

5.0 INSTALLATION

5.1. ADHESIVE BEDDING - MATERIAL PREPARATION

To prevent poor performance and failure, adhesive bedding should be mixed with consistent proportions. When proprietary products are used, the manufacturer's instructions should be followed, especially for the mixing proportions, procedure and slaking time, where applicable.

The photos below (Figure 5.1.a to 5.1.d) demonstrate the preparation process.



Amount of water or liquid latex added according to manufacturer's specs
Figure 5.1.a



Adding powder into the container according to manufacturer's specs
Figure 5.1.b



Mix with electric mixer
Figure 5.1.c



Adhesive mix ready for use
Figure 5.1.d

Table 5.1: Surface preparation for different types of substrates

Type of substrate	Surface preparation	Remarks
1. Masonry surfaces e.g. brick walls	- Check level and render to level.	In wet areas, apply waterproofing membrane before rendering.
2. Reinforced concrete surfaces	- Concrete to cure for 28 days. - Apply screed to level if necessary.	
3. High-precision concrete block surfaces	- If level satisfies, suitable primer may be applied. Otherwise, apply render to level.	If in doubt, seek the recommendations of the manufacturers before rendering.
4. Proprietary partition walls e.g. dry walls	- Manufacturers of these boards should certify their suitability of uses. The boards should be installed in strict accordance with the manufacturer's instructions, especially with spacing and grade requirements of the supporting metal studs to ensure the rigidity of the substrate. Boards and steel frames should be strong enough to take the load of the tiles. - The boards may be coated with a suitable primer to adjust moisture absorption before tile installation. The board manufacturer's instructions should be strictly followed. - The surface boards should be free from contaminations such as dust, laitance, grease, wax, loose or flaking areas etc. - For more details, refer to Good Industry Practices Guide – Drywall Internal Partition, CONQUAS® Enhancement Series.	

5.2. LAYING OF TILES

Adequate lighting must be provided when laying tiles. Tiles that are slightly out of alignment may show up badly when lighting falls on them.

For large format panel or tiles, adhesive should be applied on both the slab and back surface of tile to ensure sufficient and proper coverage for the tiles.

When handling the installation of large format ceramic panel on the wall, an aluminum frame with suction pads is recommended. The use of suction pads on metal frame helps to minimise damage to large format panel/tile.

The photos below (Figure 5.2.a to 5.2.h) demonstrate the process of tile laying for floor.



Cleaning ceramic tile to remove dirt and dust before laying
Figure 5.2.a



Trowelling adhesive with notched trowel
Figure 5.2.b



Adhesive fully trowelled
Figure 5.2.c



Applying adhesive on back surface of tile
Figure 5.2.d



Using mallet to tap on tile for good coverage of tile adhesive between tile's back and floor substrate
Figure 5.2.e



Checking adhesive coverage during tiling
Figure 5.2.f



Checking the evenness and lippage after laying each tile
Figure 5.2.g



Plastic spacer for consistent joint
Figure 5.2.h

The photos below (Figure 5.2.i to 5.2.l) shows the tile laying process for wall tiles.



Applying adhesive with notched trowel on wall
Figure 5.2.i



Applying adhesive on back surface of tile
Figure 5.2.j

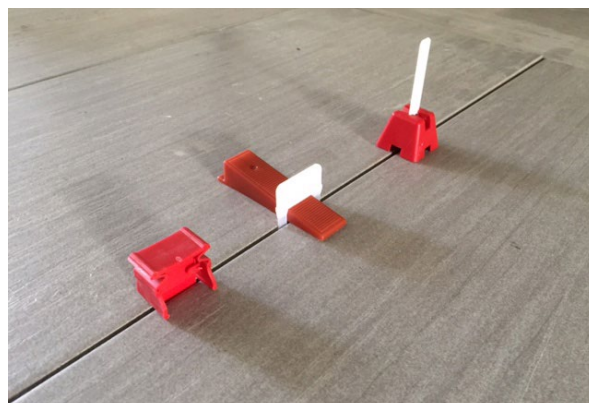


Installing tile on wall
Figure 5.2.k



Using rubber mallet to tap on tile after laying for uniformity
Figure 5.2.l

To minimise lippages when installing tiles, a suitable tile levelling system should be considered (Figure 5.2.m). Tile levelling system with a 2-in-1 function acting as a tile spacer as well are available in the market. This will help reduce/eliminate the need to level the edges and ensure consistency of the joint width. Such levelling systems can be used to address lippages that may be encountered when laying large format tiles / panel in stretcher bond pattern.



Different types of tile levelling system
Figure 5.2.m

5.3. GROUTING

Grouting can be carried out once the tile adhesive has set. The mixing method and procedure for preparing pre-packed cementitious grout paste should be in accordance to the manufacturer's recommendation. Dry or semi-dry mix should not be used to fill the joints.

Open joints collect dust and deleterious substances and thus reduce the quality of the grouting. Hence, it is advisable to fill up grout joint as soon as possible. To achieve consistency of pointing colour, it is recommended to grout one location e.g. bedroom, kitchen, etc. in one operation using the same mix ratio. The tile joints should be filled completely with the grout paste.

The grout should be given enough time to set. Surplus grout needs to be cleaned off with adequate tools. For most grouting products, a damp hard cellulose sponge and clean water should suffice. Once cleaning process is completed, the grout should be protected long enough for proper setting and hardening before foot traffic is allowed.

The photos below (Figure 5.3.a to 5.3.d) demonstrate the grouting process.



