalwork assembly Labour, handling, transportation, and installation

ITEM NO – 226

Canvas+Acrylic Painting : Providing and applying Canvas and Acrylic painting . Canvas 100% cotton, biodegradable 0.45mm thick and weight of 200 GSM canvas having tensile strength warp: 400N/ weft: 500N with pretreated prime coat. Digital High definition colour printing using non-fading eco-friendly ink. As per Architect's Selection and as per direction of Engineer in charge. at all floors / all

levels / all heights

1. MATERIAL

Canvas : 100% cotton, biodegradable, 0.45 mm thick, 200 GSM, tensile strength warp: 400N / weft: 500N, pretreated with prime coat

Acrylic Paint : High-quality, non-fading, eco-friendly, suitable for canvas and approved by Architect

Adhesives / Bonding Agents : Low VOC, suitable for fixing canvas to wall / substrate

2. WORKMANSHIP

2.1 General

- Work executed as per approved drawings, design, and instructions of Architect / Engineer-in-Charge.
- Installation at all floors, levels, and heights.
- Canvas must be smooth, taut, and free from wrinkles or defects.

2.2 Canvas Preparation

- Canvas coated with prime coat for proper adhesion and finish.
- High-definition digital printing or acrylic painting applied as per Architect's approved design and colour palette.
- Painting or print shall be uniform, defect-free, and true to approved colours.

2.3 Fixing / Installation

- Canvas fixed on wall / partition / substrate using appropriate Low VOC adhesives.
- Edges neatly finished, secured, and aligned.
- Any supporting hardware or framing to be concealed or finished as per Architect's instruction.

2.4 Quality Checks

- Canvas: defect-free, smooth, properly stretched, uniform.
- Paint / print: sharp, high-resolution, non-fading, and eco-friendly.
- Adhesion: secure, no peeling, sagging, or bubbling.

2.5 Protection & Maintenance

- Canvas protected from dust, moisture, scratches, and direct sunlight until installation is complete.
- Contractor responsible for rectifying any defects in canvas, paint, or bonding prior to handover.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Square Meter (m²)** of finished canvas surface installed.
- Rate Includes Supply of 100% cotton canvas and primer coating Acrylic paint / high-definition digital printing Adhesives / bonding agents (Low VOC) Labour, handling, transportation, and installation

ITEM NO – 227

Fabric with Block Printing: Providing and Fixing Fabric with Block printing with framing on plywood and 5mm thick glass with PU pain. As per Design on Architect's selection and as per direction of Engineer-in=charge. With all material, labour, Accessories, Hardware (screw, glue, kneel, wire etc.) , transportation .etc. at all floors / all levels / all heights

1. MATERIAL

Fabric : Premium quality, suitable for block printing, colourfast and approved by Architect

Plywood : BWP / MR grade plywood, thickness as per design (Low VOC and formaldehyde-free per GRIHA 3-star / IGBC Gold rating)

Glass : 5 mm thick, clear, toughened or annealed as per design, polished edges

PU Paint : Low VOC, suitable for finishing frame and wooden components

Hardware & Accessories : Screws, glue, kneels, wires, fasteners, and other fixing hardware of approved make

Adhesives / Bonding Agents : Low VOC, suitable for fabric, plywood, and glass assembly

2. WORKMANSHIP

2.1 General

- Fabric panels fabricated, supplied, and installed as per approved drawings and design by Architect / Engineer-in-Charge.
- Installation at all floors, levels, and heights.
- All surfaces smooth, aligned, and aesthetically finished.

2.2 Fabric Preparation & Fixing

- Fabric shall be hand-block printed or digitally block-printed as per approved design.
- Fabric shall be framed on BWP / MR grade plywood.
- Fabric surface shall be taut, smooth, and free from wrinkles, stains, or misprints.

2.3 Glass & Framing

- 5 mm thick glass fixed over fabric-framed plywood with PU-painted wooden / metal frame.
- Edges of glass polished and free from chips.
- Frame securely fixed using screws, glue, kneels, wires, and other hardware as required.

2.4 Quality Checks

- Fabric: block printing sharp, clear, consistent in colour, defect-free.
- Plywood: straight, smooth, free from warping.
- Glass: clear, polished, securely fixed, no cracks or scratches.
- PU paint: uniform, smooth, low VOC.
- Hardware: firmly fixed, corrosion-resistant, aligned.

2.5 Protection & Maintenance

- Panels protected from dust, moisture, scratches, and impact until installation is complete.
- Contractor responsible for rectifying any defects in fabric, printing, frame, glass, or hardware prior to handover.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (Nos.)**
- Rate Includes Supply and block printing of fabric Plywood substrate and frame with PU paint 5 mm glass with polished edges Hardware, adhesives, screws, wires, knees, and fasteners Labour, handling, transportation, and installation

ITEM NO – 228

Solid Wood Carving: Providing and Fixing Solid wood with Carving and with PU Polish . Design as per Architect's selection and as per direction of Engineer-in-charge. With all material, labour, accessories, Hardware(wires, knee, glue, screws, etc.) , transportation and with all scaffolding, and support system. at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating)

1. MATERIAL

Wood : Seasoned solid wood as per Architect's selection, defect-free, suitable for carving

PU Polish : Low VOC, water-based, as per GRIHA 3-star / IGBC Gold rating

Hardware & Accessories : Screws, glue, knees, wires, fasteners, and other fixing accessories of approved make

Composite Materials (if used) : MDF / plywood – Low VOC and formaldehyde-free as per GRIHA 3-star / IGBC Gold rating

Scaffolding / Support System : As required for safe handling and installation

2. WORKMANSHIP

2.1 General

Carving panels fabricated, finished, and installed as per approved design and drawings of Architect / Engineer-in-Charge.

- Installation at all floors, levels, and heights.
- All surfaces must be smooth, aligned, and free from defects.

2.2 Fabrication & Carving

- Solid wood panels shall be carved as per approved motifs, patterns, and detailing.
- Edges and corners to be neatly finished, no splintering.
- Carving must be precise, symmetrical, and consistent with approved design.

2.3 Finishing

- PU polish applied on all carved surfaces using low VOC, water-based polish.
- Surfaces sanded, filled with matching putty where required, and polished to uniform smooth finish.
- All PU coats applied as per manufacturer's specification for durability and sheen.

2.4 Installation

- Panels fixed securely using screws, glue, wires, knees, and other approved hardware.

- Proper alignment, level, and structural stability to be ensured.
- Scaffolding and support system to be provided for safe installation at all heights.

2.5 Quality Checks

- Wood: defect-free, seasoned, properly carved
- Carving: accurate, smooth, consistent with approved design
- PU Polish: uniform, smooth, low VOC, free from runs, drips, or streaks
- Hardware & Fixing: secure, corrosion-resistant, properly aligned

2.6 Protection & Maintenance

- Panels protected from dust, moisture, scratches, and impact until installation is complete.
- Contractor responsible for rectifying any defects in wood, carving, finishing, or fixing before handover.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Square Meter (m²)**
- Rate Includes Supply of solid wood Carving and design work PU polish and finishing materials Hardware, glue, screws, wires, knees, and fixing accessories Labour, scaffolding, transportation, and installation

ITEM NO – 229

Jute Weaving: Providing and Fixing Jute Weaving artwork with fixing on plywood and glass framing with all material, labour , accessories, Hardware(Glue, screw, etc.) , Transportation, .Design as per Architect's selection and as per direction of Engineer-in-charge.at all floors / all levels / all heights (Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating)

1. MATERIAL

Jute : High-quality natural jute yarn / strips, handwoven, colourfast and durable

Plywood : BWP / MR grade plywood, low VOC and formaldehyde-free, as per GRIHA 3-star / IGBC Gold rating

Glass : Clear / toughened 5 mm thick, edges polished

Adhesives / Bonding Agents : Low VOC, suitable for jute to plywood/glass bonding

Hardware & Accessories : Screws, glue, fasteners, knees, wires, and other approved fixing hardware

Composite Materials (if used) : MDF / plywood – Low VOC and formaldehyde-free

2. WORKMANSHIP

2.1 General

- Artwork fabricated, supplied, and installed as per approved drawings and design by Architect / Engineer-in-Charge.
- Installation at all floors, levels, and heights.
- Surfaces must be neat, properly aligned, and aesthetically finished.

2.2 Jute Weaving Preparation & Fixing

- Jute weaving handwoven or machine-woven as per approved design and pattern.
- Weaving securely fixed on BWP / MR grade plywood backing using approved Low VOC adhesives.
- Edges neatly finished and tension maintained to avoid sagging or wrinkles.

2.3 Glass & Framing

- 5 mm glass mounted over jute-framed plywood using PU-painted or polished wooden / metal frame.
- Glass edges polished and defect-free.
- Hardware (screws, glue, knees, wires) used as required to ensure stability and alignment.

2.4 Quality Checks

- Jute: consistent weave, colourfast, no fraying
- Plywood: smooth, straight, defect-free
- Glass: polished, clear, securely fixed
- Hardware: corrosion-resistant, firmly fixed
- Overall panel: aligned, visually neat, true to design

2.5 Protection & Maintenance

- Panels protected from dust, moisture, and scratches until installation is complete.
- Contractor responsible for rectifying any defects in jute, plywood, glass, or hardware prior to handover.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (Nos.)**
- Rate Includes Supply of jute weaving material Plywood backing and glass framing PU paint / adhesive bonding materials (Low VOC) Hardware, glue, screws, wires, knees, and fixing accessories Labour, handling, transportation, and installation

ITEM NO – 230

MDF+CNC : Providing and fixing CNC cut MDF panel of 12mm thickness fixed with ply wood with PU Paint . Design as per Architect's selection and as per direction of Engineer-in-charge. With all Material, labour , accessories, hardware(wires, nails, etc.), transportation with All scaffolding & support sytem. at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating)

1. MATERIAL

MDF Panel : 12 mm thick, high-density Medium-Density Fiberboard (MDF), Low VOC, formaldehyde-free as per GRIHA 3-star / IGBC Gold rating

Plywood : BWP / MR grade plywood, Low VOC and formaldehyde-free as per GRIHA 3-star / IGBC Gold rating

PU Paint : Low VOC, water-based, suitable for finishing MDF and plywood

Hardware & Accessories : Screws, nails, wires, adhesives, fasteners, and other approved fixing hardware

Composite Materials : MDF / plywood – Low VOC and formaldehyde-free

Scaffolding / Support System : As required for safe handling and installation

2. WORKMANSHIP

2.1 General

- CNC-cut MDF panels fabricated, supplied, and installed as per approved design and drawings by Architect / Engineer-in-Charge.
- Installation at all floors, levels, and heights.
- Panels to be smooth, properly aligned, and defect-free.

2.2 Fabrication & CNC Cutting

- MDF panels cut precisely using CNC machine as per approved patterns and designs.
- Edges smooth, free from chipping or splintering.
- CNC patterns to be consistent across panels, maintaining symmetry and design alignment.

2.3 Plywood Backing & Fixing

- MDF panel fixed over BWP / MR plywood backing using approved Low VOC adhesive and screws/nails as required.
- Panel properly aligned and securely fixed to prevent movement or warping.
- PU paint applied uniformly on all exposed surfaces after installation or pre-finish as approved.

2.4 Quality Checks

- MDF & Plywood: straight, defect-free, properly bonded
- CNC Cutting: accurate, edges smooth, design consistent
- PU Paint: uniform, smooth, low VOC, free from drips, streaks, or imperfections
- Hardware & Fixing: corrosion-resistant, firmly secured, aligned

2.5 Protection & Maintenance

- Panels protected from dust, moisture, scratches, and impact until installation is complete.
- Contractor responsible for rectifying any defects in MDF, plywood, CNC cutting, PU finish, or fixing prior to handover.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Square Meter (m²)**
- Rate Includes Supply of MDF and plywood CNC cutting as per design PU paint and finishing Adhesives, screws, nails, wires, fasteners, and other hardware Labour, scaffolding, transportation, and installation

ITEM NO – 231

Brass +Patina : Providing and Laying Brass sculpture and Artwork with patina finish at desired location with all material, labour , transportation etc. Design as per Architect's selection and as per direction of Engineer-in-charge. at all floors / all levels / all heights

1. MATERIAL

Brass : High-quality brass sheets / castings as per design, corrosion-resistant, free from defects

Patina Finish : Chemical or mechanical patina treatment to achieve antique / aged finish as approved by Architect

Hardware & Accessories : Screws, fasteners, brackets, adhesives, and other fixing hardware as required

Supporting Substrate : Concrete / masonry / wooden / metal base as per site requirement and approved design

2. WORKMANSHIP

2.1 General

- Brass sculpture / artwork fabricated, supplied, and installed as per approved drawings and design by Architect / Engineer-in-Charge.
- Installation at all floors, levels, and heights.
- Finished surface to be smooth, uniform, and free from scratches, dents, or defects.

2.2 Fabrication

- Brass cut, shaped, and formed as per design using approved fabrication techniques (casting, cutting, welding, or embossing).
- All edges neatly finished and de-burred.
- Patina finish applied uniformly, ensuring design intent, colour, and texture as approved.

2.3 Installation

- Sculpture / artwork securely fixed at the specified location using approved hardware and supporting structure.
- All fixing to ensure stability, alignment, and safety.
- Care taken to protect finished surface during handling and installation.

2.4 Quality Checks

- Brass: defect-free, smooth, corrosion-resistant
- Patina: uniform, consistent with approved shade and finish
- Fixing: stable, aligned, corrosion-resistant hardware
- Overall appearance: true to approved design, safe, and aesthetically appealing

2.5 Protection & Maintenance

- Brass artwork protected from scratches, dents, and stains during transportation and installation.
- Contractor responsible for rectifying any defects in fabrication, finishing, or fixing before handover.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (Nos.)**
- Rate Includes Supply of brass material Fabrication, shaping, forming, and patina finishing Hardware, adhesives, fasteners, and accessories Labour, transportation, handling, and installation

ITEM NO – 232

Cortel Steel+ Patina: Providing and Laying Cortel steel sculpture and artwork with patina finish at desired location with all material, labour , transportation etc. Design as per Architect's selection and as per direction of Engineer-in-charge. at all floors / all levels / all heights

1. Material

1. Cortel Steel : Shall conform to relevant IS standards for mild/structural steel, with minimum yield strength as per design requirements.
2. Patina Finish Chemicals : Shall conform to approved chemical manufacturer specifications, compatible with steel substrate, and resistant to weathering and UV exposure.
3. Fasteners & Fixings : All bolts, nuts, and weld materials shall conform to relevant IS codes and approved quality standards.
4. Primer / Protective Coating (if required) : Shall conform to manufacturer specifications for steel protection before patina application.
5. Water & Cleaning Materials : Shall conform to M1 page no-9 in General Technical Specification Booklet.

2. Workmanship

1. Fabrication:
 - Steel sculpture and artwork shall be fabricated strictly as per architect's approved drawings and design intent.
 - All cutting, welding, and bending shall be done by skilled personnel using approved tools and techniques.
 - Welds shall be clean, continuous, and free from porosity or slag.
2. Surface Preparation:
 - Steel surfaces shall be cleaned of rust, mill scale, oil, and dust using grinding, sandblasting, or chemical cleaning as per approved method.
3. Patina Application:
 - Patina chemicals shall be applied in multiple coats to achieve uniform color and texture.
 - Adequate curing/drying time between coats as per manufacturer's recommendations.
 - Finished patina surface shall have uniform appearance, free from streaks, blotches, or uneven patches.
4. Handling & Installation:
 - Sculpture and artwork shall be carefully transported and handled to prevent damage.
 - Installation at all floors, levels, and heights shall be carried out using proper lifting devices, scaffolding, or temporary supports as required.
 - Fixings and anchoring shall be strong, stable, and concealed where possible, per engineer-in-charge's directions.

5. Protection:

- Completed works shall be protected from scratches, stains, or mechanical damage until final handover.
- Temporary protective coverings shall be removed only after final inspection and approval.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **kg or per metric ton** of Cortel steel used including sculpture frame, paneling, and supports.
- Including supply of materials, fabrication, surface preparation all labour, patina finish, fixing, transportation handling to site at all level, and all incidental charges. All steel shall pass visual inspection and weld testing. Patina finish shall be inspected for uniformity and adherence to approved samples.

ITEM NO – 233

STENSIL TEXTURE ART WORK - Manufacturing, supply, arrangement and keeping in good condition until project completion either on wall or ceiling art work mural made with 6-8 mm thick copolymer emulsion based special texture applied in 2-3 coats with roller/ brush on a surface fixed with 6 mm thick MDF stensil having CNC/ laser cut shapes/ patterns/ design/ art work. The MDF stensil shall be temporarily fixed on wall/ ceiling with help of screws/ fastners and the texture paint shall be applied with cleaning the surface and applying acrylic putty/ primer as per instruction of the architect. The dried texture surface shall be painted with dirt and fungus resistant low VOC premium emulsion paint in colour, shade, finish as selected by the architect. The rate shall be inclusive all temporary props/ materials, scaffolding, tools and all provisions for the artists including all labour and material. All product Make approved as per tender and architect selection.at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating)

1. Material

1. Copolymer Emulsion Texture Paint : Shall be 6–8 mm thick, applied in 2–3 coats, and conform to manufacturer’s specification for wall/ceiling texture work. Must be low VOC and dirt/fungus resistant.
2. MDF Stencil : 6 mm thick Medium Density Fiberboard, CNC/laser-cut patterns as per architect’s design. Must be low VOC and formaldehyde-free, suitable for GRIHA 3-Star / IGBC Gold rating compliance.
3. Primer / Acrylic Putty : Approved low VOC primer/putty as per manufacturer’s specification and architect’s instructions.
4. Paint : Premium emulsion paint (low VOC, dirt and fungus resistant) in color/shade/finish approved by architect.
5. Fasteners / Screws : Approved quality, corrosion-resistant screws and fixings for temporary MDF stencil attachment.
6. Temporary Materials : Props, scaffolding, masking tape, protective sheets, and other supports required for safe execution.
7. Surface Cleaning Materials : Water and approved cleaning agents conforming to M1 page no-9 in General Technical Specification Booklet.

2. Workmanship

1. Surface Preparation:
 - Wall/ceiling surface shall be cleaned of dust, grease, and loose particles.
 - Apply acrylic putty / primer to smoothen surface irregularities and ensure uniform adhesion of texture coat.
2. Stencil Installation:
 - Fix 6 mm MDF stencil temporarily on wall/ceiling using screws or approved fasteners.
 - Ensure stencil is firmly positioned and aligned as per approved design pattern.
3. Texture Application:
 - Apply copolymer emulsion texture in 2–3 coats using roller or brush.
 - Ensure uniform thickness (6–8 mm) and crisp pattern transfer from stencil.
 - Remove stencil carefully after each coat dries to maintain edges and pattern integrity.
4. Painting:
 - After drying of texture, apply dirt/fungus resistant low VOC premium emulsion paint in the approved color, shade, and finish.
 - Ensure uniform coverage without smudges, drips, or color inconsistencies.
5. Safety & Protection:
 - Provide scaffolding, temporary props, and protective coverings as required.
 - Protect adjacent surfaces, flooring, and finished areas from splashes or spills.
 - Keep all materials, tools, and artwork in good condition until project completion.
6. Sustainability Compliance:
 - All composite wood products (MDF/Plywood) and coatings must be low VOC and formaldehyde-free as per GRIHA 3-star / IGBC Gold rating.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit **per square meter (m²)**
- Includes all layers of texture coat, primer, putty, stencil installation, painting, scaffolding, props, and incidental materials. Additional design modifications or repeat applications required by architect/engineer-in-charge Surface finish shall be uniform, clean, free from cracks, blotches, or smudges. Texture thickness, color, and pattern shall conform to approved samples. Only architect-approved products shall be used.

ITEM NO – 234

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. Material

1. Glass-Reinforced Gypsum (GRG) : Shall conform to IS 2545 or manufacturer's specifications for high-strength decorative panels.
2. Fibre Reinforced Plastic (FRP) : Shall conform to IS 15658 or approved manufacturer specifications; UV-stable and weather-resistant.
3. High-Density Gypsum / Cementitious Composite : Shall conform to IS 2545 / IS 2546; suitable for high-relief sculptural finishes.
4. Primer / Putty / Finishing Compound : Approved low-VOC primer and putty suitable for GRG/FRP/composite surfaces.
5. Paint : Premium emulsion, low VOC, dirt and fungus resistant, in color/shade/finish as approved by architect.
6. Mechanical Anchors & Adhesives : Approved fixings and adhesives suitable for GRG, FRP, or composite materials for long-term stability.
7. Moulds / CNC Templates : Pre-approved design templates for carving or moulding.
8. Scaffolding & Temporary Supports : Standard scaffolding, props, and lifting devices for safe installation at all floors, levels, and heights.
9. Surface Cleaning Materials : Water and approved cleaning agents conforming to M1 page no-9 in General Technical Specification Booklet.

2. Workmanship

1. Design & Fabrication:
 - Execute murals strictly as per approved design/drawings.
 - Panels may be hand-crafted or CNC-carved to create high-relief 3D motifs (floral/lotus-inspired).
 - Relief shall be multi-layered with varying depths for a rich three-dimensional visual effect.
2. Surface Preparation:
 - Prepare wall surface by cleaning, leveling, and priming.
 - Apply joint filler and sanding to ensure smooth, crack-free, and uniform texture.
3. Installation & Fixing:
 - Panels shall be fixed using mechanical anchors and approved adhesives, ensuring proper alignment and stability.
 - Include cut-outs for lighting or electrical coordination if required.
 - Ensure alignment at all floors, levels, and heights.
4. Finishing:
 - After installation, apply primer, sanding, and final paint finish in approved color/shade.
 - Finished surface must be uniform, smooth, and crack-free.
5. Protection & Cleaning:
 - Protect panels during and after installation until project completion.
 - Clean all debris, dust, and fingerprints before final handover.
6. Sustainability Compliance:
 - Materials should be low VOC, environmentally friendly, and meet applicable GRIHA / IGBC standards if required.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **square meter (m²)** of installed mural or 3D wall panel.
- Includes all materials, moulding, carving, fixing framework, adhesives, scaffolding, tools, finishing, and cleaning. Extra work due to changes in design, depth, or pattern approved by architect Panels must maintain approved relief depth, texture, and alignment. Finished surface must be smooth, crack-free, and uniform in color and finish, as per architect-approved sample.

ITEM NO – 235

BED : Manufacturing, supply, arrangement and keeping in good condition until project completion of single or double bed upto 550 mm height of as per design drawings and instruction of EIC. Framing, bracing, horizontal and vertical supports and facia shall be made of seasoned Indian teak wood, MS pipes and Urea formaldehyde free MR/BWP grade ply wood as per drawings and top shall be made of 18 / 25 mm thick ply wood confirming to Urea formaldehyde free MR/BWP grade Decorative type (BWP/MR-DEC) as per relevant IS codes using low VOC adhesive. CFC HFCF free suitable adhesive. External facia of plywood to be covered with 10 mm solid indian teakwood as per selection. Top face of ply wood support of mattress to be covered with 1 mm thick laminate. For all edges 9 mm solid indian team wood lipping to be used. 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 EIC. Price to be inclusive of all other hardware such as adhesive, nails, screws, fasteners, clips, abro tap, ABS parts etc and all labour. All external wood to be seasoned indian teak wood. All externally visible surfaces of 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. and all internal surfaces of plywood/ wood to be polished using laquer polish. All externally visible MS pipes to be finished using polyster powder coating and non visible pipes to be finished with epoxy primer and satin oil paint. Rates to be for complete product as per drawings and as directed by EIC. Area to be measured in plan. All plywood/ solid wood to be treated for termite using Terminator Wood Preservative or equivalent. at all floors / all levels / all heights

(Composite Wood products like MDF, Plywood etc Should be Low VOC and formaldehyde free containt, Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating)

1. MATERIALS

Plywood / Composite Wood:

- Urea Formaldehyde-free MR/BWP decorative plywood (BWP/MR-DEC) as per relevant IS codes (M37, Page no-18).
- Thickness: 18 / 25 mm for mattress support.
- Low VOC adhesive (CFC/HFCF free) for bonding.

Solid Teak Wood:

- Seasoned Indian teak wood (M29, Page no-15), free from knots, cracks, warping, and insect attack.
- External facia: 10 mm solid teak wood.
- Edges: 9 mm solid teakwood lipping.

Non-Teak Wood (if any): Shall conform to M29.A, Page no-16 in General Technical Specification Booklet

MS Pipes / Supports:

- Visible pipes: Polyester powder coating.
- Non-visible pipes: Epoxy primer + satin oil paint.

Laminate:

- 1 mm thick approved laminate on top face of plywood support.

Adhesives / Bonding Agents: Low VOC, CFC/HFCF free, suitable for wood and metal bonding (M37, Page no-18).

Hardware / Fasteners:

- L-brace, T-brace, corner brace, screws, nails, pocket screws, clips, abro tape, ABS parts, etc.
- All hardware durable, corrosion-resistant (M43, Page no-19).

Termite Treatment:

- All plywood and solid wood treated with Terminator Wood Preservative or equivalent (M29, Page no-15).

Polish / Finish:

- External solid wood: Water-based Low VOC PU polish (M44, Page no-21).
- Internal surfaces (plywood/wood): Lacquer polish (M45, Page no-21).

Environmental Compliance:

- Composite wood products (MDF, plywood, particle board: M40) shall be Low VOC and formaldehyde-free.
- Polish, paint, and adhesives shall comply with GRIHA 3 Star / IGBC Gold rating.

2. WORKMANSHIP

- Manufacturing, supply, and installation as per approved drawings and directions of the Engineer-in-Charge (EIC).
- Bed construction to include:
 - Framing, bracing, horizontal/vertical supports, and fascia from specified materials.
 - Mattress support using plywood and laminate as per design.
- Joinery to follow best practices: tongue & groove, dovetail, mortise & tenon, pocket-screw joinery, etc.
- All components properly aligned, square, and structurally stable.
- Hardware and fasteners properly fixed, concealed where required.
- Bed installed at all floors, levels, and heights, ensuring proper leveling and alignment.
- Complete protection during handling, transportation, and installation.
- External wooden surfaces polished with water-based Low VOC PU polish as per shade, finish, and texture approved by architect.
- Internal surfaces of plywood/wood polished using lacquer polish.
- MS pipes finished: visible – polyester powder coating; non-visible – epoxy primer + satin oil paint.
- Final product smooth, uniform, defect-free, and free from sharp edges.
- Protect units from scratches, moisture, or damage until project completion.
- Contractor to maintain beds in good condition and rectify defects.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (NOS)**

- Rate Includes Supply of all materials: plywood, solid wood, MS pipes, laminate, adhesives, hardware, fasteners. Fabrication, carpentry, joinery, polishing, finishing, termite treatment, and installation. Skilled labor, transportation, and handling.

ITEM NO – 236

VIP Bed: 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

(Composite Wood products like MDF, Plywood etc Shouldbe Low VOC and formaldehyde free containt, Polish/Paint/adhesive Shouldbe Low VOC containt as per the GRIHA 3star/IGBC gold rating)

- Relevant to item specification shall be followed **Item No - 237** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 237

V.VIP solid wooden caving Bed: Providing, fabricating and installing a premium quality custom-made solid wood bed of approved design, size and finish, manufactured from first-class seasoned teak wood or approved hardwood, kiln dried and chemically treated for termite, borer and moisture resistance. The bed shall include an ornamental hand-carved wooden headboard with traditional / heritage motifs, solid wood side rails and footboard with decorative carved profiles, and a heavy-duty wooden base or slatted support system suitable to receive mattress (mattress excluded). All components shall be assembled using proper carpentry joinery with concealed fittings to ensure strength, stability and durability. All exposed wooden surfaces shall be finished with premium quality polish / PU / melamine in natural wood tone or approved shade, free from cracks, warping, tool marks or sharp edges. The item shall include all materials, skilled labour, carving workmanship, polishing, transportation, handling, installation, fittings, fixtures and accessories complete in all respects, executed strictly as per approved drawings, samples and directions of the Architect / EIC.at all floors / all levels / all heights

(Composite Wood products like MDF, Plywood etc Shouldbe Low VOC and formaldehyde free containt, Polish/Paint/adhesive Shouldbe Low VOC containt as per the GRIHA 3star/IGBC gold rating)

1. MATERIALS

Solid Wood:

- Seasoned first-class teak wood or approved hardwood (M29, Page no-15), kiln-dried, chemically treated for termite, borer, and moisture resistance.

- All exposed wood shall be defect-free: no cracks, knots, warping, tool marks, or sharp edges.

Plywood / Composite Wood (if used):

- Urea formaldehyde-free MR/BWP grade or equivalent (M37, Page no-18).
- Low VOC adhesive for bonding (CFC/HFCF free).

Carving / Decorative Work:

- Premium quality solid wood with hand-carved traditional/heritage motifs.
- All carvings properly cured and polished to ensure durability.

Fittings / Hardware:

- Concealed joinery fittings (screws, brackets, L/T braces, fasteners) of approved make and corrosion-resistant (M43, Page no-19).

Finish / Polish:

- Premium quality polish / PU / melamine in natural wood tone or approved shade (M44/M45, Page no-21).
- Low VOC, non-toxic, scratch and moisture-resistant.

Other Materials:

- Laminates or internal supports (if required) shall be low VOC and formaldehyde-free (M40).
- Termite treatment applied to all wood components (M29).

Environmental Compliance:

- All composite wood, adhesives, and finishes to comply with GRIHA 3 Star / IGBC Gold rating requirements.

2. WORKMANSHIP

- Manufacturing, fabrication, and installation as per approved drawings, designs, and directions of the Architect / EIC.
- Bed to include:
 - Hand-carved ornamental headboard with traditional / heritage motifs.
 - Solid wood side rails and footboard with decorative carved profiles.
 - Heavy-duty base or slatted support suitable for mattress (mattress excluded).
- Carpentry: All joints to use proper joinery techniques (tongue & groove, mortise & tenon, dovetail, pocket screws) ensuring structural stability.
- Concealed fittings to ensure strength and aesthetics.
- Polishing: All exposed surfaces finished with PU / melamine / polish in approved shade, smooth and uniform.
- Execution by skilled carpenters and master carvers to achieve precision, durability, and fine detailing.
- Installation at all floors, levels, and heights with proper alignment and leveling.
- Complete protection of bed components during handling, transportation, and installation.

3. MODE OF MEASUREMENT & PAYMENT

3.1 Measurement

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** installed.
- Rate includes all hand-carved headboard, rails, footboard, base/slatted support, and fittings. Supply of solid wood, plywood/composite materials, hardware, fittings, and adhesives. Carving and decorative workmanship. Polishing / PU / melamine finish. Skilled labor, transportation, handling, and installation. Termite treatment, protection, and alignment.

ITEM NO – 238

MATTERESS : Supply and placing in position keeping in good condition until project completion of meteress height upto 150 mm depth having 3” Ortho bonded + 1” H.R foam + 2” Memory + full foam quilted jaquared cover with 5 year replacement warranty.at all floors / all levels / all heights

- Relevant to item specification shall be followed **Item No - 240** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 239

VIP MATTERESS : Providing and placing premium quality King size mattress of approved make, made of high-density PU foam / spring or foam-spring combination, minimum 150 mm thick, finished with quilted fabric cover, complete all as per approved specification and directions of Engineer-in-Charge.at all floors / all levels / all heights

- Relevant to item specification shall be followed **Item No - 240** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 240

V.VIP MATTERESS : Providing, supplying and placing premium quality King size mattress of approved make and specification, suitable for luxury residential / hospitality use, comprising high-density PU foam / pocketed spring or spring-foam combination (as approved), with a minimum overall thickness of 150–200 mm. The mattress shall have a medium-firm comfort level, ensuring adequate body support and long-term durability. Outer cover shall be of premium quality quilted fabric, breathable, anti-dust and anti-allergic, neatly stitched and finished. Mattress shall be resistant to sagging, deformation and moisture, and suitable for continuous use. The rate shall include cost of mattress, transportation, handling, placing in position complete in all respects, as per approved samples and directions of the Architect / EIC.at all floors / all levels / all heights

1. MATERIALS

- Core / Filling:
 - High-density PU foam, pocketed spring, or spring-foam combination, as approved.
 - Overall thickness: 150–200 mm.
 - Medium-firm comfort level, providing adequate support and durability.
- Outer Cover / Fabric:
 - Premium quilted fabric, breathable, anti-dust, anti-allergic, and neatly stitched.
 - Resistant to sagging, deformation, and moisture.
- Other Materials:
 - Thread, binding, and stitching materials of high quality to ensure longevity.
 - All materials should comply with safety, hygiene, and environmental standards for luxury residential / hospitality use.

2. WORKMANSHIP

- Mattress shall be manufactured, supplied, and placed as per approved samples and directions of the Architect / EIC.
- Mattress shall maintain uniform thickness and comfort, with no uneven surfaces, lumps, or sagging.
- Edges, stitching, and quilting to be neat, secure, and aesthetically finished.
- Mattress to be handled carefully during transport and placement to prevent damage.
- Mattress to be installed at all floors, levels, and heights as required.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (NOS)** as supplied and placed in position.
- Rate Includes Supply of mattress of approved make and specification. Transportation, handling, and placement in position. All labor and materials required for complete installation.

ITEM NO – 241

BEDSHEET PLAIN : Manufacturing, supply, arrangement and keeping in good condition until project completion of Bed sheet having size as per approved drawing. Bedsheet finish and colour as per architect selection. Bedsheet material shall be 100% Cotton or Cotton-Polyester Blend with spun. Bedsheet having 200-300 Thread Count with 120-140 GSM and feel like Soft, breathable, durable. Bedsheet shall be fully washable with percentage 3% to 5% of Shrinkage after washing. Measurement should be consider in plan area. all item shall be done as per approved sample. (size= 2.1 x 2.2 m)at all floors / all levels / all heights

- Relevant to item specification shall be followed Item No - 243 & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 242

VIP BEDSHEET PLAIN : Manufacturing, supply, arrangement and keeping in good condition until project completion of Bed sheet having size as per approved drawing. Bedsheet finish and colour as per architect selection. Bedsheet material shall be 100% Long-Staple Cotton with spun. Bedsheet having 300-500 Thread Count with 140-160 GSM and feel like Silky smooth, luxurious touch. bedsheet shall be fully washable with percentage 3% to 5% of Shrinkage after washing. Measurement should be consider in plan area. all item shall be done as per approved sample. (size= 2.1 x 2.2 m)at all floors / all levels / all heights

- Relevant to item specification shall be followed Item No - 243 & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 243

V.VIP BEDSHEET PLAIN : Manufacturing, supply, arrangement and keeping in good condition until project completion of Bed sheet having size as per approved drawing. Bedsheet finish and colour as per architect selection. Bedsheet material shall be 100% Organic Long-Staple Cotton with spun.

Bedsheet having 600–1000+ TC Thread Count with 160–200+ GSM feel like Ultra-premium, softness. bedsheet shall be fully washable with percentage 3% to 5% of Shrinkage after washing. Measurement should be consider in plan area. all item shall be done as per approved sample. (size= 2.1 x 2.2 m)at all floors / all levels / all heights

1. MATERIALS

- Fabric:
 - 100% Organic Long-Staple Cotton, spun yarn.
 - Thread Count (TC): 600–1000+ for ultra-premium softness.
 - GSM: 160–200+ to provide a premium feel.
 - Fully washable with shrinkage limited to 3–5% after washing.
- Color & Finish:
 - As per architect-approved selection.
 - Smooth, even texture without defects or irregularities.
- Other Materials:
 - High-quality sewing threads to match the fabric and ensure durability.
 - All materials compliant with luxury residential / hospitality standards.

2. WORKMANSHIP

- Bedsheet shall be manufactured, supplied, and installed as per approved size and sample (size: 2.1 × 2.2 m).
- Edges neatly hemmed; stitching secure and uniform.
- Surface free from pulls, snags, or defects.
- All bedsheets handled and stored carefully to maintain cleanliness, softness, and premium quality.
- Work to be executed at all floors, levels, and heights.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (Nos)**.
- Rate Includes Supply of fabric and all sewing materials. Manufacturing, finishing, and preparation as per approved sample. Transportation, handling, and placement in position.

ITEM NO – 244

BEDSHEET ELASTIC FITTED : Providing and placing elastic fitted bedsheet of approved make, made from superior quality cotton / blended fabric, high thread count, colourfast and soft finish, with elastic all around for proper mattress fit, neatly stitched and finished, complete all as per approved specification and directions of Engineer-in-Charge.. (Size: 1.8 x2.1 m)at all floors / all levels / all heights

1. MATERIALS

- Fabric:
 - Superior quality cotton or cotton-blend fabric.
 - High thread count for premium feel.
 - Colorfast, soft, and smooth finish.
- Elastic:
 - Durable elastic all around the perimeter to ensure snug fit on mattress.
 - Retains elasticity after repeated washing.

- Other Materials:
 - High-quality stitching threads to match fabric.
 - All materials compliant with luxury residential / hospitality standards.

2. WORKMANSHIP

- Bedsheet to be manufactured, supplied, and installed as per approved specification and sample.
- All edges neatly hemmed; stitching uniform, strong, and durable.
- Elastic properly fixed all around, ensuring secure fit on mattress.
- Surface free from defects, pulls, snags, or irregularities.
- Work to be executed at all floors, levels, and heights.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** as supplied and fitted.
- Rate Includes Supply of fabric, elastic, and stitching materials. Manufacturing, finishing, and preparation as per approved specification. Transportation, handling, and placement in position.

ITEM NO – 245

Deluxe Pillow With Cover : Manufacturing, supply, arrangement and keeping in good condition until project completion of pillow of Microfiber / Hollow Conjugated Siliconized Fiber minimum 430 x 680 mm with 150 mm thickness as per approved drawing. pillow cover finish and colour as per architect selection. pillow cover material shall be 100% Cotton or Cotton-Polyester Blend with spun. All pillow and covers . Measurement should be consider in plan area. all item shall be done as per approved sample.at all floors / all levels / all heights

- Relevant to item specification shall be followed **Item No - 247** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 246

VIP Pillow With Cover : Manufacturing, supply, arrangement and keeping in good condition until project completion of pillow of Down-Alternative / Premium Microfiber / Memory Foam Blend minimum 430 x 680 mm with 150 mm thickness as per approved drawing. pillow cover finish and colour as per architect selection. pillow cover material shall be 100% Long-Staple Cotton with spun. All pillow and covers . Measurement should be consider in plan area. all item shall be done as per approved sample.at all floors / all levels / all heights

- Relevant to item specification shall be followed **Item No - 247** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 247

V.VIP Pillow With Cover : Manufacturing, supply, arrangement and keeping in good condition until project completion of pillow of Goose Down / 100% Natural Down / Premium Memory Foam

minimum 430 x 680 mm with 150 mm thickness as per approved drawing. pillow cover finish and colour as per architect selection. pillow cover material shall be 100% Organic Long-Staple Cotton with spun. All pillow and covers . Measurement should be consider in plan area. all item shall be done as per approved sample.at all floors / all levels / all heights

1. MATERIALS

- Pillow Core / Filling:
 - Goose Down, 100% Natural Down, or Premium Memory Foam as approved.
 - Pillow size: 430 × 680 mm, thickness: 150 mm.
 - Provides softness, support, durability, and maintains shape over time.
- Pillow Cover / Fabric:
 - 100% Organic Long-Staple Cotton, spun yarn.
 - Premium finish, smooth, breathable, anti-dust, and anti-allergic.
 - Colour and finish as per architect-approved selection.
- Other Materials:
 - High-quality stitching threads for pillow and cover.
 - All materials compliant with luxury residential / hospitality standards.

2. WORKMANSHIP

- Pillow and cover to be manufactured, supplied, and installed as per approved drawings and samples.
- Pillow to be filled uniformly, maintaining consistent thickness and support.
- Pillow cover neatly stitched and finished; seams and edges secure and uniform.
- Pillows and covers handled carefully to maintain cleanliness, softness, and premium quality.
- Work to be executed at all floors, levels, and heights.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (Nos)**for pillows with covers.
- Rate Includes Supply of pillow core material and fabric cover. Manufacturing, finishing, stitching, and preparation as per approved sample. Transportation, handling, and placement in position.

ITEM NO – 248

Natural Plantation: Providing and placing Natural Plantation (Aglaonema, Chlorophytum comosum (Spider Plant), Sansevieria (Snake Plant), Dracaena marginata, Aspidistra elatior, Monstera Deliciosa, Zanzibar Gem, Aglaonema Wishes, Indoor Majesty Palm, Peace lily, Syngonium podophyllum, Dracaena marginata, Parlor Palm, etc. or equivalent) with Round Ceramic/FRP Planter Pots of shall be approved by Engineer In charge/Architect.at all floors / all levels / all heights

1. MATERIALS

- Plants / Plantation:
 - Indoor ornamental plants such as:
 - Aglaonema, Chlorophytum comosum (Spider Plant), Sansevieria (Snake Plant), Dracaena marginata, Aspidistra elatior, Monstera Deliciosa, Zanzibar

Gem, Aglaonema Wishes, Indoor Majesty Palm, Peace Lily, Syngonium podophyllum, Parlor Palm, *or approved equivalents*.

- Plants must be healthy, disease-free, well-grown, and suitable for indoor conditions.
- Planter Pots:
 - Round Ceramic or FRP (Fiber Reinforced Plastic) pots.
 - Size, finish, and design to be approved by the Architect / Engineer-in-Charge (EIC).
 - Durable, stable, and suitable for indoor use.
- Growing Medium / Soil:
 - Good quality potting soil, enriched with nutrients suitable for each plant type.
 - Adequate drainage provision to prevent waterlogging.
- Other Materials:
 - Fertilizers, water retention material, and protective agents as required.
 - Materials must comply with environmental and safety standards for indoor plants.

2. WORKMANSHIP

- Plants to be planted, supplied, and installed in planter pots as per approved layout and drawings.
- Plants should be properly positioned and secured in the pot with suitable soil and drainage.
- Planters must be level, stable, and aesthetically arranged.
- Care to be taken to avoid damage during transportation and installation.
- Installation at all floors, levels, and heights as directed by Architect / EIC.

