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CHANGI AIRPORT

IMPROVEMENT WORKS AT **TOILET CLEANER ROOM** **TERMINAL 1**



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OBEJECTIVES

Purpose of method of statement

To define a safe procedure for the installation of work without any compromise to personnel safety or damage to third party properties.

Please note that this method statement is divided into 2 parts:

- Piping Installation
- Tilling Installation

Work Location

Working location mention in tender are:

- West Immigration Male Toilet (T1-T108)
- East Immigration Female Toilet (T1-T104)
- East Immigration Male Toilet (T1-T105)
- West Entrance Hall Male Toilet (T1-T135)
- West Entrance Hall Female Toilet (T1-T137)
- West Immigration Female Toilet (T1-T110)
- Centre Core Male Toilet (T1-T106)
- East Baggage Claim Hall Handicap Toilet

TILING WORKS



Materials

- A 'Material Proposals' schedule shall be submitted to the Client / Consultant giving details of materials, manufacturer's name, technical details etc. Once these details are approved, procurement shall begin and a "Material procurement schedule" will be submitted.
- Total care shall be taken to ensure that the materials that finally arrive at site meet all requirements of specifications and the bill of quantities, for which the store-keeper and site engineer should be responsible.

Project Management

- Site staff will be organized as per an 'Organization Chart' issued at the beginning of the Project. Any revisions to the site organization will be duly recorded and intimated to the Project Managers.
- Weekly site meetings shall be attended by a senior member of the contractor's team. There should be periodic visits by the Executive Management.
- Any deviation from approved working drawings made by site instructions by the Client / Consultant shall be indicated in the 'As Installed' drawings to be issued at the end of the project known as "as built drawings". These instructions will have to be formally confirmed before the required changes or deviations are implemented. Time or cost implications, if any, shall be brought to the client's notice subsequently.
- The site engineers shall co-ordinate with agencies handling other services such as electrical, HVAC, Interiors etc as and when required.
- A strict quality control program should be implemented and all efforts must be made to achieve and maintain a high degree of workmanship.

SafetyPlan

A safety plan shall also be submitted prior to commencement of work. Due care shall be taken as regards all the safety aspects of the works. Relevant PPE (Personal Protective Equipment) shall be used by all personnel working on the installation.

Method for Tiling Installation



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Before start of tiling work make sure that ceramic tiles type & color, mortar mix, glue, grout, shop drawings and method of application are acceptable to the consultant or any other approving authority. After that make sure that materials that are available are from approved manufactures and in original packing. This will ensure that no counterfeit material is used at project site.

Before bulk installation works mock up approval is important that is normal process for smooth site construction activities. Mock up shall be raised for the inspection and approval from consultant or contractor as applicable. Approved mock up and sample shall be available at site and the materials delivered to site shall be checked with respect to the approved sample.

Pre Requisite For Tiling Work at Walls:

- Ensure the MEP clearance obtained and all other under laying installations are approved prior to start of tiling works.
- Working area to be restricted for unauthorized entry.
- The surface to which tiles are to be fixed shall be thoroughly dry before fixing commences and free from all defects.
- The areas to be tiled shall be brushed clean and all traces of grease, oil, loose particle etc. must be removed.
- Ensure that the laying of tiles shall be as per the direction and pattern agreed with the consultant.
- Before laying tiles obtain approval of setting out by consultant. Provide symmetry about center lines of the space or areas and adjust to minimize tile cutting.
- Lay out tile work so that tiles less than 1/2 full size do not occur and with minimum of cutting. Carefully grind edges of cut tile. Ensure cut tiles are in corners and are equal on each wall face.
- Tile layout on floors / walls shall follow the layout on floors / walls as per approved shop drawings.

Method Statement for Tiling at Walls

- For concrete block walls and concrete walls to be finished with tile, apply a leveling



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coat of plaster minimum 12 mm thick, sufficient to cover the unevenness of the substrate and to make walls true vertical.

- Plaster shall be finished rough in order to have a strong key for tiling works.
- Plaster curing period shall be completed before start of tiling work.
- To ensure rows of tiles are truly horizontal, a level line shall be established to position the starting course.
- Tiles of specified and approved sizes shall be fixed to wall surfaces by approved adhesive.
- Mixing of adhesive shall be strictly followed in accordance with manufacturer's recommendations.
- Mortar shall be used within 2 hours of mixing at normal temperatures or within the pot life of the mix whichever is achieved earlier.
- Material shall not be used after initial set has taken place.

Thin Bed Adhesive-Walls

Apply floated coat of adhesive to dry background in areas of approximately 1 M2 and comb the surface with the recommended solid bed trowel. Apply thin even coat of adhesive to backs of dry tiles. Press tiles onto bedding with twisting/sliding action to give finished bed thickness of not more than 2 mm.