Surface preparation to receive grout mix
Figure 5.3.a



Grout joints to be filled up with grout mix
Figure 5.3.b



Filling of grout joints
Figure 5.3.c



Removal of surplus grout
Figure 5.3.d

5.4. MOVEMENT JOINT INSTALLATION




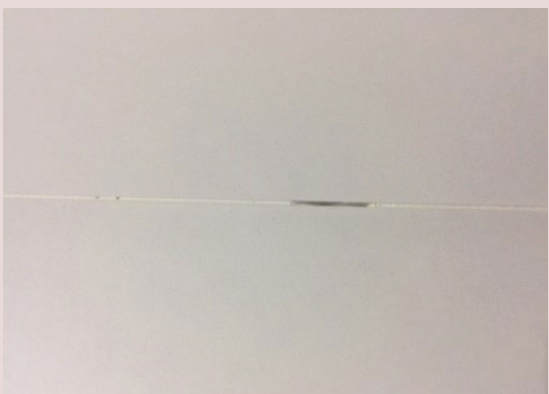
The depth of the movement joints should be controlled, as specified by the sealant manufacturer, by proper filling material (e.g. polystyrene foam board) and compressible backer-rod with closed pores.

The joints should be sealed by sealant of adequate durability and movement accommodation factor (MAF). It is a good practice to abide strictly to the sealant manufacturer’s recommendation.

5.5. INSPECTION OF COMPLETED WORKS

The finished works should be inspected to ensure they meet the client’s requirements and standards. Table 5.5 shows the inspection checklist for final inspection of ceramic tiling works.

Table 5.5: Checklist for final inspection of ceramic tiling works

Inspection checklist	
1. CONQUAS Assessment – Jointing	
<p>1.1 Tile size should be consistent and according to specifications.</p>  <p>Use of measuring tape to measure tile Figure 5.5.a</p>	<p>1.2 Joints are aligned and consistent with skirting and wall tiles.</p>  <p>Joints aligned with wall tiles Figure 5.5.b</p>
<p>1.3 Consistent and neat pointing.</p>  <p>Good pointing works Figure 5.5.c</p>	 <p>Pointing defects – joints not properly filled Figure 5.5.d</p>

2. CONQUAS Assessment – Finishing

2.1 Mortar stains or paint drips should not be seen.

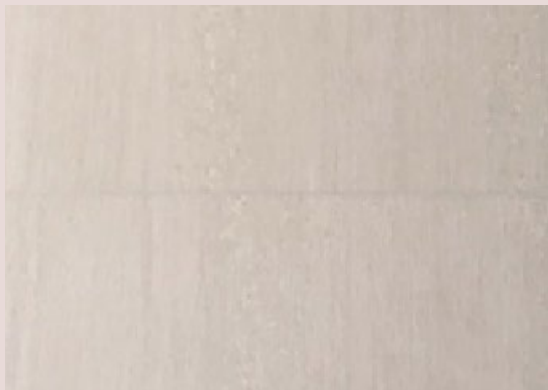


Good surface finishes
Figure 5.5.e

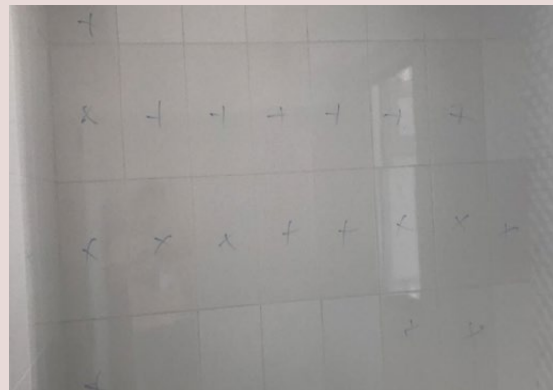


Paint stains
Figure 5.5.f

2.2 Consistent color tone.



Consistent tonality –
pattern and shades are well blended
Figure 5.5.g



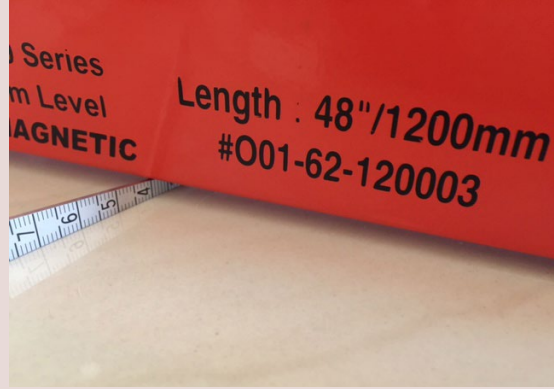
Inconsistent tonality
Figure 5.5.h

3. CONQUAS Assessment – Evenness

3.1 Surface are even (not more than 3mm over 1.2m). For floor, level to proper falls in wet areas like kitchen and toilet. No ponding should occur at any part of the floor.



Evenness not more than 3mm over 1.2m
Figure 5.5.i



Evenness not more than 3mm over 1.2m
Figure 5.5.j

3.2 Lippage between 2 tiles should not be more than 0.5mm.



No lippage
Figure 5.5.k



Lippage between tiles not more than 0.5mm
Figure 5.5.l

4. CONQUAS Assessment – Cracks & Damages

4.1 From distance of 1.5m, no chips, cracks and other visible damages.



Chipping
Figure 5.5.m



Cracks
Figure 5.5.n

5. CONQUAS Assessment - Hollowness

5.1 No hollow sound when tapped with a tapping rod.



Figure 5.5.o