3. MODE OF MEASUREMENT & PAYMENT

- Measurement:
 - The work shall be Measuring & Payment paid a unit per **Number (Nos)**
 - Rate Includes Supply of plants of approved species and size. Planter pots (Ceramic or FRP) of approved design and finish. Soil, fertilizers, drainage material, and other planting accessories. Transportation, handling, installation, and planting.

ITEM NO – 249

Cloth Liner : Providing and fixing in position as per drawing and manufacturer specification cloth liner Adjustable fiber line extends up to a long range: up to 8.2 Feets. Lock Button with Made of Premium Solid 18/10 stainless steel construction with Copper PULL HEAD and accessories, ensuring durability and longer life time. Shiny mirror finish, nice and elegant appearance. Dimension: 3.66 X 2.17 inches, Weight: 8.82 oz. including 1x clothesline, 1 x installation accessories.at all floors / all levels / all heights

1. MATERIALS

- Clothesline:
 - Adjustable fiber line capable of extending up to 8.2 feet.
 - Smooth, durable, and resistant to wear or fraying.
- Lock Mechanism & Accessories:
 - Lock button made of premium solid 18/10 stainless steel.
 - Copper pull head included for smooth operation.
 - Shiny mirror finish for aesthetic appearance.
- Dimensions & Weight:
 - Unit dimensions: 3.66 × 2.17 inches.

- Weight: 8.82 oz per set.
- Components Included:
 - 1 × clothesline
 - 1 × installation accessories kit (screws, anchors, brackets as required)

2. WORKMANSHIP

- Cloth liner to be supplied, installed, and fixed strictly as per manufacturer specifications and approved drawings.
- Installation shall ensure:
 - Proper alignment and leveling.
 - Smooth operation of adjustable line and locking mechanism.
 - Secure anchoring to wall or supporting structure to carry the expected load.
- All surfaces finished without scratches or defects.
- Installation at all floors, levels, and heights.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (Nos)**.
- Rate Includes Supply of clothesline and all accessories (lock button, pull head, brackets, screws). Installation and fixing as per manufacturer and approved drawings. Transportation, handling, and alignment.

ITEM NO – 250

Mosquito Jali : Providing and fixing SS304 grade Mosquito Jali of approved quality as per EIC / Architect of any size and any shape in frame and shutter fixed with approved quality of screws and fasteners required to tighten the Jali / Net all as per direction etc. including providing and fixing EPDM quality rubber /siliconsealant /structural sealant, complete at all floors /all levels /all heights. Actual installed quantity shall be measured and paid. Rate shall be inclusive of all type of wastages.

1. MATERIALS

- Jali / Net:
 - Stainless Steel SS304 grade, corrosion-resistant, approved quality.
 - Size and shape as per Architect / EIC approval.
 - Durable for long-term indoor/outdoor use.
- Frame & Shutter:
 - Material as per approved design (MS/Aluminium/SS frame), compatible with SS304 Jali.
 - All frames treated or finished to resist corrosion.
- Fasteners & Fixings:
 - Approved screws, bolts, and fasteners suitable to secure the Jali firmly.
 - Corrosion-resistant, durable for long-term installation.
- Sealing / Gasket:
 - EPDM rubber, silicone sealant, or structural sealant as per approved specifications.
 - Ensures airtight, water-resistant, and secure installation.

2. WORKMANSHIP

- Jali to be cut, shaped, and installed according to approved drawings, design, and EIC directions.
- Frames and shutters must be properly aligned, square, and leveled.
- Jali/net to be tightly fixed using screws/fasteners.
- Sealant / rubber gaskets applied uniformly for proper sealing.
- No gaps, sharp edges, or loose fittings allowed.
- Installation at all floors, levels, and heights.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per Actual installed area of Jali/net **Square Meter (m²)**
- Rate Includes Supply of SS304 jali/net, frame, screws, fasteners, and sealant/rubber gaskets Cutting, alignment, and secure fixing. Transportation, handling, and installation. All allowances for wastage and minor cutting.

ITEM NO – 251

Polyster Anti Slip shaggy fluffy fur Rugs and Carpet: Providing and placing of polyester anti slip shaggy fluffy fur rugs and carpet with extra 1 to 2 inch pile high skin in comfort, the design shall be approved by engineer in charge or architect.at all floors / all levels / all heights

1. MATERIALS

- Rug / Carpet Fabric:
 - 100% Polyester, anti-slip backing.
 - Shaggy / fluffy fur with 1–2 inch pile height for extra comfort.
 - Soft, durable, and resistant to wear, deformation, and shedding.
- Backing / Anti-Slip Layer:
 - High-quality non-slip backing to prevent movement on floor surfaces.
 - Fire-retardant and safe for indoor use (as per local regulations).
- Design / Colour:
 - As per Architect / EIC approval.
 - Uniform, neat pile, consistent texture and colour.

2. WORKMANSHIP

- Rugs and carpets to be supplied, cut, and laid as per approved drawings and layout.
- All edges neatly finished to prevent fraying.
- Anti-slip backing to be fully effective and secure the rug in position.
- Rugs / carpets to be level, flat, and properly aligned with flooring.
- Installation at all floors, levels, and heights.
- Care during handling to avoid stains, dirt, or damage to pile.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Square Meter (m²)** of installed rug/carpet area.

- Rate Includes Supply of polyester shaggy/fluffy rug material. Anti-slip backing. Cutting, laying, finishing, and alignment. Transportation, handling, and installation. All allowances for minor cutting/wastage.

ITEM NO – 252

**Pelmet Work: Providing and fixing AC Pelmet of Wooden .Design as per selection of Architect and as per direction of Engineer -in-charge.at all floors / all levels / all heights
(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt as per the GRIHA 3star/IGBC gold rating)**

1. MATERIAL

Plywood / MDF / Composite Wood:

- Shall conform to M37 Page no-18 in General Technical Specification Booklet
- Low VOC, formaldehyde-free, environmentally friendly.
- Thickness and grade as approved by Architect.

Adhesives / Glues:

- Shall be low-VOC, water-resistant, suitable for furniture/fixture works.

Finishing Material (Polish / Paint / Laminate):

- Shall conform to M44 Page no-21 in General Technical Specification Booklet.
- PU / Melamine polish or approved laminate finish of approved shade and texture.

Fasteners / Hardware:

- Screws, nails, brackets, and supports shall be of SS / corrosion-resistant material as per site requirement.

2. WORKMANSHIP

Fabrication

- Pelmet shall be fabricated as per approved design, dimensions, and profile provided by Architect.
- Composite panels shall be cut, machined, and assembled to produce a seamless finish.
- Edges shall be smoothened, chamfered, or moulded as required.

Installation

- Pelmet shall be securely fixed to walls / ceilings / AC openings using suitable brackets, screws, or concealed supports as per site conditions.
- Alignment shall be true and level with the wall, ceiling, and AC unit.
- Gaps and joints shall be minimal and uniform.

Finishing

- Surfaces shall be sanded, polished, or laminated as per approved samples.
- All exposed surfaces shall have uniform texture and color.
- Finishing shall be resistant to moisture, scratches, and fading.

Compliance

- Composite wood products shall be formaldehyde-free and Low VOC.
- All work shall be in accordance with GRIHA 3-star / IGBC Gold standards for indoor air quality.

- Work shall conform to site safety and quality standards.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Square Meter (m²)** of finished installed pelmet
- Including all joints, corners, and required cutouts. Supply of all materials: composite wood, adhesives, hardware, and finishing materials. Fabrication, cutting, assembly, and installation. Polishing / laminating / painting as per approved finish. All scaffolding, tools, and labour. Alignment, levelling, and finishing to Architect/Engineer satisfaction.

ITEM NO – 253

Door Mat: Providing and fixing of Door Mat of any design, texture and material as per directed by Engineer In Charge at all floors / all levels / all heights

1. MATERIAL

Mat Base / Core Material:

- Shall be of approved material such as rubber, coir, PVC, or synthetic fibers depending on design and site requirements.
- Must be durable, slip-resistant, and suitable for indoor or outdoor use.

Surface Layer / Fiber Material:

- Shall conform to IS: 14462 or as per manufacturer's approved standard for anti-slip and water-resistant mats.
- Surface shall allow easy cleaning, anti-dust, and anti-moisture properties.

Backing / Non-slip Layer:

- Shall be made of rubber or PVC to prevent slippage and provide stability.

Adhesives / Fasteners (if required):

- Shall be non-toxic, durable, and suitable for fixing to floor surfaces without causing damage.

2. WORKMANSHIP

Fabrication & Design

- Door mat shall be fabricated or cut to exact dimensions and approved design.
- Edges shall be neatly finished to prevent fraying or lifting.
- Patterns, textures, or logos (if specified) shall be accurately aligned and fixed.

Installation

- Mat shall be placed / fixed securely at door threshold, entrance, or as directed.
- Mat must be level with surrounding floor and must not pose a tripping hazard.
- Installation shall include any necessary adhesives or backing support as approved.

Compliance & Durability

- Materials and installation shall be resistant to moisture, abrasion, and sunlight (if outdoor).
- All work shall conform to safety and quality standards as approved by Engineer-in-Charge.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Square Meter (m²)** of installed mat. All mats shall be measured in finished installed condition, including cutouts or special designs.
- Rate Includes Supply of all mat materials and backing. Cutting, shaping, finishing, and installation. Adhesives, fasteners, or fixing accessories required for proper installation. Labour, scaffolding (if required), and tools.

ITEM NO – 254

VIP Dining Hall Table : Providing, fabricating, supplying and placing premium quality dining table of size 1800 mm × 900 mm × 750 mm (L × W × H) made from first-class seasoned hardwood / approved engineered wood with solid wood framing, kiln dried and chemically treated for termite and moisture resistance. The table shall have a solid or veneered top with smooth edges, supported on sturdy wooden legs with proper joinery ensuring strength and stability. All exposed surfaces shall be finished with premium quality PU polish finish in approved shade, complete all as per approved design, specification and directions of Engineer-in-Charge.

at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating)

- Relevant to item specification shall be followed **Item No - 219** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 255

General Dining Hall Table : Providing, fabricating, supplying and placing dining table of size 1800 mm × 900 mm × 750 mm (L × W × H), made from first-class seasoned hardwood / teak wood/ approved engineered wood with solid wood framework, kiln dried and chemically treated for termite and moisture resistance. The table shall have a thick laminated tabletop with rounded edges and uniform thickness, supported on sturdy central solid wood pedestal legs or panel legs as per approved design, ensuring strength and stability. All exposed surfaces shall be finished with melamine polish finish in approved shade, complete all as per approved drawings, specifications and directions of Engineer-in-Charge.at all floors / all levels / all heights

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating)

- Relevant to item specification shall be followed **Item No - 219** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 256

VIP Dining Hall Chair : Providing, supplying and placing premium quality dining chair made from seasoned hardwood / approved material, kiln dried and chemically treated for termite resistance, with ergonomically designed backrest and seat. The seat and backrest shall be upholstered with

high-density foam and finished with premium quality leatherette in approved colour and texture, neatly stitched and securely fixed. The chair shall be stable, comfortable and suitable for regular dining use. The item includes all materials, upholstery, fittings, finishing, transportation and placing in position complete all as per approved specification and directions of Engineer-in-Charge.at all floors / all levels / all heights

All exposed surfaces shall be finished with PU polish or laminate finish as approved. The chair shall be sturdy, well-balanced and suitable for regular institutional use, complete with protective PVC / nylon bushes at bottom.

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating)

- Relevant to item specification shall be followed **Item No - 221** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 257

General Dining Hall Chair : Providing, supplying and placing premium quality dining chair made from seasoned hardwood / teak wood / approved material, kiln dried and chemically treated for termite resistance, with ergonomically designed backrest and seat. The seat and back shall be upholstered with high-density foam and finished with premium quality fabric in approved colour and texture, neatly stitched and fixed. Chair shall be stable, comfortable and suitable for regular dining use. The item includes all materials, fittings, upholstery, finishing, transportation and placing in position complete all as per approved specification and directions of Engineer-in-Charge.at all floors / all levels / all heights

All exposed surfaces shall be finished with melamine polish finish as approved. The chair shall be sturdy, well-balanced and suitable for regular institutional use, complete with protective PVC / nylon bushes at bottom.

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating)

- Relevant to item specification shall be followed **Item No - 221** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 258

Meeting Table : Providing, fabricating, supplying and placing premium quality conference table of approved design and size, made from first-class seasoned hardwood / engineered wood framework, kiln dried and chemically treated for termite and moisture resistance. The tabletop shall be of solid/veneered or laminated wood with smooth edges, supported on robust wooden or panel legs, designed to accommodate multiple seating as per approved layout. All exposed surfaces shall be finished with premium PU / melamine / polish finish in approved shade. The item includes all materials, fabrication, finishing, fittings, transportation and installation complete in all respects as per approved drawings, specifications and directions of Engineer-in-Charge.at all floors / all levels / all heights.

(Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating)

1. MATERIAL

Wood:

- Hardwood: Seasoned, kiln-dried, chemically treated for termite and moisture resistance, conforming to IS 1708 / IS 303.
- Engineered wood (if used): High-density plywood or MDF, low formaldehyde content, conforming to IS 303 / IS 710 standards.

Veneer / Laminate:

- Approved natural wood veneer or high-quality laminate, selected for uniform color and grain.

Adhesives / Bonding Agents:

- Low VOC type, as per GRIHA 3-star / IGBC Gold rating.

Polish / Finish:

- Premium PU or melamine polish, durable, glossy/semi-glossy, low VOC.

Fasteners / Joinery Hardware:

- Wood screws, dowels, corner braces, brackets as required, rust-proof and durable.

2. WORKMANSHIP

Fabrication:

- Cutting, shaping, and assembling of table components to exact dimensions.
- Table edges to be smooth, chamfered, or rounded as per approved design.
- Legs and framework joined using strong joinery techniques (mortise & tenon, dowel joints, or equivalent).
- All joints to be tight, flush, and stable for long-term use.

Veneering / Laminating & Finishing:

- Veneer/laminate properly bonded to tabletop surface with approved adhesive.
- Surfaces sanded smooth before applying PU or melamine polish.
- Polish applied in multiple coats, each coat sanded lightly for uniform finish.
- Finish free from runs, bubbles, scratches, or uneven areas.

Installation:

- Table placed at designated location, leveled, and aligned with room layout.
- All legs and framework components secured firmly.

Environmental Compliance:

- All wood products, adhesives, and polish to meet low VOC / formaldehyde-free standards for indoor air quality.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Square Meter (m²)**
- Rate Includes Supply of all wood, veneer, laminate, hardware, adhesives, and finishing materials. Fabrication, assembly, finishing, and polishing. Transport, loading/unloading, and placement at site. All labor, scaffolding, tools, and handling required for complete installation.

ITEM NO – 259

Meeting Chairs : Providing, supplying and placing premium quality conference chair of approved design, made from seasoned hardwood / metal frame as approved, with ergonomic seat and backrest. The chair shall be upholstered with high-density foam and premium quality fabric / leatherette in approved colour and texture, neatly stitched and fixed. The base shall include swivel / fixed support with adequate stability for long-duration seating. The item includes all materials, upholstery, fittings, finishing, transportation and placing in position complete in all respects as per approved specifications and directions of Engineer-in-Charge.at all floors / all levels / all heights (Composite Wood products like MDF,Plywood etc Should be Low VOC and formaldehyde free containt,Polish/Paint/adhesive Should be Low VOC containt as per the GRIHA 3star/IGBC gold rating)

1. MATERIAL

Frame:

- Wood: Seasoned, kiln-dried hardwood treated for termite and moisture resistance, conforming to IS 1708 / IS 303.
- Metal: Powder-coated mild steel / aluminum frame, rust-resistant, designed for long-term load-bearing.

Upholstery / Cushion:

- Foam: High-density polyurethane foam, resilient, conforms to IS 7888 / IS 7889 for comfort and durability.
- Fabric / Leatherette: Premium quality, abrasion-resistant, fire-retardant, approved color and texture, conforming to ISO 12947 (Martindale abrasion test) standards.

Fasteners / Hardware:

- Stainless steel or zinc-plated screws, nuts, bolts, and brackets for assembly.
- Swivel mechanism, casters, or fixed legs as per approved design.

Finishes:

- Wood: PU / melamine / polish finish, low VOC, GRIHA/IGBC compliant.
- Metal: Powder coating or approved paint finish, corrosion-resistant.

2. WORKMANSHIP

Fabrication / Assembly:

- Frames fabricated and assembled accurately to ensure level seating, stability, and ergonomic compliance.
- All joints tightly fitted, flush, and secure.
- Swivel / fixed base installed with proper alignment.

Upholstery Installation:

- Foam cut to dimensions, fixed securely to seat and backrest frame.
- Fabric / leatherette neatly upholstered and stitched, free of wrinkles, sagging, or loose areas.
- All exposed edges properly finished, with no sharp edges or protrusions.

Quality & Finishing:

- Chairs inspected for durability, stability, and ergonomic compliance.
- Smooth surfaces, even polish, and clean finishes.
- Any defects corrected prior to placement.

Installation / Placement:

- Chairs delivered, placed, and leveled as per approved layout.
- All swivel / moving parts tested for smooth operation.
- Minor adjustments performed for stability and alignment.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Number (Nos)**
- Rate Includes Supply of all materials including wood, metal, foam, upholstery, fasteners, and finishes. Fabrication, assembly, and finishing. Transportation, loading/unloading, and placement in position. All labor, scaffolding, tools, and accessories required for complete installation.

ITEM NO – 260

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. MATERIAL

Wood:

- Teak Wood (Second Class): Well-seasoned, kiln-dried, free from cracks, knots, sapwood, and defects.
- Moisture content: 8–12%, conforming to IS 2796 (Seasoned Timber).
- Treated for termite and insect resistance with approved wood preservatives.

Fixings / Hardware:

- Iron screws: Corrosion-resistant, conforming to IS 1363 for screws.
- Adhesives (if required): Low-VOC, formaldehyde-free bonding agent for additional fixation.

Finishes:

- Surface finish with PU / Melamine polish of approved shade, low-VOC, GRIHA 3-star / IGBC Gold rating compliant.

2. WORKMANSHIP

Surface Preparation:

- Subfloor shall be level, clean, dry, and free from dust, debris, and moisture.
- Any undulations shall be corrected with leveling compound or approved screed.

Planking Installation:

- Wooden planks laid in tongue-and-groove pattern, ensuring tight and flush joints.
- Fixed using iron screws at regular intervals, countersunk and filled with wood filler to maintain smooth surface.
- Expansion gaps (5–10 mm) to be provided at perimeter and adjacent to walls, columns, or fixed elements to allow for seasonal wood movement.
- Planks aligned to approved layout direction, avoiding short or random joints in prominent areas.

Finishing:

- Sanding of surface to remove unevenness or protrusions.
- Application of PU / Melamine polish in multiple coats, ensuring smooth, uniform, and glossy finish.
- Care taken to prevent damage to planks during finishing.

Quality Control:

- Planks checked for alignment, flush joints, and tightness.
- Screws securely fixed, countersunk properly, and filled neatly.
- Moisture content and finish inspected for compliance with approved standards.

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be Measuring & Payment paid a unit per **Square Meter (m²)** of finished wooden flooring laid. Measured from wall to wall
- Including any skirting. Supply of 25 mm teak wood planks. All fixings including iron screws and adhesives. Surface preparation, sanding, finishing, and polishing. Labour, scaffolding, tools, and transportation to site. Protection of flooring during subsequent construction works.

ITEM NO – 261

MIRROR PANELING : Manufacturing, supply, arrangement mirror paneling upto 2100 mm height as per design and instruction of architect having: 1) Mirror: 6 mm thick mirror having copper-free coating and lead-free protective paint 2) Spacer - Mirror shall be fixed on non-metalling full width horizontal and vertical 40mm X 10 mm spacer at maximum of 300 mm c/c with two side high strength adhesive tape. 3) Panel- the mirror pasted on spacers shall be fixed on 9mm thick heavy duty compressed (high pressure steam cured) Asbestos free fibre cement board confirming to IS 14862: 2000 Type A Category III. The fibre cement board back side facing wall/partition shall be painted with 2 coats of epoxy/ elastomeric polymer based water proofing chemical. 4) Framing & Beading- There shall be 30 mm deep continuous extruded aluminium "T" profile with rubber gaskets to support the mirror panel and fix the secured mirror panel to the wall/ partition using heavy duty anchor fasteners. The aluminium profile shall be powder coated with pure polyester or epoxy polyester in 50 micron thickness as per colour, finish as per drawing and instruction by architect. at all floors / all levels / all heights.

1. Materials

1. Mirror:
6 mm thick mirror having copper-free coating and lead-free protective paint.
Glass : Shall conform M38 page no-18 in General Technical Specification Booklet.
2. Spacer:
Non-metallic spacer, 40 mm × 10 mm, for full width horizontal and vertical, fixed at maximum 300 mm c/c using two-side high-strength adhesive tape.
Adhesive tape as per manufacturer's recommendation; substrate compatibility to be confirmed on site.
3. Fibre Cement Board:
9 mm thick, heavy-duty compressed, high-pressure steam-cured, asbestos-free fibre cement board conforming to IS 14862:2000, Type A, Category III. Back side facing wall/partition to be coated with 2 coats of epoxy/elastomeric polymer-based waterproofing chemical.
Cement : Shall conform M3 page no-9 in General Technical Specification Booklet.
Paints : Shall conform M44 page no-21 in General Technical Specification Booklet.
4. Aluminium Framing & Beading:
30 mm deep continuous extruded aluminium "T" profile with rubber gaskets to support and secure the mirror panels to the wall/partition using heavy-duty anchor fasteners.
Powder-coated with pure polyester or epoxy polyester to 50 microns thickness, color and finish as per architect's instructions.
Aluminium sections as per IS 733 / IS 1285; Powder coating per IS 101, IS 1623 standards.
5. Fasteners:
Heavy-duty anchor fasteners for fixing aluminium profile to masonry/concrete wall, corrosion-resistant as per IS 1363 & IS 1367.
6. Waterproofing:
Epoxy/elastomeric polymer-based chemical for fibre cement board backing; IS 101 standards for chemical coatings.

2. Workmanship

- Surface Preparation:
 - Ensure wall/partition is clean, dry, and free from dust, oil, and loose particles.
 - Fibre cement board back surfaces shall be painted with two coats of waterproofing chemical before fixing.

- Panel Installation:
 - Spacers to be fixed horizontally and vertically at 300 mm c/c using two-side high-strength adhesive tape, ensuring uniform alignment.
 - Mirror panels to be carefully pasted on spacers with no air gaps, bubbles, or misalignment.
 - All joints to be flush and aligned with continuous line.
- Framing & Beading:
 - Extruded aluminium T-profile with rubber gaskets to be installed along panel edges to provide support and aesthetic finish.
 - Profiles must be securely fixed using heavy-duty anchor fasteners; ensure profiles are plumb and level.
 - Powder-coated aluminium shall be protected from scratches during installation.
- Protection & Finishing:
 - Mirrors shall be protected with masking tape or films during installation.
 - Any scratches, chips, or misalignment shall be rectified immediately.
 - Clean mirror surface after installation using non-abrasive cleaners; avoid solvents.
- Quality Control:
 - Ensure uniform panel spacing and consistent joint lines.
 - Verify powder coating thickness (50 microns) with standard gauge.
 - Fasteners should be corrosion-free and properly tightened.
 - Check waterproofing coating for uniformity and adhesion.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Square Meter (m²)** of finished wall/partition surface
- including all material, labour, adhesives, spacers, fibre cement board, aluminium profiles, waterproofing chemical, and fasteners. No extra payment shall be made for minor cutting, waste, or alignment adjustments. Any damage during installation shall be rectified at contractor's cost.

ITEM NO – 262

TRAP DOOR : Providing and fixing 38-52 mm thick door having single leaf/double leaf shutter hollow flush type door (36 mm thick base shutter along with 2/16 mm thick finish finish as specified), made out as following or superior specifications:

- 1) Aluminium extruded profile section frame at periphery of along with intermediate horizontal and vertical members of shutter in specified size, shape and thickness so as to have cumulative weight not less than 2.5 kg/m².**
- 2) 20 x 20 mm vertical/ horizontal teak wood member with black painting at handle side (fixed with aluminium section) for fixing tower bolt, handle, concealed lock body, etc.**
- 3) 8 mm thick, IS 303 grade, urea formaldehyde (UF) free environment friendly plywood or Wood Polymer Composite (WPC) Board meeting green building norms fixed on both side of aluminium frame.**
- 4) One side of shutter shall be covered either with 4 mm thick teak veneer / 8 mm solid wood battens of width as per design of specified and approved figure, shade and make and fixed with suitable low VOC adhesive as per requirement and instruction of architect. and second side covered with 1 mm thick laminate**
- 5) 9mm thick external lipping of seasoned teak wood. water based low VOC PU polishing with necessary backing coat low VOC primer as per requirement and gap between two part should be filled with wool pile etc. complete as per drawing and as directed by architect.**

6) The cavity of the door shall be filled with 20 mm thick low VOC environmental friendly mineral wool slab insulation having minimum density 48 kg/m³. Actual shutter including lipping area (single side) shall be measured for payment. Rate shall be inclusive of Aluminium & Necessary hardware like hinges, pivot, handle, tower bolts, all type of locks wooden framing, low VOC adhesive, nails, fastener with all labour for no item specified or which is necessary to have a complete door assembly etc complete for all level all height. Design, figure, colour shade and polish tint to be as approved by architect at all floors / all levels / all heights.

1. Materials

1. Aluminium Extruded Frame:
 - Periphery and intermediate horizontal/vertical members with cumulative weight $\geq 2.5 \text{ kg/m}^2$.
 - Profile as per IS 733 / IS 1285 standards.: Aluminium : Shall conform M31 page no-17 in General Technical Specification Booklet.
2. Teak Wood Members:
 - 20 × 20 mm vertical/horizontal members at handle side, painted black, fixed with aluminium section for tower bolt, handle, and lock installation.
Teak Wood : Shall conform M29 page no-15 in General Technical Specification Booklet.
3. Plywood/WPC Board:
 - 8 mm thick, IS 303 grade, urea formaldehyde (UF) free, environmentally friendly plywood or WPC board on both sides of aluminium frame.
Plywood : Shall conform M37 page no-18 in General Technical Specification Booklet.
4. Veneer / Solid Wood Battens:
 - One side of shutter: 4 mm thick teak veneer or 8 mm solid wood battens fixed with low VOC adhesive.
Adhesive as per manufacturer's recommendation; ensure compliance with low VOC and green building norms.
5. Laminate:
 - Opposite side of shutter: 1 mm thick laminate of approved color/shade.
6. Lipping:
 - 9 mm thick external lipping of seasoned teak wood with water-based low VOC PU polishing and primer.
Teak Wood : Shall conform M29 page no-15, Paints : Shall conform M44 page no-21.
7. Cavity Insulation:
 - 20 mm thick mineral wool slab with density $\geq 48 \text{ kg/m}^3$, low VOC, environmentally friendly.
8. Hardware:
 - Hinges, pivots, handles, tower bolts, concealed locks, fasteners, nails, aluminium connectors, etc., all as required for complete door assembly.
 - Materials to be corrosion-resistant and conform to IS 1363, IS 1367 standards.
9. Adhesives & Coatings:
 - Low VOC adhesives and primers for veneer, battens, lipping, and laminate installation.

2. Workmanship

- Frame Installation:

- Aluminium frame shall be assembled accurately, ensuring all members are square, plumb, and aligned.
- Intermediate horizontal and vertical members to provide structural rigidity and support for hardware.
- Plywood/WPC Fixing:
 - Both sides of the frame to be covered with 8 mm thick plywood/WPC board using low VOC adhesive.
 - Ensure boards are flush, no gaps, cracks, or warping.
- Veneer / Solid Wood Battens & Laminate:
 - Apply 4 mm veneer or 8 mm solid wood battens using suitable adhesive.
 - Laminate on opposite side to be fixed flat, free from air bubbles or peeling.
- Lipping & Polishing:
 - Apply 9 mm teak lipping with PU coating. All joints to be filled with wool pile to eliminate gaps.
 - Ensure smooth finish, uniform color, and sheen.
- Cavity Filling:
 - Insert 20 mm mineral wool insulation carefully to fill cavity without compression.
- Hardware Installation:
 - Install hinges, pivots, handles, tower bolts, and concealed lock body as per approved design.
 - Verify smooth operation of all hardware; no misalignment.
- Finishing & Quality Checks:
 - Ensure flush shutter surface, no misaligned panels.
 - Check smooth operation of door, handle, and locking mechanism.
 - Clean all surfaces, remove adhesive stains or dust before handover.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Square Meter (m²)** of actual shutter area.
- Including lipping aluminium frame, plywood/WPC boards, veneer, solid wood battens, laminate, lipping, insulation, hardware, adhesives, nails, fasteners, labour, and polishing. No separate payment for minor items such as filler, wool pile, or trimming.

ITEM NO – 263

Providing and fixing false ceiling of 10mm thick PVC fluted panels of approved make in wooden finish, including 50x25mm GI frame, tongue & groove fixing, corner moldings, and hardware, complete for all level height.Shade and pattern as per drawing and directed by architect and instruction by EIC.at all floors / all levels / all heights.

1. Materials

1. PVC Fluted Panels:
 - 10 mm thick, pre-finished PVC panels in approved wooden finish.
 - Panel should be of approved make, durable, and fire-retardant.
 - Edge profile designed for tongue & groove fixing.
PVC Panels – Manufacturer’s specification; low VOC and compliant with local fire safety regulations.
2. GI Frame Members:
 - 50 × 25 mm GI sections for perimeter and intermediate support framework.

- Galvanised steel conforming to IS 277 / IS 1161 for strength and corrosion resistance.
Galvanised Iron Sheets : Shall conform M23 page no-14 in General Technical Specification Booklet.
- 3. Corner Moldings:
 - PVC or aluminium corner moldings to cover edges and ensure neat finish.
 - Must match panel color and finish.
- 4. Fixing Hardware:
 - GI hangers, screws, fasteners, and clips suitable for false ceiling suspension.
 - Hardware should be corrosion-resistant and capable of carrying ceiling weight safely.

2. Workmanship

- Framework Installation:
 - Erect GI frame as per layout drawing, maintaining proper level and alignment.
 - Ensure maximum spacing between main members and cross members as per panel size to avoid sagging.
 - Secure frame to structural slab or beam using approved hangers and fasteners.
- Panel Installation:
 - Install PVC panels in tongue & groove manner. Ensure tight joints, no gaps, and uniform finish.
 - Cut panels carefully at edges, corners, and openings.
- Corner & Edge Finishing:
 - Fix corner moldings along perimeter to cover joints and provide aesthetic finish.
 - Ensure moldings align flush with panels, no gaps or misalignment.
- Quality Checks:
 - Ensure panels are free from scratches, cracks, or color variation.
 - Ceiling must be level and flush at all points.
 - Check all fixings for firmness; no loose panels or hardware.
- Cleaning & Protection:
 - Protect finished ceiling from dust, paint splashes, or scratches until project completion.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Square Meter (m²)**.
- Includes panels, GI frame, corner moldings, hangers, and all associated hardware.
- Payment includes supply, fabrication, erection, fixing of PVC panels, GI framework, moldings, hangers, screws, and all accessories required for a complete installation.
- Payment shall be for all levels and heights, inclusive of scaffolding or temporary supports.

ITEM NO – 264

Supply, Installation, Testing ,Commissioning of Electric driven main fire pump (Hydrant Pump)

suitable for automatic operation and consisting of following: complete in all respect as required.

a) Horizontal, centrifugal, end suction pump to ensure a minimum pressure of 3.5 kg / sq.cm. at highest and farthest outlet at specified flow of 2280 lpm at 70 m. head conforming to IS standards.

- b) Squirrel cage induction motor with suitable HP with synchronous speed 3000 RPM, Suitable for operation on 415 volts, 3 phase 50 Hz. AC with IP 55 protection for enclosure, horizontal foot mounted type with Class-F insulation, Conforming to IS standards.**
- c) Common Base plat for Pump and motor and coupling, coupling guard, vibration pad, cables and other accessories as required for complete Installation of pump set.**

1. Materials

1. Centrifugal Pump:
 - Horizontal, centrifugal, end suction type pump capable of delivering 2280 LPM at 70 m head.
 - Pump shall ensure minimum pressure of 3.5 kg/cm² at the highest and farthest outlet.
 - Casing, impeller, shaft, and wear rings shall be of robust construction suitable for fire-fighting duty.
 - Pump shall conform to IS 1520 / IS 9137 standards.
2. Electric Motor:
 - Squirrel cage induction motor, horizontal foot mounted type.
 - Suitable HP to match pump requirement, 3000 RPM synchronous speed.
 - Suitable for 415 Volts, 3 Phase, 50 Hz AC supply.
 - Protection: IP 55 enclosure, insulation Class-F.
 - Motor shall conform to IS 325 standards.
3. Base Plate & Coupling:
 - Common fabricated mild steel base plate for pump and motor.
 - Flexible coupling with proper alignment and coupling guard.
Structural Steel : Shall conform M22 page no-14 in General Technical Specification Booklet.
4. Vibration Isolation:
 - Anti-vibration pads or mounts below base frame to reduce noise and vibration.
5. Cables & Electrical Accessories:
 - Suitable size copper conductor cables for motor connection.
 - Cable glands, lugs, earthing, and all accessories required for complete installation.
 - Electrical components shall conform to relevant IS standards.
6. Fasteners & Fixtures:
 - Nuts, bolts, anchor fasteners, washers, etc. for proper installation.
Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.
7. Painting & Coating:
 - All exposed MS parts shall be painted with anti-corrosive primer and finish paint.
Paints : Shall conform M44 page no-21 in General Technical Specification Booklet.

2. Workmanship

- Installation of Pump Set:
 - Pump and motor shall be mounted on a rigid common base plate and installed on a concrete foundation.
 - Proper alignment between pump and motor shall be ensured using dial gauge methods.
- Mechanical Works:
 - Coupling shall be properly aligned and provided with guard for safety.
 - All bolts and fasteners shall be tightened and checked for stability.

- Vibration pads shall be placed properly to minimize vibration and noise.
- Electrical Installation:
 - Motor shall be connected with suitable cables, glands, and lugs.
 - Proper earthing shall be provided as per IS standards.
 - Check rotation direction of motor before commissioning.
- Testing & Commissioning:
 - Pump shall be tested for flow (2280 LPM) and head (70 m) performance.
 - Ensure minimum pressure at hydraulically remote point.
 - Check for vibration, noise, leakage, and overheating.
 - Trial run shall be carried out for continuous operation to ensure reliability.
- Quality Checks:
 - Verify compliance with specified discharge and head.
 - Ensure smooth operation without abnormal noise or vibration.
 - All safety guards and protections shall be in place.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Per Set)** of complete fire pump system installed, tested, and commissioned.
- Include supply, installation, testing, commissioning (SITC) of pump, motor, base plate, coupling, vibration pads, cables, accessories, fasteners, and all incidental works required for complete functioning system. alignment, foundation fixing, electrical connections, trial runs, and performance testing. No separate payment shall be made for minor components required for completion.

ITEM NO – 265

Supply, Installation, Testing ,Commissioning of Diesel Engine Driven (Stand By) fire pump suitable for automatic operation and consisting of following: complete in all respect as required.

a) Horizontal, centrifugal, back pullout pump to ensure a minimum pressure of 3.5 kg / cm². at highest and farthest outlet at specified flow of 2280 lpm at 70m. head conforming to IS standards.
b) Diesel engine of 1500/2900 RPM water cooled type with radiator conforming to relevant BS & IS standard complete with auto starting mechanism, 12 volts/24 volts electric starting equipment, Diesel tank, exhaust pipe extended up to 1 m. outside pump house duly insulated with 50 mm. thick glass wool with 1.0 mm. thick aluminium sheet cladding, residential silencer, instruments and protection as per specification, stop solenoid for auto stop in the event of fault with audio indications, painted with post office red colour etc. vibration pad & other accessories as required for complete Installation of pump set.All product Make approved as per tender and architect selection.

- Relevant to item specification shall be followed **Item No - 264** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 266

Supply, Installation, Testing, Commissioning of Electric driven pressurization pump (Working) suitable for automatic operation and consisting of following: complete in all respect as required.

a) Horizontal Type, single stage, centrifugal pump of cast iron body and bronze impeller with stainless steel shaft, mechanical seal and flow of 180 lpm at 70m.head conforming to IS standards.

b) Squirrel cage induction motor with suitable HP with synchronous speed 3000 RPM, Suitable for operation on 415 volts, 3 phase 50 Hz. AC with IP 55 protection for enclosure, horizontal foot mounted type with Class-F insulation, Conforming to IS standards.

c) Common Base plat for Pump and motor and coupling, coupling guard, vibration pad, cables and other accessories as required for complete installation of pump set.

- Relevant to item specification shall be followed Item No - 264 & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 267

Supply, Installation, Testing, Commissioning of Electric driven Terrace pump suitable for automatic operation and consisting of following: complete in all respect as required.

a) Horizontal Type, single stage, centrifugal pump of cast iron body and bronze impeller with stainless steel shaft, mechanical seal and flow of 900 lpm at 40m.head conforming to IS standards.

b) Squirrel cage induction motor with suitable HP with synchronous speed 3000 RPM, Suitable for operation on 415 volts, 3 phase 50 Hz. AC with IP 55 protection for enclosure, horizontal foot mounted type with Class-F insulation, Conforming to IS standards.

c) Common Base plat for Pump and motor and coupling, coupling guard, vibration pad, cables and other accessories as required for complete installation of pump set.

- Relevant to item specification shall be followed Item No - 264 & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 268

Supply, Installation, testing and commissioning of indoor FIRE FIGHTING PANEL as per Specification, Technical Data sheet & make list. Refer Single line diagram-J40_F_301_R0_SINGLE LINE DIAGRAM FOR FIRE FIGHTING PANEL.

(TYPE- 2 CO-ORDINATION REQUIRED FOR CONTACTOR & I/C AND O/G MCCB & STARTER.)

Incoming: 160A, 4P, 35 KA, MCCB WITH THERMAL MAG. BASED RELEASE (O/L, S/C, E/F PROTE.) with CT and MFM & ON, OFF, TRIP & RYB indication lamp

Busbar : 200 A, 415V, 4P, 35kA, 50Hz, AL. BUSBAR

Outgoing : (A) 2 NOS. 125 A FP 35 KA, MCCB WITH THERMAL MAG. BASED RELEASE (O/L, S/C, E/F PROTE.) with CT and MFM & ON, OFF, TRIP indication lamp

(B) 1 NOS. 40 A FP MCB 10KA (D-Curve), 1 NOS. 32 A DP MCB 10KA (D-Curve) with ON OFF indication & DG ON, OFF indication lamp and SPD (8/350 μ s current wave, 125 ka, mcoV:-1.2 kv) & other required accessories.

(C) Fully Automatic Star-Delta Starter for above motors suitable for upto 75 HP with Electronic Overload, single phasing protection and reverse phase protection, Auto/Manual/Remote/Off Selector Switch, Push Button for Manual Start & Stop, Alarm with reset push button which will automatically reset for the next cycle, LED Type indication for ON/OFF/ TRIP status and digital motor protection relay and hooter, star delta timer, A-meter with selector switch with CT and provision for pressure switch control. & other required accessories (refer single line diagram). -1 nos.

(D) Fully Automatic Star-Delta Starter for above motors suitable for upto 10 HP with Electronic Overload, single phasing protection and reverse phase protection, Auto/Manual/Remote/Off Selector Switch, Push Button for Manual Start & Stop, Alarm with reset push button which will

automatically reset for the next cycle, LED Type indication for ON/OFF/ TRIP status and digital motor protection relay and hoot ,star delta timer ,A-meter with selector switch with ct and provision for pressure switch control. & other required accesories (refer single line diagram). -1 nos.

(E) Control panel for diesel engine driven pump Auto/Manual/Remote/Off Selector Switch, Push Button for Manual Start & Stop,Alarm with reset push button which will automatically reset for the next cycle, LED Type indication for ON/OFF/ ACON/DCON/DG SET TO START FAIL and hooter with engine cranking relay and battery charging with auxilary relay. & other required accesories (refer single line diagram). -1 nos.

1. Materials

1.1 Panel Enclosure

- Floor-mounted, cubicle type, dust and vermin proof, fabricated from CRCA sheet steel of minimum 2.0 mm thickness.
- Suitable for indoor use, IP-54 protection.
- Powder coated with approved shade after 7-tank treatment process.
- Compartments provided for busbars, MCCBs, starters, and control wiring.
Structural Steel : Shall conform M22 page no-14 in General Technical Specification Booklet.
Paints : Shall conform M44 page no-21 in General Technical Specification Booklet.

1.2 Incoming MCCB

- 160A, 4 Pole, 35 kA MCCB with thermal-magnetic release (O/L, S/C, E/F protection).
- Provided with CTs and Multifunction Meter (MFM).
- Indications: ON / OFF / TRIP / RYB phase lamps.
- Conforming to IS/IEC 60947-2.

1.3 Busbar

- 200A, 415V, 4 Pole, 50 Hz Aluminium busbar with short circuit withstand capacity of 35 kA.
- Insulated with heat shrink sleeves and supported on SMC/DMC insulators.
- Busbar sizing and spacing as per IS standards. Aluminium Busbar as per IS 5082 / IS 8623.

1.4 Outgoing Feeders

(A) MCCB Feeders

- 2 Nos. 125A, 4P, 35 kA MCCB with thermal-magnetic release (O/L, S/C, E/F protection).
- Provided with CTs and MFM.
- Indications: ON / OFF / TRIP.

(B) MCB Feeders & SPD

- 1 No. 40A FP MCB, 10 kA (D-Curve).
- 1 No. 32A DP MCB, 10 kA (D-Curve).
- SPD: 8/350 μ s waveform, 125 kA discharge capacity, MCOV 1.2 kV.
- Indications: ON / OFF, DG ON / OFF.
- Conforming to IS/IEC 60898 / IEC 61643.

1.5 Star-Delta Starter (75 HP Motor)

- Fully automatic star-delta starter suitable up to 75 HP motor.
- Features:
 - Electronic overload relay
 - Single phasing & reverse phase protection
 - Auto / Manual / Remote / Off selector switch
 - Push buttons for start/stop
 - Alarm with auto reset
 - LED indication (ON/OFF/TRIP)
 - Digital motor protection relay
 - Hooter
 - Star-delta timer
 - Ammeter with selector switch and CT
 - Provision for pressure switch control
- Conforming to IS 13947 / IS 8544.

