



Selection of replacement stones of Mathias Church, Budapest; non-destructive and destructive laboratory tests

S. Polányi, **Á. Török**

Budapest University of Technology and Economics, Department of Construction Materials and Engineering Geology, H-1111 Budapest, Stoczek u. 2, Hungary, polsac@gmail.com, torokakos@mail.bme.hu

Mathias Church is one of the emblematic monuments of Budapest in Hungary. The first church was erected in between 1250 and 1270, but the present form of the church shows the signs of 1874-1896 rebuilding. The church was mostly built of porous Miocene limestone that now shows severe decay. At some parts travertine was also applied. The present phase of reconstruction of the church began in last years. Stone replacement is one possible alternative. The paper presents the laboratory test results of three types of porous limestone (fine-grained, medium-grained and coarse-grained) and two types of travertine. The fabric and macroscopic properties of each rock-type were analyzed under laboratory conditions. Non-destructive test of test specimens includes porosity and pore-size distribution, water absorption, ultrasonic sound velocity tests and thermal dilatation measurements. Compressive strength of air-dry and water saturated samples were also measured. Application of ultrasonic sound velocity tests and the reliability of various receiving and transmitting heads were also evaluated: the results display great scatters when various heads were applied. Laboratory test results were used to help in the selection of proper stones and also to outline criteria for best practice of stone selection to be used in this monument. Besides strength parameters and durability the fabric and visual appearance was also considered in selection criteria.