Development and Application of Reuse Method of Ceramic Tile

Michihiko MATSUBARA
Shingo YOSHIDA
Sho MORITA
Takahiro SUZUKI

1 TAKENAKA Corporation

A ceramic tile has more durability than other building materials. It was usually discarded as industrial waste after use. Because the mortar adhered to the back of it, it cannot be separated. We have developed a reuse method of used tiles for the first time in the construction industry.

In the method, the mortar was removed from used tiles by dissolving it with acid. A very practical process was established by studying the types and concentrations of acids that dissolve mortar well. The cleaning process of water immersion and the quality control process were also established by evaluating the adhesion durability of reusable tiles.

We have created three added values through this development. The first is to contribute to global environmental conservation. Reuse of discarded tiles has reduced waste. Resources and energy were saved by not producing new tiles. The second is to contribute to cultural preservation. The tiles that have historical and cultural value can continue to be used for the restorations of historical buildings of important cultural properties. The third is to contribute to maintaining the aesthetics of the building. If new tiles are used for partial tile replacement, the color may differ from the existing tile. The color of reused tiles from existing tile does not differ. These added values have been highly evaluated, therefore this method has been adopted for 20 properties in Japan.