1.6 Star-Delta Starter (10 HP Motor)

- Fully automatic star-delta starter suitable up to 10 HP motor with similar features as above including protection, indication, and control accessories.

1.7 Diesel Engine Pump Control Panel

- Control system for diesel-driven fire pump with:
 - Auto / Manual / Remote / Off selector switch
 - Push buttons for start/stop
 - Alarm with reset
 - LED indications (ON/OFF/AC ON/DC ON/DG START FAIL)
 - Hooter
 - Engine cranking relay
 - Battery charger with auxiliary relay
- Conforming to fire safety control standards and engine manufacturer specifications.

1.8 Wiring & Accessories

- Internal wiring with FRLS copper wires of appropriate size.
 - Terminal blocks, cable glands, lugs, ferrules, etc.
 - Proper earthing of panel body and components.
- Fixtures and Fastenings: Shall conform M43 page no-19 in General Technical Specification Booklet.

2. Workmanship

- Panel Fabrication:
 - Panel shall be fabricated with precision, ensuring rigidity and proper compartmentalization.
 - All components shall be neatly arranged for accessibility and maintenance.
- Busbar & Wiring:
 - Busbars shall be properly supported and insulated.
 - Wiring shall be neatly dressed, ferruled, and tagged for identification.

- Installation:
 - Panel shall be installed on a rigid foundation, aligned, and properly anchored.
 - All incoming and outgoing cables shall be terminated with proper glands and lugs.
- Protection & Coordination:
 - Ensure Type-2 coordination between contactors, MCCBs, and starters.
 - All protection settings shall be calibrated as per system requirement.
- Testing & Commissioning:
 - Insulation resistance test of wiring and busbars.
 - Functional testing of MCCBs, MCBs, starters, relays, and indicators.
 - Simulation of fault conditions (O/L, S/C, phase failure).
 - Verification of auto/manual operation and interlocks.
 - Integration with pressure switch and fire pump system.
- Quality Checks:
 - Ensure proper labeling of all components.
 - Verify smooth operation of switches and starters.
 - Check earthing continuity and safety compliance.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Nos (Per Panel)** for complete
- Including design, fabrication, supply, installation, testing, and commissioning of panel with all MCCBs, MCBs, starters, SPD, control wiring, meters, relays, accessories, and interconnections. all labour, tools, testing equipment, and incidental works required for complete operation. No separate payment for internal wiring, labeling, minor components, or accessories.

ITEM NO – 269

Supplying, Installation, Testing and Commissioning of Control Panel suitable for automatic operation of fire fighting pump consisting (Terrace pump)

(a) Necessary cabling, wiring, earthing from panel to individual equipment shall be included in the quoted price.

(b) Facility for more selections i.e auto or manual.

(c) Protection failure and control cabling.

(d) interlocking of pressure switch with pumps

(e) Compatible for IBMS

Major component of panel are as under :

63A FP MCB with soft starter

Single phasing preventor

With push button

On,off, trip indication lamp

Space heater with thermostate

Cooling exhaust fan. All product Make approved as per tender and architect selection.

- Relevant to item specification shall be followed **Item No - 268** & Item shall be Measuring & Payment paid a unit per one **Number (Nos. Per Panel)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 270

Supply, Installation, Testing ,Commissioning of 150 mm dia Pressure Gauge of range 0 - 15 Kg / cm² conforming to IS - 3624 having bourdon tube of stainless steel 316 in cast aluminium, stove enameled, black, weather proof case with outer, screwed aluminium bezel and complete with necessary U-type stainless steel siphon tube and cock including providing suitably painted angle iron support to the tube etc.as per specification complete as required.

1. Materials

1. Pressure Gauge:
 - 150 mm dial size, range 0–15 kg/cm².
 - Bourdon type pressure gauge conforming to IS 3624.
 - Bourdon tube made of Stainless Steel Grade SS 316. Stainless Steel shall conform to relevant IS standards (IS 6911 / IS 6603).
2. Gauge Case:
 - Cast aluminium body, stove enamelled black finish.
 - Weatherproof construction with screwed aluminium bezel and glass front.
3. Siphon Tube:
 - U-type siphon tube made of stainless steel (SS 316) suitable for pressure applications.
4. Cock / Isolation Valve:
 - Gunmetal / brass cock for isolating pressure gauge during maintenance.
Gun Metal Valves : Shall conform M58 page no-25 in General Technical Specification Booklet.
5. Support Structure:
 - Angle iron support for mounting gauge and accessories, properly painted.
Structural Steel : Shall conform M22 page no-14 in General Technical Specification Booklet.
6. Fasteners & Accessories:
 - Nuts, bolts, washers, clamps, and fittings required for complete installation.
Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.
7. Painting:
 - Angle support and exposed metal parts shall be painted with anti-corrosive primer and finish coat.
Paints : Shall conform M44 page no-21 in General Technical Specification Booklet.

2. Workmanship

- Installation:
 - Pressure gauge shall be installed at specified locations on pipeline using proper threaded/ flanged connections.
 - Ensure vertical mounting and clear visibility of dial.
- Siphon & Cock Fixing:
 - U-type siphon tube shall be installed between pipeline and gauge to protect from high temperature/pressure surges.
 - Isolation cock shall be provided for easy maintenance and replacement.
- Support Arrangement:
 - Provide rigid angle iron support to avoid vibration and ensure stability.
 - Support shall be properly anchored and painted.
- Leak Testing:
 - All joints shall be tested for leakage under working pressure conditions.

- Calibration & Testing:
 - Gauge shall be factory calibrated and verified at site.
 - Check accuracy across full range (0–15 kg/cm²).
- Quality Checks:
 - Ensure clear and legible dial markings.
 - No vibration, pointer fluctuation, or leakage during operation.
 - Confirm weatherproof sealing of gauge case.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** of pressure gauge installed, tested, and commissioned.
- Include supply, installation, testing, commissioning, including gauge, siphon tube, cock, support structure, fasteners, and all accessories required for complete installation. No separate payment for minor fittings, painting, or supports.

ITEM NO – 271

Supply, Installation, Testing ,Commissioning of Pressure Switches for automation of fire pumps. Pressure switches shall be double pole single throw type suitable for single phase supply with diaphragm. Aluminum Enclosure with IP 66 protection, cable connection to pressure switch to control panel & other accessories as required.

1. Materials

1. Pressure Switch:
 - Double Pole Single Throw (DPST) type pressure switch suitable for single phase supply.
 - Diaphragm-operated mechanism for accurate pressure sensing.
 - Adjustable cut-in and cut-out pressure settings suitable for fire pump automation.
 - Suitable for working pressure of fire hydrant system.
 - Conforming to relevant IS/IEC standards for control devices (IS/IEC 60947).
2. Enclosure:
 - Cast aluminium enclosure with IP 66 protection, dust and weatherproof.
 - Suitable for indoor fire pump room conditions.
3. Cable & Wiring:
 - Copper conductor cable of suitable size for connection between pressure switch and control panel.
 - FRLS insulated, conforming to IS standards.
4. Accessories:
 - Cable glands, lugs, ferrules, conduit, clamps, and fixing hardware required for complete installation.

Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.
5. Mounting Arrangement:
 - Suitable GI/MS mounting bracket or support for fixing pressure switch on pipeline.

Structural Steel : Shall conform M22 page no-14 in General Technical Specification Booklet.
6. Painting:
 - Support structures and exposed metal parts to be painted with anti-corrosive primer and finish coat.

Paints : Shall conform M44 page no-21 in General Technical Specification Booklet.

2. Workmanship

- Installation:
 - Pressure switch shall be installed on pipeline at designated locations for sensing system pressure.
 - Proper orientation to ensure accurate diaphragm operation.
- Mounting & Support:
 - Switch shall be rigidly mounted using MS/GI bracket to avoid vibration.
 - Ensure accessibility for maintenance and adjustment.
- Electrical Connection:
 - Wiring between pressure switch and fire pump control panel shall be done using suitable size FRLS copper cable.
 - Proper termination using glands, lugs, and ferrules.
 - Ensure correct connection for automatic pump start/stop logic.
- Calibration & Setting:
 - Adjust cut-in and cut-out pressure settings as per system requirement (hydrant/jockey pump operation logic).
 - Verify settings with pressure gauge during commissioning.
- Testing & Commissioning:
 - Simulate pressure drop and rise to check automatic operation of pumps.
 - Ensure proper functioning in Auto/Manual modes.
 - Check for response time, accuracy, and repeatability.
- Quality Checks:
 - Ensure enclosure is properly sealed (IP 66).
 - No loose connections or exposed wiring.
 - Stable operation without false triggering.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** of pressure switch installed, tested, and commissioned.
- including supply, installation, testing, commissioning, including pressure switch, enclosure, wiring, mounting bracket, accessories, and all incidental works required for complete operation. No separate payment for minor accessories like lugs, glands, clamps, etc.

ITEM NO – 280

**Supply, Installation, Testing ,Commissioning of Y Strainer of CI Body flanged ends with stainless steel strainer 304 having 1.2mm perforation complete with necessary accessories:
150 mm dia.**

1. Materials

1. Y-Strainer Body:
 - Cast Iron (CI) body, flanged ends, suitable for fire-fighting/pressurized pipeline system.
 - Designed for easy removal and cleaning of strainer element.
 - Conforming to IS 210 / IS 14846 standards.
2. Strainer Element:
 - Removable perforated screen made of Stainless Steel Grade SS 304.
 - Perforation size: 1.2 mm dia holes.

- Adequate open area to ensure minimum pressure drop.
Stainless Steel shall conform to relevant IS standards (IS 6911 / IS 6603).
- 3. Flanges & Gaskets:
 - Flanged ends suitable for 150 mm dia pipeline, drilled as per IS 1538 / IS 6392.
 - Rubber / CAF gaskets for leak-proof joints.
- 4. Fasteners:
 - Nuts, bolts, washers for flange connection.
Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.
- 5. Painting & Coating:
 - External surface of CI body painted with anti-corrosive primer and finish paint.
Paints : Shall conform M44 page no-21 in General Technical Specification Booklet.

2. Workmanship

- Installation:
 - Y-strainer shall be installed in pipeline at designated location (generally before pump suction or equipment).
 - Orientation shall ensure strainer pocket faces downward for proper sediment collection.
- Jointing:
 - Flanged connections shall be made using proper gaskets, nuts, and bolts ensuring leak-proof joints.
 - Bolts shall be tightened uniformly to avoid leakage or distortion.
- Accessibility:
 - Provide sufficient clearance for removal of strainer cap and cleaning of screen.
- Alignment:
 - Ensure proper alignment with pipeline to avoid stress on flanges.
- Testing:
 - After installation, test under working pressure for leakage.
 - Check for smooth flow without abnormal pressure drop.
- Quality Checks:
 - Verify perforation size and SS 304 quality of strainer element.
 - Ensure no damage to screen during installation.
 - Confirm proper sealing and absence of leakage.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** for 150 mm dia Y-strainer installed, tested, and commissioned.
- include supply, installation, testing, commissioning, including CI body, SS strainer, gaskets, nuts, bolts, and all accessories required for complete installation. No separate payment for minor fittings, jointing materials, or consumables.

ITEM NO – 287

Supply, Installation, Testing ,Commissioning of Air vessel,size of 250 mm dia., 8 mm thick M.S sheet, 1200 mm in height with Air release valve on top and flanged connection to down comer, drain arrangement with 25 mm dia. valve, pressure gauge with required accessories and painting with synthetic enamel paint of approved shade as required.

The vessel shall be suitable for working pressure 8 kg/cm², Hydro test at 12Kg/cm².

1. Materials

1. Air Vessel Body:
 - Fabricated from 8 mm thick Mild Steel (MS) plates, cylindrical in shape.
 - Size: 250 mm diameter and 1200 mm height.
 - Suitable for working pressure of 8 kg/cm² and hydrostatic test pressure of 12 kg/cm².
 - Structural Steel : Shall conform M22 page no-14 in General Technical Specification Booklet.
2. Flanged Connection:
 - MS flanged connection at bottom for connection to down comer pipe.
 - Flanges drilled as per IS 6392 / IS 1538.
3. Air Release Valve:
 - Provided at top of vessel for release of trapped air.
 - Valve suitable for system pressure and conforming to IS standards.
4. Drain Arrangement:
 - 25 mm dia drain pipe with valve (gunmetal/brass) for draining water. Gun Metal Valves : Shall conform M58 page no-25 in General Technical Specification Booklet.
5. Pressure Gauge:
 - Suitable pressure gauge with required fittings for monitoring internal pressure.
 - Conforming to IS 3624.
6. Accessories:
 - Nozzles, sockets, supports, nuts, bolts, gaskets, clamps, etc. required for complete installation.
 - Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.
7. Painting:
 - External surface cleaned, primed, and painted with synthetic enamel paint of approved shade.
 - Paints : Shall conform M44 page no-21 in General Technical Specification Booklet.

2. Workmanship

- Fabrication:
 - MS plates shall be cut, rolled, and welded to form cylindrical vessel.
 - Welding shall be continuous, defect-free, and tested for strength.
 - End caps shall be properly dished or flat as per design requirements.
- Connections & Fittings:
 - Provide properly welded nozzles for air release valve, drain valve, and pressure gauge.
 - Flanged connection to down comer shall be properly aligned and leak-proof.
- Installation:
 - Vessel shall be installed vertically on suitable support/base.
 - Ensure proper alignment with pipeline and accessibility for maintenance.
- Testing:
 - Hydrostatic testing shall be carried out at 12 kg/cm² pressure to check leakage and strength.
 - All weld joints and connections shall be inspected for leakage.
- Finishing:
 - Surface preparation by cleaning and removing rust/scale.

- Apply primer and two coats of synthetic enamel paint.
- Quality Checks:
 - Verify thickness of MS plate (8 mm).
 - Ensure proper operation of air release valve and drain valve.
 - Confirm pressure gauge functionality.
 - Check overall stability and workmanship quality.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** of air vessel installed, tested, and commissioned.
- include fabrication, supply, installation, testing, commissioning, including vessel body, valves, pressure gauge, flanges, fittings, painting, supports, and all accessories required for complete system. No separate payment for welding, consumables, minor fittings, or testing.

ITEM NO – 288

Supply, Installation, Testing ,Commissioning of GM Single headed oblique type Hydrant valve (Internal & External) with instantaneous gun metal cuplings of 63 mm dia with cast iron wheel ISI marked conforming to IS 5290 (Type-A) with blank pvc cap and chain as required.

1. Materials

1. Hydrant Valve:
 - Single headed, oblique type hydrant valve suitable for internal & external fire fighting system.
 - Size: 63 mm dia outlet with instantaneous coupling.
 - Made of Gun Metal (GM), robust construction.
 - Conforming to IS 5290 (Type-A) and ISI marked. Gun Metal Valves : Shall conform M58 page no-25 in General Technical Specification Booklet.
2. Instantaneous Couplings:
 - 63 mm dia GM instantaneous type coupling conforming to IS standards.
 - Provided with standard lugs for quick hose connection.
3. Hand Wheel:
 - Cast Iron (CI) wheel for operation of valve.

Reference: Cast Iron shall conform to relevant IS standards (IS 210).
4. Blank Cap & Chain:
 - PVC blank cap with chain to prevent entry of dust and dirt.
5. Spindle & Internal Parts:
 - Non-corrosive spindle and internal components suitable for repeated operation under pressure.
6. Fasteners & Accessories:
 - Necessary nuts, bolts, washers, gaskets, and sealing materials.

Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.
7. Painting / Coating:
 - External surfaces to be painted or coated for corrosion resistance.

Paints : Shall conform M44 page no-21 in General Technical Specification Booklet.

2. Workmanship

- Installation:
 - Hydrant valve shall be installed at specified locations on hydrant riser/landing valve points.
 - Ensure correct orientation for easy hose connection and operation.
- Jointing:
 - Proper threaded or flanged connection with pipeline ensuring leak-proof joint using suitable gaskets/sealants.
- Alignment & Support:
 - Valve shall be properly aligned and supported to avoid stress on pipeline.
- Accessories Fixing:
 - Fix blank cap with chain securely to prevent loss.
 - Ensure coupling is easily operable and properly seated.
- Testing:
 - Valve shall be tested under working pressure for leakage and smooth operation.
 - Check opening/closing mechanism and ensure no jamming.
- Quality Checks:
 - Verify ISI marking and compliance with IS 5290 Type-A.
 - Ensure smooth rotation of hand wheel.
 - Confirm proper sealing and no leakage at joints.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** of hydrant valve installed, tested, and commissioned.
- include supply, installation, testing, commissioning, including valve, coupling, blank cap with chain, fasteners, and all accessories required for complete installation. No separate payment for minor fittings, sealing materials, or consumables.

ITEM NO – 289

Supply, Installation, Testing, Commissioning of Fire Hose Cabinet of size 750mmx600mmx250mm fabricated from 16 swg thick MS sheet with 6mm thick glazed hinged type centre opening doors having locking arrangement suitable for accommodating 2 nos RRL hose pipes, 1 no. nozzle, branch pipe & painting with two coats of anti-corrosive primer and two coats of approved red enamel paint etc. complete as required.All product.

1. Materials

1. Cabinet Body:
 - Fabricated from 16 SWG thick Mild Steel (MS) sheet.
 - Size: 750 mm × 600 mm × 250 mm.
 - Suitable for wall mounting or recessed installation.
Reference: Structural Steel : Shall conform M22 page no-14 in General Technical Specification Booklet.
2. Doors:
 - Double leaf (centre opening) hinged type doors.
 - Provided with 6 mm thick clear glass (glazed panel) for visibility.
Glass : Shall conform M38 page no-18 in General Technical Specification Booklet.
3. Locking Arrangement:

- Suitable locking system (cam lock / key lock) for secure closure with easy accessibility during emergency.
- 4. Internal Arrangement:
 - Suitable supports/hooks/brackets to accommodate:
 - 2 Nos. RRL hose pipes
 - 1 No. branch pipe
 - 1 No. nozzle
- 5. Hinges & Hardware:
 - Heavy-duty MS/SS hinges, handles, screws, and fittings.

Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.
- 6. Painting:
 - Surface preparation followed by:
 - Two coats of anti-corrosive primer
 - Two coats of approved red enamel paint

Paints : Shall conform M44 page no-21 in General Technical Specification Booklet.

2. Workmanship

- Fabrication:
 - MS sheets shall be cut, bent, and welded to form rigid cabinet structure.
 - Edges shall be smooth, free from burrs and sharp corners.
- Door Fixing:
 - Doors shall be properly aligned and fitted with hinges for smooth opening/closing.
 - Glass panels shall be securely fixed with beading and rubber gasket.
- Surface Preparation & Painting:
 - Clean surface to remove rust, oil, and dust.
 - Apply primer and enamel paint uniformly to achieve smooth finish.
- Installation:
 - Cabinet shall be fixed to wall/recess using suitable fasteners.
 - Ensure proper level and alignment.
- Accessories Arrangement:
 - Provide proper supports inside cabinet for placing hose pipes, nozzle, and branch pipe neatly.
- Quality Checks:
 - Ensure door operation is smooth and locking system is functional.
 - Verify proper finish of paint without peeling or uneven coating.
 - Confirm firm fixing and stability of cabinet.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** of fire hose cabinet installed, painted, and completed.
- include fabrication, supply, installation, painting, and all accessories required for complete cabinet. Includes hinges, glass, locking arrangement, internal supports, and fixing hardware. No separate payment for minor fittings or consumables.

ITEM NO – 290

Supply, Installation, Testing ,Commissioning of 63 mm dia, 2x15 Mtrs. long RRL Hose Pipe with 63 mm dia male & female gun metal couplings duly binded with GI wire, rivets etc. conforming to IS 636 (type-A - RRL) as required.

1. Materials

1. RRL Hose Pipe:
 - 63 mm dia Reinforced Rubber Lined (RRL) hose pipe, non-percolating type.
 - Length: 2 lengths × 15 meters each (total 30 m per set).
 - Flexible, durable, and suitable for fire-fighting applications.
 - Conforming to IS 636 (Type-A) and ISI marked.
2. Couplings:
 - 63 mm dia male & female instantaneous type couplings made of Gun Metal (GM).
 - Couplings shall conform to relevant IS standards for fire hose fittings.
Gun Metal Valves : Shall conform M58 page no-25 in General Technical Specification Booklet.
3. Binding:
 - Couplings shall be securely bound to hose using GI wire, rivets, and other approved methods to ensure leak-proof and firm connection.
Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.
4. Accessories:
 - Rubber washers, gaskets, and sealing rings for proper coupling connection.

2. Workmanship

- Assembly:
 - Hose pipes shall be properly fitted with couplings at both ends.
 - Binding with GI wire and rivets shall be tight, secure, and leak-proof.
- Installation / Placement:
 - Hose pipes shall be neatly coiled and placed inside fire hose cabinet or at designated locations.
 - Ensure easy accessibility for emergency use.
- Testing:
 - Hose pipes shall be tested under pressure as per IS 636 to ensure no leakage, bulging, or damage.
 - Check proper coupling engagement and locking mechanism.
- Quality Checks:
 - Verify ISI marking and compliance with IS 636 Type-A.
 - Ensure flexibility and absence of cracks or defects.
 - Check smooth operation of couplings.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos) (Per Set)** consisting of 2 lengths of 15 m each (total 30 m) with couplings.
- include supply, installation, testing, commissioning, including hose pipe, couplings, binding, washers, and all accessories required for complete set. No separate payment for minor items such as GI wire, rivets, or sealing materials

Supply, Installation, Testing ,Commissioning of 63 mm GM Branch Pipe with 20mm GM nozzle conforming to IS:903, suitable for instantaneous connection to interconnect hose pipe coupling as required.

1. Materials

1. Branch Pipe:
 - 63 mm dia Gun Metal (GM) branch pipe, suitable for fire-fighting applications.
 - Designed for smooth flow and proper jet formation.
 - Conforming to IS 903.
Gun Metal Valves : Shall conform M58 page no-25 in General Technical Specification Booklet.
2. Nozzle:
 - 20 mm dia Gun Metal (GM) nozzle, threaded or screwed type, fitted to branch pipe.
 - Designed to produce a solid jet stream for fire-fighting.
 - Conforming to IS 903.
3. Coupling Arrangement:
 - 63 mm dia instantaneous type coupling at inlet, compatible with RRL hose pipe coupling.
 - Made of gun metal and conforming to IS standards.
4. Washers & Seals:
 - Rubber washers and sealing rings to ensure leak-proof connection.
5. Accessories:
 - Necessary fittings, locking lugs, and minor accessories for proper functioning.
Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.

2. Workmanship

- Assembly:
 - Nozzle shall be securely fitted to branch pipe with proper threading or fastening.
 - Coupling shall be properly aligned and fixed for easy connection with hose pipe.
- Installation / Placement:
 - Branch pipe shall be kept inside fire hose cabinet or designated location along with hose pipes.
 - Ensure easy accessibility during emergency use.
- Testing:
 - Check assembly under pressure to ensure no leakage at joints.
 - Verify proper jet formation and flow through nozzle.
- Quality Checks:
 - Confirm IS 903 compliance and ISI marking.
 - Ensure smooth coupling engagement and locking.
 - Verify absence of casting defects, cracks, or leakage.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** of branch pipe with nozzle installed, tested, and commissioned.
- Include supply, installation, testing, commissioning, including branch pipe, nozzle, coupling, washers, and all accessories required for complete unit.

ITEM NO – 292

Supply, Installation, Testing ,Commissioning of First- Aid Hose Reel equipment with M.S. construction spray painted in post office red, conforming to IS:884 with up to date amendments, complete with the following as required.

(a) 36 m. long, 25 mm dia. water hose thermoplastic

(Textile reinforced) Type-2 as per IS:12585.

(b) 25 mm dia gun metal globe valve & nozzle

(c) Drum and swinging type fixing brackets on the wall.

(d) Connections from riser with 25 mm dia. Gun metal ball valve.All product Make approved as per tender and architect selection.

1. Materials

1. Hose Reel Drum & Structure:

- Hose reel drum made of Mild Steel (MS) construction with swinging type wall mounting bracket.
- Finished with post office red paint.
- Conforming to IS 884 (latest amendments).
Structural Steel : Shall conform M22 page no-14 in General Technical Specification Booklet.
Paints : Shall conform M44 page no-21 in General Technical Specification Booklet.

2. Hose Pipe:

- 36 m long, 25 mm dia thermoplastic hose, textile reinforced.
- Type-2 hose conforming to IS 12585.

3. Valve & Nozzle:

- 25 mm dia Gun Metal (GM) globe valve.
- Suitable GM nozzle for spray/jet operation.
Gun Metal Valves : Shall conform M58 page no-25 in General Technical Specification Booklet.

4. Drum & Brackets:

- Swinging type hose reel drum with wall mounting brackets, enabling easy rotation during operation.

5. Connection from Riser:

- 25 mm dia Gun Metal (GM) ball valve for connection to riser pipe.
- Complete with necessary fittings and adaptors.
Gun Metal Valves : Shall conform M58 page no-25 in General Technical Specification Booklet.

6. Fasteners & Accessories:

- Nuts, bolts, clamps, anchors, and other fixing materials.
Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.

2. Workmanship

• Installation:

- Hose reel shall be mounted on wall using swinging bracket at designated location near hydrant/exit points.
- Ensure proper height and accessibility as per fire safety norms.

• Fixing & Alignment:

- Brackets shall be rigidly fixed with anchor fasteners.
- Drum shall rotate smoothly without obstruction.

- Connection:
 - Hose reel shall be connected to riser through 25 mm dia GM ball valve with leak-proof joints.
- Hose Arrangement:
 - Hose shall be neatly wound on drum without kinks or twists.
- Testing & Commissioning:
 - System shall be tested under pressure to ensure no leakage.
 - Check smooth unwinding and rewinding of hose.
 - Verify proper functioning of valve and nozzle (jet/spray).
- Quality Checks:
 - Confirm IS 884 and IS 12585 compliance.
 - Ensure proper painting finish and corrosion protection.
 - Check firm fixing and operational ease.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** of complete hose reel set installed, tested, and commissioned.
- include supply, installation, testing, commissioning, including hose reel drum, hose pipe, valves, nozzle, brackets, connections, and all accessories required for complete functioning system. No separate payment for minor fittings, clamps, or consumables

ITEM NO – 293

Providing and fixing standard fireman Axe with heavy duty insulated rubber handle as per IS: 926 with clamps.All product Make approved as per tender and architect selection.

1. Materials

1. Fireman Axe:
 - Standard fireman axe conforming to IS 926.
 - Axe head made of forged high carbon steel, hardened and tempered for durability and sharp cutting edge.
2. Handle:
 - Heavy-duty insulated rubber handle, non-slip type, suitable for safe operation in emergency conditions.
 - Electrically insulated for use in fire situations involving electrical hazards.
3. Clamps / Mounting Arrangement:
 - MS/SS clamps for fixing the axe securely inside fire hose cabinet or on wall.
Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.
4. Painting / Coating:
 - Axe head coated with anti-corrosive finish.
Paints : Shall conform M44 page no-21 in General Technical Specification Booklet.

2. Workmanship

- Supply & Inspection:
 - Axe shall be checked for proper weight, balance, and sharpness.
 - Ensure compliance with IS 926 and absence of manufacturing defects.
- Fixing / Installation:

- Axe shall be securely fixed using clamps inside fire hose cabinet or at designated accessible location.
- Ensure firm holding while allowing easy removal during emergency.
- Finishing:
 - Ensure handle grip is properly finished and free from defects.
 - Axe head shall be free from rust, cracks, or blunt edges.
- Quality Checks:
 - Confirm IS marking and standard compliance.
 - Check insulation quality of handle.
 - Ensure proper mounting and accessibility.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos))** of fireman axe supplied and fixed.
- include supply and fixing, including clamps, fasteners, and all accessories required for complete installation. No separate payment for minor fittings or consumables

ITEM NO – 294

Supply, Installation, Testing ,Commissioning of Cast Iron Four Way Fire Brigade Inlet having 04 gunmetal 63mm male instantaneous inlets conforming to IS:903, fitted with non-return valves, flange outlet 280mm OD, 240mm PCD, eight holes of 22mm dia complete with 04 PVC blank caps and chains with accessories complete as required.

1. Materials

1. Fire Brigade Inlet Body:
 - Cast Iron (CI) body, four-way type suitable for fire brigade connection to hydrant system.
 - Robust construction for external installation.
 - Conforming to relevant IS standards for CI castings.
Cast Iron shall conform to relevant IS standards (IS 210).
2. Inlets:
 - 04 Nos. 63 mm dia gun metal male instantaneous inlets.
 - Conforming to IS 903.
Gun Metal Valves : Shall conform M58 page no-25 in General Technical Specification Booklet.
3. Non-Return Valves (NRV):
 - Each inlet fitted with non-return valve to prevent backflow.
 - Suitable for fire-fighting pressure applications.
4. Flanged Outlet:
 - Single outlet flange of 280 mm OD, 240 mm PCD with 8 holes of 22 mm dia.
 - Suitable for connection to fire main.
 - Flanges conforming to IS 1538 / IS 6392.
5. Blank Caps & Chains:
 - 04 Nos. PVC blank caps with chains for protection against dust and debris.
6. Fasteners & Accessories:
 - Nuts, bolts, washers, gaskets, clamps, and other required fittings.
Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.
7. Painting / Coating:

- External CI body painted with anti-corrosive primer and finish coat (usually red).
Paints : Shall conform M44 page no-21 in General Technical Specification Booklet.

2. Workmanship

- Installation:
 - Fire brigade inlet shall be installed at accessible external location as per fire authority requirements.
 - Proper orientation for easy connection by fire brigade personnel.
- Jointing:
 - Flanged connection to main pipeline using suitable gaskets and bolts ensuring leak-proof joint.
- Alignment & Support:
 - Ensure proper alignment with pipeline and provide support to avoid stress on connection.
- Accessories Fixing:
 - Blank caps with chains shall be securely fixed to each inlet.
 - Ensure NRVs are properly installed and functioning.
- Testing:
 - Assembly shall be tested under pressure for leakage and proper functioning.
 - Check operation of NRVs to prevent backflow.
- Quality Checks:
 - Verify compliance with IS 903.
 - Ensure proper casting quality without cracks or defects.
 - Confirm all inlets and caps are intact and functional.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** of four-way fire brigade inlet installed, tested, and commissioned.
- include supply, installation, testing, commissioning, including CI body, GM inlets, NRVs, flange, blank caps with chains, fasteners, and all accessories required for complete installation. No separate payment for minor fittings or consumables

ITEM NO – 295

Supply, Installation, Testing ,Commissioning of Cast Iron Two Way Fire Brigade inlet having 02 gunmetal 63mm male instantaneous inlets conforming to IS:903, fitted with non-return valves, flange outlet 228mm OD, 190mm PCD, eight holes of 19mm dia complete with 02 PVC blank caps and chains with accessories complete as required.

1. Materials

1. Fire Brigade Inlet Body:
 - Cast Iron (CI) body, two-way type suitable for fire brigade connection to hydrant system.
 - Heavy-duty construction for external use.
 - Conforming to relevant IS standards for CI castings.
Cast Iron shall conform to relevant IS standards (IS 210).
2. Inlets:
 - 02 Nos. 63 mm dia gun metal male instantaneous inlets.

- Conforming to IS 903.
Gun Metal Valves : Shall conform M58 page no-25 in General Technical Specification Booklet.
- 3. Non-Return Valves (NRV):
 - Each inlet fitted with non-return valve to prevent backflow into fire brigade line.
 - Suitable for fire-fighting pressure systems.
- 4. Flanged Outlet:
 - Outlet flange of 228 mm OD, 190 mm PCD with 8 holes of 19 mm dia.
 - Suitable for connection to fire main.
 - Conforming to IS 1538 / IS 6392.
- 5. Blank Caps & Chains:
 - 02 Nos. PVC blank caps with chains for protection from dust and damage.
- 6. Fasteners & Accessories:
 - Nuts, bolts, washers, gaskets, and necessary fittings.
Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.
- 7. Painting / Coating:
 - External CI body painted with anti-corrosive primer and finish coat (fire red or approved shade).
Paints : Shall conform M44 page no-21 in General Technical Specification Booklet.

2. Workmanship

- Installation:
 - Fire brigade inlet shall be installed at easily accessible external location as per fire authority norms.
 - Orientation shall allow quick connection by fire brigade personnel.
- Jointing:
 - Flanged connection to pipeline shall be made using proper gaskets and tightened bolts ensuring leak-proof joints.
- Alignment & Support:
 - Ensure proper alignment and provide necessary support to avoid stress on pipeline connections.
- Accessories Fixing:
 - Blank caps shall be securely attached with chains to prevent loss.
 - Ensure NRVs are correctly installed and functional.
- Testing:
 - Assembly shall be tested under system pressure for leakage.
 - Check NRV functionality to ensure no reverse flow.
- Quality Checks:
 - Verify compliance with IS 903.
 - Ensure casting is free from cracks and defects.
 - Confirm smooth and proper fitment of all components.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** of two-way fire brigade inlet installed, tested, and commissioned.
- include supply, installation, testing, commissioning, including CI body, GM inlets, NRVs, flange, blank caps with chains, fasteners, and all accessories required for complete installation. No separate payment for minor fittings or consumables.

ITEM NO – 296

Supply, Installation, Testing ,Commissioning of Gun Metal Single Draw Out connection having 100mm female round threaded connection to fit pump suction with accessories complete as required.

Size:100mm

1. Materials

1. Draw Out Connection Body:
 - Gun Metal (GM) single draw out connection, suitable for fire pump suction application.
 - Size: 100 mm dia female round threaded connection.
 - Robust construction suitable for repeated coupling/decoupling during fire brigade operation.
Gun Metal Valves : Shall conform M58 page no-25 in General Technical Specification Booklet.
2. Threaded Connection:
 - Female round threaded inlet compatible with fire brigade suction hose.
 - Threads machined accurately for leak-proof and secure connection.
3. Accessories:
 - Necessary adaptors, gaskets, washers, sealing rings, and fittings required for complete installation.
Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.
4. Protective Cap:
 - Suitable blank cap with chain to protect threaded opening from dust and damage.
5. Painting / Coating:
 - External parts to be finished with anti-corrosive coating or natural polished finish of gun metal.
Paints : Shall conform M44 page no-21 in General Technical Specification Booklet (for MS parts if any).

2. Workmanship

- Installation:
 - Draw out connection shall be installed at pump suction line at designated accessible location.
 - Ensure proper alignment with pipeline and accessibility for fire brigade connection.
- Jointing:
 - Threaded or flanged connection shall be made using suitable sealing materials (PTFE tape or equivalent) to ensure leak-proof joints.
- Fixing & Support:
 - Provide adequate support to prevent stress on connection due to hose handling.
- Accessories Fixing:
 - Blank cap with chain shall be securely attached.
- Testing:
 - Connection shall be tested under pressure/vacuum conditions to ensure no leakage.
 - Check compatibility with fire brigade hose connection.
- Quality Checks:
 - Ensure smooth threading without damage.

- Verify proper seating and leak-proof performance.
- Confirm material quality and finish.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** of draw out connection installed, tested, and commissioned.
- include supply, installation, testing, commissioning, including GM connection, threaded fittings, blank cap with chain, fasteners, and all accessories required for complete installation. No separate payment for minor fittings, sealing materials, or consumables

ITEM NO – 298

Supply, Installation, Testing ,Commissioning of carbon dioxide (CO₂) fire extinguisher user of following capacity with necessary clamps made from 50 x 6 mm M.S. Flat with nut & bolts grouted in wall complete.

[A] For 4.5 Kg Capacity.All product Make approved as per tender and architect selection.

1. Materials

1. Fire Extinguisher:
 - Carbon Dioxide (CO₂) type fire extinguisher, capacity 4.5 kg.
 - Suitable for Class B & C fires (flammable liquids and electrical fires).
 - Cylinder made of high-quality seamless steel, tested and approved.
 - Complete with discharge horn, valve, and operating lever.
 - Conforming to IS 15683 (latest amendments) and ISI marked.
2. Discharge Horn:
 - Non-conductive horn suitable for safe operation on electrical fires.
3. Mounting Clamp:
 - Made from 50 × 6 mm MS flat, properly shaped to hold extinguisher securely.
 - Provided with nuts, bolts, and grouting arrangement for wall fixing.
Structural Steel : Shall conform M22 page no-14 in General Technical Specification Booklet.
4. Fasteners & Accessories:
 - Nuts, bolts, washers, and anchor fasteners for fixing clamp.
Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.
5. Painting / Coating:
 - Extinguisher painted in signal red color with anti-corrosive coating.
Paints : Shall conform M44 page no-21 in General Technical Specification Booklet.

2. Workmanship

- Supply & Inspection:
 - Extinguisher shall be checked for ISI marking, manufacturing date, and hydrostatic test certification.
 - Ensure no dents, corrosion, or damage to cylinder.
- Fixing:
 - Clamp shall be securely fixed on wall using anchor fasteners and grouting.
 - Extinguisher shall be mounted firmly but easily removable during emergency.
- Installation Location:

- Installed at accessible height and location as per fire safety norms.
- Clear visibility and easy reach shall be ensured.
- Testing & Commissioning:
 - Check weight of CO₂ charge and pressure condition (if applicable).
 - Ensure smooth operation of valve and discharge system.
- Quality Checks:
 - Verify proper labeling and instructions on extinguisher body.
 - Ensure proper fitment in clamp without looseness.
 - Confirm readiness for immediate use.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** of CO₂ fire extinguisher installed and fixed.
- include supply, installation, testing, commissioning, including extinguisher, clamp, fasteners, grouting, and all accessories required for complete installation. No separate payment for minor fittings or consumables.

ITEM NO – 299

ABC Type Fire Extinguisher: Supply, Installation, Testing ,Commissioning of ABC type fire extinguisher for following capacity cartridge type with gun metal cap 150 gram CO₂ gas cartridge, powder and brackets confirming to IS 2171 1985 and complete erected with necessary clamps made from 50 x 6 mm M S Flat with nuts and bolts grouted in wall complete. [A] For 6 Kg Capacity.

- Relevant to item specification shall be followed Item No - 298 & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 300

Supply, Installation, Testing ,Commissioning of D.C.P. type fire extinguisher for following capacity cartridge type with gun metal cap 150 gram CO₂ gas cartridge, powder and brackets confirming to IS 2171 1985 and complete erected with necessary clamps made from 50 x 6 mm M S Flat with nuts and bolts grouted in wall complete.

[A] For 5 Kg Capacity.

- Relevant to item specification shall be followed Item No - 298 & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 301

Supply, Installation, Testing, Commissioning of Orifice plate to reduce pressure upto 5.5 Kg/sqcm complete in all respects. (for 80mm dia pipe - external and internal hydrants) .

1. Materials

1. Orifice Plate:
 - Orifice plate made of Stainless Steel (SS 304 / SS 316) suitable for fire-fighting pipeline.

- Precisely machined orifice to reduce downstream pressure to 5.5 kg/cm².
- Plate thickness and orifice size as per hydraulic design calculations.
Stainless Steel shall conform to relevant IS standards (IS 6911 / IS 6603).
- 2. Flange Assembly:
 - MS/CI flanges suitable for 80 mm dia pipeline, drilled as per IS 1538 / IS 6392.
Structural Steel : Shall conform M22 page no-14 in General Technical Specification Booklet.
- 3. Gaskets:
 - Rubber / CAF gaskets for proper sealing between flange and orifice plate.
- 4. Fasteners:
 - Nuts, bolts, washers for flange tightening.
Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.
- 5. Pressure Tapping (if required):
 - Provision for upstream and downstream pressure measurement using tapping points.
- 6. Painting / Coating:
 - MS parts shall be painted with anti-corrosive primer and finish paint.
Paints : Shall conform M44 page no-21 in General Technical Specification Booklet.

2. Workmanship

- Installation:
 - Orifice plate shall be installed between flanges in 80 mm dia hydrant pipeline at specified locations (internal & external hydrants).
 - Ensure correct orientation of plate (sharp edge facing upstream).
- Alignment & Fixing:
 - Plate shall be centrally aligned within pipeline to ensure uniform flow.
 - Flanges shall be tightened uniformly to avoid leakage or misalignment.
- Jointing:
 - Proper gaskets shall be used to ensure leak-proof joints.
- Calibration & Setting:
 - Orifice size shall be selected/designed to achieve desired pressure reduction to 5.5 kg/cm².
- Testing:
 - System shall be tested under working conditions to verify pressure reduction.
 - Check for leakage at flange joints.
- Quality Checks:
 - Ensure smooth finish and accurate machining of orifice.
 - Verify pressure reduction performance.
 - Confirm stability and leak-proof installation.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** of orifice plate assembly installed, tested, and commissioned.
- include supply, installation, testing, commissioning, including orifice plate, flanges, gaskets, fasteners, and all accessories required for complete installation.

Providing, fixing AUTO GLOW photo luminescent Signage's as per IS standard in Block / Small Letters on rigid sheet with necessary wall or Ceiling fittings as Specified Sizes:

Fire Equipment: 4" x 12".

1. Materials

1. Photo Luminescent Signage:
 - Signage made of auto glow photo-luminescent material, capable of glowing in dark after exposure to ambient light.
 - Size: 4 inch × 12 inch.
 - Text in Block / Small letters as per fire safety norms.
 - Suitable for indicating Fire Equipment location.
 - Conforming to relevant IS standards for safety signage (IS 12349 / ISO 7010 equivalent).
2. Base Sheet:
 - Rigid base made of PVC / Acrylic / Aluminium composite panel (ACP) for durability and dimensional stability.
Acrylic Sheets : Shall conform M39 page no-19 in General Technical Specification Booklet.
3. Lettering & Finish:
 - Printed / screen printed / vinyl pasted letters with high visibility contrast.
 - UV resistant and non-fading type.
4. Fixing Accessories:
 - Screws, rawl plugs, double-sided tape, or hanging supports for wall/ceiling mounting.
Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.