Thick Bed Adhesive-Walls

Apply floated coat of adhesive to dry background and comb the surface with the



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recommended solid bed trowel. Fill any keys and apply thin even coat of adhesive over the entire back of each tile. Press tiles onto bedding with twisting/sliding action to give finished bed thickness within the range recommended by the manufacturer.

- Tamp the tile with rubber mallet to obtain required adhesion and level.
- Tiles shall be laid with required spacing and spacers shall be used to align horizontal and vertical joints.
- Lay tile to pattern in accordance with Shop Drawings. Verify pattern is uninterrupted through openings.
- Establish lines of borders where applicable.
- Excessive mix/adhesive shall be removed with a damp cloth before the material has set.
- The vertical joints shall be maintained plumb for the entire true level and plane by uniformly applied pressure.
- Joints in glazed wall tiles and fittings, after edges of tiles have been thoroughly wet (After 48 hours later) it shall be grouted with neat white or colored approved grout.
- Grout shall be applied to the spaces between the tiles using a sponge or a small piece of the soft
- cloth.
- Ensure that joints are 6 mm deep (or the depth of the tile if less), and are free from dust and debris.
- Force grout and fill joints completely to entire depth, tool to an approved profile, clean off surface and leave free from blemishes.
- Rub wall tiling with a dry cloth when joints are hard.
- Keep expansion/contraction and control joints free of mortar or grout.
- Control Joints: Provide Control Joints 6mm minimum width in large tile areas at a maximum of 4.5m in each direction and at the perimeter walls. Do not saw-cut joints after installing tiles.
- Movement joints shall be located as required and be carried through backing to the structural wall, partially fill with strip and finish flush with sealant to the manufacturer's recommendations.
- Tiling shall be protected from heat and inclement weather until jointing has completely set.

Tiling Work Method for Floors

- Ceramic tiles type & color, mortar mix, glue, grout, shop drawings and method of Application shall be approved by the consultant.



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- Ensure that delivered materials from approved manufactures and in original labeled packing.
- Mock up shall be arranged for wall and floor tiles at location designated by the consultant for the final approval.
- Approved mock up and sample shall be available at site and the materials delivered to site shall be checked with respect to the approved sample.
- Tiles of approved sizes shall be used for laying.
- Ensure the MEP clearance obtained
- Restrict the working area to prevent unauthorized entry.
- The areas of substrate to be tiled shall be brushed clean and the finished floor level shall be established by means of dots.
- All traces of grease, oil and loose particles etc. must be removed.
- In wet areas check that approved Water proofing is completed as per Manufacturer's instruction and tested for leakage.
- Ensure that the laying of tiles shall be as per the direction and pattern agreed with the consultant.
- Setting out shall be done by the surveyor and approved by the consultant.
- Before laying tiles obtain approval of setting out by consultant. Provide symmetry about center lines of the space or areas and adjust to minimize tile cutting.
- Tiling should be started from the start point as fixed on the approved shop drawings.
- Lay out tile work so that tiles less than 1/2 full size do not occur and with minimum of cutting. Carefully grind edges of cut tile. Ensure cut tiles are in corners and are equal on each wall face.

Preparation of Floors

Cast-in-place concrete substrates shall be sufficiently smooth and level such that when thin-set mortar to accept tiles is applied, no voids under the tiles occur. Grind off high spots and fill-in low spots as necessary to ensure no voids occur.



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Floor Water Proofing Application

All toilets & pantries to receive water proofing. Apply the liquid waterproofing at a rate of minimum 1.5 kg/m² on horizontal surface and extend at least 100mm high on vertical surfaces or as per the approved shop drawings and method statement details. Before installation of porcelain tiles, place a 1000 gauge polythene sheet protected by 10mm mortar layer and coordinate floor water proofing works with the porcelain tiles installer. Testing shall be before and after the installation of tiles.

Method Statement for Tiling at Floors

- Apply tile adhesive to the wall in the required thickness.
- Tiles shall be placed according to level shown in drawing and shall be placed firmly with the help of rubber mallet.
- Remove and reset for solid bearing tiles that give hollow sound when tapped with steel rod, after installation.
- Tiles shall be laid level or enough falls in wet areas as may be required.
- Particular care shall be taken in wet areas to prevent low spot and pooling of water.
- The tiles shall be neatly cut, grind rough on exposed edges around pipes & other obstructions.
- Make provision of floor drains as per approved shop drawings.
- Silicon rubber sealant shall be inserted between tiles and sanitary fittings.
- When the installation has hardened sufficiently (after 48 hours) a thick grout of cement mixed with a minimum amount of water/approved grout shall be prepared and brushed over the floor until all the joints are thoroughly filled.
- Surplus material shall be removed with a dry cloth.

PLUMBING WORKS

INSTALLATION

Given below are method statements for general plumbing installations. This may need to be modified in specific cases depending on the nature of the installations.



