

4.0 PREPARATORY WORKS

Before commencing stonework, the site supervisors should carry out the following preparatory works to ensure proper stone installation:

- Surface preparation
- Screeding / rendering if necessary
- Stone preparation

4.1. SURFACE PREPARATION

The surface of the substrate should be level/plumb and true to design specifications, or to a tolerance of 3mm measured by a 2m straight edge. If the required surface evenness is not achieved, screed (for floor) or render (for wall) should be considered. The substrate should be level, cured to specification, clean and not hollow. It should be free from any loose or deleterious substance such as dust, debris, oil and grease that may reduce or inhibit adhesion of the next layer of material. Any strong acid or alkali on the surface should be neutralised prior to the work of the next layer of material.

In cases where moisture sensitive stones are used, the moisture content of the substrate should be checked by using a portable moisture meter. Where moisture content consistently exceeds the permissible requirement, use of portable moisture meter (measures to a depth of 25mm) may not be sufficient due to its limited depth coverage. More invasive methods such as RH probes or calcium-carbide test may be used. In view of the high relative humidity (RH) in the air locally (almost 95%), the workable moisture content range should be around 2% or < 75% in RH of the substrate. Table 4.1 provides more details on surface preparation for different types of substrate.

Table 4.1. Surface preparation for different types of substrate

Types of substrate	Surface preparations	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, to seek manufacturer's recommendations before rendering.
4. Proprietary partition walls e.g. dry walls	- Manufacturers of these boards should certify their suitability of use. 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 stones and the associated adhesive. - The boards may be coated with a suitable primer to adjust moisture absorption before stone 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.	



Removing concrete protrusion



Cleaning surface with water



Cleaning surface with broom



Checking level of surface



Checking of hollowness



Checking moisture content

Figure 4.1. Surface preparation

4.2. SCREEDING / RENDERING

4.2.1. Screeding

For floor, where screeding is required, pre-packed mortar can be considered due to the consistent quality on the mortar mix.

Screed should be allowed to be air cured for a duration recommended by the manufacturers before stonework. After curing, moisture content should be checked. Permissible moisture level will depend on the bedding used. Any hollowness or cracks must be rectified to ensure soundness of the screed. Levelness also needs to be checked. It should not exceed a tolerance of more than 3mm gap over 2m prior to stonework. This tolerance is not accumulative over the entire span of the floor. Self-levelling screed may be required to correct the level. For a screed thicker than 50mm, a layer of non-oxidising metal-mesh should be considered to be placed in the middle as reinforcement and to prevent screed cracks.



Provide level-pegs before screeding



Screeding with timber float

Figure 4.2.1. Floor screeding

4.2.2. Rendering

Cement-sand based render is also commonly used. The render thickness should be limited to 30mm, otherwise, strips of non-oxidising ribbed metal latching should be anchored onto the substrate prior to rendering. Similar to floor screed, render should be allowed to be cured for a duration recommended by the manufacturers before stonework. Checks as mentioned for the floor, similarly, need to be carried out for the wall as well.

4.3. STONES PREPARATION

For absorbent or porous stones, the front surface and edges may be pre-treated by applying impregnator. Before deciding on the use of impregnator, an appropriate test should be carried out to check on the compatibility of the impregnator with the stones. Always ensure that the correct impregnator is used. Treated stones should be allowed enough time to be cured before installation. Instructions from the impregnator's manufacturers should be strictly adhered to ensure safe application.

Dust and residue on the back surface of the stones should be removed. Coating the back surface with a sealer should be avoided as it may prevent the adhesive from adhering to the stones

Watermark and efflorescence problems can be prevented by specifying adequate adhesive and/or by providing vapour barrier and damp proof course. In any case, a trial test should always be conducted with new combination of materials to verify their suitability and compatibility.

In the case where moisture-sensitive stones are used, the moisture content of the substrate should be checked to ensure that it is within the tolerable range of both the stones and the adhesive. Both the stones and adhesive manufacturer's requirements should be met.

4.3.1. Cutting of Stones

A diamond blade cutter is the best option for cutting stones. It cuts cleanly and is suitable for all types of stone. The proposed method is to do wet cutting. The water lubricates the blade and also helps to cool down the blade from overheating. Stones should be wiped dry after cutting. Any residue from the stone should be removed immediately especially from the back and side. Appropriate proper protective equipment (PPE) should be worn when cutting stones.