2. Workmanship

- Preparation:
 - Ensure signage content, size, font, and color are as per approved drawings and fire safety requirements.
- Installation:
 - Sign boards shall be fixed at designated locations (walls/ceilings) near fire equipment.
 - Mounting height and visibility shall comply with fire norms and ensure clear readability.
- Fixing Method:
 - Fixed using screws, adhesives, or suspension system depending on location.
 - Ensure firm fixing and alignment.
- Alignment & Visibility:
 - Signage shall be properly aligned horizontally/vertically.
 - Ensure no obstruction to visibility from normal approach direction.
- Quality Checks:
 - Verify glow performance in dark conditions.
 - Ensure no peeling, fading, or damage to surface.
 - Confirm correct spelling, size, and placement.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** of signage installed.
- include supply and fixing of photo luminescent signage including base sheet, printing, fixing accessories, and all labour required for complete installation.

ITEM NO – 303

Providing, fixing AUTO GLOW photo luminescent Signage's as per IS standard in Block / Small Letters on rigid sheet with necessary wall or Ceiling fittings as Specified Sizes:

b) In case of Fire, do not use lift, use staircase: 8" x 8".

- Relevant to item specification shall be followed **Item No - 302** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 305

Supply, Installation, Testing and commissioning of Quartzoid Bulb type Sprinkler Heads. a) Pendent Sprinkler 57°C - K-80 - standard response - UL listed

1. Materials

1. Sprinkler Head:
 - Pendent type automatic sprinkler head with quartzoid glass bulb.
 - Temperature rating: 57°C (standard temperature classification).
 - K-Factor: K-80 (K=5.6).
 - Standard response type.
 - Suitable for installation in fire sprinkler systems as per design.
 - UL Listed and conforming to relevant IS / international standards (IS 15105 / NFPA guidelines).
2. Body & Frame:
 - Made of forged brass / bronze, corrosion-resistant.
3. Glass Bulb Element:
 - Quartzoid bulb filled with heat-sensitive liquid, designed to burst at specified temperature.
4. Deflector:
 - Brass deflector designed for uniform water distribution in pendent position.
5. Threaded Connection:
 - Standard threaded inlet (generally 15 mm or 20 mm BSP/NPT) suitable for sprinkler piping.
6. Sealing Assembly:
 - Includes sealing washer, seat, and spring assembly to ensure leak-proof condition before operation.
7. Accessories:
 - Required fittings, thread sealant, and minor accessories.

Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.

2. Workmanship

- Installation:
 - Sprinkler heads shall be installed in pendent position (downward facing) as per approved layout drawings.
 - Spacing and coverage area shall comply with design and fire norms.
- Fixing & Alignment:
 - Heads shall be fixed using proper threaded connections with sealant to ensure leak-proof joints.
 - Deflector shall be installed at correct distance below ceiling as specified.
- Handling:
 - Care shall be taken to avoid damage to glass bulb during handling and installation.
 - Protective caps (if provided) shall be removed only after completion of works.
- Testing & Commissioning:
 - Entire sprinkler system shall be hydrostatically tested.
 - Check for leakage at joints.
 - Ensure proper alignment and unobstructed spray pattern.
- Quality Checks:
 - Verify UL listing and compliance with standards.
 - Ensure correct temperature rating (57°C) and K-factor (K-80).
 - Check for physical damage, corrosion, or manufacturing defects.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** of sprinkler head installed, tested, and commissioned.
- include supply, installation, testing, commissioning, including sprinkler head, fittings, sealants, and all accessories required for complete installation.

ITEM NO – 306

Smoke detector :Supplying, erecting testing and commissioning conventional optical type smoke detector on suitable back box with necessary connections complete.

1. Materials

1. Smoke Detector:
 - Conventional optical (photoelectric) type smoke detector suitable for fire detection system.
 - Ceiling mounted type with high sensitivity to visible smoke particles.
 - Compatible with conventional fire alarm control panel.
 - Conforming to IS 2189 and relevant international standards (EN 54 / UL listed).
2. Detector Base / Back Box:
 - Suitable mounting base (surface / flush type) made of fire-resistant plastic or metal.
 - Designed for secure fixing and easy removal for maintenance.
3. Sensing Chamber:
 - Optical sensing chamber with LED indicator for alarm status.
 - Dust-resistant design with insect screen protection.
4. Wiring & Terminals:
 - Terminal connections for loop wiring with proper polarity and continuity.
5. Accessories:

- Mounting screws, rawl plugs, connectors, and other fixing materials.
Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.

2. Workmanship

- Installation:
 - Detector shall be installed on ceiling or wall as per approved fire alarm layout.
 - Location shall ensure proper coverage without obstruction.
- Fixing:
 - Base shall be fixed firmly on back box using screws.
 - Detector shall be mounted on base with proper locking arrangement.
- Wiring:
 - Proper electrical connections shall be made to detector terminals ensuring correct polarity.
 - Wiring shall be neatly dressed and properly insulated.
- Testing & Commissioning:
 - Detector shall be tested using smoke simulation to verify proper operation.
 - Check alarm signal transmission to fire alarm panel.
- Quality Checks:
 - Ensure compliance with IS 2189.
 - Verify LED indication and sensitivity.
 - Ensure no loose connections or faulty installation.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** of smoke detector installed, tested, and commissioned.
- include supply, installation, testing, commissioning, including detector, base, back box, wiring connections, fixing accessories, and all labour required for complete installation.

ITEM NO – 307

Heat detector :Supplying, erecting testing and commissioning heat detector with combination "ROR and Fixed Temp." complete.

1. Materials

1. Heat Detector:
 - Combination type heat detector with both Rate of Rise (ROR) and Fixed Temperature sensing.
 - Designed to activate alarm when:
 - Rapid rise in temperature occurs (ROR), or
 - Pre-set fixed temperature is reached (typically 57°C / 68°C as per design).
 - Suitable for conventional fire alarm system.
 - Conforming to IS 2189 and relevant international standards (EN 54 / UL listed).
2. Detector Base / Back Box:
 - Compatible mounting base made of fire-resistant plastic or metal.
 - Designed for easy installation and maintenance.
3. Sensing Element:

- Thermal sensing mechanism (bi-metal / thermistor based) for accurate temperature detection.
- LED indicator for alarm condition.
- 4. Wiring & Terminals:
 - Terminals for loop wiring with proper polarity and secure connections.
- 5. Accessories:
 - Screws, rawl plugs, connectors, and fixing materials.
 Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.

2. Workmanship

- Installation:
 - Detector shall be installed on ceiling at locations shown in approved drawings.
 - Placement shall ensure proper heat detection coverage.
- Fixing:
 - Base shall be securely fixed to back box using screws.
 - Detector head shall be properly mounted with locking mechanism.
- Wiring:
 - Electrical connections shall be made as per system wiring diagram ensuring proper polarity.
 - Wiring shall be neatly arranged and properly insulated.
- Testing & Commissioning:
 - Detector shall be tested using heat source/simulator to verify both ROR and fixed temperature operation.
 - Ensure proper signal transmission to fire alarm control panel.
- Quality Checks:
 - Verify compliance with IS 2189.
 - Check LED indication and response time.
 - Ensure no loose connections or improper fixing.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** of heat detector installed, tested, and commissioned.
- include supply, installation, testing, commissioning, including detector, base, back box, wiring connections, fixing accessories, and all labour required for complete installation.

ITEM NO – 308

Response indicator : Supplying, installing, testing and commissioning remote response indicators suitable to operate on 5- 28 V dc supply having FR Polymer ABS Housing complete.

1. Materials

1. Response Indicator Unit:
 - Remote response indicator suitable for use with fire detection system (smoke/heat detectors).
 - Operating voltage: 5–28 V DC.
 - Provided with high visibility LED indication for remote alarm status.
2. Housing:

- Made of FR (Flame Retardant) Polymer / ABS material.
- Durable, heat-resistant, and suitable for indoor installation.
- 3. Electrical Components:
 - Internal circuitry compatible with conventional fire alarm system.
 - Suitable terminals for wiring connections.
- 4. Accessories:
 - Mounting screws, rawl plugs, connectors, and fixing materials.
 Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.

2. Workmanship

- Installation:
 - Response indicator shall be installed at visible locations such as outside rooms, false ceiling areas, or corridors.
 - Position shall correspond to the detector it represents.
- Fixing:
 - Unit shall be firmly fixed on wall/ceiling using appropriate fasteners.
 - Ensure proper alignment and visibility.
- Wiring:
 - Electrical connections shall be made from detector loop to indicator terminals.
 - Ensure correct polarity and secure connections.
- Testing & Commissioning:
 - Indicator shall be tested by activating the corresponding detector.
 - Ensure LED glows when detector is in alarm condition.
- Quality Checks:
 - Verify proper operation and visibility of LED.
 - Ensure no loose wiring or faulty connections.
 - Confirm compatibility with fire alarm system.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** of response indicator installed, tested, and commissioned.
- include supply, installation, testing, commissioning, including indicator unit, wiring connections, fixing accessories, and all labour required for complete installation.

ITEM NO – 309

Fire suppression system for kitchen :Supplying, installing, testing and commissioning of automatic wet chemical kitchen fire suppression system complete as per specifications.

1. Materials

1. Suppression System:
 - Automatic wet chemical fire suppression system specially designed for commercial kitchen protection (hood, duct, and appliances).
 - System shall be pre-engineered and compliant with relevant fire safety standards (UL listed / LPCB approved / equivalent).
2. Agent Cylinder:
 - Steel cylinder charged with wet chemical extinguishing agent suitable for Class K (cooking oil/grease) fires.

- Complete with valve assembly, pressure gauge, and discharge mechanism.
- 3. Discharge Nozzles:
 - Specially designed spray nozzles for hood, duct, and cooking appliances.
 - Provided with protective caps to prevent grease clogging.
- 4. Piping Network:
 - MS/SS piping network connecting cylinder to nozzles, designed for required pressure and flow.
 - Structural Steel : Shall conform M22 page no-14 in General Technical Specification Booklet.
- 5. Detection System:
 - Linear heat detection cable / fusible link mechanism for automatic activation.
 - Suitable for high-temperature kitchen environment.
- 6. Control Mechanism:
 - Mechanical or electrical control panel for automatic and manual actuation.
 - Manual pull station for emergency activation.
- 7. Shut-off System:
 - Provision for automatic shut-off of gas/electric supply to kitchen appliances upon activation.
- 8. Alarm System:
 - Audio/visual alarm to indicate system activation.
- 9. Accessories:
 - Brackets, clamps, fasteners, fittings, valves, pressure switches, and other components.
 - Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.
- 10. Painting / Coating:
 - MS components painted with anti-corrosive primer and finish coat.
 - Paints : Shall conform M44 page no-21 in General Technical Specification Booklet.

2. Workmanship

- Installation:
 - System shall be installed covering kitchen hood, duct, and all cooking appliances as per approved design.
 - Nozzles shall be positioned to ensure complete coverage of hazard areas.
- Fixing & Alignment:
 - Piping shall be properly routed, supported, and clamped.
 - Cylinder shall be securely mounted in accessible location.
- Detection System Installation:
 - Heat detection cable / fusible links shall be installed along hood and duct area.
- Integration:
 - System shall be integrated with gas shut-off valve and electrical interlock system.
- Testing & Commissioning:
 - Functional testing of detection, actuation, and discharge system.
 - Check proper operation of alarms and shut-off mechanisms.
 - Simulated test for system activation.
- Quality Checks:
 - Verify compliance with approved standards and manufacturer specifications.
 - Ensure proper nozzle alignment and coverage.
 - Check for leak-proof piping and secure fixing.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** installed, tested, and commissioned.
- include design, supply, installation, testing, commissioning, including cylinder, piping, nozzles, detection system, control panel, shut-off system, alarms, and all accessories required for complete functioning system.

ITEM NO – 310

Supplying, installing, testing and commissioning of CO₂ tube-based automatic fire suppression system for electrical panels complete as per specifications.

1. Materials

1. Suppression System:
 - Automatic CO₂ tube-based fire suppression system designed for protection of electrical panels and enclosures.
 - System shall be self-activating type using heat-sensitive detection tube.
 - Suitable for Class B & C fires, especially electrical hazards.
 - Conforming to relevant UL / CE / ISO standards.
2. CO₂ Cylinder:
 - Seamless steel cylinder filled with carbon dioxide gas under pressure.
 - Complete with valve, pressure gauge, and discharge assembly.
3. Detection Tube:
 - Special linear heat-sensitive polymer tube which ruptures at predetermined temperature to release extinguishing agent directly at fire source.
4. Discharge Nozzles (if applicable):
 - Brass/SS nozzles for uniform discharge (in indirect systems).
5. Piping & Fittings (if applicable):
 - MS/SS piping for connection between cylinder and protected area.
Structural Steel : Shall conform M22 page no-14 in General Technical Specification Booklet.
6. Mounting Accessories:
 - Clamps, brackets, and supports for fixing cylinder and routing detection tube.
Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.
7. Control & Alarm (Optional):
 - Micro switch or pressure switch for alarm signal to fire alarm panel (if specified).
8. Painting / Coating:
 - Cylinder and MS components shall be painted with anti-corrosive coating.
Paints : Shall conform M44 page no-21 in General Technical Specification Booklet.

2. Workmanship

- Installation:
 - System shall be installed inside or near electrical panels as per approved layout.
 - Detection tube shall be routed covering critical components inside panel.
- Fixing:
 - Cylinder shall be securely mounted using clamps/brackets.
 - Detection tube shall be properly clipped and protected from mechanical damage.
- System Arrangement:

- Direct release system: tube ruptures and releases CO₂ directly at fire location.
- Indirect system: tube activates valve to discharge through nozzles.
- Testing & Commissioning:
 - Functional testing of detection and actuation mechanism.
 - Check pressure of CO₂ cylinder and ensure no leakage.
 - Simulate activation (without discharge) to verify system readiness.
- Quality Checks:
 - Verify certification and compliance with standards.
 - Ensure proper routing of detection tube and coverage.
 - Check secure fixing and accessibility for maintenance.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** installed, tested, and commissioned.
- include supply, installation, testing, commissioning, including cylinder, detection tube, piping (if any), nozzles, clamps, accessories, and all components required for complete system.

ITEM NO – 311

Supplying, installing, testing and commissioning of CO₂ bottle and SS 304 pipe and chemical sprinkler system based fire fighting for kitchen complete as per specifications.

1. Materials

1. Fire Suppression System:
 - Automatic CO₂ / chemical-based fire suppression system designed for kitchen areas including hood, duct, and cooking appliances.
 - System shall be pre-engineered and conform to relevant UL / LPCB / NFPA standards.
2. CO₂ Cylinder:
 - Seamless steel cylinder charged with CO₂ gas, complete with valve, dip tube, pressure gauge, and discharge mechanism.
 - Suitable capacity as per hazard area and design.
3. Chemical Agent (if combined system):
 - Approved wet chemical agent suitable for grease and cooking oil fires (Class K).
4. Piping Network:
 - SS 304 piping for distribution of extinguishing agent.
 - Corrosion-resistant and suitable for kitchen environment.
 - Pipes and fittings conforming to relevant IS standards.
5. Discharge Nozzles / Sprinklers:
 - Special chemical spray nozzles/sprinklers designed for kitchen protection.
 - Provided with protective caps to prevent grease accumulation.
6. Detection System:
 - Heat-sensitive detection system (fusible links / linear heat detection cable).
7. Control Panel / Actuation System:
 - Mechanical/electrical control system for automatic and manual activation.
 - Manual pull station for emergency use.
8. Gas Shut-Off System:
 - Automatic shut-off valve for LPG/PNG supply integrated with suppression system.
9. Alarm System:

- Audio-visual alarm for system activation indication.

10. Supports & Accessories:

- Clamps, brackets, hangers, fasteners, valves, fittings, and necessary installation accessories. Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.

11. Painting / Coating:

- MS components (if any) painted with anti-corrosive primer and finish coat. Paints : Shall conform M44 page no-21 in General Technical Specification Booklet.

2. Workmanship

- Installation:
 - System shall be installed to cover kitchen hood, duct, and all cooking appliances as per approved design and hazard analysis.
- Piping Work:
 - SS 304 pipes shall be properly routed, cut, threaded/welded, and supported with clamps.
 - Ensure leak-proof joints and proper alignment.
- Nozzle Placement:
 - Nozzles/sprinklers shall be positioned to ensure complete coverage of cooking area, plenum, and duct.
- Cylinder Mounting:
 - CO₂ cylinder shall be securely mounted at accessible location with proper brackets.
- Detection System Installation:
 - Heat detection system shall be installed along hood and duct areas.
- Integration:
 - System shall be integrated with gas shut-off valve and electrical interlocks.
- Testing & Commissioning:
 - Functional testing of detection, actuation, and discharge mechanism.
 - Check operation of alarms and gas shut-off system.
 - Ensure leak-proof piping and proper pressure conditions.
- Quality Checks:
 - Verify compliance with standards and approved make.
 - Ensure proper nozzle alignment and coverage.
 - Confirm system readiness for emergency operation.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** installed, tested, and commissioned.
- include design, supply, installation, testing, commissioning, including CO₂ cylinder, SS piping, nozzles/sprinklers, detection system, control panel, gas shut-off system, alarms, supports, and all accessories required for complete system.

ITEM NO – 331

Providing and fixing mosquito proof stainless steel overflow grating for tanks. (100 dia)

1. Materials

1. Overflow Grating:
 - Circular mosquito proof grating suitable for water tank overflow pipe.
 - Size: 100 mm diameter.
 - Made of Stainless Steel (SS 304), corrosion-resistant and durable.
 - Designed with fine perforations/mesh to prevent entry of mosquitoes, insects, and debris.
2. Frame / Ring:
 - SS 304 frame or collar for fixing grating to overflow pipe.
 - Properly finished with smooth edges.
3. Wire Mesh:
 - Fine stainless steel mesh of suitable aperture size (generally 1–2 mm) for effective mosquito proofing.
4. Fasteners & Fixing Accessories:
 - SS screws, clamps, or locking arrangement for secure fixing.Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.

2. Workmanship

- Fabrication:
 - Grating shall be fabricated with proper mesh fixing inside SS frame.
 - Edges shall be smooth and free from burrs or sharp projections.
- Installation:
 - Grating shall be fixed at overflow outlet of water tank (100 mm dia pipe).
 - Ensure tight fitting to prevent entry of insects.
- Fixing Method:
 - Fixed using clamps, screws, or press-fit arrangement as approved.
 - Ensure grating is removable for cleaning and maintenance.
- Alignment & Finishing:
 - Proper alignment with pipe opening.
 - Ensure no gap between pipe and grating.
- Quality Checks:
 - Verify SS 304 material quality and corrosion resistance.
 - Ensure mesh size is adequate for mosquito prevention.
 - Check firm fixing and durability.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** of overflow grating installed.
- include supply and fixing of SS grating, mesh, frame, fasteners, and all accessories required for complete installation.

ITEM NO – 332

Supplying, installing, testing & commissioning of 'HDPE' double layer water storage tank including holes for inlet, outlet, overflow, level indicator, drain & vent points, manhole cover, suitable steel supporting structure complete. 1000 ltr.

1. Materials

1. Water Storage Tank:
 - 1000 litres capacity HDPE (High Density Polyethylene) double layer tank.
 - Made from food-grade, UV stabilized polyethylene suitable for potable water storage.
 - Double layer construction (inner white/outer coloured) for durability and temperature resistance.
 - Conforming to IS 12701 (latest amendments).
2. Openings & Fittings:
 - Factory-made provisions for:
 - Inlet
 - Outlet
 - Overflow
 - Drain
 - Vent
 - Level indicator connection
 - Threaded inserts / sockets provided in tank body.
3. Manhole Cover:
 - Airtight HDPE lid/manhole cover with locking arrangement.
4. Supporting Structure:
 - Suitable steel supporting structure fabricated from MS sections to safely bear full tank load.
Structural Steel : Shall conform M22 page no-14 in General Technical Specification Booklet.
5. Fasteners & Accessories:
 - Nuts, bolts, washers, anchor fasteners, and clamps for fixing tank and support.
Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.
6. Painting / Coating:
 - Steel structure painted with anti-corrosive primer and finish paint.
Paints : Shall conform M44 page no-21 in General Technical Specification Booklet.

2. Workmanship

- Installation:
 - Tank shall be installed on firm, level, and properly designed supporting structure.
 - Ensure proper orientation and accessibility for maintenance.
- Supporting Structure:
 - Structure shall be fabricated, erected, and aligned properly.
 - Designed to safely carry full tank load (water + tank weight).
- Connection:
 - Inlet, outlet, overflow, drain, and vent connections shall be made with proper fittings ensuring leak-proof joints.
- Fixing:
 - Tank shall be securely placed and fixed to avoid movement due to wind or vibration.
- Testing & Commissioning:
 - Tank shall be filled with water to check for leakage or deformation.
 - Verify proper functioning of all inlet/outlet connections.
- Quality Checks:

- Ensure IS 12701 compliance and manufacturer certification.
- Check for uniform thickness, no cracks, or defects.
- Confirm stability of supporting structure.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** of tank installed, tested, and commissioned.
- include supply, installation, testing, commissioning, including tank, manhole cover, fittings provision, supporting steel structure, painting, fasteners, and all accessories required for complete installation.

ITEM NO – 333

Supply, installation, testing and commissioning of digital water meter suitable for cold water application, of electromagnetic / ultrasonic / mechanical type with digital display, conforming to IS 779 / ISO 4064 or latest relevant standards, including supply and fixing of all necessary fittings, complete testing, calibration, sealing and commissioning, capable of measuring and displaying cumulative water consumption, complete as per specifications and directions of Engineer-in-Charge. 25mm dia.

1. Materials

1. Water Meter:
 - Digital water meter suitable for cold water application, 25 mm dia.
 - Type: Electromagnetic / Ultrasonic / Mechanical (with digital display) as specified.
 - Capable of measuring and displaying cumulative water consumption.
 - Conforming to IS 779 / ISO 4064 or latest relevant standards.
2. Body & Construction:
 - Meter body made of brass / cast iron / engineering plastic as per approved make.
 - Corrosion-resistant and suitable for potable water use.
3. Display Unit:
 - Digital LCD/LED display showing flow and cumulative reading.
 - Weatherproof and tamper-resistant housing.
4. Internal Mechanism:
 - Measuring mechanism (magnetic/ultrasonic/mechanical) with high accuracy and low pressure loss.
5. Connections & Fittings:
 - Threaded / flanged end connections suitable for 25 mm dia pipeline.
 - Includes unions, nipples, gaskets, reducers (if required).
6. Accessories:
 - Strainer (if required), non-return valve (optional), sealing arrangement, and meter box (if specified).

Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.

2. Workmanship

- Installation:
 - Meter shall be installed in pipeline at designated location as per drawing and direction of Engineer-in-Charge.
 - Installed in horizontal/vertical position as per manufacturer recommendation.

- Alignment & Fixing:
 - Ensure proper alignment with pipeline to avoid stress on meter body.
 - Provide adequate support to prevent vibration.
- Jointing:
 - Connections shall be made using proper fittings, gaskets, and sealing materials ensuring leak-proof joints.
- Calibration & Sealing:
 - Meter shall be factory calibrated and site verified.
 - Proper sealing shall be done to prevent tampering.
- Testing & Commissioning:
 - Check meter operation by passing water through system.
 - Verify display readings and accuracy.
 - Ensure no leakage at joints.
- Quality Checks:
 - Verify compliance with IS 779 / ISO 4064.
 - Ensure proper functioning of digital display.
 - Confirm smooth flow without obstruction.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** of water meter installed, tested, and commissioned.
- include supply, installation, testing, calibration, sealing, and commissioning, including meter, fittings, accessories, and all labour required for complete installation.

ITEM NO – 334

Supply, installation, testing and commissioning of digital water meter suitable for cold water application, of electromagnetic / ultrasonic / mechanical type with digital display, conforming to IS 779 / ISO 4064 or latest relevant standards, including supply and fixing of all necessary fittings, complete testing, calibration, sealing and commissioning, capable of measuring and displaying cumulative water consumption, complete as per specifications and directions of Engineer-in-Charge. 32mm dia.

- Relevant to item specification shall be followed **Item No - 333** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 335

Supply, installation, testing and commissioning of digital water meter suitable for cold water application, of electromagnetic / ultrasonic / mechanical type with digital display, conforming to IS 779 / ISO 4064 or latest relevant standards, including supply and fixing of all necessary fittings, complete testing, calibration, sealing and commissioning, capable of measuring and displaying cumulative water consumption, complete as per specifications and directions of Engineer-in-Charge. 40mm dia.

- Relevant to item specification shall be followed **Item No - 333** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.

- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 336

Supply, installation, testing and commissioning of digital water meter suitable for cold water application, of electromagnetic / ultrasonic / mechanical type with digital display, conforming to IS 779 / ISO 4064 or latest relevant standards, including supply and fixing of all necessary fittings, complete testing, calibration, sealing and commissioning, capable of measuring and displaying cumulative water consumption, complete as per specifications and directions of Engineer-in-Charge. 50mm dia.

- Relevant to item specification shall be followed **Item No - 333** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 357

Making connection to the ex.M.H.in running sewer incl. Dewatering and other required machinery etc. of following dia pipes at any convenient time. All damaged work shall be well repaired as per instructions. etc..complete.

For Sewer / Storm water Connection (Up to 900 mm diameter) in RCC Chamber.

1. Materials

1. Cement:
Cement : Shall Conform M3 page no-9 in General Technical Specification Booklet
2. Sand:
Sand : Shall Conform M6 page no-10 in General Technical Specification Booklet
3. Water:
Water : Shall conform M1 page no-9 in General Technical Specification Booklet
4. Cement Mortar:
Cement Mortar : Shall Conform M11 page no-11 in General Technical Specification Booklet
5. Bricks (for repair if required):
Bricks : Shall Conform M15 page no-12 in General Technical Specification Booklet
6. Concrete (if required):
 - Nominal mix cement concrete for making good damaged portion, benching, or bedding as required.
7. Machinery & Equipment:
 - Dewatering pumps, cutters, breakers, lifting tools, safety equipment, and other necessary machinery.

2. Workmanship

- Preliminary Work:
 - Locate and identify existing RCC manhole and confirm invert levels and pipe alignment.
 - Arrange traffic control, barricading, and safety measures before execution.
- Dewatering:
 - Carry out continuous dewatering of running sewer/manhole using suitable pumps to maintain dry working conditions throughout execution.

- Cutting & Opening in RCC Chamber:
 - Carefully cut/open the RCC wall of existing manhole to required size using mechanical tools.
 - Ensure no structural damage to chamber beyond required opening.
- Pipe Connection:
 - Insert incoming sewer/storm water pipe into chamber at correct invert level and alignment.
 - Maintain proper slope for smooth flow.
- Jointing & Sealing:
 - Seal the pipe entry point with cement mortar to achieve a watertight and leak-proof joint.
- Benching & Channeling:
 - Reform benching inside manhole with smooth finish to guide flow towards outlet.
 - Ensure no obstruction or turbulence in flow.
- Repair & Restoration:
 - All damaged portions of RCC chamber, plaster, benching, and surrounding area shall be repaired and restored to original condition or better as directed by Engineer-in-Charge.
- Cleaning:
 - Remove all debris, sludge, and construction waste from manhole and surrounding area after completion.
- Safety Measures:
 - Provide proper ventilation, gas detection, and confined space safety measures.
 - Workers shall use PPE (helmets, gloves, masks, harness, etc.).
- Testing:
 - Check flow through connection for smooth discharge.
 - Ensure no leakage at joints.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** for sewer/storm water pipeline connection up to 900 mm diameter in RCC manhole.
- include cutting of RCC, dewatering, pipe connection, jointing, benching, plastering, repairs, labour, machinery, tools, and all materials required for complete work.
- No separate payment shall be made for dewatering, temporary works, or minor materials

ITEM NO – 358

Providing and installing RO plant of capacity 10000LPH which includes

- (1) raw water transfer pump with motor, HP : 5.5 HP, size : 2000 LPH @ 3.0 KG/cm²**
- (2) sand medis filter manual multiport valve, size : 42"x72"**
- (3) activated carbon filter with manual multiport valve, size : 42"x72"**
- (4) Special antiscalant solution preparation tank with dosing pump, HP : 0.5 HP**
- (5) micron cartridge Filter with PP spun**
- (6) high pressure pump, HP : 20 HP**
- (7) RO membranes**
- (8) RO pressure tube side port**
- (9) RO skid**
- (10) high pressure pump pipe line**
- (11) CIP arrangement**

(12) Pre treatment piping

(13) RO control panel

Raw water storage tank and RO water storage tank to be constructed sepeartely, of required quantity. Electrical connection of 230 V preface , 50 HZ and inklet of panel to be provided by client.

1. Materials

1. Raw Water Transfer Pump:
 - Centrifugal pump with motor of 5.5 HP, suitable for approx. 2000 LPH @ 3.0 kg/cm².
 - Pump and motor shall conform to relevant IS standards.
2. Sand Media Filter:
 - FRP/MS pressure vessel of size 42" × 72" with manual multiport valve.
 - Filled with graded silica sand media.
3. Activated Carbon Filter:
 - FRP/MS vessel of size 42" × 72" with manual multiport valve.
 - Filled with activated carbon media for removal of chlorine, odour, and organic impurities.
4. Antiscalant Dosing System:
 - Chemical preparation tank with 0.5 HP dosing pump.
 - Suitable for controlled dosing of antiscalant solution.
5. Micron Cartridge Filter:
 - Housing with PP spun cartridges (5 micron or suitable rating).
6. High Pressure Pump:
 - Multistage pump with motor of 20 HP, suitable for RO operation pressure.
7. RO Membranes:
 - Thin film composite (TFC) membranes with high salt rejection efficiency.
8. RO Pressure Tubes:
 - FRP pressure vessels (side port type) suitable for membrane housing.
9. RO Skid:
 - MS skid frame with epoxy coating for mounting all RO components. Structural Steel : Shall conform M22 page no-14 in General Technical Specification Booklet.
10. High Pressure Piping:
 - SS / UPVC piping suitable for high pressure operation with valves and fittings.
11. CIP (Cleaning in Place) System:
 - CIP tank, pump, and piping arrangement for membrane cleaning.
12. Pre-treatment Piping:
 - Interconnecting piping between all pre-treatment units and RO system.
13. RO Control Panel:
 - Electrical control panel with protection system, indicators, switches, and automation features.
14. Valves & Instruments:
 - Pressure gauges, flow meters, control valves, sampling valves, and other instruments.

15. Fasteners & Accessories:

- Nuts, bolts, clamps, supports, and fittings.
Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet.

16. Painting / Coating:

- MS parts painted with anti-corrosive primer and finish paint.
Paints : Shall conform M44 page no-21 in General Technical Specification Booklet.

2. Workmanship

- Installation:
 - Complete RO plant shall be installed on prepared foundation with proper alignment.
 - All components shall be mounted on skid and interconnected as per approved layout.
- Piping Work:
 - Proper routing and fixing of pre-treatment and high-pressure piping.
 - Ensure leak-proof joints and proper support system.
- Electrical Work:
 - Internal wiring between panel and equipment shall be carried out by contractor.
 - External power supply (230V, 3 Phase, 50 Hz) shall be provided by client.
- System Integration:
 - Integration of pumps, filters, membranes, dosing system, and control panel.
- Testing & Commissioning:
 - Hydro testing of pipelines.
 - Trial run of complete system.
 - Check flow rate, pressure, and water quality parameters (TDS reduction).
- Performance Testing:
 - Ensure system achieves 10000 LPH output capacity with desired rejection rate.
- Cleaning & Flushing:
 - System shall be flushed before commissioning.
- Quality Checks:
 - Verify all components as per specifications.
 - Ensure proper functioning of control panel and automation.
 - Check vibration, noise, and leakages.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** (Per Complete RO Plant System) installed, tested, and commissioned.
- include design, supply, installation, testing, commissioning, including all components such as pumps, filters, membranes, piping, skid, control panel, instruments, valves, and accessories required for complete functioning system.
- Raw water tank and treated water tank are excluded and shall be measured and paid separately.

ITEM NO – 359

BOREWELL : Borewell of 400 mm diameter bore & sinking up to 300 mtr depth, Charges for electro logging for tube well, Charges for mud cutting & disposal by Tanker day to day from the site

without staking at site, Charges for Cement sealing work if required, Providing, Laying. Testing & Commissioning of 200 mm dia NB MS ERW pipes having minimum 5mm thickness with square face & chaplas confirming to IS-4270 Size: 150mm dia, 150mm Johnson filtration make continuous slotted strainer pipe having minimum tensile strength 18mt collapsible strength: 3 KG/sq. cm in slot opening of 1mm slot opening, 150mm Johnson filtration make continuous slotted strainer pipe having minimum tensile strength 18mt collapsible strength : 3 KG/ sq. cm. in slot opening of 1.5mm slot opening, Cost of bail plug 150 mm dia x 5 mm minimum wall thickness x 5 mt. length with welded cone at the bottom with 55 mm length x 1.5 mm width 2900 NO'S'S Slot in 3 mt. length of bail plug at the bottom, 150 mm dia. Well cap as per requirement, Supplying, washing and shrouding with approved gravel, the annular gap between the casing pipe and the remaining annular space to be filled in with puddle clay (for which NO'S measurement will be taken and paid for),Washing and developing the tube well with the air compressor and furnishing yield test by continuous pumping with air compressor for minimum 4 hours till the availability of sand free clear water or as specified, Including cost of fuel and necessary equipment, Supplying, installing and connecting on site suitable approved make flat type cable for above submersible pump with P.V.C. clamps at every 1.5 m. distance etc. complete as per approved sample and as directed. Providing of 50mm dia UPVC heavy quality column pipe, as per IS 12818-2000 with all fittings, coupler & wire lock Supply of following size of TOP & BOTTOM accessories i.e. adaptor set (CI) long, pump guard set, starter pipe rubber ring for submersible pump & UPVC column pipe as directed by Engineer - in – charge with necessary plumbing as required, Providing & fixing of sluice valve as per tender specification. All product Make approved as per tender and EIC selection. Providing, & fixing Bore well submersible pump-motor set for bore of 100mm dia having suitablefor 10HP , 3 Phase, 415 V, 50 Hz. motor having following discharge capacity. The pump shall be operatedat 2900 RPM. The scope shall also include all required accessories viz. strainer, foot valve, level guard,delivery pressure guage, Standard double length flat submersible cable, float with control cable etc. asper specifications and data sheet Capacity: 120 to 125 LPM Head : 155 to 120m.

1. Materials

1. Borewell Drilling:
 - Drilling of 400 mm dia borewell up to 300 m depth using suitable rotary drilling rig.
2. Electro Logging:
 - Conducting electro logging test to identify aquifer zones and water-bearing strata.
3. Casing Pipe:
 - MS ERW casing pipes (200 mm NB, min. 5 mm thickness) with square face and chamfered ends.
 - Conforming to IS 4270.
4. Strainer Pipe:
 - Johnson make continuous slotted SS strainer pipes (150 mm dia) with:
 - Slot size: 1.0 mm and 1.5 mm
 - Minimum tensile strength: 18 MT
 - Collapse strength: 3 kg/cm²
5. Bail Plug:
 - 150 mm dia MS bail plug, 5 mm thick, approx. 5 m length with bottom cone.
 - Slotted portion (approx. 3 m length) for filtration.
6. Well Cap:
 - 150 mm dia well cap fabricated from MS, properly sealed.
7. Gravel Packing:
 - Supplying and placing graded gravel around strainer zone for filtration.
8. Puddle Clay:

- Filling annular space above gravel with puddle clay for sealing contamination.
- 9. Cement (for sealing if required):
Cement : Shall Conform M3 page no-9 in General Technical Specification Booklet
- 10. Water:
Water : Shall conform M1 page no-9 in General Technical Specification Booklet
- 11. UPVC Column Pipe:
 - 50 mm dia heavy quality UPVC column pipe conforming to IS 12818:2000 with couplers and locking system.
- 12. Submersible Pump Set:
 - Borewell submersible pump-motor set:
 - 10 HP, 3 Phase, 415 V, 50 Hz
 - Speed: ~2900 RPM
 - Discharge: 120–125 LPM
 - Head: 120–155 m
- 13. Pump Accessories:
 - Strainer, foot valve, level guard, delivery pressure gauge, float switch, starter, etc.
- 14. Cable:
 - Flat submersible cable with proper insulation.
 - Fixed with PVC clamps at every 1.5 m interval.
- 15. Top & Bottom Accessories:
 - CI adaptor set, pump guard, starter pipe rubber ring, etc.
- 16. Sluice Valve:
 - Suitable size sluice valve for delivery line.
- 17. Fasteners & Accessories:
Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet

2. Workmanship

- Drilling Operations:
 - Borewell drilling shall be carried out using appropriate drilling rig up to required depth.
 - Maintain vertical alignment and uniform diameter.
- Mud Disposal:
 - Drilling slurry/mud shall be removed and disposed daily through tanker without stacking at site.
- Electro Logging:
 - Conduct logging to determine exact depth for strainer placement.
- Casing & Strainer Installation:

- Lower casing pipes and strainers carefully to required depth.
 - Ensure proper alignment and jointing.
- Gravel Packing:
 - Place graded gravel around strainer zone uniformly.
- Sealing:
 - Fill upper annular space with puddle clay and cement sealing (if required).
- Development of Borewell:
 - Develop well using air compressor until clear and sand-free water is obtained.
- Yield Testing:
 - Conduct continuous pumping test for minimum 4 hours to determine discharge capacity.
- Pump Installation:
 - Install submersible pump with column pipe and cable.
 - Ensure proper alignment and secure fixing.
- Electrical Work:
 - Proper connection of cable, starter, float switch, and control system.
- Testing & Commissioning:
 - Test pump discharge, head, and electrical performance.
 - Ensure smooth and vibration-free operation.
- Quality Checks:
 - Verify pipe quality, slot size, gravel packing, and sealing.
 - Ensure sand-free water and required yield.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **running meter (Rmt)** of depth.
- include drilling, electro logging, mud disposal, casing, strainers, gravel packing, sealing, development, testing, pump installation, piping, cable, accessories, and all labour & machinery required for complete system.

ITEM NO – 370

Water Tank : Providing erecting and fixing Seven layer ISI water tank of required capacity each with all necessary fittings and connection etc. complete on terrace.

1. Materials

1. Water Storage Tank:
 - Seven layer rotational moulded polyethylene (HDPE) water tank of required capacity.
 - Multi-layer construction (inner food-grade layer, intermediate strengthening layers, UV-stabilized outer layer).
 - Suitable for potable water storage.
 - Conforming to IS 12701 (latest amendments) and ISI marked.
2. Tank Lid / Manhole Cover:
 - Tight-fitting HDPE lid with locking arrangement to prevent contamination.
3. Fittings & Connections:
 - Provision for inlet, outlet, overflow, drain, and vent connections.
 - Threaded brass / plastic inserts molded in tank body.
4. Base / Seating:

- RCC platform or firm level base for tank placement (provided separately or as specified).
- 5. Connecting Accessories:
 - Nipples, sockets, unions, valves, PTFE tape, and other plumbing accessories.
- 6. Fasteners:

Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet

2. Workmanship

- Preparation:
 - Ensure terrace surface is level, firm, and capable of bearing full load of tank (water + tank weight).
- Installation:
 - Tank shall be placed on prepared base without tilting.
 - Proper spacing shall be maintained for maintenance access.
- Fixing & Stability:
 - Tank shall be properly aligned and secured if required to prevent movement due to wind or vibration.
- Connections:
 - All inlet, outlet, overflow, drain, and vent connections shall be made with proper fittings ensuring leak-proof joints.
- Overflow Arrangement:
 - Overflow pipe shall be directed to suitable drainage point with mosquito-proof grating if required.
- Testing:
 - Tank shall be filled with water to check for leakage, deformation, or instability.
- Cleaning:
 - Tank shall be cleaned before commissioning for potable water use.
- Quality Checks:
 - Verify ISI marking and IS 12701 compliance.
 - Ensure no cracks, defects, or deformation.
 - Confirm proper fitting and functioning of all connections.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** based on capacity of tank installed.
- include supply, erection, fixing, and connection of water tank with all fittings and accessories required for complete installation. Supporting platform (if not specified) shall be measured and paid separately.

ITEM NO – 371

Tre-mix : Box cutting the road 300mm surface to proper slope and camber for making a base with Providing, laying, spreading and compacting Sand filling 100 mm thick including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tones to proper grade and camber, watering and compacting to the required density. below 150mm thick 1:2:4 (1- Cement : 2- Coarse sand : 4- graded stone aggregates 20 mm nominal size)cement concrete and 200 MM Thick Ready Mixed M-350 grade concrete for reinforced cement concrete work , using cement content as per approved Design Mix manufactured in fully automatic batching plant and transported to site of work in transit mixer for a lead up to 10 kms having continuous agitated

mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, including the cost of centering shuttering finishing and cost of admixtures in recommended proportions as per IS: 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability with Concrete Road joint Cutting Groove & Joint Filling with chemical and adding Concrete Road Curing Compound @ 0.33 lit/smt as per direction of the Engineer - in - charge. Without Fly Ash including (10 Dia 200c/c) FE 500D reinforcement with bending, binding and placing in position complete.

1. Materials

1. Cement:
Cement : Shall Conform M3 page no-9 in General Technical Specification Booklet
2. Sand (Coarse Sand):
Sand : Shall Conform M6 page no-10 in General Technical Specification Booklet
3. Stone Aggregate:
Stone Grit : Shall Conform M8 page no-10 in General Technical Specification Booklet
4. Water:
Water : Shall conform M1 page no-9 in General Technical Specification Booklet
5. Cement Concrete (PCC 1:2:4):
Cement Mortar : Shall Conform M11 page no-11 in General Technical Specification Booklet
6. Ready Mixed Concrete (RMC):
 - M-350 Grade Concrete, design mix manufactured in automatic batching plant.
 - Without fly ash.
 - Conforming to IS 456, IS 4926.
7. Reinforcement Steel:
 - Fe 500D TMT bars (10 mm dia @ 200 mm c/c).
 - High yield strength steel deformed bars : Shall conform M19 page no-13 in General Technical Specification Booklet
8. Admixtures:
 - Chemical admixtures to improve workability and durability.
 - Conforming to IS 9103.
9. Curing Compound:
 - Liquid curing compound applied @ 0.33 lit/sqm.
10. Joint Filling Compound:
 - Approved sealant/chemical compound for groove filling of joints.
11. Shuttering Material:
 - Steel/wood formwork for side shuttering. Shuttering : Shall conform M26 page no-14 in General Technical Specification Booklet

2. Workmanship

A. Road Cutting & Preparation

- Carry out box cutting up to 300 mm depth to required line, level, slope, and camber.
- Remove excavated material and dispose as directed.
- Subgrade shall be dressed, leveled, and compacted properly.