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External piping – Water supply

- Mark pipe lines in ground according to working drawing and provide barricading.
- Excavate trenches to required depths as per working drawings.
- Prepare base of trench for laying pipes, as per technical specifications.
- Lay the pipes on the prepared base and support them at adequate intervals.
- Test the pipes for leaks under pressure in the presence of client's representative and maintain a 'test certificate' duly signed by the representatives of the client and contractor.
- Coat the pipes with the specified anti-corrosive treatment (if metal pipes are used).
- Provide encasement with sand/granular material, if specified.
- Backfill trenches in layers including compaction.

External piping - Sewerage & Storm water

- Mark pipe lines in ground according to working drawings.
- Excavate trenches to required depths with proper barricading.
- Prepare base for laying pipes.
- Lay pipes according to specified gradient.
- Perform hydraulic/smoke test and obtain certification from client's representative.
- Provide encasement with concrete / sand/ granular material, as specified.
- Backfill trenches in layers including compaction.

Shaft Piping

- Mark for pipes on the plastered shaft walls according to details in the working drawings. Ensure that the plastering is completed as it will be almost impossible to plaster walls after the pipes are in place.
- Fix brackets as per details shown on the working drawings. A clear gap of 25 to 50mm shall be maintained between pipe and wall surface.
- Clamp pipe assemblies on to the brackets. Make sure the pipes are in 'line' (horizontal runs) or in 'plumb' (vertical stacks). Where expansion / contraction



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will be a concern, ensure that pipes are not rigidly held to brackets.

- Make cut-outs on the shaft walls for branch pipes at locations shown on the drawings.
- Insert sleeves wherever required. Ensure that annular space in sleeves is not more than 25mm. Annular space shall be filled with yarn and flexible sealant after installation of pipe through the sleeve.
- Provide branches on the pipe assembly for connections to internal pipework. Provide isolating valves on water supply pipes at locations shown on working drawings; at easily reachable heights.
- Test the pipes for leaks under specified pressure for the specified duration.
- Tests must be witnessed and approved by client's representative.
- Paint the pipes as per approved colour code and provide identification labels where called for.
- Take measurement of pipes installed. A representative of client must be present and should acknowledge the records.
- Terminate soil, waste and vent pipes with vent cowls at specified heights above terrace level. Ensure that vent cowls are not terminated within one meter (horizontally and vertically) from any window openings. Terminate water supply risers with automotive air vents (with isolating valves) and down pipes with drain plug/drain valve – all as per drawings. Ensure that water supply pipework would be self-venting and self-draining.
- Connect the soil stack(s) to inspection chamber(s) at ground level.
- Connect waste stacks(s) to the gully trap(s) at ground level. Connect the gully trap(s) to the inspection chamber(s).

Pipes in wall chases

- Make sure that walls are at least rough-plastered and finish levels are marked by the civil contractor. If proper cladding levels are not marked, the pipes could be too deep or too shallow inside. Pipes deep in the wall will require use of extension nipples at faucets. Wall flanges of concealed stop cocks, concealed shower mixer etc will not fit-in correctly.
- Mark pipe lines on walls as shown on the working drawing.
- Chase the walls to required depth using a chasing machine.
- Assemble piping starting from branch left in shaft and install in the wall chase with clamps. Use pre-fabricated assemblies wherever possible.
- Locate fixture outlets according to working drawing and tile-module drawings. Tile modules shall be marked on walls by the civil contractor.
- Plug all openings and test the pipework for leaks under specified pressure and for required duration. Test should be witnessed and approved by authorized



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personnel.

- Apply anti-corrosive coating or wrapping on the pipe, as specified (if metal pipes are used). Ensure that the tested pipe joints are not disturbed.
- Insulate hot water pipes with the specified material.
- Note: Wherever possible, pipes may be pre-insulated/pre-wrapped, leaving joints, prior to installation in the wall chase.
- Close the wall chases with cement mortar. If site conditions require a depth of more than 100mm to be chased, it is advisable to use a suitable mesh while plastering and 'making good'.

Pipes in sunken floor or suspended in ceiling (Drainage)

- Make sure that base water-proofing of toilet floors is completed.
- Locate and mark positions of soil and waste outlets. Make core drills where necessary.
- Assemble pipe headers and connect them to branches left in the shaft for this purpose. Pre-fabricate wherever possible.
- Make sure that pipes are in proper slope and are supported adequately. Always ensure that the spacing of supports is as per specifications. Ensure that floor traps are installed in level (not tilted) so that the water seal is not diminished.
- Test the pipes and attend to leaks, if any. Supervise the filling of sunken floors by civil contractor so that the alignment and slope of drainage pipes are not disturbed. It is in the plumbing contractor's interest to ensure that water proofing of the core drills is done and tested.
- Keep all open ends plugged to prevent ingress of construction debris.