

## 1.0 INTRODUCTION

A natural stone finish is a system comprising no less than substrate, adhesive, stone, grout and movement joints. All components are equally important and intimately related to one another. Adequate compatibility must exist among the components as they could only function collectively. The system could only be as strong as the weakest component, if not worse.

Therefore, material selection, system design, method identification, installation execution and maintenance must take into consideration the performance characteristics of each individual component, and the in-situ environmental conditions that prevail during the installation process as well as the long term usage. These considerations are similar for new technologies and materials in Design for Manufacturing and Assembly such as Prefabricated Prefinished Volumetric Construction (PPVC) and Prefabricated Bathroom Unit (PBU). It is recommended to refer to the respective guides for natural stone installation in these technologies.

Due to the volume constraint, this guide will focus on interior installation and finishes of natural stones.

## 2.0 DESIGN

To achieve good stone finishes, it is critical to take into account the material selection besides proper installation and quality control. It is important to understand the characteristics of the selected materials as well as their compatibility with one another to achieve optimal performance.

### 2.1. STONES SELECTION

Natural stones are cut into blocks at the quarry and then transported to a processing plant where they are cut into slabs. Modern tools such as the wire diamond cutter has improved the precision and quality of cutting blocks of stone into slabs. The slabs undergo further processing such as polishing, drying, being further cut into different sizes and dry laying in factory before getting packed for delivery.

Natural stones are formed under varying conditions, hence no two pieces bear the same composition and appearance. Besides geological types, stone names have been greatly compounded from commercial trades and quarry origins, making them very difficult to comprehend. To aid selection, the only characteristics that are relevant to the performance of the stone finishes are discussed here.

#### 2.1.1. Types of Stone

Stones are classified into 3 categories:

- **Sedimentary stone:** Formed from sediments in rivers or glaciers broken off from organic or inorganic elements, accumulated and consolidated to form rock beds. Limestone and sandstone are examples of sedimentary stone.
- **Metamorphic stone:** Originated due to transformation of existing rocks under very high heat, pressure and fluid. Marble and slate are examples of metamorphic stone.
- **Igneous stone:** Formed from volcanic material such as magma which cooled and solidified. Granite and basalt are examples of igneous stone.

#### 2.1.2. Characteristics of Stone

The characteristics of stone are dependent on the way they were geologically formed, as such, each type of stone is unique. Variations of grain and vein formed differ from stone to stone. Some stones show very little variations in colour but may show variations in pattern and grain density while others may show wide variations in colour, vein formations and porosity.