B. Sand Filling Layer

- Provide 100 mm thick sand filling layer.
- Spread uniformly and compact using 8–10 ton vibratory roller.
- Watering shall be done to achieve required density.

C. Plain Cement Concrete (PCC)

- Lay PCC 1:2:4 mix (below 150 mm thick or as specified).
- Proper compaction, leveling, and finishing to required grade and camber.

D. Reinforcement Work

- Provide 10 mm dia Fe 500D bars @ 200 mm c/c.
- Bars shall be properly cut, bent, placed, and tied with binding wire.
- Maintain proper cover and alignment.

E. RMC Concrete (M-350)

- Lay 200 mm thick RMC M-350 grade concrete using transit mixer.
- Concrete shall be pumped and placed continuously without cold joints.
- Compaction by mechanical vibrators.

F. Tremix Finishing

- Surface finished using Tremix (vacuum dewatering system) to achieve:
 - High surface strength
 - Smooth and level finish
 - Proper camber

G. Joint Formation

- Provide construction joints / expansion joints as per design.
- Cut grooves using mechanical cutter at specified intervals.
- Fill joints with approved sealant/chemical compound.

H. Curing

- Apply curing compound @ 0.33 lit/sqm immediately after finishing.
- Ensure proper curing to prevent cracking.

I. Quality Control

- Check slump, cube strength, and thickness.
- Ensure proper alignment, levels, and surface finish.
- Ensure no honeycombing or surface defects.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Square Meter (Sqm)** basis for finished road surface.
- include box cutting, sand filling, PCC, reinforcement, RMC, pumping, laying, vibrating, tremix finishing, joint cutting, joint filling, curing compound, shuttering,

labour, machinery, and all materials required for complete work. No separate payment for admixtures, curing compound, or minor consumables

ITEM NO – 372

Providing and fixing PUF Insulated continuous sandwich panels for roofs of total thickness not less than 30 mm made out from continue line method. Panel shall have 0.5 mm thick pre coated GI sheet on both side of Polyurethane foam with external face being corrugated in shape for GI and PU foam both material. The crest height of the panel shall be of 35mm minimum wiht 250mm c/c pitch. The Precoated sheet shall be of minimum 240 mpa steel grade confirming to IS 14246:1995 and shall have zinc coating of 120 gsm as per IS:277 , 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15-18 micron. The PPGI Sheet shall have protective guard film of minimum 25 microns to avoid scratches wihile trasportation. The roof panels are laid over a frame work of trusses, columns and purlins fixed using 90mm self drilling bolt with rubber washer including all types of flashings. PU Foam must be self-extinguishing, fire retardant type having minimum density of 40 Kg/Cu.mt.(+,- 2 Kgs) including 0.25mm craft paper edging, self tapping screws of required length and nos.etc complete as per structural design and direction of Engineer-in-charge.

1. Materials

1. PUF Sandwich Panels:
 - Factory manufactured continuous line PUF insulated sandwich panels of minimum 30 mm thickness.
 - Panel composition:
 - Outer and inner faces: 0.5 mm thick pre-coated GI (PPGI) sheets.
 - Core: Polyurethane Foam (PUF) insulation.
 - External face shall be corrugated profile with:
 - Minimum 35 mm crest height
 - 250 mm c/c pitch
2. PPGI Sheets:
 - Minimum 240 MPa steel grade conforming to IS 14246:1995.
 - Zinc coating: 120 GSM as per IS 277.
 - Coating system:
 - 5–7 micron epoxy primer (both sides)
 - 15–18 micron polyester top coat
 - Provided with minimum 25 micron protective guard film.
3. PUF Insulation Core:
 - Self-extinguishing, fire-retardant polyurethane foam.
 - Minimum density: 40 kg/m³ (± 2 kg/m³).
4. Edge Treatment:
 - 0.25 mm kraft paper edging for proper bonding and sealing.
5. Fasteners:
 - Self-drilling / self-tapping screws (approx. 90 mm length) with EPDM/rubber washers.
 - Reference:* Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet
6. Flashing & Accessories:
 - Ridge flashing, corner flashing, end trims, gutters, and closures made from matching PPGI sheets.
7. Supporting Structure:

- Panels shall be fixed over steel trusses, purlins, and columns (provided separately).

2. Workmanship

- Preparation:
 - Ensure supporting structure (purlins/trusses) is aligned, level, and ready for panel fixing.
- Handling & Storage:
 - Panels shall be handled carefully to avoid damage to coating or edges.
 - Protective film shall be removed only after installation.
- Laying of Panels:
 - Panels shall be laid in proper alignment with required slope for drainage.
 - Side laps and end laps shall be properly interlocked.
- Fixing:
 - Fix panels to purlins using self-drilling screws with rubber washers to ensure watertight joints.
 - Fasteners shall be placed at specified spacing and locations.
- Sealing:
 - All joints, laps, and penetrations shall be properly sealed to prevent leakage.
- Flashings:
 - Provide and fix ridge, edge, and corner flashings neatly to ensure weatherproofing.
- Finishing:
 - Ensure smooth, uniform appearance without dents or scratches.
- Quality Checks:
 - Verify panel thickness, coating thickness, and density of PUF.
 - Ensure proper alignment, slope, and leak-proof installation.
 - Check fastener tightness and sealing quality.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Square Meter (Sqm)** basis of finished roof surface area covered with panels.
- include supply, transportation, handling, laying, fixing, fasteners, flashings, sealing, labour, and all accessories required for complete roofing system.
- Supporting steel structure (truss/purlin) shall be measured and paid separately unless specified. No separate payment for minor consumables or wastage

ITEM NO – 375

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

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

1. Materials

1. Precast Kerbstone:
 - Precast half battered (K-HB) concrete kerbstone of size 600 × 450 × 150 mm.
 - Manufactured using vacuumed wet press technology for high density and durability.

- Made of grey cement-based concrete with precision finish and uniform texture.
 - Minimum average bending strength: 2.5 MPa at 28 days.
 - Shape, profile, and finish as per approved drawings and Architect/EIC instructions.
2. Cement:

Cement : Shall Conform M3 page no-9 in General Technical Specification Booklet
 3. Sand (Fine Sand):

Sand : Shall Conform M6 page no-10 in General Technical Specification Booklet
 4. Cement Mortar:

Cement Mortar : Shall Conform M11 page no-11 in General Technical Specification Booklet
 5. Water:

Water : Shall conform M1 page no-9 in General Technical Specification Booklet
 6. Foundation Material (if required):
 - Lean concrete / sand bedding for proper seating of kerbstone.

2. Workmanship

- Excavation:
 - Carry out excavation to required width and depth for kerb foundation.
 - Dressing and leveling of base to proper line and level.
- Base Preparation:
 - Provide sand bed or lean concrete base as required.
 - Ensure firm and level surface for placing kerbstones.
- Laying of Kerbstone:
 - Place kerbstones in proper line, level, alignment, and gradient as per drawings.
 - Ensure tight jointing between adjacent kerbs.
- Jointing:
 - Fill joints with cement mortar 1:3 (cement : fine sand).
 - Finish joints neatly and remove excess mortar.
- Alignment & Finishing:
 - Maintain uniform spacing, straightness, and curvature as per design.
 - Top surface shall be even and properly aligned.
- Haunching (if required):
 - Provide backing/haunching with concrete or mortar to hold kerbstone firmly in position.
- Curing:
 - Cure joints and bedding adequately to achieve strength.
- Quality Checks:
 - Verify dimensions, strength, and finish of kerbstones.
 - Ensure proper alignment and stability.
 - Check for cracks, chips, or defects.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Running Meter (Rmt)** basis of kerbstone laid in position.
- include supply of kerbstone, excavation, base preparation, laying, jointing, curing, labour, and all materials required for complete work. No separate payment for mortar, excavation, or minor consumables

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

- Relevant to item specification shall be followed **Item No - 375** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 377

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

1. Materials

1. Precast Drain Channel:
 - Factory-made U-shape drain channel of internal size 300 × 300 mm.
 - Made from High Performance Self Compacting Concrete (SCC) of minimum M-50 grade.
 - Smooth internal finish for efficient flow.
 - Adequate wall thickness for structural strength.
2. Concrete (SCC M-50):
 - Design mix concrete conforming to IS 456 and IS 10262.
 - Self-compacting type ensuring high density and durability.
3. Reinforcement Steel (if provided):
 - TMT bars as per design requirements.
 - High yield strength steel deformed bars : Shall conform M19 page no-13 in General Technical Specification Booklet
4. Cover / Lid:
 - Heavy duty precast concrete cover of same M-50 grade SCC.
 - Designed to withstand minimum load capacity of 200 kN.
 - Provided with perforations / hole pattern as per Architect's design.
5. Cement:
Cement : Shall Conform M3 page no-9 in General Technical Specification Booklet
6. Sand:
Sand : Shall Conform M6 page no-10 in General Technical Specification Booklet
7. Stone Aggregate:
Stone Grit : Shall Conform M8 page no-10 in General Technical Specification Booklet
8. Water:
Water : Shall conform M1 page no-9 in General Technical Specification Booklet
9. Cement Mortar for Jointing:
Cement Mortar : Shall Conform M11 page no-11 in General Technical Specification Booklet

10. Fasteners / Accessories (if any):

Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet

2. Workmanship

- Excavation & Preparation:
 - Excavate trench to required width and depth.
 - Prepare subgrade and ensure proper compaction.
- Base Preparation:
 - Provide PCC bedding (if required) to achieve proper level and support.
- Laying of Drain Channel:
 - Place precast U-drain units in correct line, level, and gradient.
 - Ensure proper alignment and continuous flow slope.
- Jointing:
 - Joints between precast units shall be sealed with cement mortar or approved sealant to ensure watertightness.
- Installation of Cover:
 - Place heavy-duty covers properly over channel ensuring firm seating.
 - Covers shall be removable for maintenance.
- Load Performance:
 - Drain system shall be capable of withstanding minimum 200 kN load as specified.
- Finishing:
 - Ensure smooth internal surface for free flow of water.
 - Top level shall match surrounding finished surface (road/pavement).
- Curing:
 - Proper curing of joints and bedding.
- Quality Checks:
 - Verify concrete grade (M-50), dimensions, and finish.
 - Check alignment, slope, and joint sealing.
 - Ensure no cracks, honeycombing, or defects.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Running Meter (Rmt)**
- include supply, excavation, bedding, laying, jointing, covers, labour, materials, and all accessories required for complete drain system. No separate payment for minor items like mortar, sealants, or consumables.

ITEM NO – 379

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

1. Materials

1. Paver Blocks:
 - Precast interlocking concrete paver blocks, 60 mm thick.
 - Manufactured using rubber mould / steel mould (dye) with machine pressing (vibrated / pneumatic compression).

- Concrete grade: M-300 (minimum).
- Shape, size, colour, and pattern as per approved design and Architect/EIC selection.
- Conforming to IS 15658:2006.
- 2. Cement:
 - Cement : Shall Conform M3 page no-9 in General Technical Specification Booklet
- 3. Sand (for Bedding & Joint Filling):
 - Sand : Shall Conform M6 page no-10 in General Technical Specification Booklet
- 4. Water:
 - Water : Shall conform M1 page no-9 in General Technical Specification Booklet
- 5. Bedding Layer:
 - 35 mm thick sand layer for leveling and cushioning.
- 6. Edge Restraints (if applicable):
 - Kerbs / concrete edging to hold paver blocks in position (provided separately if specified).

2. Workmanship

- Subgrade Preparation:
 - Prepare subgrade to required level, slope, and camber.
 - Compact thoroughly to achieve required density.
- Base Preparation:
 - Provide suitable base layer (WMM / PCC if specified) before sand bedding.
- Sand Bedding:
 - Spread 35 mm thick sand layer uniformly.
 - Level properly without compaction before laying blocks.
- Laying of Paver Blocks:
 - Place blocks manually in required pattern and alignment.
 - Maintain proper interlocking with tight joints.
- Joint Filling:
 - Fill joints with fine sand by brushing and vibration.
 - Repeat filling until joints are completely filled.
- Compaction:
 - Compact surface using plate compactor to achieve proper interlock and level.
- Finishing:
 - Ensure even surface, proper slope, and neat alignment.
- Curing (if required):
 - Light watering to settle sand and improve joint filling.
- Quality Checks:
 - Verify thickness (60 mm), strength, and finish of blocks.
 - Check alignment, level, and uniformity.
 - Ensure no cracked or damaged blocks are used.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Square Meter (Sqm)** basis of finished paved surface.
- include supply of paver blocks, sand bedding, laying, joint filling, compaction, labour, and all materials required for complete work. Base layer and edge restraints shall be measured and paid separately unless specified.

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

1. Materials

1. Concrete:
 - Precast concrete of M-35 grade with minimum cement content 370 kg/m³.
 - Design mix concrete conforming to IS 456 and IS 10262.
2. Cement:
Cement : Shall Conform M3 page no-9 in General Technical Specification Booklet
3. Sand:
Sand : Shall Conform M6 page no-10 in General Technical Specification Booklet
4. Stone Aggregate:
Stone Grit : Shall Conform M8 page no-10 in General Technical Specification Booklet
5. Water:
Water : Shall conform M1 page no-9 in General Technical Specification Booklet
6. Admixtures (if used):
 - Chemical admixtures to improve workability and durability.
 - Conforming to IS 9103.
7. Moulds & Formwork:
 - Steel / FRP moulds such as pallet system, tilt forms, table moulds, or other approved systems for achieving precise finish.
8. Embedded Items:
 - Shear keys, connecting loops, dowel tubes, lifting hooks, and inserts as required.
9. Finishing Materials:
 - Surface treatment materials (if required) for exposed finish.

2. Workmanship

A. Manufacturing (Factory Controlled Environment)

- Bench shall be precast in controlled factory conditions using approved mould systems.
- Proper batching, mixing, and placing of concrete shall be ensured.
- Mechanical vibration shall be used to achieve dense and void-free concrete.

B. Casting & Finishing

- Concrete shall be poured into moulds with required inserts (shear keys, loops, dowels, lifting anchors).
- Provide smooth / textured exposed finish as per approved design.
- Ensure accurate dimensions: 1800 × 500 × 450 mm.

C. Curing

- Proper curing (water/steam curing) shall be carried out to achieve required strength and durability.

D. Handling & Transportation

- Precast elements shall be handled using approved lifting accessories without damage.
- Proper stacking and transportation to site shall be ensured.

E. Installation (if applicable)

- Bench shall be placed on prepared foundation/base as per drawings.
- Ensure proper alignment, level, and stability.

F. Quality Control

- Check concrete grade (M-35), finish, and dimensions.
- Ensure no cracks, honeycombing, or surface defects.
- Verify proper placement of embedded inserts.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** of precast bench supplied (and installed if included).
- include design, mould preparation, casting, curing, finishing, handling, transportation, and all materials and labour required for complete precast bench.
- Reinforcement, mechanical, electrical, and plumbing inserts shall be measured and paid separately. No separate payment for moulds, lifting arrangements, or minor consumables.

ITEM NO – 386

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

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

1. Materials

1. Stainless Steel Letters:
 - Fabricated from Stainless Steel Grade 304 sheets.
 - Sheet thickness: 1.5 mm minimum.
 - Letter height: minimum 150 mm (or as per approved drawings).
 - Letter depth (projection): 25 mm.
2. Finish:
 - Surface finish shall be brushed / mirror polished / golden PVD coated as approved by Architect/EIC.

- Uniform finish free from scratches, dents, or discoloration.
- 3. Fixing System:
 - Concealed stainless steel studs/pins welded at back of letters.
 - High-strength epoxy adhesive / sealant for fixing.
- 4. Fasteners & Accessories:

Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet
- 5. Templates:
 - Acrylic/ply templates for accurate positioning and alignment during installation.

2. Workmanship

A. Fabrication

- Letters shall be laser cut / CNC cut from SS 304 sheets.
- Edges shall be smooth, burr-free, and properly finished.
- Depth (25 mm) shall be achieved by fabricating side returns and backing plates.
- Studs shall be welded at back side in proper alignment for fixing.

B. Finishing

- Final finish (brushed / polished / PVD coated) shall be applied uniformly.
- Protective film shall be maintained till installation to avoid damage.

C. Installation

- Marking and alignment shall be done using approved templates as per drawings.
- Holes shall be drilled accurately in substrate for stud fixing.
- Letters shall be fixed using concealed studs and epoxy adhesive ensuring:
 - Proper alignment
 - Level and spacing
 - Firm and durable fixing

D. Alignment & Aesthetics

- All letters shall be installed in straight line or required pattern as per design.
- No visible screws or fixings on front face.

E. Cleaning & Protection

- Surface shall be cleaned after installation.
- Remove protective film carefully without damaging finish.

F. Quality Checks

- Verify SS grade (304), thickness, and finish.
- Check letter size, depth, and alignment.
- Ensure firm fixing and no loose elements.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Square meter (Sqm)**

- include design, shop drawings, material, fabrication, finishing, transportation, installation, fixing system, labour, and all accessories required for complete signage work.

ITEM NO – 387

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

- Relevant to item specification shall be followed **Item No - 386** & Item shall be Measuring & Payment paid a unit per one **Square meter (Sqm)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 388

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

1. Materials

1. Natural Stone:
 - Indian natural stone such as sandstone / marble / granite as approved by Architect/EIC.
 - Stone shall be sound, dense, homogeneous, free from cracks, veins, or defects.
 - Colour, texture, and pattern as per approved sample.
2. Stone (General):
Stone : Shall Conform M16 page no-12 in General Technical Specification Booklet
3. Cement (for fixing/anchoring if required):
Cement : Shall Conform M3 page no-9 in General Technical Specification Booklet
4. Sand:
Sand : Shall Conform M6 page no-10 in General Technical Specification Booklet
5. Cement Mortar (for bedding/anchoring):
Cement Mortar : Shall Conform M11 page no-11 in General Technical Specification Booklet
6. Water:
Water : Shall conform M1 page no-9 in General Technical Specification Booklet
7. Metal Supports / Anchors:
 - MS / SS anchors, dowels, base plates, or brackets as required for fixing.
8. Fasteners & Accessories:
Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet
9. Finishing Materials:
 - Polishing compounds, sealers, or protective coatings (if required).

2. Workmanship

A. Fabrication / Carving

- Sculpture shall be hand carved / machine worked from selected natural stone blocks.
- Shape shall be abstract form as per approved design drawings.
- Use appropriate tools and techniques to achieve required surface texture, finish, and artistic detailing.

B. Finishing

- Surface shall be finished as specified:
 - Polished / honed / rough / textured finish as per design intent.
- Edges shall be smooth and well defined.

C. Handling & Transportation

- Proper care shall be taken during handling and transportation to avoid damage.
- Adequate lifting arrangements shall be used for heavy elements.

D. Installation

- Sculpture shall be placed at designated location as per drawings.
- Provide proper base support, anchoring, and fixing system to ensure stability.
- Ensure correct orientation, level, and alignment.

E. Fountain Integration (if applicable)

- Provision for water circulation, drainage, and waterproofing shall be coordinated with fountain system.

F. Cleaning & Protection

- Clean finished surface and protect from stains or damage.

G. Quality Checks

- Verify stone quality, size, and finish.
- Ensure no cracks, chips, or defects.
- Confirm proper anchoring and stability.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Cubic Meter (Cum)** basis calculated from out-to-out volumetric dimensions of the sculpture/decorative item.
- include stone procurement, carving, finishing, transportation, handling, lifting, installation, anchoring, supports, labour, tools, and all materials required for complete work.

ITEM NO – 389

BAMBOO PANELING : Manufacturing, supply , arrangement and keeping in good condition until project completion of Bamboo strips panelled ceiling as required to be fitted with the help of MS framing at all heights/all levels in Fancing work with Borex treatment on bamboo & PU polish at

regular intervals for Look . Make as per design and drawing with necessary arrangement like fix on MS frame 45*45*3mm Angle similar etc. with the help of fixtures such as bonding agents such as fevicol, screws and framing with of any diameter, fixing with the help of gripper or relevant technique etc. complete of design provided by the architect and should be installed as per the directions provided by the engineer-in-charge.

1. Materials

1. Bamboo Strips:
 - Well-seasoned, mature natural bamboo strips of approved size and diameter.
 - Free from cracks, splits, insect attack, and defects.
 - Uniform colour and texture as per approved sample.
2. Treatment:
 - Bamboo shall be treated with Borex (Boron-based preservative treatment) for protection against termites, fungi, and insects.
3. Polish / Finish:
 - PU polish (low VOC preferred) applied at regular intervals for durability and aesthetic finish.
4. MS Frame:
 - Supporting frame made of MS angle 45 × 45 × 3 mm or equivalent section as per design.
Structural Steel : Shall conform M22 page no-14 in General Technical Specification Booklet
5. Adhesives & Fixing Materials:
 - Bonding agents such as Fevicol or equivalent adhesive.
 - Screws, grippers, clamps, and fixing accessories.
Fixtures and Fastenings : Shall conform M43 page no-19 in General Technical Specification Booklet
6. Paint for MS Frame:
 - Anti-corrosive primer and finish paint for steel frame.
Paints : Shall Conform M44 page no-21 in General Technical Specification Booklet

2. Workmanship

A. Preparation & Treatment

- Bamboo shall be properly seasoned and treated with Borex solution before installation.
- Ensure complete drying before polishing.

B. Frame Work

- Fabricate and erect MS frame (45 × 45 × 3 mm) in required pattern and alignment.
- Ensure frame is rigid, level, and properly anchored to structure.

C. Bamboo Fixing

- Bamboo strips shall be cut, sized, and arranged as per approved design/drawing.
- Fixed to MS frame using screws, grippers, clamps, or adhesive bonding.
- Maintain uniform spacing, alignment, and pattern.

D. Finishing

- Apply PU polish uniformly to achieve smooth finish and enhance durability.
- Ensure proper coating in multiple coats as required.

E. Installation

- Paneling shall be installed at all heights and levels as per design intent.
- Ensure secure fixing and proper support system.

F. Protection & Maintenance

- Protect completed work from damage until project completion.

G. Quality Checks

- Verify bamboo quality, treatment, and finish.
- Ensure proper alignment, spacing, and stability.
- Check MS frame strength and corrosion protection.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Square Meter (Sqm)**
- include supply of bamboo, treatment, polishing, MS framing, fixing, adhesives, labour, transportation, and all accessories required for complete work. No separate payment for scaffolding, consumables, or wastage.

ITEM NO – 390

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

(a) Ecological paver_grid paver

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

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

1. Materials

1. Grass Paver Blocks:

- Precast ecological grid concrete pavers of size 600 × 400 × 75 mm or approved equivalent.
- Open grid structure to allow grass growth and water percolation.
- Additional units such as HB internal kerb (Radius 3 m, 6 m, 10 m) size 780 × 255 × 125 mm as per layout.
- Manufactured using high-strength concrete (minimum M-30 or above).

2. Finish:

- Shot-blasted surface finish with PremierShield (or equivalent) protective coating for durability and stain resistance.

3. Cement:

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

4. Sand (Bedding & Joint Filling):

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

5. Stone Aggregate (Base Layer if required):
Stone Grit : Shall Conform M8 page no-10 in General Technical Specification Booklet
6. Water:
Water : Shall conform M1 page no-9 in General Technical Specification Booklet
7. Joint Filling Material:
 - Sand / soil / sand-soil mix suitable for grass growth.
8. Top Soil & Grass (if specified):
 - Fertile soil and suitable grass species for plantation within grid openings.

2. Workmanship

A. Subgrade Preparation

- Prepare subgrade to required line, level, and slope.
- Compact thoroughly to achieve required density.

B. Base Layer (if applicable)

- Provide granular sub-base (GSB/WMM) or PCC base as specified.
- Compact properly to provide stable foundation.

C. Bedding Layer

- Lay sand bedding layer (25–40 mm thick) uniformly.
- Level properly without over-compaction.

D. Laying of Grass Pavers

- Place paver blocks in required pattern and alignment.
- Maintain proper interlocking and spacing.
- Ensure correct slope for drainage.

E. Joint Filling & Grid Filling

- Fill joints and grid openings with sand/soil mixture.
- Compact lightly to settle filling material.

F. Grass Plantation (if required)

- Fill grid with fertile soil and plant grass uniformly.
- Water regularly until proper growth is established.

G. Compaction

- Compact using plate compactor with protective layer to avoid damage.

H. Finishing

- Ensure even surface, proper alignment, and aesthetic finish.

I. Quality Checks

- Verify dimensions, strength, and finish of pavers.
- Ensure proper laying, compaction, and joint filling.

- Check coating and surface finish.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Square Meter (Sqm)** basis of finished grass paver area.
- include supply of pavers, bedding layer, laying, joint filling, compaction, finishing, and all materials and labour required for complete work.

ITEM NO – 391

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

1. Materials

1. Thermoplastic Paint:
 - Hot applied thermoplastic road marking compound conforming to IRC:35-2015.
 - Colour: White / Yellow as per design.
 - Thickness: 2.5 mm (excluding glass beads).
 - Shall be suitable for bituminous and concrete road surfaces.
2. Glass Beads (Reflectorising):
 - High-quality reflective glass beads.
 - Application rate: 250 g/sqm (surface applied).
 - Conforming to relevant IRC/IS specifications for retro-reflectivity.
3. Primer (if required):
 - Suitable primer for concrete/bituminous surface to ensure proper adhesion.
4. Water (for cleaning if required):

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

2. Workmanship

A. Surface Preparation

- Surface shall be clean, dry, and free from dust, oil, grease, or loose material.
- Existing markings shall be removed if required.

B. Marking Layout

- Marking lines (zebra crossing, lane line, center line, edge line, bump marking, cut marking) shall be set out as per approved drawings.
- Proper templates or pre-marking shall be done for accuracy.

C. Application of Thermoplastic Paint

- Thermoplastic material shall be heated in a thermoplastic applicator machine to required temperature (approx. 180–200°C).
- Applied uniformly to achieve 2.5 mm thickness.

D. Application of Glass Beads

- Immediately after application of paint, glass beads shall be uniformly sprayed @ 250 g/sqm.
- Ensure proper embedding for retro-reflectivity.

E. Finish Requirements

- Finished markings shall be:
 - Smooth and uniform
 - Free from streaks, cracks, or pinholes
 - Sharp edges and proper alignment

F. Performance Criteria

- Daytime luminance coefficient:
 - Cement concrete road: $\geq 130 \text{ mcd/m}^2/\text{lux}$
 - Bituminous road: $\geq 100 \text{ mcd/m}^2/\text{lux}$
- Night-time performance:
 - Retro-reflectivity, wet reflectivity, and skid resistance shall conform to IRC:35-2015 (Section 15).

G. Quality Control

- Check thickness, width, and alignment.
- Verify glass bead distribution.
- Ensure adhesion and durability.

H. Warranty

- Minimum 2-year warranty for retro-reflectivity performance.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Square Meter (Sqm)**.
- include surface preparation, supply of thermoplastic paint, heating, application, glass beads, labour, machinery, traffic control, and all materials required for complete marking work.

ITEM NO – 392

Cat Eye / Road Stud / RPM: Supplying Raised Pavement Markers made of polycarbonate and ABS moulded body and reflective panels with Micro prismatic lens (No Glass bead lens) capable of providing total internal reflection of the light entering the lens face and shall support a load of 13635 kgs. tested in accordance to ASTM D 4280 Type H and complying to Specifications of Category A of MORTH Circular No RW/NH/33023/10-97 & DO III Dt 11.06. 1997. The height, width

and length shall not exceed 20 mm, 130 mm and 130 mm and with minimum reflective area of 13 Sqcm on each side and the slope to the base shall be 35 +/- 5 degree. The body of the marker should having finger grip for easy and accurate placement and application with epoxy / bituminous Adhesive as recommended by the manufacturer of the marker. The color of the marker should be as per the IRC 35- 2015 and as directed by Engineer-in-charge.

1. Materials

1. Raised Pavement Marker (RPM):
 - Body made of high-strength polycarbonate and ABS moulded material.
 - Equipped with micro-prismatic reflective lenses (no glass bead type) capable of total internal reflection.
 - Conforming to ASTM D 4280 Type H.
 - Complying with Category A of MORTH Circular No. RW/NH/33023/10-97 (DO III dated 11.06.1997).
2. Dimensions:
 - Height: ≤ 20 mm
 - Length: ≤ 130 mm
 - Width: ≤ 130 mm
 - Reflective area: Minimum 13 sq.cm per side
 - Base slope: $35^{\circ} \pm 5^{\circ}$
3. Load Bearing Capacity:
 - Shall withstand minimum 13,635 kg load as per specified standards.
4. Colour:
 - Colour shall be as per IRC:35-2015 (white, yellow, red, etc.) and as directed by Engineer-in-Charge.
5. Adhesive:
 - Epoxy or bituminous adhesive recommended by manufacturer for fixing.
6. Water (for surface cleaning):

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

2. Workmanship

A. Surface Preparation

- Road surface shall be clean, dry, and free from dust, oil, grease, or loose materials.
- Mark exact locations as per approved layout drawings.

B. Fixing of Road Studs

- Apply epoxy/bituminous adhesive uniformly at specified location.
- Fix RPM firmly ensuring correct alignment with traffic direction.
- Press properly to ensure full contact with road surface.

C. Alignment & Spacing

- Install in straight lines or patterns as per road marking scheme (centerline, edge line, lane marking, etc.).
- Maintain uniform spacing and orientation.

D. Setting & Curing

- Allow adequate curing time for adhesive before opening to traffic.

E. Performance Requirements

- Ensure proper retro-reflectivity and visibility during night and adverse weather.
- RPM shall resist wear, impact, and environmental conditions.

F. Quality Checks

- Verify size, shape, and material quality.
- Check reflective performance and colour compliance.
- Ensure proper bonding and no loose studs.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)** basis of road studs installed.
- Include supply of RPM, adhesive, surface preparation, fixing, labour, tools, and all materials required for complete installation.

ITEM NO – 393

Kerbstone : Providing and fixing pre-cast concrete kerbstone of gray cement based concrete block 30cm length, 30cm height and 15cm thick of M250 grade concrete as per approved design and including excavation for fixing in proper line and level, filling the joint with C:M 1:3 (1cement: 3fine sand) etc complete.

- Relevant to item specification shall be followed **Item No - 375** & Item shall be Measuring & Payment paid a unit per one **Running Meter (Rmt.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 394

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

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

(2)Providing and Constructing of 20000 liter Filtration channel of 750 mm wide and 2 meter deep around the 3.0 m dia. collection tank including excavation, 100 mm thick PCC in 1:4:8 at bottom,

350 mm thick brick masonry in 1:6 cement mortar, 15 mm thick cement finish plaster on inside & outside surface of the walls in 1:4 cement mortar, filling of 300 mm thick 20 to 40 mm size and 300 mm thick 10 to 20 mm size gravels, providing and fabrication of MS grills on top of filtration channel and back filling of trenches with proper compaction etc. as per detail given by the engineer in charge. Supplying, lowering, fitting, fixing and joining with Strainer, 15 cm. diameter M.S. Pipe of minimum 5.40 mm wall thickness (DIAMETER – ERW or equivalent make) with sockets, specials complete with cutting, threading and red lead paint, etc. complete up to the required depth.

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

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

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

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

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

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

1. Materials

A. Borewell & Casing

1. PVC Pipes (Casing):

- 200 mm dia PVC pipe, CM class, minimum 10 mm wall thickness with sockets and specials.
- Conforming to relevant IS standards.

2. MS Pipe (Strainer Supporting):

- 150 mm dia MS ERW pipe with minimum 5.40 mm wall thickness.
Reference: Structural Steel : Shall conform M22 page no-14 in General Technical Specification Booklet

3. Strainer Pipes:

- PVC / MS strainers with slot size 1.5 mm × 57 mm (72 slots per line).
- Sizes:
 - 200 mm dia – 20 rmt
 - 300 mm dia – 1.2 m long (2 Nos.)

4. Bail Plug:

- 200 mm dia PVC bail plug, 3 m long, with bottom cone.

5. Gravel Packing:

- Approved graded gravel for filtration.

6. Puddle Clay:

- Suitable clay for sealing annular space.

B. Collection Tank (25,000 Liters)

1. Cement:
Cement : Shall Conform M3 page no-9 in General Technical Specification Booklet
2. Sand:
Sand : Shall Conform M6 page no-10 in General Technical Specification Booklet
3. Stone Aggregate:
Stone Grit : Shall Conform M8 page no-10 in General Technical Specification Booklet
4. Water:
Water : Shall conform M1 page no-9 in General Technical Specification Booklet
5. Bricks:
Bricks : Shall Conform M15 page no-12 in General Technical Specification Booklet
6. Cement Mortar:
Cement Mortar : Shall Conform M11 page no-11 in General Technical Specification Booklet
7. RCC:
 - RCC slab in 1:2:4 mix for top cover.
8. CI Rungs:
 - 150 mm wide CI footrests at 600 mm c/c.
9. PVC Sleeves:
 - 150 mm dia PVC sleeves for interconnection.

C. Filtration Channel (20,000 Liters)

1. Concrete (PCC):
 - 100 mm thick PCC in 1:4:8 mix.
2. Brick Masonry:
 - 350 mm thick in CM 1:6.
3. Plaster:
 - 15 mm thick cement plaster in CM 1:4 (inside & outside).
4. Gravel Filter Media:
 - 300 mm thick layer of 20–40 mm aggregate
 - 300 mm thick layer of 10–20 mm aggregate
5. MS Grill:
 - Fabricated MS grill cover.
Structural Steel : Shall conform M22 page no-14 in General Technical Specification Booklet

2. Workmanship

A. Borewell Drilling & Installation

- Borewell drilling of 450 mm diameter up to 100 m depth using approved method (Auger/Derrick).
- Lowering of casing pipes, strainers, and bail plug as per design.
- Proper alignment and verticality shall be maintained.

B. Strainer & Gravel Packing

- Install strainers at required depths.
- Fill annular space with graded gravel.
- Seal top portion using puddle clay to prevent contamination.

C. Development & Testing

- Develop borewell using air compressor until clear sand-free water is obtained.
- Conduct percolation and yield tests.

D. Collection Tank Construction

- Excavation to required depth and diameter (3.0 m dia, 3.0 m liquid depth).
- PCC base (100 mm thick 1:4:8).
- Brick masonry:
 - 350 mm thick up to 3.0 m
 - 450 mm thick above 3.0 m
- Internal and external plaster (15 mm thick CM 1:4).
- Provide 600 mm thick brickbat layer at bottom.
- RCC slab (125 mm thick) with 2 manholes (600 × 600 mm).
- Fix CI rungs at 600 mm c/c.

E. Filtration Channel Construction

- Excavation and PCC base.
- Brick masonry in CM 1:6.
- Plastering on both faces.
- Provide graded gravel layers (coarse + fine).
- Install MS grill cover at top.

F. Installation & Finishing

- Provide interconnection via PVC sleeves.
- Backfilling with proper compaction.
- Remove all temporary equipment and clear site.

G. Quality Control

- Check verticality and depth of borewell.
- Verify material quality and workmanship.
- Ensure watertight plastering and proper filtration media placement.

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)**
- include drilling, casing, strainers, gravel packing, construction of tanks, filtration system, labour, machinery, testing, and all materials required for complete system. No separate payment for temporary works, dewatering, or consumables.

Providing, supplying and installation of Kitchen equipment of SS 304 and make it functional while comissioning for all mentioned equipments, with respect to all general arrangement drawings and associated support system for its placement and connection system of LPG or PNG gas supply system to ensure the leak proof and hazard proof connection with their instructions and manuals. Any change in size or location as per the requirements are to be done, as per instructions of architect and Engineer incharge. (PNG/ LPG supply is in the clients scope)

ITEM NO – 395

SS STORAGE RACK 4 TIER of Size (1050x450x1500)

1. Materials

- Stainless Steel:
 - Grade: SS 304
 - Sheet thickness: 1.0–1.2 mm for shelves
 - Frame: 25–30 mm SS 304 square/rectangular tubes, minimum 1.2 mm thickness
- Fasteners: Stainless steel nuts, bolts, and screws (all SS 304)
- Finish: Brushed / Hairline / Matte finish for all visible surfaces
- Optional Accessories: Adjustable nylon feet or bullet feet for leveling

2. Fabrication / Workmanship

- Structure:
 - 4-tier shelves evenly spaced (approx. 350–400 mm spacing)
 - Shelves fully welded or mechanically fixed to frame for rigidity
 - Edges folded or rounded to avoid sharp edges
- Load Capacity: Designed to support minimum 100–120 kg per tier evenly distributed
- Welding: Continuous TIG / MIG welding; joints ground smooth and polished
- Support: Legs equipped with adjustable feet for leveling on uneven floors
- Back/Side Rails: Optional side lips (10–15 mm) to prevent items from sliding off
- Finish: Surfaces polished to remove burrs and ensure hygienic smooth finish

- Site Fixing:
 - Rack shall be placed on leveled floor with adjustable feet
 - Ensure stability; no wobbling
- Connections: None required for freestanding unit; if bolted to wall, use SS fasteners
- Cleaning: Clean with non-abrasive cloth after installation

- Load Test: Apply uniform weight to each shelf to check deflection
- Inspection: Ensure all welds, joints, and finish are defect-free
- Approval: Obtain Engineer-in-Charge sign-off after installation

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)**
- Fabrication, supply, transport, installation All fixtures, fittings, and finishing Load test and commissioning

ITEM NO – 396

SS STORAGE RACK 4 TIER of Size (1650x450x1500)

- Relevant to item specification shall be followed **Item No - 395** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 397

SS STORAGE RACK 4 TIER of Size (900x450x1500)

- Relevant to item specification shall be followed **Item No - 395** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 398

POT STOVE of Size (600x600x450)

1. Materials

- Stainless Steel:
 - Grade: SS 304 for body and top surface
 - Thickness: 1.0–1.2 mm for body, 2–3 mm for top cooking plate (as required for durability)
- Burner: Brass / Stainless Steel burner suitable for LPG / PNG supply
- Gas Fittings: Brass / SS 304 valves, pipe connectors, and regulators as per approved standards
- Insulation: High-temperature resistant material around burner chamber to prevent heat loss
- Legs / Support: SS 304 tubular legs, thickness 25–30 mm with adjustable bullet feet for leveling

2. Fabrication / Workmanship

- Top Plate: Heavy-duty cooking top designed to hold large pots securely
- Frame: Welded SS 304 frame ensuring rigidity and load-bearing capacity
- Gas Burner Mounting: Properly aligned and fixed to allow leak-proof operation
- Edges: Rounded / folded edges to avoid sharp corners
- Finish: Brushed or polished finish for hygienic and aesthetic appearance
- Accessibility: Provision for cleaning under burner and ash/drip collection if required
- Gas Connection:
 - Stove to be connected to LPG / PNG supply by the client with proper leak-proof fittings
 - Ensure compliance with safety regulations and manufacturer's instructions
- Leveling: Adjustable feet for stable placement on kitchen floor
- Clearances: Maintain proper clearances as per safety guidelines
- Gas Leak Test: Before commissioning, check all connections for leaks
- Burner Performance: Test flame stability, uniformity, and heat output
- Approval: Sign-off by Engineer-in-Charge after operational testing

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)**
- Including Supply of materials, fabrication, transport Installation, gas fitting preparation, testing, and commissioning

ITEM NO – 399

WORK TABLE WITH 2 U/S (500x900x850)

1. Materials

- Stainless Steel:
 - Grade: SS 304 for all surfaces
 - Thickness:
 - Table top: 1.2–1.5 mm
 - Undershelves: 1.0–1.2 mm
 - Frame / Legs: 25–30 mm SS 304 tubular sections, thickness 1.2 mm minimum
- Fasteners: All nuts, bolts, screws in SS 304
- Feet: Adjustable bullet / nylon feet for leveling

2. Fabrication / Workmanship

- Top Surface: Flat, hygienic, brushed / polished finish
- Undershelves: 2 shelves evenly spaced, fully welded or mechanically fixed to the frame
- Frame: Welded SS 304 tubular frame, rigid and stable
- Edges: Folded or rounded edges to prevent injuries and ease cleaning
- Load Capacity: Designed for minimum 100–120 kg per shelf evenly distributed
- Finish: All welds ground smooth; surfaces polished for hygiene

- Placement: Level on kitchen floor using adjustable feet
- Clearances: Ensure sufficient space around table for kitchen operations
- No Additional Connections: Freestanding unit; if required, bolt to wall with SS fasteners

- Load Test: Apply uniform weight on table top and undershelves to ensure no deflection or wobble
- Inspection: Verify welds, joints, and surface finish are defect-free
- Approval: Sign-off by Engineer-in-Charge after functional inspection

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)**
- Including Supply of materials, fabrication, transport Installation, leveling, and commissioning

ITEM NO – 400

WORK TABLE WITH FRYER (500x900x850)

- Relevant to item specification shall be followed **Item No - 399** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 401

WORK TABLE WITH 2 U/S (600x900x850)

- Relevant to item specification shall be followed **Item No - 399** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 402

THREE BURNER RANGE(1650x700x850)

1. Materials

- Stainless Steel:
 - Grade: SS 304 for body, top plate, and side panels
 - Thickness:
 - Top plate: 2–3 mm heavy-duty SS 304 to withstand commercial use
 - Body panels: 1.2–1.5 mm SS 304
 - Frame / Legs: 25–30 mm SS 304 tubular sections, thickness 1.2 mm minimum
- Burners:
 - Brass / Stainless Steel commercial burners suitable for LPG / PNG supply
 - Flame output as per manufacturer's specification for commercial kitchens
- Fasteners: All nuts, bolts, and screws in SS 304
- Feet: Adjustable bullet / nylon feet for leveling

2. Fabrication / Workmanship

- Top Plate: Heavy-duty, flat, and hygienic with 3 burners spaced evenly
- Frame: Welded SS 304 tubular frame for rigidity and load-bearing capacity
- Front Panel: Folded edges for safety and ease of cleaning
- Burner Mounting: Leak-proof and aligned for uniform flame distribution
- Side Panels & Back Panel: Fixed with SS screws or fully welded for structural strength
- Finish: Brushed / polished for hygiene; welds ground smooth
- Gas Connection:
 - Connected to LPG / PNG supply by the client
 - All fittings to ensure leak-proof operation following manufacturer and safety guidelines
- Leveling: Adjustable feet for stable placement on kitchen floor
- Clearances: Maintain safe clearances from walls, adjacent equipment, and combustible materials
- Gas Leak Test: Check all connections for leaks before commissioning
- Burner Test: Verify flame stability, uniformity, and heat output
- Operational Test: Ensure all three burners work simultaneously without backflow, sputtering, or flame instability
- Approval: Sign-off by Engineer-in-Charge after operational testing

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)**

- Including Supply of materials, fabrication, and transport Installation, leveling, and commissioning

ITEM NO – 403

WORK TABLE WITH SINK (600x900x850)

- Relevant to item specification shall be followed **Item No - 399** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 404

SS SQUARE TANDOOR (900x900x850)

1. Materials

- Stainless Steel:
 - Grade: SS 304 for body, inner lining, and outer panels
 - Thickness:
 - Body: 2–3 mm SS 304 for structural strength
 - Inner chamber lining: 1.5–2 mm SS 304 for high temperature resistance
 - Outer panels: 1.2–1.5 mm SS 304 for finishing and insulation support
- Insulation:
 - High-temperature ceramic or refractory wool lining between inner and outer walls for heat retention and safety
- Frame / Legs:
 - SS 304 tubular sections, minimum 25×25 mm, thickness 1.2 mm
- Fasteners: All nuts, bolts, and screws in SS 304

2. Fabrication / Workmanship

- Body & Chamber:
 - Square design, dimensions 900×900×850 mm
 - Welded and leak-proof joints
 - Inner chamber polished / brushed for easy cleaning
- Top / Opening:
 - Removable lid with handle
 - Heat-resistant gasket or rubber sleeve if required
- Outer Panels:
 - Brushed finish for hygiene and aesthetics
 - Air vents / exhaust ports as per design
- Legs:
 - Rigid, adjustable for leveling
- Safety & Ergonomics:
 - Adequate insulation to prevent excessive external heating
 - Edges folded or rounded to prevent injury
- Placement:
 - Freestanding on kitchen floor, leveled using adjustable feet
 - Clearance around tandoor for safe operation as per kitchen layout

- Gas / Fuel Connection:
 - Connected to PNG / LPG supply by the client
 - Leak-proof connections ensured as per manufacturer's instructions
- Anchorage: Optional, if required for stability
- Heat Test: Check uniform heating in chamber
- Fuel Test: Ensure stable flame with no leakage
- Operational Test: Verify lid, exhaust ports, and insulation performance
- Approval: Sign-off by Engineer-in-Charge after successful functional testing

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)**
- including Supply of materials, fabrication, transport, installation, and commissioning Any insulation, fasteners, and finishing as specified

ITEM NO – 405

WORK TABLE WITH 2 U/S (450x900x850)

- Relevant to item specification shall be followed **Item No - 399** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 406

WORK TABLE WITH 2 U/S (1550x450x850)

- Relevant to item specification shall be followed **Item No - 399** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 407

PICK UP TABLE WITH 2 U/S WITH 2 OHS (1200x800x850)

- Relevant to item specification shall be followed **Item No - 399** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 408

PICK UP TABLE WITH 2 U/S WITH 2 OHS (1000x800x850)

- Relevant to item specification shall be followed **Item No - 399** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 409

PICK UP TABLE WITH 2 U/S WITH 2 OHS (600x800x850)

- Relevant to item specification shall be followed **Item No - 399** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 410

PICK UP TABLE WITH 2 U/S WITH 2 OHS (900x800x850)

- Relevant to item specification shall be followed **Item No - 399** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 411

PICK UP TABLE WITH 2 U/S WITH 2 OHS (650x800x850)

- Relevant to item specification shall be followed **Item No - 399** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 412

WORK TABLE WITH 2 U/S (1050x650x850)

- Relevant to item specification shall be followed **Item No - 399** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 413

WORK TABLE WITH 2 U/S (650x900x850)

- Relevant to item specification shall be followed **Item No - 399** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 414

FOUR BURNER RANGE (900x900x850)

- Relevant to item specification shall be followed **Item No - 399** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 415

THREE CHINESE BURNER RANGE (1800x900x850)

- Relevant to item specification shall be followed **Item No - 399** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.

- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 416

DOSA PLATE (600x900x850)

- Relevant to item specification shall be followed **Item No - 399** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 417

TWO BURNER RANGE (600x900x850)

- Relevant to item specification shall be followed **Item No - 399** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 418

SINGLE SINK UNIT (800 X 800 X 850)

- Relevant to item specification shall be followed **Item No - 399** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 419

CLEAN DISH TABLE (800 X 800 X 850)

- Relevant to item specification shall be followed **Item No - 399** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 420

POT RACK 4 TIER (1050 X 600 X 1500)

- Relevant to item specification shall be followed **Item No - 395** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 421

SS EXHAUST HOOD WITH BUFFLE FILTER (600 X 750 X 500)

1. Materials

- Stainless Steel:
 - Grade: SS 304 for all exposed and structural parts
 - Thickness:
 - Body panels: 1.2–1.5 mm

- Baffle filter frame: 1.0–1.2 mm
- Filters:
 - SS 304 Baffle type grease filters
 - Designed to trap grease and particles efficiently, removable for cleaning
- Fasteners & Accessories:
 - SS 304 screws, rivets, brackets, and hanging chains/rods
- Finish:
 - Brushed / Satin finish for hygiene and aesthetics

2. Fabrication / Workmanship

- Hood Body:
 - Rectangular design: 600 mm (height) × 750 mm (width) × 500 mm (depth)
 - Seamless fabrication with folded edges for strength and safety
 - Welded joints polished to remove sharp edges
- Baffle Filter:
 - Slide-in type for easy removal and cleaning
 - Designed to capture grease particles from cooking fumes
- Exhaust Outlet:
 - Provision for duct connection at the top
 - Flange and reinforcement for secure duct attachment
- Mounting:
 - Ceiling suspension or wall-mounted arrangement using SS brackets and hanging rods
 - Adjustable leveling possible
- Safety:
 - All edges folded or rounded to prevent injury
 - Adequate clearance for maintenance
- Placement:
 - Installed directly above cooking equipment (as per kitchen layout)
 - Securely fixed using SS rods/brackets
- Duct Connection:
 - Connection to duct provided by client; hood should align perfectly with duct
- Electrical (if applicable):
 - Connection for hood lighting or fan (if provided) as per client scope
- Air Flow Test: Verify efficient extraction of smoke and fumes
- Filter Test: Ensure filters are properly fitted and removable
- Structural Test: Verify hood is securely suspended and level
- Approval: Engineer-in-Charge to inspect and approve

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)**
- Including Supply of materials, fabrication, transport, installation, baffle filters, and commissioning Any necessary mounting accessories

ITEM NO – 422

SS EXHAUST HOOD WITH BUFFLE FILTER (1650 X 850 X 500)

- Relevant to item specification shall be followed **Item No – 421** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 423

SS EXHAUST HOOD WITH BUFFLE FILTER (900 X 1050 X 500)

- Relevant to item specification shall be followed **Item No – 421** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 424

SS EXHAUST HOOD WITH BUFFLE FILTER (1800 X 1050 X 500)

- Relevant to item specification shall be followed **Item No – 421** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 425

SS EXHAUST HOOD WITH BUFFLE FILTER (600 X 1050 X 500)

- Relevant to item specification shall be followed **Item No – 421** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 426

SS EXHAUST HOOD WITH BUFFLE FILTER (850 X 950 X 500)

- Relevant to item specification shall be followed **Item No – 421** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 427

Electric combo Oven

1. Materials

- Body / Chamber:
 - Material: SS 304 stainless steel, corrosion and heat-resistant
 - Thickness: 1.5 mm for external body, 1.2 mm for internal chamber
 - Finish: Brushed / Satin finish, hygienic and easy to clean
- Insulation:
 - High-grade mineral wool or ceramic insulation, 50–80 mm thick
 - Prevents heat loss and ensures energy efficiency
- Door:

- Double-walled SS 304 door with tempered glass window for observation
- Heat-resistant gasket for leak-proof sealing
- Insulated handle, ergonomic and safe for operators
- Racks / Trays:
 - SS 304 wire mesh racks, removable and adjustable
 - Tray slides with multiple positions for different cooking requirements

Heating System

- Type: Electric
- Elements:
 - SS 304 heating elements for top, bottom, and convection (as applicable)
 - Even heat distribution with forced convection fan (if combo includes convection mode)
- Temperature Range: 50°C to 300°C (programmable)
- Control:
 - Digital control panel with timer, temperature, and cooking mode selector
 - Multiple cooking modes: Bake, Grill, Roast, Convection, Combination (if applicable)
- Safety:
 - Over-temperature protection
 - Automatic shutdown in case of fault

Electrical

- Voltage: 415 V, 3 Phase, 50 Hz (or as per site requirement)
- Power Rating: Depending on oven capacity (e.g., 15–30 kW typical for commercial combo ovens)
- Connections: Hardwired or plug-in with suitable isolation switch

2. Installation

- Placement: On level, heat-resistant base, away from combustible surfaces
- Ventilation: Ensure proper ventilation around oven for safety and cooling
- Electrical Connection: To be done as per local electrical regulations and manufacturer instructions
- Verify temperature uniformity
- Functional test of all modes: Bake, Convection, Grill, Roast
- Safety interlocks and overheating protection
- Calibration of temperature display
- Approval by Engineer-in-Charge

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)**
- inclusive Supply of materials and components Fabrication, transportation, installation, and commissioning All wiring, controls, trays, and fittings as required for fully functional operation

ITEM NO – 428

100 KG Stainless Steel Grain Storage Big Containers

1. Materials

- Body Material:
 - Stainless Steel Grade: SS 304 (Food grade, corrosion resistant)
 - Thickness: Minimum 1.2 mm for walls, 1.5 mm for bottom
 - Finish: Brushed / Satin finish for hygienic storage and easy cleaning
- Lid / Cover:
 - Hinged or removable lid with tight-fitting design
 - Rubber or silicone gasket for airtight sealing
 - Optional locking mechanism for security
- Support / Base:
 - SS 304 or powder-coated mild steel stand/base for stability
 - Designed to handle full weight (100 kg of grain) safely
- Handles:
 - Ergonomic stainless steel handles for lifting and transport
 - Welded securely to body for strength
- Inner Features:
 - Smooth interior for easy cleaning and prevention of grain accumulation
 - Optional perforated inner lining for aeration (if required)
- Capacity: 100 kg of grains (wheat, rice, pulses, etc.) Approx. Dimensions: As per manufacturer standard for 100 kg capacity (typically ~900–1000 mm height, 600–700 mm diameter)
- Food-safe materials complying with FSSAI / ISO 22000 standards
- Corrosion and rust-resistant for long-term storage
- Airtight lid prevents moisture ingress and contamination
- Easy to clean and maintain

2. Installation & Placement

- Location: Level platform, dry area, away from heat and moisture
- Assembly: Supplied fully fabricated or with minimal assembly required
- Support: Base stand or floor mounting as required
- Check structural integrity with full load of 100 kg grains
- Verify airtight sealing and lid operation
- Ensure no sharp edges or weld burrs
- Approval by Engineer-in-Charge

3. Mode of Measurement & Payment

- The work shall be Measuring & Payment paid a unit per **Number (Nos)**
- Inclusive of Supply, fabrication, surface finishing Handles, lid, base/support stand Transportation, placement, and commissioning

ITEM NO – 429

50 KG Stainless Steel Grain Storage Big Containers

- Relevant to item specification shall be followed **Item No – 428** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.

- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.

ITEM NO – 430

25 KG Stainless Steel Grain Storage Big Containers

- Relevant to item specification shall be followed **Item No – 428** & Item shall be Measuring & Payment paid a unit per one **Number (Nos.)** for completed item.
- Refer & Consider of manufacture or supplier except details specified for the change given in item description and Make approved as per tender.



Government of Gujarat
ROAD AND BUILDING DEPARTMENT
City Division
CITY CIRCL(R&B)

City (R&B) DIVISION
AHMEDABAD

AHMEDABAD ELECTRICAL DIVISION NO-1

DRAFT TENDER PAPER

Technical Specifications for Internal
Electrification, External Electrifications

**Construction of New Building of State Guest House at Annexe
Circuit House Campus, Shahibaug, Ahmedabad.**

Note: This is General specifications of items and materials, if any conflict with BOQ, Work will be carried out as per the BOQ only.

Specifications for Electrical Works in Government Building Subject other
General condition of Contract in force(1986)General

1. *WiringsRule:*

The installation generally shall be carried out in conformity with relevant Indian standard. Specification of and code of practices prevalent, Indian Electricity Rules, 1956 and Indian Electricity Act. 1910 as amended from time to time.

2. *Definition:*

The definition of terms shall be in accordance with Indian standard code of Practice for Electrical wiring installation IS-732-1982 except for the definition of point in case of internal Electrical Installation. For definition of point wiring and measurement of Electrical works IS-5908-1970 shall be referred to.

3. *Voltage and Frequency of supply:*

All current consuming devices shall be suitable for frequency of 50 C/s and system of voltage manual for unless otherwise specified.

4. *Layout of wiring and its description:*

(i) the wiring shall be carried out as per schedule "Power" wiring must be in screwed conduit and shall be kept separate and distinct from lighting wiring. All wiring must be done on the distribution system with main and branch distribution boards at convenient centers and without isolated fuses. All conductors shall be run as far as possible along the walls and ceiling as to be easily accessible and capable of being thoroughly inspected. The balancing of circuit will be arranged beforehand by the Ex. Engineer Electrical Division.

(ii) Within one month of the taking over the installation, the contractor shall supply to the Ex. Engineer Elect. Division a complete set of wiring diagrams of the same on drawings to be supplied when available by the Executive Engineer Electrical Division and to the satisfaction of the Ex. Engineer, Elect. Dept. and these wiring plans shall be "Drawings" within the meaning of the term as used in the General conditions of contract.

5. *Conductors:*

All conductors unless otherwise specified shall not be less than 1.5 sq. mm. for point wiring and 2.5 sq. mm for main conductors for power and lighting circuit shall be adequate size to carry the designed circuit load without exceeding the permissible thermal limits for the installation, and such sizes will be stipulated in specifications and or drawings.

6. *Cables:*

All cables shall conform to relevant Indian Standards.

Conductors of all cables except the flexible cable shall be of aluminum. The smallest aluminum conductor for the final circuit shall have nominal cross sectional area of not less than 1.5 sq. mm. The minimum size of the aluminum conductors for power wiring shall be 4 sq. mm.

Conductors of flexible cables shall be of copper the minimum cross sectional area of such a cable shall be 14.0193 mm. the Flexible cable shall have uniform and adequate insulation.

Unless the flexible cables and conductors are protected by amount or through rubber or PVC Sheath, these shall not be used in workshops and other places where they are liable to mechanical damage.

Core flexible cables shall be used for connecting single phase Appliances or phase, natural & earth connections.

7. *Fall of Potential:*

The Cross sectional area of all conductors inside buildings shall be so proportioned to their length that the drop in voltage between main fuses and the farthest point or any lamp shall not exceed three percent of the voltage of the consumer's with all the consuming devices in use.

If the Cable Size is increased to avoid the voltage drop in circuit current rating of the cable shall be more than that for which circuit is designed. In each circuit or subcircuit or sub circuit every cable shall have current higher than the full load current.

8. Rating of lamps and fans socket outlets: Points and exhaust fans

Incandescent lamps installed in residential and non-residential building shall be rated at 60 watts & 100 watts respectively.

Table fans and ceiling fans shall be rated at 60 watts, exhaust fan shall be rated at 100 watts and 1000 watts respectively for the purpose of load assessment unless actual values of the load are, known or specified.

9. Tests:

Before the installation is commissioned following tests shall be carried out.

- (1) Insulation Resistance Test.
- (2) Polarity Test of Switches
- (3) Earth continuity tests
- (4) Earth electrode Resistance test.

The insulation Resistance shall be measured between earth and the whole system of conductors or any section thereof with all fuses in place and all switches close, and except in earthed concentric wiring all lamps in position or both poles of

installation otherwise electrically connected together. A direct current pressure of not less than the twice working pressure provided that it need not exceed. 500 volts for

medium voltage circuits where the supply is derived from three wire D.D or a ploy phase A.C. system, the neutral pole of which is connected to earth either direct or through added resistance, the working pressure shall be deemed to be that which is maintained between the phase conductor and the neutral.

The insulation resistance shall also be measured between all conductors to one pole or phase conductor of the supply and all the conductors connected to the neutral or to the other pole or phase conductors of the supply with all lamps in position and switches in "OFF" position and its value shall be less than specified in sub-clause

9.2. 1.3

The insulation resistance in Mega-ohms measured as above shall not be less than 50 mega ohms divided by the number of outlets or when PVC insulated cables are used for wiring 12.5 mega ohms divided by number of outlets.

Where a whole installation is being tested a lower value than that given by the formula subject to a minimum of 1 mega ohm is acceptable.

A preliminary and similar test may be made before lamps, etc. are installed and in this event the insulation resistance to earth should be not less than 100 mega ohms divided by the number of outlets or when PVC insulated cables are used for wiring 25 mega ohms divided by number of outlets.

The term "Outlet" includes every switch except that a switch combined with a socket outlet appliance or lighting, fitting is regarded as one outlet.

Control rheostat heating and electric sign may, if required, be disconnected from the circuit during the test, but in that event the insulation resistance between the case or frame work, and all live parts of each rheostat, appliance and sign, shall be not less than that specified in the relevant Indian Standard Specification or where there is no such specification shall be not less than half a mega ohm.

Polarity Test:

In a two wire installation a test shall be made to verify that all switches in every circuit have been fitted in the same conductor throughout & such conductor shall be labeled or marked for connection to the phase conductor or to the non-earthed conductor of the supply is fitted in a conductor which is labeled or marked for connection to one of the phase conductor of the supply.

In a three wire or a four wire installation a test shall be made to verify that every non-linked single pole switch is fitted in a conductor which is labeled or marked for connection to one of the phase conductor of the supply.

The installation shall be connected to the supply for testing. The terminate of all switches shall be tested by a test lamp one lead of which is connected to the earth. Glowing of test lamp to us full brilliance when the switch is in on position irrespective

of appliance in position or not shall indicate that the switch is connected to the right polarity.

Earth Continuity Test:

The earth continuity conductor including metal conduits and metallic envelops of cables in all cases shall be tested for electric continuity and the electrical resistance of the same along with the earthing lead but excluding any added resistance or earth leakage circuit breaker measured from the connection with the earth electrode to any point in the earth continuity conductor in the completed installation shall not exceed one ohm.

Earth Electrode Resistance Test:

Earth electrode Resistance test may be carried out by mugger Earth Testers containing a direct reading ohmmeter, a hand driven generator and auxiliary electrodes.

On completion of an electric installation (addition and alteration) a certificate shall be furnished by the contractor countersigned by the certified Supervisor under whose direction supervision the installation was carried out. This certificate shall be in the prescribed form as given in Appendix-B in addition to the test certificate required by Local Electrical Supply Authorities.

10. *Joint and looping back:*

Unless with the sanction of Ex. Engineer, Electrical Divisions all joints in conductor shall be means of approved mechanical connectors in suitable and approved junction boxes but looping back system shall be preferable. In wiring unless otherwise specified phase and live conduct shall be looped at the switch box where a neutral conductor can be looped from light, fan or socket in non-residential buildings neutral and earth continuity wire shall be brought to each of the switch boards should be of adequate size to accommodate at least one number of 5 Amps, socket outlet and control switch in future.

11. *Switches:*

Main Switch gears, Switch Board and their location:

All main switches (other than loss of iron clad pattern) carrying current of 10 Amp. And above shall be fitted for back connections and shall be suitably protected.

AH switches and circuit breakers shall be constructed in accordance with the I.S. 4237-1967. General requirement for switchgear and control gear for voltage not exceeding 1000 volts and other relevant I.S. provided also that spring shall be either of phosphor bronze or if steel shall be copper or Nickel plated and that handle shall be so fastened that they do not tend to unscrew or become loose.

All main switches shall be either of metal clad enclosed pattern or any insulated enclosed pattern which shall be fixed at close proximity to the point of entry of supply.

Switch boards shall not be erected above gas, stoves, or within 2.5 mm of any washing unit in the washing rooms of laundries or in the bath rooms, lavatories, toilets or kitchens.

Switch boards, if unavoidably fixed in places likely to be exposed to weather, to drip or to abnormal moisture temperature the outlet casing shall be weather proof and shall be provided with glands or bushing of adopted to receive screwed" conduit according to the manner in which cables are run P/C and double flanged bushes shall be fitted in the holes of the switches for entry and exit of wires.

A Switch board shall be installed so that its bottom is within 1.25 mm above the floor unless the front of the switch board is completely enclosed by a door or the switch board is located in a position to which only authorized persons have access.

Switch boards shall be recessed in the wall if so specified in the schedule of work or in the special specification. The front shall be fitted with hinged panel of other suitable materials such as Bakelite in wood frame with locking arrangement, the butt surface of door being flush with the walls. Ample room shall be provided at the back for connections and at the front between the switchgear mountings and the door.

Equipment's which are on the front of a switch board shall be so arranged that inadvertently personal contact with live parts is unlikely during the manipulation of switchgears. Changing of fuses or like operations.

No holes other than the holes by means of which the panel is fixed shall be drilled closer than 1.3 from any edge of the panel.

The various live parts, unless they are effectively screened by substantial barriers of non-hygroscopic, nonflammable insulating material, shall be so spaced that space shall not be maintained between such parts and earth.

The arrangement of gear shall be such that they shall be readily accessible and their connections to all instruments and apparatus shall also be traceable.

In every case in which switches and fuses are fitted on the same pile, these fuses shall be so arranged that the fuses are not alive when their respective switches are in the off position.

No fuses other than fuses in instrument circuit shall be fixed on the back of or behind a switch board panel or frame.

All the metal switchgears and switch boards shall be painted, prior to erection with one coat of antirust primer, After erection they shall be painted with two coats of approved enamel or aluminum paint as required on all sides wherever accessible.

All switch boards connected to medium voltage and above shall be provided with "Danger Notice Plate" conforming to relevant Indian Standards.

12. Control at Point of Commencement of Supply:

There shall be a linked main switchgear with fuse on each live conductor of the supply mains at the point of entry. The wiring throughout the installation shall be such that there is no break in the natural shall also be distinctly marked. In this connection Rule 32(2) of the Indian Electricity Rules, 1966 (See Appendix-A_ shall also be referred.

The main switchgear shall be situated as near as practicable to the termination of services line and shall be easily accessible without the use of any external aid.

On the main switchgear, where the conductor of a two wire system or any earthier neutral conductor of a multi wire system or a conductor which is to be connected thereto, an indication of a permanent nature shall be provided to identify earthier neutral conductor. In this connection Rule 32(1) of Indian Electricity Rules, 1956 (see appendix 'A') shall be referred.

13. Switch Board & Distribution Boards:

I Metal clad switch gear shall preferably be mounted on any of the following types of Board.

Hinged type Metal Board:

There shall consist of a box made of sheet metal not less than 2 mm thick and shall be provided with a hinged cover to enable the board to swing open for examination of the wiring at the back. The joints shall be welded. A teak wood board, thoroughly protected both inside and outside with good

insulating varnish conforming to IS: 347-

1952 specification for varnish sheath for General purpose and of not less than 6.5 mm thickness shall be provided at the back for attachment of incoming and outgoing cables. There shall be a clear distance of not less than 2.9 cm between the teakwood board and the cover, the distance being increased for larger boards in order that on closing of the cover, the insulation of the cables is not subjected to damage and no short length of cables is subjected to excessive twisting or bending in any case. The board shall be securely fixed to the wall by means of ragbolts, plugs or wooden Gut ties and shall be provided with a locking arrangement and an earthing stud. All wires passing through the metal board shall be bunched. Alternatively, hinged type metal boards shall be made of sheet covering mounted on channel or angle iron frame.

NOTE: Such type of boards are particularly suitable for small switch-boards for mounting metal-clad switchgear connected to supply at low voltages.

Fixed type Metal Boards:

These shall consist of an angle or Channel of iron frame fixed on the wall or on floor and supported on the wall at the top if necessary. There shall be a clear distance of one metre in front of the switchboard. If there are attachments of base connections at the back of the switch board Rules 51(1)(c) of Indian Electricity Rules, 1956 shall apply

NOTE: Such type of boards are particularly suitable for large switchboard for mounting large Number of switchgears or higher capacity metal clad switchgears of both.

Teakwood Boards:

For small installation connected to a single phase 230 volts supply teak wood boards may be caused as main boards or sub-boards. These shall be of seasoned teak or other durable wood with solid back impregnated with varnish of approved quality with all joints dovetailed.

In large size medium voltage installations, before proceeding with the actual construction of the boards proper drawing showing the detailed dimensions and design including the disposition of the mounting which shall be symmetrically and neatly arranged for arriving at the overran dimensions shall be prepared and approved by the engineer-in-charge.

Recessing of Boards:

Where so specified the switchboards shall be recessed in the wall. The front shall be fitted with a hinged panel of teak wood or other suitable materials, such as bakelite, or with unbreakable glass doors in teak wood frame with locking arrangement, the other surface of the doors being flush with the walls, ample room shall be provided at the back for connection and at the front between the switchgear mountings.

Arrangement of Apparatus:

- a) Equipment which is on the front of a switch board shall be so arranged that inadvertently personal contact with live parts is unlikely during the manipulation of switches, changing of fuses or like operation.
- b) No apparatus shall project beyond any edge of panel. No fuse body shall be mounted within 2.5 cm of any edge of the panel and no hole other than holes by means of which the panel is fixed shall be drilled closer than 1.3 cms from any edge of the panel.
- c) The various live parts unless they are effectively screened by substantial barriers of non-hygroscopic, non-inflammable insulating material, shall be so spaced that an arc cannot maintain between such parts and earth.
- d) The arrangement of the gear shall be such that they shall be readily accessible and their connections to all instruments and apparatus shall be so spaced that an arc cannot maintain between such parts and earth.
- e) The arrangement of the gear shall be such that they shall be readily accessible and their connection to all instruments and apparatus shall also be easily traceable.
- f) In every case in which switches and fuses are fitted on the same pole, these fuses shall be so arranged that the fuses are not alive when their respective switches are in the 'OFF' position.
- g) No fuses other than fuses instrument circuit shall be fixed on the back of or behind a switchboard panel or frame.

Marking of Apparatus:

- a) Where a board is connected to voltage higher than 250 volts, all the apparatus mounted on it shall be marked in the following colours to which the apparatus or its different terminal may have been connected.

Alternating Current	Direct Current
Three-phase-red	Three wire system-2 otherwise
Yellow & blue	Positive red & negative blue
Natural-black	Natural-black

Where fuse-wire three phase wiring is done, the neutral shall be in one color and the other three wires in another color

- b) Where a board has more than one switch shall be marked to indicate which section of the installation it controls)
- c) All markings required under the rules shall be clear permanent.

Main & Branch Distribution Board:

Main and branch distribution boards shall be any type mentioned in 13.1, 13.8.1. Main and branch distribution boards shall be of any type mentioned in 13.1

Main distribution boards shall be provided with a switch or air circuit breaker on each pole of each circuit, a fuse on the phase or live conductor and a link on the neutral or earthed conductor of each circuit. The switches shall always be linked.

Branch Distribution Board:

Branch distribution boards shall be provided with a fuse or a miniature circuit breaker of both the (adequate rating-setting chosen on the live conductor of each circuit and the earthed neutral conductor shall be connected to a common line and be capable of being disconnected individually for testing purposes. At least one spare circuit of the same capacity shall be provided on each branch distribution board.

In residential installations, lights and fans may be wired on a common circuit such sub circuit shall not have [more than total after points of lights, fans and socket outlets/The load of such circuits shall be restricted to 800 watts. If a separate circuit is provided the number of fans in the circuit shall not exceed ten. Power sub-circuits shall be designed according to the load but in no case shall there be more than two outlets on each sub-circuits

In industrial and other similar installations requiring the use of group control of switching operation, circuits, for (socket outlets may be kept separate from fans & lights. Normally fans and lights may be wired on a common circuit, however, if need is let separate circuits may be provided for the two. The load on any low voltage sub circuit

shall not (exceed 3000 Watts.) In case of new installation, all circuits and sub-circuits shall be designed by making provision of 20 (percent increase in load due to any future modification.

Power sub-circuits shall be designed according to the load but in no case shall there be more than four outlets in each sub-circuits

Installation of Distribution Boards:

The distribution fuse-boards shall be located as near as possible to the center of the load they are intended to control.

These shall be fixed on suitable stanchion or wall and shall be accessible for replacement of fuses.

These shall be of either metal-clad type, or damp situations, they shall be of the weather proof type and if installed where exposed to explosive dust, vapor or gas, they shall be of flame proof type

Where two or more distribution fuse boards feed low voltage these distribution boards shall be

- (1) Fixed not less than 2 mm apart or
- (2) Arranged so that it is not possible to open two at a time, namely they are interlocked and the metal case is marked Danger 415 volts or
- (3) installed in a room of enclosure accessible to only authorized person.

All distribution boards shall be marked lighting, power as the case may be and also marked with the voltage and number of phases of the supply. Each shall be provided with a circuits list giving details of each circuit which it controls and the current rating of the circuit and size of fuse element.

Triple pole distribution boards shall not be generally used for final circuit distribution unless specification approval of Engineer-in-charge is obtained in special cases where use of Triple pole distribution boards are inevitable they shall be of H.R.C. fuse type only.

Wiring and Distribution Board:

In wiring a branch board, total load of the consuming devices shall be divided as far as possible, evenly between the numbers of ways of the boards leaving the spare circuit for future extension.

All connections between pieces of apparatus or between apparatus and terminal on a board

shall be neatly arranged in a definite sequence following the arrangement of the apparatus mounted thereon, avoiding unnecessary crossing.

Cables shall be connected to a terminal only by soldered or welded or crimped lugs using suitable sleeve, lugs or ferrules unless the terminal is such a form that it is possible to securely clamp them without the cutting away of cable strands.

All bare conductors shall be rigidly fixed in such a manner that a clearance of at least 2.5 cms. is maintained between conductors of opposite polarity or phase and between the conductors and any material other than insulating material.

If required a pilot lamp shall be fixed and connected through an independent single-pole switch and fuse to the bus-bars of the board.

In a hinged type board, the incoming and outgoing cables shall be fixed at one or more points according to the number of cables on the back of the board leaving suitable space in between cables and shall also, if possible be fixed at the corresponding points on the switch board panel. The cables between these points shall be arranged to form a "U" or "S" shaped loop which shall be of such length as to allow the switchboard panel to swing through an angle of not less than 90°

14. Capacity of Circuits:

Lights and fans may be issued on a common circuit and such a circuit shall not have more than a total of ten points of lights, fan and socket outlets or a load of 800 watts whichever is less. The power circuits shall be designed with a maximum of two outlets per circuit generally when load is not known or specified. In non-residential buildings at important District centres however one outlet per circuit may be preferred. The circuit shall be designed based on the loading of the circuit where not specified the load shall be taken as 1 kw per outlet, where the load is more than 1 kw it should be controlled by a isolator switch or miniature circuit breaker.

15. Passing Through Walls and Floors:

Where conductors pass through walls one of the following methods shall be employed. Care shall be taken to see that wires pass very freely through protective pipe or box and that the wires pass through in a straight line without any twist or cross in wires, on other ends of such holes.

(a) A teak wood box extending through the whole thickness of the wall shall be buried in the wall and casings or conductors shall be carried so as to allow 1.3 cms air space on three sides,

of the casing conductor.

(b) The conductor shall be caned either in a rigid steel conduit conforming to *IS : 1653-1964 specification for Rigid Steel conduits of Electrical wiring (Revised) or a rigid non-metallic conduit conforming to *IS: 2609-1963 specification of Rigid Non-Metallic conduits for Electrical Installations, or in a porcelain tube of such size which permit easy drawing in. The end of conduit shall be neatly bushed with porcelain, wood or other approved material.

(c) Insulated conductors while passing through floors shall be protected from mechanical injury by means of rigid steel conduit (see *IS 1653-1964) to a height not less than 1.5 m above the floors and flush with the ceiling below. This steel conduit shall be earthed and securely bushed.

Where a wire tube passed outside a building so as to be exposed to weather the outer end shall be belt mounted and turned downwards and properly bushed on the open end.

16. Fixing to Walls and Ceilings: Plugs for ordinary walls or ceilings shall be of well seasoned teak or other approved hardwood not less than 5 cm long 2.5 cm square on the inner end and 2 cm square on the outer end. They shall be cemented into walls to within 7.5 mm of the surface, the remaining being finished according to the nature of the surface with plaster of lime punning.

Where owing to irregular crossing or other reasons the plugging of the walls or ceiling with wood plugs presents difficulties, the wire casing wire pattern, metal conduit or clear (as the case may be) shall be attached to the wall or ceiling in an approved manner in the case of new building wherever possible teak wood plugs shall be fixed in the walls before they are plastered.

To achieve neatness, plugging of walls or ceiling may be done by an approved type of asbestos metallic or a fiber fixing plug.

17. Branch Switches:

Where the supply is derived from a three-wire or four-wire source, and distribution is done on the two wire system all branch switches shall be placed in the outer or live conductor of the circuit and no single-phase switch of use shall be inserted in the middle wire, earth or earthed natural conductor of the circuit. Single pole switches (Other than for multiple control) Carrying not more than 15 amperes any type of tumbler type which shall be 'ON' when the handle is down.

18. Fittings:

Where conductors are required to be threaded through tubes or channels formed in the metal work of fittings, they must be free from sharp angles or projecting edges and such size that will enable them to be wired with the conductors used for the final sub-circuits without removing the boarding, taping or outer covering as far as possible. All tubes and channels should be of sufficient size to permit 'Looping back' of wires, cables and flexible cords other than those designed for high temperature shall not be used for wiring fittings except for portable fire limits. All fittings must have not less than a half inch male nipple. Fittings and lamp holders for gas filled lamps shall be adequately ventilated.

Where light fitting is supported by one or more flexible cords the maximum weight to which the two flexible cords may be subjected shall be as follows.

Nominal cross Sectional Area of cord in mm ²	No. & Dia in mm of wires.	Max. Permissible Weight
0.5	16/0.2	1.7
0.75	24/0.2	2.6
1.0	32/0.2	3.5
2.5	48/0.2	5.3
3.5	80/0.2	8.8
4	128/0.2	14.0

No inflammable shade shall form a part of light fitting unless such shade is well protected against all risks of fire. Celluloid shade or light fitting shall not be used under any circumstances.

Fitting of wire:

The use of fitting wire shall be restricted to the internal wiring and the lighting fittings. Where fitting wire is used for wiring, for the sub-circuit loads shall be terminated in a ceiling zone or connector from which they shall be carried into the fittings.

19. Lamp Holders:

Lamp holders for use on brackets and the like shall be in accordance with *IS :1258- 1967 specification for Bayonet lamp holders and all those for use flexible pendants shall be provided with cord grips. All lamp holders shall be provided with shade carriers. Where centre contact Edison screw lamp holders are used, the outer or screw contacts shall be connected to the middle wire, the natural and the earthed conductor of the circuit.

20. Outdoor Lamps:

External and road lamps shall have weatherproof fittings of approved design so as to effectively prevent the admission of moisture. An insulating distance piece of moisture proof materials shall be inserted in the fittings. Flexible cord and cord grip lamp holders shall not be used where exposed to weather in veranda's and similar exposed situations where pendants are used, they shall be of fixed rod type

21. Lamps:

All incandescent lamps, unless otherwise required, shall be hung at a height of not less than 2.5 m above the floor level. They shall be in accordance with IS : 418 : 1957 specification for Tungsten Filament General Service electric lamps

22. Fans, Regulators and Clamps

Ceiling fans:

Ceiling fans including their suspension shall conform to *IS 374-1960 specification for electric ceiling fans and regulators (Revised) & to the following requirements

- (a) All ceiling fans shall be wired to ceiling roses or to special connector boxes to which fan rod wires shall be connected and suspended from hooks or shackles with insulators between rod wires shall be connected and suspended from hooks or shackles with insulators between hooks and suspension rods. There shall be no joint in the suspension rod. but if joints be avoidable then such joints shall be screwed to special couplers of 5 cm minimum length and both ends of pipes shall touch together within couplers and shall in addition be secured by means of split pins alternatively the two pipes may be welded.
- (b) Fan clamps shall be of suitable design according to the nature of construction of ceiling on which these clamps are fitted in all cases fan clamps shall be fabricated from tested new metal of suitable sizes and they shall be as close fitting as possible Fan clamps for wood beams shall be of suitable flat iron fixed on two sides of the beam and according to the size and section of the beam one or two mild steel bolts passing through the beam shall hold both flat irons together Fan clamps for steel join shall be fabricated from tested flat iron to fit in rigidly at the bottom flange of the beam. Care shall be taken during form tested flat iron to fit in rigidly at the bottom flange of the beam. Care shall be taken during form tested flat iron to fit in rigidly to the bottom flange of the beam Care shall be taken during fabrication that the metal does not crack while hammering to shape. Other fan clamps shall be made to suit the position, but in all cases care shall

be taken to see that they are rigid and safe.

Note: All tan clampss shall be so fabricated that fans revolve steadily.

- (c) Canopies on top and bottom of suspension rod shall effectively hide suspensions and connections to fan motors, respectively.
- (d) The lead-in wire shall be of nominal cross-sectional area not less than 1.0 mm² with copper and 1.5 mm² aluminum and shall be protected from abrasion.
- (e) Unless otherwise specified the clear distance between the ceiling fan and the floor shall be less than 2.75 m

22.2.0 Exhaust Fans:

For fixing of an exhaust fan a circular hole shall be provided in wall to suit the size of the fan which shall be fixed by the means of rag-bolts embedded in the wall the hole shall be neatly plastered with cement and brought to the original finish of the wall. The exhaust fan shall be connected to exhaust fan point which be wired as near to the hole as possible by means of a flexible cord, care being taken that the blades in the proper direction.

23. Attachment of fittings and accessories:

In other than conduit wiring all ceiling crosses, brackets, pendants and accessories attached to walls or ceiling shall be mounted on substantial teak wood block twice Varnished after all fixing holes are made in them. Blocks shall be not less than 4 cms deep. Brass screws only shall be used for attaching fittings and accessories to their base blocks.

24. Interchangeability:

Similar part of all switches, lamp holder, distribution, fuse board, ceiling roses, brackets, pendants, fans and all other fittings of same type shall be interchangeable in each installation.

25. Conduit Wiring System:

Type and size of conduit - All conduit pipes shall be conforming to *IS : 1653-1964, furnished with galvanized or stove enameled surface. All conduit accessories shall be of threaded type and under no circumstances pin grip type or clamp type accessories be used. No steel conduit less than 16 mm in diameter shall be used. The number of insulated conductors that can be drawn into rigid steel conduit are given in Table II.

Bunching of cables - Unless otherwise specified, insulated conductors of AC supply and DG supply shall be bunched in separate conduits.

Conduit-Joints-Conduit pipes shall be joined by means of screwed couplers and screwed accessories only (*IS : 2667-1964)

Specification for Fittings for Rigid Steel Conduits for Electrical Wiring. In long distance straight runs of conduit inspection type couplers at reasonable intervals shall be provided or running threads with couplers and jam-puts (in the latter case the bare threaded portion shall be treated with anti-corrosive preservative) shall be provided. Thread on conduit pipes in all cases shall be between 11 mm to 27 mm long sufficient to accommodate pipes to full thread portion of couplers or accessories. Cut ends of conduit pipes shall have no sharp edges nor any burrs left to avoid damage to the insulation of conductors while pulling them through such pipes.

Table-II Maximum Permissible Number of 250-V Grade Single Core cable that can be drawn into rigid steel Conduit
(Clause 6.5.11)

Size of cable	Nominal	Cross-sectional area	Number of wires	Diameter in mm	16	20	25	32	40	50	63	(No. of Cables Max)			
					S	B	S	B	S	B	S	BS	B	S	B
1.0	1/1.12	5				4	7	5	12	10	20	14	-		
1.5	1/1.40	4	3		7	5	12	10	20	14	-	-	-		
2.5	1/1.80	3	2		6	5	10	8	16	12	-	-	-		
	4	1/2.24	3		2	6	5	10	8	18	12	-	-	-	
				(3/1.06*)											
	6	1/2.80	2			3	2	6	5	10	8				
				(7/1.06*)											
10	1/3.55	+	-		-	2	-	5	4	8	7	-	-		
	7/1.40	+	-		-	2	-	4	3	6	5	8	6	-	
16	7/1.70	+	-		-	-	2	-	4	3	7	6	-25		
	7/2.24	+	-		-	-	-	-	2	-	4	3	-		
					-	-	-	-	-	-	-	-	-		
35	7/2.50	+	-		-	-	-	-	2	-	5	4	6		
	5														
50	7/3.00	+	-		-	-	-	-	-	-	-	2	-		
	5	4	6		5										
	19/1.80	+	-		-	-	-	-	-	-	-	2	-		
	5	4	6		5										

*For Cu. Conductor only

+For Al Conductor only

Note-1 The cable shows the maximum capacity of capacity for the simultaneous drawing of cables. The table applies to 250 volt grade cable. The column heads 'S' apply to runs of

conduit which have table applies to 250 volts grade able the columns heads 'S' apply to runs of conduit which have distance not exceeding 4.2 SM between draw in boxes and which do not deflect from the straight by angle of more than 150.

Protection against dampness-in order to minimize condensation or seepage inside the tube, all outlets of conduit system, shall be properly drained and ventilated, but in such a manner as to prevent the entry of insects as far as possible

Protection of conduit against rust -The outer surface of the conduit pipes including all bends, unions, tees junction boxes, etc., forming part of the conduit system shall be adequately protected against rust particularly when such system is exposed to weather in all cases no bare threaded portion of conduit pipe shall be allowed unless such bare threaded portion is treated with anti-corrosive preservative or covered with approved plastic compound.

Fixing of Conduit - Conduit pipes shall be fixed by heavy gauge saddles, secured to suitable wood plugs or any other approved plug with screws in an approved manner at an interval of not more than one meter but on either side of couplings or bends or similar fittings, saddles shall be fixed at a distance of 30 cm. from the centre of such fittings.

Bends in conduit - All necessary bends in the system including diversion shall be done by bending pipes, or by insuring suitable solid or inspection type normal bends, elbows or similar fittings or by fixing cast iron inspection boxes whichever is more suitable. Conduit fitting shall be avoided as far as possible. On conduit system exposed to weather, where necessary, said type fitting shall be used. Radius of such bends in conduit pipes shall be not less than 7.5 cm. No length of conduit shall have more than the equivalent of four quarter bends from outlet, the bends at the outlets not being counted.

Outlets - All outlets for fitting switches etc., shall be boxes, of suitable metal or any other approved outlet boxes for other surface mounting or flush mounting system.

Conductors - All conductors used in conduits wirings shall preferably be stranded. No single core cable nominal Cross-sectional area greater than 130 mm shall be enclosed in a conduit and used for alternating current.

Erection and earthing of conduit - The conduit of each circuit or section shall be completed before conductors are drawn in. The entire system of conduit and permanently" connected to earth conforming the requirements specified under pipe in a workman like manner for a perfect continuity between each wire and conduit. Gas or water pipes shall not be used as earth medium. If conduit pipes are liable to mechanical damage, they shall be adequately protected..

Recessed Conduit wiring system with Rigid Steel conduits - Recessed conduit wiring system comply with all the requirements for surface conduit wiring systems specified in 6.5.2.1 to 6.5.2.4.

Making of chase - The chase in the wall shall be neatly made and be of ample dimensions to permit the conduit to be fixed in the manner desired. In the case of buildings under construction chases shall be provided in the wall, ceiling etc., at the time of their construction and shall be filled up nearly after erection of conduit and brought to the original finish of the wall.

Fixing of conduit in chase - The conduit pipe shall be fixed by means of staples or by means of soft saddles not more than 60 cm apart. Fixing of standard bends or elbows shall be avoided as far as practicable and all curves maintained by bending the conduit pipe itself with a large radius which will permit easy drawing in of conductors. All threaded joints of rigid steel conduit shall be treated with some approved preservative compound to secure protection against rust.

Inspection boxes - Suitable inspection boxes shall be provided to permit periodical inspection and to facilitate removal of wires, if necessary. These shall be mounted flush with the wall. Suitable ventilating holes shall be provided in the inspection box covers.

Type of accessories to be used - All outlets such as switches and wall sockets, shall be either of flush mounting type or surface mounting type.

(a) Flush mounting type - All flush mounting outlets shall be of cast iron mild steel boxes with a cover of approved insulating material or shall be a box made of a suitable insulating material. The switches and other outlets shall be mounted on such boxes as would be approved. The metal box shall be efficiently earthed with conduit by an approved means of earth attachment.

(b) Surface mounting type - If surface mounting type outlet box is specified, it shall be of

any be through flexible conduits of the same size as the rigid conduit.

ConduitWiringSystemwithRigidNon-MetallicConduits:

Rigid Non-Metallic conduits are used for surface recessed and concealed conduit wiring.

Type and size - All non-metallic conduits used shall conform to IS : 2509-1963 and shall be used with the corresponding accessories (See IS : 3419-1965) specification for Fittings for Rigid Non - Metallic Conduits).

Bunching of cables - Conductors of AC supply and DC supply shall be bunched in separate conduits. The number of insulated cables that may be drawn into the conduits are given in Table III. In this table space factor does not exceed 40 percent.

Table-III MAXIMUM PERMISSIBLE NUMBER OF VOLT GRADES SINGLE, GORE CABLE

		Size of Conduits (mm)					
Nominal Cross Sectional area mm ²	Number and	16	20	25	32	40	50
		(Number of Cables Max)					
1.0	1/1.12*	5	7	13	20	-	-
1.5	1/1.40	4	6	10	14	-	-
2.5	1/1.80	3	5	10	14	-	-
	3/1.06*						
4	1/2.24	2	3	6	10	14	-
	7/0.85*						
6	1/2.80	-	2	5	8	11	-
10	1/3.55*	-	-	4	7	9	-
	7/1.40*						
16	7/1.70	-	-	2	4	5	15
25	7/2.24	-	-	-	4	2	5
35	7/2.50	-	-	-	-	2	5
50	7/3.00*)	-	-	-	-	2	3
	19/1.80						

*For copper conductors only

*For aluminum conductors only.

Conduit joints - shall be joined by means of screwed or plain couplers depending on whether the conduits are screwed or plain. Where there are long runs of straight conduit. Inspection type couplers shall be provided at intervals. For conduit fittings and accessories reference may be made to IS : 3419-1965.

fixing of conduits - The provision of 25.1.6 shall apply except that the septum between saddles or supports is recommended to be 60 cms for rigid non-metallic conduits.

Bends in conduit - wherever necessary, bends or diversions may be achieved by bending the conduits (See 6.5.3.9) or by employing normal bends, inspection bends, impaction boxes elbows or similar fittings.

Conduit fittings shall be avoided, as far as possible on outdoor system.

Outlets - All the outlets or fittings, switches, etc. shall be boxes of substantial construction. In Order to minimum is condensation or sweating inside in side the conduit, all outlets of conduit system shall be properly drained and ventilated, but in such a manner as to prevent the entry of insects, etc. as far as possible.

For use with recessed conduit wiring system the provisions of 6.5.2.1 to 6.5.2.4 shall apply

Heat may be used to soften conduit for bending and forming joints in case of plastic conduits. As the material softens when heated fitting of conduit in close proximity to hot surfaces should be avoided. Caution should be exercised in the use of the conduit in locations where the ambient temperature is 50°C or above. Use of such conduits in place where ambient temperature is 60°C or above is prohibited.

PVC INSULATED AND P.V.C. sheathed or T.R. Swiring SYSTEM

GENERAL

This system of wiring is suitable for low pressure installation and shall not be used in places exposed to sun and rain nor in damp places. provided they are sheathed in the special approved protective covering and well protected to withstand dampness.

Attachment to walls and ceiling:

All cables on brick walls, stone or plastered walls and ceiling shall be run on well seasoned perfectly straight and well seasoned, perfectly straight and well varnished on four sides, teak wood or any approved hard wood battens not less than 10 mm thick, width of which shall be such as to suit total width of cables laid on the batten, prior to election, these shall be painted with one coat of varnish or approved paint of colour to match with surrounding. These battens shall be secured to wall and ceilings by flat head wood screws to fix a plug or Phil plug at an interval not exceeding 75 cm. Wood plug can be used only with special approval of the Engineer in charge. The flat head wood screws shall be countersunk within wood batten and smoothed down

Where wiring is to be carried out along the face of the rolled steel joints a wooden batten adequate width shall first be laid on the same and dipped to it as in conspicuous as possible. The wiring should then be fixed to this batten shall be suitable bushes to prevent the abrasion of the cables.

Attachment to false ceiling: In no case, the open wiring shall be run above the false ceiling without the approval of Engineer-in-charge

26.20 Link dips: Only aluminum alloy clips/joint clips shall be used. The thickness shall be

0.32 mm (30 SWG) for lengths of 50 mm to 80 mm. The width shall not be less than 8 mm in all these cases. Link clips/joint clips shall be so arranged that one single clip shall not hold more than two core or three single core Tiffsof PVC insulated and PVC sheathed upto 2.5 sq. mm above while a single clip shall hold a single twin core or two single core cables. The clips shall be fixed on varnished wood batten switch iron pins and space at interval of 15 cm bet in the case of horizontal and vertical runs.

26.3.0 Bends in wiring: The wiring shall not in circumscribes be bent so as to form an abrupt right angle but must be rounded off at the corners to a radius not less than six times the overall diameter of the cable.

Protection of wiring from Mechanical Damage:

In cases where there are chances of any damage to wiring such wiring shall be drawn complying with all the requirements of conduit wiring system.

Such protective covering shall in all cases be fitted on all down drops within 1.5m from the floor. or from floor level upto the switch board whichever is less.

26.5.0 Passing through floors: All cables taken through floor shall be enclosed in heavy gauge steel conduit extending 1.5m above the floor or upto the switch board whenever is less and flush conduits or pipes shall be neatly bushed with porcelain wood or other approved material. The conduit pipes shall be security earthed.

26.6.0 Passing through walls: When conductors pass through walls, any one of the following methods shall be employed. Care should be taken to see that Wires pass very freely through protective pipe or box and that wires pass through in a straight line without any twist or cross in wires on their ends of such holders.

(a) A box of teak wood or approved hard wood extended through the hole thickness of the wall shall be buried in the wall and casings or conductors and casing or conductors shall be carried so as to allow 1.3 cm air space on the three sides of the casing of the conductor.

(b) The conductors shall be carried in an approved heavy gauge solid drawn or lap weld conduit or in a race-train of such a size that it permits easy drawing in, the end of conduit shall be neatly bushed with porcelain, wood or other approved material.

26.6.1 Where a wall tube passed outside a building so as to be exposed to weather, the outer end shall be mounted and turned downwards and properly bushed or the open end, The conduit shall be neatly arranged so that the cables enter them without bending.

26.7.0 Buried cables: The PVC sheathed cable shall not normally be buried directly in plaster. Where so specified in the special in the specification they may be taken in task wood channeling of ample capacity or conduit pipe bonded in the wall.

26.8.0 Stripping of outer covering: While cutting and stripping of the outer covering of the, care shall be taken that the sharp edge of the cutting instrument does not touch the inner insulation of the conductors. The protective outer covering of the cable shall be stripped off near connecting terminals as far as practicable. Care shall be taken to avoid hammering on link clips with any metal instrument after the cables are laid. Where junction boxes are provided they shall be made moisture proof with a plastic compound.

PAINTING WORKING GENERAL:

Paints: paints, oils varnishes etc. of approved make in original to the satisfaction of the Engineer-in-charge shall only be used.

Preparation of surface: The surface shall be thoroughly cleaned and dusted before painting is started. The proposed surface shall be inspected by Engineer-in-charge or his authorized agent and shall have received the approval before painting is commenced.

Application: Paint shall be applied with brush. The paint shall be spread as smooth & even as possible particular care shall be paid to rivets, nuts bolts and cover lapping. Before drawing cut, it shall be continuously stirred, in the sardolier containers with a smooth stick while it is being applied.

Each coat shall be allowed to dry out sufficiently before a subsequent coat is applied

Scope: painting on old surface in indoor Situations will not include primer coat except where specially motioned in the schedule of work or special specification. However, where rust has formed on iron and steel surfaces the spots will be painted with one anti-rust primer coat.

Precautions: All furniture fixtures, glazing floors, etc. shall be protected by covering. All stains, smears, oil, dirt, etc. of every kind shall be removed. While painting of wiring etc. it shall be ensured that painting of wall ceiling etc. is not spoiled in any way.

Painting of conduit and accessories: After installation surface of conduit pipes, fittings switch and regulator boxes, etc. shall be painted with two coats of approved enamel paint or aluminum paint as required to match the finish of surrounding wall, trussed, etc.

28. Link clip:

The clip for batten wiring shall be of Aluminum conforming to I.S. specification No. 2415-1975.

APPENDIX- 'A'

Important Clauses of Indian Electricity Rules, 1956. Following clauses of Indian Electricity Rule, 1956 shall in particular be taken care of in the execution of electrical works. Clause No. Subject

Authorization:

1. Construction, installation, protection, operation and maintenance of electric supply lines and apparatuses.
2. Cut-out on consumer's premises.
3. Identification of earthed and earthed neutral conductors and position of switches and cutouts therein.
4. Earthed terminal on consumer's premises.
5. Handling of electric supply lines and apparatus.
6. Distinction of circuits of different voltages.
7. Accidental charge.
8. Provisions applicable to protective equipment.
9. Instruction for restoration of persons suffering from electric shock.
10. Precautions to be adopted by consumers, owners electrical contractors. Electrical workmen and suppliers.
11. Periodical inspection and testing of consumer's installation.
12. Precautions against leakage before connection
13. Supply to consumers.
14. Provisions applicable to medium high voltage installations.
15. Point of commencement of supply.
16. Precautions against failure of supply; Notice of failures.
17. Connection with earth, (low and Medium Voltage system.)
18. Use of energy at high and extra-high voltage system.
19. Connection with earth. (high & Extra-high voltage system)
20. General conditions as to transformation and control of energy. All clauses under Chapter VIII on Overhead Lines.
21. Mode of entry.
22. Penalty for breaking seal.
23. Penalty for breach of rule 45.

24. Penaltyforbreachofrule 82.

25. Penaltyforbreachofrules

APPENDIX- 'B'

Form of Completion Certificate

I/We certify that the installation detailed below has been installed by me/us and tested and that to the best of my/our knowledge and belief, it complies with Indian Electricity Rules, 1956, as well as the C.P.W.D. General Specification for Electrician Works, 1972.

Electrical Installation at Voltage and system of supply

(1) Particulars of works:

(a) Internal Electrical installation No. Total Load Type of system or wiring

- (i) Light point
- (ii) Fan point
- (iii) Plug point
- (a) 3 pin 5 Amp.
- (b) 3 pin 15 Amp.
- (b) others:

Description HP/KW Type of starting

- (a) Motors: (i)
(ii)
(iii)

(c) Other plants:

(d) If the work involves installation of overhead line/or underground cable:

- (a) (i) Type & Description of overhead line.
- (ii) Total length & No. of spans,
- (iii) No. of street light & its description

- (b) (i) Total length of underground cable & its size
- (ii) No. of joint.

End joint: Toe Join
St. through joint:

2) Earthing:

- (i) Description of earthing electrode
- (ii) No. of earthing electrodes:
- (iii) Size of main earth lead:

3) Test Results:

- (a) Insulation Resistance:
 - (i) Insulation resistance of the whole system Megohms. of conductors to earth.
 - (ii) Insulation resistance between the Phase conductors and neutral. Megohms.

Between phase R and neutral. Megohms
Between phase Y and neutral. Megohms

BetweenphaseBandneutral

Megohoms

(iii) Insulation resistance between the phase conductors in case of polyphase supply.

Between phase R & phase Y	Megohms
Between phase Y & phase B	Megohms
Between phase B & phase R	Megohms

(b) Polarity Test:

Polarity of non-linked single pole branch switches.

(c) Earth continuity Test:

Maximum resistance between any point in the earth continuity conductor including metal conduits & main earthing lead.

(d) Earth Electrode Resistance.

Resistance of each electrode.

(i) Ohms

(ii) ohms

(iii) ohms

(iv) ohms

(e) Lighting protective system:

Resistance of the whole of lighting protective system to earth before any bonding is effected with electrode and not in/on the structure.

*Deputy Executive Engineer
Ahmedabad Electrical subdivision
Ahmedabad*

*Executive Engineer
Ahmedabad Electrical Dn-01
Ahmedabad.*

SPECIFICATIONS

All Specification standard publication etc. specified mean the latest standards, publication etc. pertaining to electrical and should conform to the following wherever applicable.

- 1) IndianElectricityAct.2003with itsamendments.
- 2) IndianElectricityRules1956andits amendments.
- 3) IndianElectricitysupplyAct 1948.
- 4) RegulationforElectricityEquipmentinbuildingbyI.E.F.London.
- 5) TheFactoryAct,1948andits amendments.
- 6) I.S.732*1982Part -1,II&1.11codeofpracticefor Electrical wiringandfilings in buildings for low and medium voltages
- 7) I.S.4064-1976H.D.Airbreakswitchesandfusesfor-Voltagesnotexceeding 1100 volts.
- 8) I.S.3043 -Earthingcodeofpracticefor
- 9) I.S.-1554Part-11970PVCInsulated(Heavyduty)ElectricalCablesfor working voltages upto and unfading 110 volts
- 10) I.S. 694-1964 Part-11 - PVC insulated cable with Aluminum conduits (revised) for voltages upto 110 volts.
- 11) I.S.:5908 -1970-Electricalinstallationsinbuildingsmethodofmeasurements
- 12) I.S.:4237-1967-Generalrequirementforswitchgearandcontrolgearfor voltage not exceeding 1000 volts.
- 13) I.S.:1653-1964-rigidsteel conduitsforelectrical wiring(revised)
- 14) I.S.:2509 -1973-Rigidsteelconduitsforelectricalinstallation(Firstrevision)
- 15) I.S.:1248 -1967-Bayonetlandholders(Firstrevision)
- 16) I.S.:4181957-Tungsten-FilamentGeneralservice-electricclamps(Third revision)
- 17) I.S.:374-1966-FansandRegulators,ceilingtype,electric(secondrevision)
- 18) I.S.:2667-1964-Filingsforrigidsteel conduitsforelectrical wiring.
- 19) I.S.:3419-1976-Finingforrigidnon-metallicconduits(Firstrevision)
- 20) NationalElectricCode,1986.

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ANNEXURE-I

Abstract of the Wiring Rules of the Institution of Electrical Engineer (Referred to in the specification)
Division (See clause 2 of the specification)

Systems:

All electrical system in which all the conductor and apparatus are connected to a common source of supply.

- 1) Earthed: Effectually connected, to the general mass of the earth. Solidly earthed without the intervention of a fuse, switch, circuit -breaker, resistor, reactor or solenoid.
- 2) Un-insulated Conductor: A conductor without provision, by the interposition of a dielectric or otherwise, for its insulation from earth.
- 3) Bare: Not covered with insulating material.
- 4) Dielectric: any material which offers high resistance to the passage of an electric current.
- 5) Bunch Conductor: When more than one conductor is contained within a single duct or groove or when they are run enclosed and spaced and not spaced apart from each other;
- 6) Points: In wiring as per IS: 5908 -1970 - Method of measurements of electrical installation in buildings.
- 7) Switch board: Assemblage of switchgear with or without instruments, but the term does not apply to a group of local switches in a final sub- circuit where each switch has its own insulating base.

Note: In the electricity (Factories Act) special regulations, 1908 and 1944 the term "Switchboard" includes "Distribution board."

- 8) Single pole switch: A switch suitable for closing and opening a circuit on one phase or pole only.
- 9) Linked switches: A switch the blades of which are so linked mechanically as to make break all poles simultaneously or in a definite sequence.
- 10) Fuse Switch: A switch the moving part of which carries one or more fuses.
- 11) Three Wire System:
 - a) Outer Conductor: Those between which there is the greatest difference of potential. This use of the word outer must not be confused with the use of the word when applied to the external conductor of a concentric main.
 - b) Neutral Conductors: The term includes the neutral conductor of a 3 phase 4 wire system, the conductor of a single phase or d. c. installation which is earthed by the supply undertaking (or otherwise at the source of the supply) and the middle wire or common return conductor of a 3 wire d.c. or single phase a.c. system.
- 12) Semi enclosed machine: One in which the ventilating openings in the frame are covered with -
 - a) Girds expanded metal or wire gauze, with openings of less than 1/4 inch but not less than so as to obstruct free ventilation.
 - b) Wire gauge. in which the openings are less than 1/4 inch but not less than 3/32 inch (diameter or width):
 - c) Screens with smaller openings than the above.
- 13) Totally-enclosed Machine:

One in which the enclosing case and bearings are dust proof and which does not allow circulation of air between the inside and outside of the case.
- 14) Pipe Ventilated Machine: An enclosed machine in which, the frame is so arranged that the ventilating air may be conveyed to it through a pipe attached to the frame the ventilation opening maintained by the fanning action produced by the machine itself.

- 15) Forced draught machine: An enclosed machine in which the ventilating air supply is maintained by an independent fan external to the machine itself.
- 16) Protected Machine: One having end shall bearings and in which is free access to the interior without opening doors or removing covers.

SWICHESANDBREAKERSCIRCUIT

(See clause 1 of Specifications)

17) Switches and Circuits Breakers:

Switches and circuit breakers (rules 2b.36 and 37) whether fixed separately or

combined with lamps, holders of fittings, must comply with the following requirements:

- (a) Overthrowing must not take place at the point of contract or elsewhere, when the full current flows continuously.
- (b) They must be so constructed or arranged that the contracts cannot accidentally close when left open.
- (c) The base must be of incombustible, non-conductor and moisture proof material.
- (d) Circuit breaker as must be so Engaged and placed that no combustible material is endangered by their action.
- (e) Unless placed in an engine room or in a compartment arranged for the purpose, they must have their live parts covered. The covers must be of incombustible material and, must be either non-conducting or of rigid metal and clear of all internal machinery. For more than 6 amperes, at pressures exceeding 125 volts metal covers must be lined with insulating material.
- (f) In positions where they are liable to injure or come into contact with goods, they must be further protected by an open fronted box or other suitable guard.
- (g) Handles must be insulated so arranged that the hand cannot touch live metal, or be injured through and adjacent face blowing.
- (h) Switches having a handle projecting through an, open slot in the cover, must not be used.

GENERAL REQUIREMENTS

Scope of works:

The work covered by electrical specification consists supplying and installing, electrical wiring system complete in strict accordance with this specification and the applicable drawing and subject to the terms and conditions of the contract. It includes.

- (a) Conduit and wiring system for fans, lighting points, bells, clocks, sockets, etc. including fixing of lighting fixtures and fans etc. and miscellaneous points.
- (b) Conduit and wiring system for exhaust fans, power sockets etc.
- (c) Panelboards, distribution boards, switch fuse units.
- (d) Complete power and lighting cable systems.
- (e) Grounding system.
- (f) Conduit system.
- (g) Street lighting system.
- (h) Other miscellaneous electrical work.

Completeness of Contract;

Any work fittings accessories or apparatus which may not have been specifically mentioned in the specification but which are necessary in the equipment for efficient working of the plant should be deemed to be included in the contract and should be executed and provided by the contractors. All plant and apparatus should be complete in all the details, where such details, are mentioned in the specifications or not.

Three prints and one permanent negative of each of the finally approved drawings incorporating all the modifications proposed by the Department should be submitted. No modifications should be made in a drawing already approved by the Engineer-in-charge without his prior consent.

Approval of the contractor's drawing will not relieve the contractor of any part of his obligation to meet all the requirements of the contract.

Guarantee:

The performance of all the equipments and the installation should be guaranteed at least a minimum period of one year from the date of taking over the installation by the Department. All equipments must comply with the relevancy IS-BS specifications.

Interchangeability:

All corresponding parts of similar plant and equipment should be interchangeable in every way.

Tools;

All special tools required for dismantling and assembly of the equipment covered by the contract shall be supplied as obligation under the contract.

All tools to be supplied by the Contractor should be submitted along with the tender.

Specifications for Electrical Installation in Buildings

1. GENERAL:

These specifications relate to the electrical installations in the buildings of P.W.D. Electrical. These specifications cover general requirements to be fulfilled. These general specifications are supplemented by the specifications for the particular buildings separately attached.

These specifications are governed by the General conditions of the contract attached hereto.

APPLICABLE RULES AND REGULATIONS:

Installation shall be carried out conformity with regulations for electrical equipment of buildings, published by the Institute of Electrical Engineers London (14th Edition 1966 and as amended up to date) herein after referred to as the I. E. E. wiring regulations Where these specifications, or the special specifications for the particular building attached hereto are at variance with the I.E.E. regulation shall also comply with the requirements of the Indian Electricity Act, 1910 as amended up to date rules issued there under and also the regulations for the Electrical Association of India Where not specified otherwise, the installation should generally follow the Indian standard codes of practice and in their absence the relevant British Standard of practices. All the materials shall comply with the relevant Indian Standard or British Standard specifications

DEFINITIONS:

1.4.1. The definitions of terms in the I.E.E. Regulations shall apply in general.

DRAWINGS:

1.5.1. The preliminary drawings only indicate the general scheme of requirement. The exact position of all points, control switch boxes, runs of wiring and/or conduits joint boxes, inspection boxes, ladders,

and sub-distributionboards, mains etc shall be got approved Engineer-in-charge. All circuits shall be clearly numbered in wiring diagrams and building plans. The detailed design of a switch-board, specialfixture or any other part

of the electric installation as may be called for by the engineer-in-charge shall also be supplied by the Contractor and should be got approved by the Engineer-in-charge. Three sets of completion drawings and wiring diagrams showing the installations as executed shall be supplied by the contractor along with the completion certificate.

MATERIALS:

All materials shall be new and of the best quality conforming to the relevant I.S.B.S. specifications. They must be the products of reliable manufacturers of many years or standings, All like parts of materials shall be interchangeable. In case of equipments such as circuit breakers; switch fuses etc. a descriptive and illustrated literature shall accompany the tender. The names of manufacturers' of various materials shall be furnished in proform in Appendix-1. Samples of materials wherever required should be deposited with the Engineer-in-charge. All materials shall be rust-proof or rendered rust proof by application of suitable paints. The supply of all equipments, switchgear etc. shall be complete with accessories. Filings and mountings as may be required for their proper performance, and as specified in the relevant IS-BS Code of Practice and standards.

WORKMANSHIP:

Good workmanship and neat finished appearance are the prerequisites for complying with the clauses of these specifications. With a view to ensure fine workmanship the Tenderer shall employ licensed wiremen with an experience of not less than 5 years in the type of work they are engaged. The work should be done under supervision of licensed Electrical Supervisors with good educational qualifications and considerable experience.

- 1.7.2 Tenderer shall furnish the names of Supervisor and their wiremen. who will be engaged in this work, with details of their experience.

CO-OPERATIVE WITH CIVIL AND OTHER WORKS CONTRACTORS:

The Tenderer after the award of the contract, shall co-operate with the civil and other contractors and shall coordinate his work of the other contractors with the least amount of dislocation and interference to the other works. Tenderer shall go through the drawings carefully and shall furnish the Engineer-in-charge with all the details of openings in the wall set etc. they may be required for concealing any of the electrical

equipments or accessories. Where the contractor fails to furnish such information as may be required for the purpose of concealing the equipments etc. they shall be made at his (Contractor) cost and expense. Any alteration to parts of the buildings shall be made good at the contractor's expense and brought to the original shape finish and colour.

TESTING

The electrical contractor shall be completely responsible of the testing and commissioning of those installations covered by these specifications in compliance with the standard procedure, in obtaining permission of the Government Electrical Inspector. Any modification which is demanded by Government Electrical Inspector shall have to be carried out within the scope of the contract. The contractor shall submit four copies of drawings of installations as per regulations for shall be provided by the contractor for carrying out the installation work. All test shall be carried out in the presence of the Engineer-in-charge or his authorized representative and his approval obtained for the test results.

COMPLETION CERTIFICATE AND MAINTENANCE GUARANTEE:

After the completion of the installation and contractor should furnish a certificate in the proforma in Appendix-III, at the time of taking over the installation by the Department. The installation shall be guaranteed for period of 36 months (Except Elevators) from the date of taking over by the Department. During the period of guarantee all defects in material or workmanship shall be rectified or replaced free of cost to the Department.

For Elevators, DLP of 12 months shall be start from the handing over the building/Elevators (whichever is later). During the DLP, elevator sub-contractor shall enter in the 15 years of AMC contract.

TENDERER'S ABILITY

In order to enable the Department to assess the ability of the Tenderer to execute the work, the Tenderer shall furnish evidence of his experience and capacity to carry out magnitude and nature.

RATES:

The rates of items shall include all traces, transport, loading and unloading charge and all such charges that may the market are not entertained Break up figure as required in the schedule of work shall also be furnished. As far as possible indigenous materials only shall be included for supply. Where It is unavoidable, imported items may be included and Tenderer should clearly indicate materials, quantity, rate and amount of these items.

STORAGE SPACE:

~~No covered storage space will be provided by the Department. The contractor has to make his own arrangement. However, the Department may give an open space near the place of execution where the contractor can build his own stores for executing the work.~~

DEPARTURE FROM SPECIFICATIONS:

~~The Tenderer should clearly indicate departure, if any from the specifications with reasons for the same.~~

EXTRA ITEMS: As per maintenance Clause.

2. TECHNICAL SPECIFICATION:

Supply System:

The wiring installations shall be suitable for 3 phase 4 wire, 400-440V 50 cycles system of supply Color code of different phase shall be followed as per standard.

Wiring for Light and Fans:

2.2.2 Looping system to wiring shall be adopted. No joints shall be made at intermediate runs of cables and where they are unavoidable. such joints shall be through approved mechanical connections.

Point wiring:

Point wiring shall consist to the branch wiring from the board together with the controlling switch or push as far as and including the ceiling rose or any other approved connector or socket, outlets. In case of more than one light being controlled by one switch, the wiring up to the ceiling rose of the first light including the switch shall be considered as a Primary point. Loop wiring from light shall be considered as a 'Secondary' point and rates shall be quoted separately, including final connections to fixtures and plugs.

Conductors:

No conductor for final sub circuit wiring for light and socket outlets shall have cross-section less than that of 2.5 sq.m (aluminium)

Loading:

No final sub-circuit radiating from the fuse board of a sub-distribution board and wires with 25 sq. m. (Al) cable shall carry more than 10 lights, fans or socket outlets or a connected load of 800 watts whichever is greater. The following wattages may be assumed for estimating the load on each sub-circuit unless otherwise known or specified.

Incandescent lamps	100 watts
Ceiling fans	60 watts
5-A Socket Outlets (lighting)	100 watts
4. ft. fluorescent tube	50 watts
5. ft. fluorescent tubes	100 watts

In each sub-distribution board at least one way preferably two ways shall be left spare for future requirement. A wiring diagram giving the exact Utilization of the ways shall be prepared and fixed in the sub-distribution board itself or any other easily accessible place. The ways of sub distribution boards shall be accordingly numbered.

Local Control Switches (General):

Local control switches for circuit carrying not less than 5-A shall be piano type and shall conform to relevant I.S. Standards. The switch shall be "ON" when the knob is in the down position. All local control switches shall be connected in the phase or live conductor only and in the neutral conductor, switches shall be fixed in iron clad box and shall be so placed that the centre of the switch box is 1.3 Mtr. from the finished floor level unless otherwise stated. All switch boxes shall be provided with 1/8" thick Perspex cover fixed to the switch box with chromium plated counter sunk screws (brass).

2.2.5A Switches (Two Way):

- (a) Two way switches shall be piano type single pole, double throw, 250V, suitable for flush mounting and of 5A capacity as per the drawings. All switches shall be recessed in an embedded metal box.
- (b) Each box shall have suitable outlet for fixing conduits directly.
- (c) Each box shall have Perspex cover painted inside with the wall color, if required.
- (d) Each switch shall have suitable for the position in a stairway wiring. 2.2.5.B Switch Boxes (General) Electrical circuits shall be written suitable on the cover of all switched boxes, as approved by the Engineer-in charge (elect) whenever different phase are terminated in a switch box bakelite partition shall be provided. Each box shall be provided with a G.I. Earth stud nut and washers for earth connectors.

Ceiling Rose:

Ceiling rose shall be used on circuits having a normally exceeding 200V. Only one flexible cord shall be attached to a ceiling rose. Only 3-pin 5A socket outlet shall be provided in lighting circuits. All socket outlets be provided with a control switch and they shall be mounted in switch boxes in an approved manner.

Fittings:

These shall be of approved type as specified in the tender schedule. The subscript leads should terminate in a ceiling rose or conductor in the fitting and internal connection made there from. Wherever these fittings are suspended they shall be done so through the conduits and ball and socket joint. All fittings shall be grounded by a G.I. conductor not less than 16 S.W.G.

Flexible wiring:

Flexible cords of not less than .23/0076 size shall be used, The weight of suspension rod shall be governed by I.E.F. Regulations.

2.2.9. Ceiling Fans:

All ceiling fans shall be wired to ceiling rose and suspended from a hook shackle or clamp and insulated from the same. All joints in the suspension, rod shall be screwed and means of split pins. The fan clamps supplied by the Contractor shall be

suitable for the ceiling or roof member as the case may be. For concrete roofs, fan hooks shall be buried in concrete during construction in an approved manner and secure bound to the reinforcement.

2.2.10 Conduits and Earthing:

All conduits feeding lighting and circuits shall be provided with earth continuity G.I. conductor as specified for power wiring. All conduits shall be as specified for power wiring.

2.3.1 Point wiring:

Point wiring power shall be as defined under section 2.2.2 and shall include the switches and sockets.

2.3.2. Loading:

All distribution board for power wiring shall be not less than 15 A per way. Loading per way shall not exceed normally 100 watts. The following loads may be assumed if exact figure are not known.

3-Pin 15A Outlets	1.000 Watts	3-
Pin 5A Outlets	100 Watts	

Wiring for Motors:

Final sub-circuits loop in motors shall be connected to separate ways of the Distribution board even if the current in the sub-circuit is less than 15A. No looping is permissible.

All wiring shall be carried in H.G. conduit as specified in I.S. specification for gauge for different sizes of conduit. When the motor is resiliently mounted, fixable with approved adaptors shall be used for the last few feet. Where cables are used sufficient loop shall be left.

All switch fuse units controlling circuits feeding motor shall be provided with H.R.C. fuses or as specified:

The frame of every motor and its association contragear shall be earthed by two separate and distinct connections to earth connector shall be capable of carrying 3

times the rating of fuse or 1.1/2 time the setting or the circuit breakers but in no case than NO.8 S.W.G. or 7064" or equivalent cross section of copper. Where practicable, the earth connections shall be visible for periodical inspection. Gas or water pipes shall not be used for earth connections.

Socket Outlets and Control Switches A and 15A:

All socket outlets shall be of 3 pin type, the third pin being connected to the earth stud of nearest distribution board by separate earthing wire: The socket shall conform to I.S.: 1293/1938, 'single pole, piano type. Each socket outlet shall be provided with a control switch of appropriate rating and as specified. The switch and socket shall be mounted inside the iron clad box provided with 1/8" Perspex cover as directed by the Engineer-in-charge or as specified in schedule of quantities. Inside switch box ample space shall be available around switches for connection wires to switches. All socket outlets for power shall be mounted at the skirting level otherwise specified or as directed by the Engineer-in-charge.

The three phase plug receptacles shall have their earth terminals connected by independent earth wires to ring main strip on the building. In buildings where explosion proof fixtures are installed single phase plug receptacles as well as light points shall be connected to ring main ground bus installed in the building by separate earth wires of approved size.

Socket outlet shall have some provision not to receive the matching plug unless the grounding pin is in correct position. The grounding pin of the plug shall make the contact first and break the contact last at the time of inserting or removing the plug respectively.

The grounding terminal shall be connected to the enclosed metal body providing G.I. Stud, nut washers welded to the box.

Each unit shall be suitable for flush mounting as required and indicated in the applicable drawings.

Combination unit socket outlet and switch shall be complete with necessary internal wiring. The switch/socket shall be mounted on M.S. bracket enclosed in a box.

Conduit Wiring:

Where conduit wiring is adopted type and size of the conduit shall be as indicated in the drawing. The minimum of the conduit shall be 19 mm.

The contractor shall thoroughly study the structural of the buildings and wherever, necessary shall in consultation with Department's representatives at site, make

suitable adjustments in the cable routings, earthing arrangements, and location boxes, fitting etc. with a view to avoid interference with any part of the building, structure, equipment or any other work in the building or to effect any improvement in the arrangement.

Protection of conduit against rust:

Conduit shall be given two coats of oxide paint before they are placed in position. All exposed conduit shall be painted after installation with the colour as approved by the Engineer-in-charge. This does not apply to galvanized conduit.

Protection against insects and damp:

In order to minimize condensation or sweating inside the conduit, system shall be properly drained and ventilated in such a manner as to prevent the entry of insects.

Conduit shall first be installed as a complete system without cables and shall be continuous from outlet to outlet from fitting to fitting and mechanically and electrically connected to all boxes and fittings.

2.5. SPECIFICATION FOR POWER, CONTROL AND TELEPHONE CABLES:

I. SCOPE:

- i. The specifications cover the supply and medium voltage "Power and control cables either in ground or trench depending on the conditions at site including accessories for the same. The work in general, consists of supplying, laying, jointing, terminating and connecting at. 1.1. KV APLSTS PVC power and control cables.
- ii. The contractor shall supply all accessories including jointing and terminating materials, compound, tapes, supporting materials, cleats, cable lugs, concrete staples, bricks, sand, cable-markers etc. as required to make the installation work including digging and filling of the trenches as required.

II. SPECIFICATION:

- i. All power cables to be supplied mentioned as 'APLSTS' in the Schedule should be mass impregnated, non draining, paper insulated lead sheathed, double steel tape armored and must comply with the latest IS 1132 specifications.

- ii. All cabling materials such as cable compound, cable lugs, taped shall be of approved quality acceptable to the type recommended by the manufacture of the cable for which it is used and approved by the Department.

as installation of all equipment shall also conform to the applicable. Codes and practice as per the IS and shall be executed to comply with the latest Indian Electrical rules as regards the safety, payable of equipments and other essential provisions specified therein.

- iv. Only approved make of cables shall be used. ICC and CCI will be preferred,
- v. The cables shall generally be laid as per Code of practice.

III. GENERAL RULES CABLE LAYING:

- i. Installation shall be carried out in a neat workmen like manner by skilled experienced and competent workmen in accordance with the standard practices.
- ii. Cables shall be laid preferably in one length to avoid joints. If straight joints are found necessary, these can be introduced with prior approval of the Engineer-in-charge. The cost of the straight joint however, shall not be borne by the Department. But in no case joint shall be within the conduit G.I. pipe and duct.
- iii. Proper care should be exercised in handling the cable to avoid formation of kink etc. and should it become necessary a cable be bent to a radius not less than 20 times the overall diameter of the cable.
- iv. Method of installation, routing of cable etc. shall in every case be subject to the Department's approval and the contractors shall modify and or certificate no extra cost to the Department's any portions of the installation which do not meet with the Department's approval. All damages to the civil and other works on this account shall be made good by the contractor at no extra cost to the Department.

The electrical contractor while notifying the building contractor for such work shall furnish the proper drawings, fully explaining the work involved of indicate at suit actual work to be carried out as may be required by the building contractor. The electrical of any such work as the electrical work with this to the same has been completed.

- v. Where cables pass through masonry pipes, contractor shall fix hard wood bushed round

thecablesattheendsofhumepipes.Wherethecablespassthroughthefloorsor

chambers and in such situation's the Engineer shall require, the contractor shall seal cable holes in a manner approved by Engineer-in-charge. Where cable. passthrough roadsmullahs. etc. cables must be protected by class 'A' Hume pipe of diameters not less than 6. (15cms).

- vi. The cable routes shall be the shortest and these shall be minimum inference with built up areas, lawns etc.
- vii. Care shall be exercised for providing suitable props other service lines one near that the time of excavation. Where cutting of a lawn inevitable it should be with the approval of the Engineers-in-charge.
- viii. Excavation of the trenches shall be executed with vertical sides and the trench shall be kept as straight as possible. The exact location of each trench shall be settled by the Engineer-in-charge. On the site when the contract is in a position to commence each portion of the work.

The trench shall be not less than 1/2 meter wide and 90 cms deep. If more, cables are to be laid, the width should be suitably increased.

- ix. After the cables are laid, the trench shall be filled in layers, the each layer being well rammed by spraying. water and consolidated and sufficient allowance made for settlement. The extra earth over the trench should be removed from the place of trench to a place as decided by the Engineer-in-charge at site.
- x. Ends of cables shall be properly sealed to prevent entry of moisture prior to installation.
- xi. Where it is as specified as 1/2 core cables the 1/2 core shall be a natural conductor having reduced section.
- xii. For all multi core cables each core and tails shall be brought out, marked and or colored in an approved manner.
- xiii. Cables termination shall be done with suitable compression brass glands in the case of PVC cables and cast iron trifurcating boxes in the case of APLSTS cables. The Armour should be connected to the right main earth building with duplicate earth wires as per

the relevant IS/BS specification.

The core insulation over each conductor shall however be retained through out the run of the conductor upto the end where lugs shall be fitted thereon for connections. The lugs shall be fitted by means of approved solder and the such as aleap and Eyer NO.7 liberally used. The joint shall be mechanically strong and pressure tested.

DISTRIBUTION BOARDS AND PANELS.

General Requirements:

All distribution panels shall comply with IEE. Rules 60-61. A clear distance of 0.91 meter in front of the switch board shall be kept. Where bare connections of attachment are provided at the back of the switch board the space behind the panel shall be better less than 0.299 meter or more than 0.762 main width there shall be a passage way from the further outstanding part of any attachment or conductor. If the space behind the switch board exceeds 0.70 main width there shall be a passageway from either end of the switch board clear to night of 1.928m width 0.299 m. All wiring connection shall be made neatly and securely.

For circuits carrying more than 10 Amps, tinned cable sockets shall be used, all connections shall be so made as to form own diagram Circuit shall be clearly numbered to correspond to wiring diagram. Names of the distribution boards shall be painted as directed by the Engineer-in-charge. All the which fuse units and isolators D.Bs. shall be complete with earthing studs lugs neutral bar ink. H.R.C. fuses and of approved make.

Skeleton type panels shall have a rigid frame work adequately braced and supporting frames adequately braced over which sheet metal shall be neatly secured. All switches distribution boards etc. shall be neatly arranged on the panels and all connections made from the back of switches. The panels shall be rendered dust and vermin-proof. The interior of the panels shall not be accessible to unauthorized persons.

The recess type boards shall be embedded in wall in a cupboard with a metal hinged door with locking arrangement. In all recessed conduit work all distribution boards shall be recessed. Where recessing is not possible, free standing panel may be provided as approved by the Engineer-in-charge.

All individual components the switch fuse units D.Bs. etc. shall be connected by earth

connected by earth continuity wire of appropriate size with the main earth bus of the

D.B.etc.The panel switches of D.Bs. shall be earthed by the less than 2 distinctive paths to earth. Earthing of metallic parts of exposed metal shall not be effected through any structural metal work which houses the installation. Where metallic parts are not required to be earthed and are liable to become alive should the installation of the contractor become defective such metallic parts shall be separated by durable non conducting material from any structural work.

- (a) Power panels shall be 3 phase, 4 wire, 400/230 volts for the distribution of 3 phase or single phase power loads. Lighting panels shall be 3 phase 4 wire 400/230 volts for single phase lighting load distribution on all 3 phase.
- (b) All panels shall be done of protected front type with no mechanical or electrical defects.
- (c) Bus bars shall be of electrolytic copper or aluminium as specified and the properly tinned sizes as indicated on applicable drawings as required.
- (d) All knock outs for branch circuits entries shall be drilled and filled as required, for lighting panels the top and bottom cover plates shall be removable type.
- (e) Main disconnect device for all panel boards shall be of switches of disconnect type and of the size as indicated shall be mounted directly below the panel or through a short thread conduit of required size.
- (f) The main disconnect for all panel boards shall have an entry suitable for PVC Armored cable from bottom.
- (g) All panel boards shall be provided with an earthing terminal and lug for connection to the grounding system.
- (h) Temperature rise of all electrical parts shall not be more than 30°C With full load amperes at room temperature.
- (i) All bases and supports of current carrying parts shall be of moisture resistant insulating material and shall not be adversely affected by arcing.
- (k) The locations of panels shown in the drawings are only tentative; panels may be located at a place approved by the Engineer-in-charge.
- (l) All civil works connected, with fixing such as grouting chasing and making good shall be the Tenderer responsibility.
- (m) Wires adequate capacity with proper size of lugs shall be used for inter connections.
- (n) Panels should be self-supported on angle channel iron framework. It should be preferably of bolted construction in case bolted or grouted rigidly after leveling and alignment.

(0) The cupboard and D. B. should be of such size so to be accommodated in the existing room as per 1.5 rules and I.S. codes of practice for installations of Medium voltage switchgear.

(p) Fabrication drawing showing the detailed dimensions and panels and its components indicating the frame work, earthing positioning of switches. 6 Bs. cable boxes, adopter chambers etc shall be furnished to the Engineer-in- charge for his approval. All material to be got approved by the Engineer-in- charge. Panel should be guaranteed for satisfactory operations for a period of one year after handing over.

(q) The panel should be painted with anticorrosive paint suitable for humid ,and salty atmosphere on two coast to primer.

Switch Gears, power panels D.B. And S.F.Us. phase busbar, the Sizes of the bus bars shall be so selected that the current density in bar does not exceed 150 amps, per sq. m. for copper. The length of Dus-bar chamber should be as suitable length to fix all the switches etc. as per the prevailing standards, clear spacing of two adjacent buses shall be 1 a/2" minimum bar should be tasted all along with colour coated 11 KV grade PVC tape The maximum internal of support for each unsupported length shall exceed 600 mm.

The bus bar shall be of copper/alluminium and fabricated to the relevant standard specification. In case alluminium busbar is used special with high conductivity alluminium bus bar alloy E 91 C frame conforming to E.S.S. 2898 shall be used. The current density shall not exceed 800 A per sq. inch. Hylam barriers will be provided over the joints to prevent any short circuit.

The bus enclosing shall be made out not less than 16 gauge M. S. sheet construct on with angle iron support. All interconnections between bus bars S. F Us and

O. Bs shall be of adequate size and detail of such inter connection shall be furnished to the Engineer-in - charge for his approval.

The busbar shall be air insulated extensible type rectangular one. The bus bars chamber shall be dust tight by providing gaskets secured properly so as to tender it veritin proof.

The combination fuse switch unit should comply with IS 4064 BSS61 and BBS 2510 wherever applicable. It should be suitable to accommodate High Rupturing capacity cartridge Fuse links complying with IS 2208 or BS 88 and having a certified rupturing capacity of not less than 35 MVA at 4440 volts (ACS duly Q The switch gear (panrsD, Bs. etc. shall be installed generally as per is-Part -13072 and as specified and shown in drawings.

All fuse switch units shall be provided with, non-deteriorating HRC fuse links complying with IS 2208-1962 and having rupturing capacity of 35 MVA at 415 volts as specified.

All switches above 60 amps, rating shall be provided with suitable size adapted boxes. All switches mounted on the top of the busbars shall be provided with detachable type reverse entry adapter boxes. Suitably engraved tables shall be provided for each circuit as well as for the board.

A meters sector switches and LMH meter shall be provided where. Specifically mentioned. Small wiring for the inter-connecting shall be color coded and provided with numbered fuses for easy identification of circuits.

- (a) The distribution boards should be totally enclosed metal clad complying with B. S. 214. The M. S. sheet steel enclosures for recessed D. Bs. shall be of not less than 14 gauge.
- (b) The D. B. shall be with hinged door and the locking arrangements as approved by the Engineer-in-charge.
- (c) All the components shall be enclosed in the enclosure. The mounting of D. B. shall be got approved by the Engineer-in-charge before carrying out the installation.
- (d) The D. Bs shall have proper side-cut outs for conduits entry or cable entry as required and these shall be made on site
- (e) Adequate spacing shall be provided inside the D Bs. for easy removal of the fuses and carry out the interconnection.
- (f) A set of insulating barriers have to be provided between incoming breakers switches and fuses.

Switch fuse Units:

- (a) All the D.P.T.P. and T. PN. Switch fuse units shall be totally enclosed in a clad quick make, quick break type to best Indian make conforming to the I.S. or S. 3185 specifications. All the switch fuse units shall have mechanical interlock with a door so that the door so that the door cannot be opened when the switches are in ON position. The switch should be of double break solution type to ensure safety.
- (b) Each T.P.&T.P.N switch fuse unit shall be earthed with two distinct earth connections.
- (c) Suitable insulators shall be provided between phases.
- (d) There shall be suitable natural link in the fuse box.

- (e) All T.P. and T.P.N. switch fuse units shall be rated for 500 volts and D.P. (required for single phase supply) and S.P.N. switches for 250 volts.
- (f) The H.C. and D.G. fuses shall conform to U.S. 88 (1952).

The O.C.Bs. ACS shall be suitable for 400/440 volts 3 phase escapable of interrupting a fault MVA of not less than 31. The circuit breaker shall conform to the BSS-9361940. BSS3659 with such tripping arrangement as may be required under special specification is for the building. Efficient and fool - proof mechanical interlocking shall be provided for the safe operation and maintenance. The rate be inclusive of the first filling of oil.

Instrumentation:

All instruments and meters wherever necessary shall be housed in special sheet steel box located between switch fuses units and bus bar chambers. The instruments etc. shall be mounted on the hinged cover with their dial flushed. All instruments shall have protective H. R.C. fuse links. All interconnections and small wiring shall be neatly dressed arranged and duly coloured for easy identification of circuits.

Meters shall be provided as required in the Schedule, Meters shall be dead head and be suitable for 400/ 440 volt 3 phase 4 wire 50 c/cie (in balanced load) supply.

Each section switch shall be 3 point and of minimum 250 volts grade with silver tipped contact suitable for metering circuits, current transformers shall be of 5VA burden and commercial metering accuracy. Indication lamps shall be panel mounting type preferably of 250V grade. Every unit shall be prewired and interconnected to the system for its required indicating performance. Indicating lamps shall have independent circuit fuse.

FIXING OF LIGHTING FIXTURES:

1. Location of fixtures their manner of fixing mounting height etc. are indicated in relevant drawing. Actual location and levels shall however be arrived at site in co- ordination with other service etc. and prior approval of the Engineer-in-charge regarding the actual location Manner of fixing shall be obtained before the work is taken up in hand.
2. In all cases the contractor shall provide necessary interconnection wiring earthing painting etc. all necessary for complete installation. The contractor shall also test and commission the fixtures during completion of the work.
3. General arrangement of fixtures layout is indicated in drawings. Care shall be taken to see that all light fixtures are in a row in a room or particular area, are in

absolutely line and plumb and are symmetrically disposed with respect to finished surfaces of walls, columns, beams etc.

4. The inter-connections wiring from the light outlet point up to the fixture shall be carried out by means of flexible copper wire of section not less than 1.5 mm².
5. All fixtures suspended by means of conduits shall be done with all and socket joints or as per approved design.

INTERNAL ELECTRICAL WORKS TECHNICAL SPECIFICATIONS

GENERAL

NOTES:

1. The item given in this schedule are provisional. The Contractor shall be paid for the actual quantity of work executed as measured at the site at the rates tendered. The Engineer-in-Charge reserves the right to increase or decrease any of the quantities, or omit totally any item of work. Any claim by the Contractor on these accounts will not be entertained.
2. All the item of work given in this schedule of quantities shall be executed strictly in accordance with the latest Indian Standard Specifications and the requirements of the Electricity Supply Authority.
3. The Contractor shall visit the site and shall satisfy himself as to the conditions under which the work is to be performed. He shall also check and ascertain the location of any existing structure or equipment or any other situation which may affect the work. No extra claim as a consequence of ignorance or on ground of insufficient description will be allowed at a later date.
4. All equipment and material shall be NS/IS/BS approved.
5. All approvals shall be obtained from Engineer-in-Charge.
6. All equipment and material shall be inspected at manufacturer's works as per relevant IS by the Owner or his representative before dispatch to site.
7. All Shop drawings shall be approved by the Engineer-in-Charge/ before work at site or fabrication starts.
8. All Testing and Commissioning shall be as per relevant IS for equipment and IS: 732:1989 for the installation. All these testing records are to be maintained and submitted for Engineer-in-Charge representative.

9. The Contractor shall provide detail shop /working drawing and receive approval from Engineer-in-Charge before commencement of work.

10. The item given in this schedule are provisional. The Contractor shall be paid for the actual quantity of work executed as measured at the site at the rates tendered. The Engineer-in-Charge/ reserves the right to increase or decrease any of the quantities, or omit tally any item of work. Any claim by the Contractor on these accounts will not be entertained.

WIRING

GENERAL

Technical Specifications in this section cover the Internal Wiring Installations comprising of: Wiring for lights and convenience socket outlets etc. in concealed/surface conduit/raceways. Wiring for telephone outlet, Sub main wiring etc.

STANDARDS AND CODES

The following Indian Standard Specifications and Codes of Practice will apply to the equipment and the work covered by the scope of this contract. In addition the relevant clauses of the Indian Electricity Act 1910 and Indian Electricity Rules 1956 as amended up to date shall also apply. Wherever appropriate Indian Standards are not available, relevant British and/or IEC Standards shall be applicable.

BIS certified equipment shall be used as a part of the Contract in line with Government regulations. Necessary test certificates in support of the certification shall be submitted prior to supply of the equipment.

It is to be noted that updated and current Standards shall be applicable irrespective of those listed below.

1100V grade PVC insulated wires.	IS	694:1990
Rigid steel conduits for electrical wiring.	IS	9537: Part I 1980 IS 9537: Part II 1981

Accessories for rigid steel conduits	IS	3837:1990
Flexible steel conduits for electrical wiring	IS	3480:1990
Switch socket outlets	IS	4615:1990
Switches for domestic and similar purposes	IS	3854:1997
Boxes for the enclosure of electrical accessories	IS	5133:Part-I & II 1969
Code of practice for personal hazard fire safety of buildings	IS	1644:1998
Code of practice for electrical installation fire safety of bldg...	IS	1646:1997
Code of practice for electrical wiring installations	IS	732:1989

Outlet Boxes for Ceiling

Workmanship:

Outlet boxes for ceiling fans shall be fabricated from minimum 2 mm thick sheet steel. The boxes shall be hexagonal/round in shape of minimum 75 mm depth and 60 mm sides or 120 dia in case of round type box. Each box shall be provided with a recessed fan hook in the form of one 'U' shaped 12 mm dia rod welded to the box and securely tied to the top reinforcement of the concrete slab for a length of minimum 150 mm on either side. 3 mm thick Perspex/ hylam sheet cover of matching color shall be provided.

Boxes for Modular Wiring Accessories

Switch Boxes-Modular Type Switches

Workmanship:

Switch boxes suitable to house modular type switches of required ratings, and fan regulators as required shall be provided. In case the number of switches in one box is not tallying with that available in standard manufacture, the box accommodating the next higher number of switches shall be provided without any extra cost. In case fan regulator/regulators is /are to be provided at a later date, suitable provision for accommodating such regulators shall be made in the switch boxes and blank off covers shall be provided without any extra cost. Boxes shall be of same make as of Switches

Switch boxes shall be so designed that accessories are mounted on a grid plate with tapped holes for brass machine screws leaving ample space at the back

and on the sides for accommodating conductors, check-nuts and screwed bushes at conduit entries etc. The grid plates and M.S. boxes shall be fitted with a brass earth terminal. Boxes shall be attached to conduits by means of check-nuts on either side of their walls. Moulded front covers made from high impact resistant, flame retardant and ultra violet stabilized engineering plastics shall be fixed by means of countersunk chromium plated brass machine screws. No timber shall be used for any supports. Switch boxes shall be located with bottom at 1200 mm above floor level unless otherwise indicated.

Primary and Secondary Light Point Wiring

In respect of group control of lights (more than one light controlled by one switch or MCB), wiring up to the first light in the group shall be measured and paid for as a primary light point. Wiring for other lights looped in one group for switch controlled as also MCB controlled lights shall be measured and paid for as secondary light points. Primary light points for switch controlled lights shall include the cost of control switch whereas primary light points controlled by MCBs shall not include the switch cost. The cost of MCB controlling such lights shall not be included in the primary light point rate since the MCB shall be paid for in the item of DB.

The point wiring basis shall assume average wiring length and average conduiting length per point based on parameters stipulated in para 8.2 below. The average wiring length and average conduiting length forming the basis of point wiring payment, shall take the electrical layouts of the entire project into consideration. Tenderers are advised to seek clarifications, if they so desire, on this aspect before submitting their tenders. No claim for extra payment on account of electrical layouts in part or whole of the project requiring larger average wiring and conduiting length per point, whether specifically shown in tender drawings or not, shall be entertained after the award of contract.

Parameters: Wiring shall be carried out as per following parameters in recessed/surface conduit system.

- Only loop system of wiring shall be adopted throughout. No joints excepting at wiring terminals shall be permitted.
- All accessories shall be flush type unless otherwise stated.

- Lights, fans and 6 amp socket outlets may be wired on a common final such circuit. Such circuit shall not normally have more than a total of ten lights, fans or socket outlets or a load of 800 watts whichever is lesser.
- Power circuit shall normally have maximum one 16 amp socket outlet unless otherwise stated. Separate circuit shall be run for each geyser, kitchen equipment, window air conditioners and similar appliances.
- Wiring rates shall include painting of conduits and other accessories as required.
- Wiring rates shall include cleaning of dust, splashes of colour wash or paint from all fixtures, fans, and fittings etc. at the time of taking over of the installation.
- Wiring rates shall include blanking of outlet boxes to prevent damage/pilferage of wires as elaborated in para 7.2.

CONDUITS: All the conduits are 25mm rigid PVC MMS pipes/DB to Switch Board

- 2.5 sq.mm for phase & neutral & 1.5 sq.mm for earth / SB to point wiring -
1.5 sqmm for phase, neutral & earth.

Workmanship:

PVC Conduits:

Conduits shall be heavy gauge rigid PVC of minimum thickness of 1.8 mm. Conduits shall be ISI marked conforming to IS 9537 (Part 3) – 1983. All conduit and conduit accessories shall be of PVC. Conduits shall be joined together by a vinyl type cement/ solvent. Minimum size of conduit shall be 20 mm. Conduit shall be fixed on ceiling, wall or above false ceiling. All conduits shall be concealed in wall ceiling etc. or fixed on surface of wall with clamps at regular interval as called for elsewhere. For termination of PVC conduits into switch outlet boxes, PVC female adapters shall be used. Wherever conduit run exceeds 10 meter, circular junction boxes shall be provided to facilitate pulling and inspection of wires. Inspection boxes shall be suitable for size springs. Long radius bends shall be provided. Heating shall not be used to bend the conduits. Size of conduit shall depend upon number and size of wires to be drawn.

FIXING OF CONDUITS:-

Surface Conduit

Conduit pipes shall be fixed by heavy gauge saddles, secured to suitable wood plugs or other approved plugs with screws in an approved manner at an interval of not more than one meter but on either side of the couplers or bends or similar fittings, saddles shall be fixed at a distance of 30 cm from the center of such fittings. The saddles should not be less than 24 gauge for conduits upto 25 mm dia and not less than 20 gauge for larger diameter conduits. The corresponding widths shall be 19 mm & 25 mm. Where conduit pipes are to be laid along the trusses, steel joint etc. the same shall be secured by means of special clamps made of where it is not possible to drill holes in the trusses member's suitable clamps with bolts and nuts shall be used.

For 25mm diameter conduit width of clip shall be 19 mm and of 20 SWG. For conduit of 32 mm and above, width of clip shall be 25 mm and of 18 SWG.

Where conduit pipes are to be laid above false ceiling, either conduit pipes shall be clamped to false ceiling frame work or suspended with suitable supports from the soffit of slab. For conduit pipe run along with wall, the conduit pipe shall be clamped to wall above false ceiling in uniform pattern with special clamps if required to be approved by the Engineer-in Charge at site.

Recess/concealed Conduit

The chase in the wall shall be neatly made and of ample dimensions to permit the conduit to be fixed in the manner desired. In the case of building under construction, conduit shall be buried in the wall before plastering and shall be finished neatly after erection of conduit. In case of exposed brick/rubble masonry work, special care shall be taken to fix the conduit and accessories in position along with the building work. Entire work of chasing the wall, fixing the conduit in chases, and burning the conduit in mortar before plastering shall form part of this work.

The conduit pipe shall be fixed by means of staples or by means of saddles not more than 60 cm apart or by any other approved means of fixing. Fixing of standard bends and elbows shall be avoided as far as practicable and all curves maintained by bending the conduit pipe itself with the long radius, which shall permit easy drawing in of conductors. All threaded joints of conduit pipe shall be treated with some approved preservative compound to secure protection against rust. Suitable

inspection boxes to the barest minimum requirements shall be provided to permit periodical inspection and to facilitate replacement of wires if necessary. These shall be mounted flush with the wall. Suitable ventilating holes shall be provided in the inspection box covers. Wherever the length of conduit run is more than 10 meters, then circular junction box shall be provided.

POINTWIRING

- a) The Point Wiring shall commence from the Distribution Board and shall include the circuit wiring of length as required via the switch to the fitting/socket outlet as called for unless otherwise specified.
- b) The Circuit Wiring shall be with 2 Nos. 2.5 sq mm PVC insulated stranded copper conductor 1100 volt grade wires in PVC Conduit.
- c) The rates for all point wiring shall include the supplying and fixing of:
 - d) ISI approved & marked PVC conduits.
 - e) Conduit accessories conforming to IS
 - f) Draw, inspection and junction boxes.
 - g) Zinc chromate passivized switch boxes, outlet boxes etc.
 - h) All fixing accessories such as clips, brass screw etc.
- i) Embedding conduits and accessories in walls and floors etc. during construction and/or cutting chases and making good as necessary in the case of concealed conduit work and/or providing and fixing saddles, hangers, stirrups etc. and grouting of the same as required for surface conducting.
- j) Switches, wiring accessories and molded cover plate as required.
- k) Insulated copper earth wire for fixture, switch, outlet box and third pin of socket outlet to common earth.
- l) All work necessary for wiring a point circuit of any length from the Final Distribution Board to ceiling rose or connector via switch including circuit wiring with 2 x 2.5 sq mm PVC insulated stranded copper conductor 1100 volt grade wires in conduit as required.
- m) Painting all conduits, outlet boxes and junction boxes.

PVC INSULATED P.V.C. SHEATHED WIRING SYSTEM

GENERAL:

This system of wiring, is suitable for low pressure installation, and shall not be used in places exposed to sun and rain nor in damp places, provided they are sheathed in the special approved protective covering and well protected to withstand dampness.

Attachment to walls and ceiling:

All cables on brick walls, stone or plastered walls ceiling shall be run on well-seasoned, perfectly straight and well varnished on four sides, teak wood or any approved hardwood battens not less than 10 mm finished thick, width of which shall be such as to suit total width of cables laid on the batten, prior to erection, these shall be painted with one coat of varnish or approved paint of colour to match with surrounding. These battens shall be secured to wall and ceilings by flat head wood screws to raws plug or phill plug at an interval not exceeding 75 cm. Wood plugs can be used only with special approval of the Engineer-in-charge. The flat head wood screws shall be counter within wood batten and smoothed down with file.

Where wiring is to be carried out along the face of the rolled steel joints a wooden batten of adequate width shall first be laid on the same and dipped to it as inconspicuously as possible. The wiring should then be fixed to this backing in the ordinary way. Where wiring passes through structural steel work, the hole shall be suitably bushed to prevent the abrasion of the cables.

Attachment to false ceiling:

In no case, the open wiring shall be run above the false ceiling without the approval of Engineer-in-charge.

Link clips:

Only aluminum alloy clips/joint clips shall be used. The thickness shall be 0.32 mm (30SWG) for lengths of 25 mm to 40 mm and 40 mm (28SWG) for lengths of 50 mm to 80 mm. The width shall not be less than 8 mm in all these cases. Link clips/ joint clips shall be so arranged that one single clip shall not hold more than two core or three single core TRS of PVC insulated and PVC

sheathed upto 2.5 sw. mm. above while a single clip shall hold a single twin core or two single core cables. The

clips shall be fixed on varnished wood batten switch iron pins and spaced at interval of 15 cm both in the case of horizontal and vertical runs.

Bends in wiring:

The wiring shall not in any circumstances be bent so as to form an abrupt right angle but must be rounded off at the corners to radius not less than six times the overall diameter of the cable.

Protection of wiring from Mechanical Damage:

In cases where there are chances of any damage to wiring, such wiring shall be drawn complying with the all the requirements of conduit wiring system.

Such protective coverings shall in all cases be fitted on all down drops within 1.5m. from the floor or from floor level up to the switch board whichever is less.

Passing through floors:

All cables taken through floor shall be enclosed in heavy gauge steel conduit extending 1.5 m. above the floor or up to the switch board, whichever is less and flush with the ceiling below or by means of any approved type of metallic covering. The ends of all conduits or pipes shall be neatly bushed with porcelain wood or other approved material. The conduit pipes shall be securely earthed.

Passing through walls:

When conductors pass through walls, any one of the following methods shall be employed. Care should be taken to see that wires pass very freely through protective pipe or box and those wires pass through in a straight line without any twist or cross in wires on either ends of such holes.

A box of teak wood or approved hard wood extending through the hole thickness of the wall shall be buried in the wall and casings or conductors shall be carried so as to allow 1.3 cm air space on the three sides of the casing or conductor.

The conductors shall be carried in an approved heavy gauge solid drawn or lap weld conduit or in a porcelain tube of such a size that it permits easy drawing in, the ends conduit shall be neatly bushed with porcelain, wood or other approved material.

Where a wall tube passes outside a building so as to be exposed to weather, the outer end shall be mounted and turned downwards and properly bushed on the

open end. The conduit shall be neatly arranged so that the cables enter them without bending.

Buried cables:

The TRS or PVC sheathed cable shall not normally be buried directly in plaster. Where so specific in the special specification they may be taken in teak wood channeling of ample capacity or conduit pipe buried in the wall.

Stripping of outer covering:

While cutting and stripping of the outer covering of the cable care shall be taken that the sharp edge of the cutting instrument does not touch the inner insulation of the conductors. The protective outer covering of the cables shall be stripped off near connecting terminal and this protective covering shall be maintained up to the close proximity of connecting terminals as far as practicable. Care shall be taken to avoid hammering on link clips with any metal instrument after the cables are laid. Where junction boxes are provided they shall be made moisture proof with a plastic compound.

CIRCUIT CUM POINT WIRING

The rates for all point wiring items shall also include supplying and fixing of the following:

- 1 This schedule of Quantities shall be read in conjunction with the technical specification, General & Special conditions as well as all tender drawings.
- 2 Approved GI saddles and grouting the same for exposed conduit work.
- 3 16 gauge thick Outlet boxes and junction box.
- 4 All fixing accessories such as clips, brass screw etc.
- 5 Quoted rate for MCB controlled primary point shall include all the materials and works necessary including circuit length from DB up to first Point. Quoted rate for Switch controlled primary point shall include all the materials and works necessary including 1st switch board and first light point.
- 6 Embedding conduits and accessories in walls and floors etc. during construction and/or cutting chases (with chase cutting machine) and making good the same as necessary in the case of concealed conduit work.
- 7 Switch, socket outlet and necessary blank plates wherever required.

- 8 PVC insulated copper conductor stranded flexible wire of Green color with yellow bands for earthing of fixtures, outlet boxes and third pin of socket outlet.
- 9 Repainting of conduits, outlet boxes and junction boxes where ever damaged.
- 10 All wires shall be PVC insulated copper conductor stranded flexible 1100 volts grade and shall be of approved make. All wires shall be as per (FRLS).
- 11 All socket shall be shuttered type and with earth terminal.
- 13 Separate neutral and earthing wire shall be provided for each circuit.
- 14 Lighting and power circuit to be kept separate.
- 15 Average length consider by us for point wiring are tentative only. Vendor to reverify the same from drawings before quoting.
- 16 In case of switch control, primary point shall be considered as from switch board to first light point and secondary point shall be considered as from first light point to next light points (Loop point). In case of MCB control, primary point shall be from MCB (D.B.) to first light point and secondary point shall be considered as from first light point to next light points (Loop point)
- 17 The Contractor shall provide detail shop /working drawing and receive approval from Engineer-in-Charge /consultant before commencement of work.
 - (A) For 6A plug point 2.5 sq.mm for phase, 1.5 Sq.mm for neutral & earth
 - (B) For 16A plug point for A/C & Geyser 4 sq.mm for phase, Neutral & 2.5 sq.mm earth

WIRES

Wiring shall be carried out with PVC insulated (FRLS) 1100 volt grade unsheathed single core wires with electrolytic annealed stranded copper (unless otherwise stated) conductors and conforming to IS 694/1990. All wire rolls shall be ISI marked. All wires shall bear manufacturer's label and shall be brought to site in new and original packages. Manufacturer's certificate, certifying that wires brought to site are of their manufacture shall be furnished as required.

Light, fans and call bells shall be wired in the 'lighting' circuits. 15A/16A socket outlets and other power outlets shall be wired in the 'power' circuits. 5A/6A socket outlets shall also be wired in the 'power' circuit both in

Residential as well as non-residential buildings.

Colour coding: Following color codings shall be followed in wiring:- Phase:

	Red/Yellow/Blue. (Three phase wiring)
Live:	Red (Single phase wiring)
Neutral:	Black
Earth:	Yellow/Green.

Termination of circuit into switchboard: - Circuit will consist of phase/neutral/earth wire. Circuit will terminate in a switch board (first tapping point, where from point wiring starts) in following manner:-

Phase wire terminated in phase connector. Neutral wire terminated in neutral connector.

Earth wire terminated in earth connector.

The switchboard will have phase neutral and earth terminal connector blocks to receive phase/ neutral/earth wire.

LAYING AND DRAWING OF WIRES

Bunching of Wires

Wires carrying current shall be so bunched in conduits that the outgoing and return wires are drawn into the same conduit. Wires originating from two different phases shall not be run in the same conduit.

Drawing of Wires

The drawing of wires shall be done with due regard to the following precautions:-

1. No wire shall be drawn into any conduit, until all work of any nature, that may cause injury to wire is completed. Burrs in cut conduits shall be smoothen before erection of conduits. Care shall be taken in pulling the wire so that no damage occurs to the insulation of the wire. Approved type bushes shall be provided at conduit terminations.
2. Before the wires are drawn into the conduits, conduits shall be thoroughly cleaned of moisture, dust, dirt or any other obstruction by forcing compressed air through

the conduits if necessary.

3. While drawing insulated wires into the conduits, care shall be taken to avoid scratches and kinks which cause breakage of conductors.
4. There shall be no sharp bends.
5. The Contractor shall, after wiring is completed, provide a blank metal/sun mica plate on all switch / outlet / junction boxes for security and to ensure that wires are not stolen till switches / outlets etc. are fixed at no extra cost the contractor shall be responsible to ensure that wires and loop earthing conductors are not broken and stolen. In the event of the wire been partly / fully stolen, the contractor shall replace the entire wiring along with loop earthing at no extra cost to the Owners. No joint of any nature whatsoever shall be permitted in wiring and loop earthing.

Termination/Jointing of Wires

Sub-circuit wiring shall be carried out in looping system. Joints shall be made only at distribution board terminals, switches/buzzers and at ceiling roses/connectors/lamp holder terminals for lights/fans/ socket outlets. No joints shall be made inside conduits or junction/draw/inspection boxes.

Switches controlling lights, fans or socket outlets shall be connected in the phase wire of the final sub circuit only. Switches shall never be connected in the neutral wire.

Wiring conductors shall be continuous from outlet to outlet. Joints where unavoidable, due to any special reason shall be made by approved connectors. Specific prior permission from Architect/Owners in writing shall be obtained before making such joint.

Insulation shall be shaved off for a length of 15 mm at the end of wire like sharpening of a pencil and it shall not be removed by cutting it square or wringing.

Strands of wires shall not be cut for connecting terminals. All strands of wires shall be twisted round at the end before connection.

Conductors having nominal cross sectional area exceeding 4 sq. mm shall always be provided with crimping sockets.

At all bolted terminals, brass flat washer of large area and approved steel spring washers shall be used.

Brass nuts and bolts shall be used for all connections.

The pressure applied to tighten terminal screws shall be just adequate, neither too much nor too less.

Switches controlling lights, fans, socket outlets etc. shall be connected to the phase wire of circuits only.

Only certified valid license holder wiremen shall be employed to do wiring/ jointing work.

Load Balancing

Balancing of circuits in three phase installations shall be planned before the commencement of wiring and shall be strictly adhered to.

Colour Code of Conductors

Colour code shall be maintained for the entire wiring installation - red, yellow, blue for three phases, black for neutral and green for earth.

Fan Point Wiring

Point wiring for FAN with 2-1.5 sq.mm & earth wire of 1.5 sq.mm (Green) both are of ISI marked 1.1 KV Grade (FRLS) PVC insulated multi-stranded copper wires, in following type of pipe to be erected concealed in / flushed on wall/ceiling complete with 6A Modular type switch and hum-free EME four or more step type electronic fan regulator with separately mounted and accessories with earth continuity of following type erected on PVC / Metallic box, single mounting base frame covered with textured/metallic front plate modules erected on / in wall / ceiling as per pipe erected. With necessary ceiling rose / Connector including flexible conduit as required & all mounting accessories to mount the fan as directed. (a) With medium class Rigid PVC pipe and accessories Cat. III

Workmanship:

Point Wiring for fan shall be carried out with PVC insulated (FRLS) 1100 volt grade unsheathed single core wires with electrolytic annealed stranded copper (unless otherwise stated) conductors and conforming to IS 694/1990. All wire rolls shall be ISI marked. All wires shall bear manufacturer's label and shall be brought to

site in new and original packages. Manufacturer's certificate, certifying that wires brought to site are of their manufacture shall be furnished as required.

Fans shall be wired in the 'lighting' circuits. 15A/16A socket outlets and other power outlets shall be wired in the 'power' circuits. 5A/6A socket outlets shall also be wired in the 'power' circuit.

LOOP PLUG

Point wiring for Looped Plug with 6A Modular type switch & 5 pin socket erected on PVC / Metallic box, single mounting base frame covered with textured / metallic front plate modules erected on/ in wall / ceiling with following type accessories.

PVC PIPES

Providing and erecting ISI mark Medium class RIGID PVC PIPES of following size complete to be erected on/in wall or ceiling erected with necessary PVC fittings & Junction boxes fixed with adhesive solution & Clamps with following dia of pipes, in approved manner as directed, a) 20 mm., b) 25 mm., c) 32 mm.

Workmanship

CONDUITING

The rates to be quoted by tenderers shall include any or all of the following. No additional costs shall be paid for tools etc. as required to complete the work.

- All cutting of chase in brick wall shall be with chase cutting tools.
- Whenever required chases shall be cut in stone walls with a chase cutting machine and with specific tools as required prior to plastering.
- In case of exposed stone walls the conduits shall be laid along with the construction of the wall and coordinated with civil activity.

Fabricated accessories

Wherever required, outlet/junction boxes of required size shall be fabricated from

1.6 mm thick sheet excepting ceiling fan outlet boxes which shall be fabricated from minimum 2 mm thick sheets. The outlet boxes shall be of approved quality, finish and manufacture. Suitable means of fixing connectors etc., if required, shall be provided

in the boxes. The boxes shall be protected from rust by zinc phosphate primer process. Boxes shall be finished with minimum 2 coats of enamel paint of approved color. A screwed brass stud shall be provided in all boxes as earthing terminal.

Outlet Boxes for Light Fittings.

These shall be minimum 75mm x 75mm x 50mm deep and provided with required number of threaded collars for conduit

Entry. For ceiling mounted fluorescent fittings, the boxes shall be provided 300 mm off center for a 1200 mm fitting and

150 mm off center for a 600 mm fitting so that the wiring is taken directly to the down rod. 3 mm thick Perspex / hylam

sheet cover of matching colour shall be provided. LAYING

OF CONDUITS

Conduits shall be laid either recessed in walls and ceilings or on surface on walls and ceilings or partly recessed and partly on surface, as required.

Same rates shall apply for recessed and surface conduiting in this contract.

Stranded copper conductor insulated wire of size as per schedule of quantities shall be provided in entire conduiting for loop earthing.

GI wire of suitable size to serve as a fish wire shall be left in all conduit runs to facilitate drawing of wires after completion of conduiting.

RECESSED CONDUITING

Conduits recessed in concrete members shall be laid before casting, in the upper portion of slabs or otherwise as may be instructed, so as to embed the entire run of conduits and ceiling outlet boxes with a cover of minimum 12 mm concrete. Conduits shall be adequately tied to the reinforcement to prevent displacement during casting at intervals of maximum 1 meter. No reinforcement bars shall be cut to fix the conduits. Suitable flexible joints shall be provided at all locations where conduits cross expansion joints in the building.

Conduits recessed in brick work shall be laid in chases to be cut by electrical Contractor in brickwork before plastering. The chases shall be cut by chase cutting electric machine. The chases shall be of sufficient width to accommodate the

required number of conduits and of sufficient depth to permit full thickness of plaster over conduits. The conduits shall be secured in the chase by means of heavy duty pressed steel clamps screwed to flat strip saddles at intervals of maximum 1 meter. The chases shall then be filled with cement and coarse sand mortar (1:3) and properly cured by watering.

Entire recessed conduit work in concrete members and in brick work shall be carried out in close coordination with progress of civil works. Conduits in concrete members shall be laid before casting and conduits in brick work shall be laid before plastering. Should it become necessary to embed conduits in already cast concrete members, suitable chase shall be cut in concrete for the purpose? For minimizing this cutting, conduits of lesser diameter than 25 mm and outlet boxes of lesser depth than 50 mm could be used by the Contractor for such extensions only after obtaining specific approval from Architects/Owners. For embedding conduits in finished and plastered brick work, the chase would have to be made in the finished brick work. After fixing conduit in chases, chases shall be made good in most workmanlike manner to match with the original finish.

Cutting chases in finished concrete or finished plastered brick work for recessing conduits and outlet boxes etc. shall be done by the Contractors without any extra cost.

Surface Conduiting

Wherever so desired, conduit shall be laid in surface over finished concrete and/or plastered brickwork. Suitable spacer saddles of approved make and finish shall be fixed to the finished structural surface along the conduit route at intervals not exceeding 600 mm. Holes in concrete or brick work for fixing the saddles shall be made neatly by electric drills using masonry drill bits. Conduits shall be fixed on the saddles by means of good quality heavy duty clamps screwed to the saddles by counter sunk screws. Neat appearance and good workmanship of surface conduiting work is of particular importance. The entire conduit work shall be in absolute line and plumb.

Fixing of conduit fittings and accessories

For concealed conduiting work, the fittings and accessories shall be completely embedded in walls/ceilings leaving top surface flush with finished wall/ceiling surface in a workman like manner.

Loop earthing wire shall be connected to a screwed earthstead inside outlet boxes to make an effective contact with the metal body.

INTERNAL LIGHTING

All lights accessories with driver to be provided with 5 Years Warranty.

1. Detailed Catalogues, Technical data sheet showing all specified parameters, labels as mentioned for each item.
2. CE Test certificate for all Luminaires.
3. Photometry & Luminance distribution tables for all Luminaires.
4. Relevant certificates showing Lamp data (Lamp Life, Lumen Output, and Lumen Depreciation Curves).
5. Samples of the Luminaires to be made available at site Along with the Quote.
6. Guarantee Certificates Mentioning Free replacement of Luminaires, Lamps & Lighting Control Equipment.
7. Supply, Installation, testing, commissioning, receiving the lighting fixture including assembling etc. of the following lighting fixtures including fixing arrangement and with all accessories as required with necessary GI pipe/steel pipe etc as required for hanging of lighting fixtures.
8. Supplying, installation, testing & commissioning of All fixtures shall be complete with lamps and required control gear.
9. All, LED Light fixtures shall be complete with control gear. All lights accessories with driver to be provided with 5 Years Warranty.
10. Samples of all the fixtures with all available color shall be submitted to the Engineer-in-Charge before supply & approval is taken.
11. Please check the fixtures final quantity from the Engineer-in-Charge before ordering and be sure of actual requirement prior to ordering.

1. Providing and erecting Approved make Ceiling fan with double ball bearing ISI mark with condenser A.C. 230V.50 c/s.1200 mm. sweep complete, canopy erected on existing hook or clamp with earthing. [Make shall be approved by Engineer in charge]
2. Supplying&erectingFanHookof10mmM.S.RoundbargroutedinRCCslab with making the site as original.
3. Providing 2.5mm.thick laminated acrylic sheet to cover the fan hook or Fan box.
4. Supplying & erecting low noise decorative exhaust fan having square frame ABS body with inbuilt lowers & square frame.200mm with 1350RPM.
5. Ceiling fans including their suspension shall confirm to * IS 374-1960 specificationforelectricceilingfansandregulators(Revised)&tothefollowing requirements:
 - (a) All ceiling fans shall be wired to ceiling roses or to special connector boxes, to which fans rod wires shall be connected and suspended from hooks or shackles with insulators between hooks and suspension rods. There shall be no joint in the suspension rod, but if joints be unavoidable then such joints shall be screwed to special couplers of 5 cm minimum length and both ends of pipes shall touch together within couplers, and shall in addition be secured by means of split pins; alternatively, the two pipes any be welded.
 - (b) Fans clamps shall be of suitable design according to the nature of construction of ceiling on which these clamps are fitted. In all cases fan clamps shall be fabricated from tested new metal of suitable sizes and they shall be as close fitting as possible. Fan clamps for reinforced concrete roots shall be buried with the casting end due care shall be taken that they shall serve the purpose. Fan clamps for wood beamsshall be of suitable flatiron fixed on two sidesof the beamand according to the size and section of the beam one or two mild steel bolts passing through the beamshall hold both flatirons together. Fan clamps for steel joint shall be fabricated from tested flat iron to fit in rigidly to the bottom flange of the beam. Care shall be taken during fabrication that the metal doesnotcrackwhilehammeringtoshape.Otherfanclampsshallbe

made to suit the position, but in all cases care shall be taken to see that they are rigid and safe.

NOTE: All fan clamps shall be so fabricated that fans revolve steadily.

- (c) Canopies on top and bottom of suspension rod shall effectively hide suspensions and connections to fan motors, respectively.
- (d) The lead-in wire shall be of nominal cross-sectional area not less than 1.0 mm² with copper and 1.5 mm² with aluminium and shall be protected from abrasion.
- (e) Unless otherwise specified, the clear distance between the ceiling fan and the floor shall not be less than 2.75 m.

Exhaust Fans:

For fixing of an exhaust fan, a circular hole shall be provided in the wall to suit the size of the frame which shall be fixed by means of lag-bolts embedded in the wall. The hole shall be neatly plastered with cement and brought to the original finish of the wall. The exhaust fan shall be connected to exhaust fan point which shall be wired as neat to the holes as possible by means of a flexible cord, care being taken that the blades rotate in the proper direction.

Attachment of fittings and accessories:

In other than conduit wiring, all ceiling crosses, brackets, pendants and accessories attached to walls or ceilings shall be mounted on substantial teak wood block twice varnished after all fixing holes are made in them. Blocks shall be not less than 4 cms. deep. Brass screws only shall be used only shall be used for attaching fittings and accessories to their base blocks.

Main Switch gears, Switch Board and their location:

- 1 Switch boards, if unavoidably fixed in places likely to be exposed to weather, to drip or to abnormal moist temperature the outlet casing shall be weather proof and shall be provided with glands or bushing of adopted to receive screwed conduit according to the manner in which cables are run. PVC and

double flanged bushes shall be fitted in the holes of the switches for entry and exit of wires.

- 2 A switch board not be installed so that its bottom is within 1.25 m. above the floor unless the front of the switch board is completely enclosed by a door or the switch board is located in a position to which only authorized persons have access.
- 3 Switch boards shall be recessed in the wall if so specified in the schedule of work or in the special specification. The front shall be fitted with hinged panel of other suitable material such as Bakelite in wood frame with locking arrangement, the outer surface of door being flush with the walls. Ample room shall be provided at the back for connections and at the front between the switchgear mountings and the door.
- 4 Equipment which are on the front of a switchboard shall be so arranged that inadvertently personal contact with live parts is unlikely during the manipulation of switchgears, changing of fuses or like operations.
- 5 No holes other than the holes by means of which the panel is fixed shall be drilled closer than 1.3 cms. from any edge of the panel.
- 6 The various live parts, unless they are effectively screened by substantial barriers of non-hydroscopic, non-inflammable insulating material, shall be so spaced that space shall not be maintained between such parts and earth.
- 7 The arrangement of gear shall be such that they shall be readily accessible and their connections to all instruments and apparatus shall also be traceable.
- 8 In every case in which switches and fuses are fitted on the same pole, these fuses shall be so arranged that the fuses are not alive when their respective switches are in the off position.

Control at Point of Commencement of Supply:

- 1 There shall be linked main switchgear with fuse on each live conductor of the supply mains at the point of entry. The wiring throughout the installation shall be such that there is no break in the neutral wire except in the form of a linked switchgear. The neutral shall also be distinctly marked. In this

connection Rule 32 (2) of the Indian Electricity Rules, 1966 (See Appendix - 'A') shall also be referred.

- 2 The main switchgear shall be situated as near as practicable to the termination of service line and shall be easily accessible without the use of any external aid.
- 3 On the main switchgear, where the conductor of a two wire system or an earth neutral conductor of a multi-wire system or a conductor which is to be connected thereto, an indication of a permanent nature shall be provided to identify the earth neutral conductor. In this connection Rule 32 (1) of Indian Electricity Rules, 1956 (See Appendix 'S') shall be referred.

*Deputy Executive Engineer
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