

## Construction technology and materials of a medieval fortress at Balaton Highland (Hungary)

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Medieval fortresses in Hungary represent unique architectural heritage. This study focuses on one of these structures found at Balaton Highland at Nagyvázsony. The best preserved part of the building is the 25 m high tower that was used as a living quarter. The fortress itself dates back to the 15th century but it was first mentioned in the chronicles in the late 14th century. The tower is located in courtyard and is surrounded by a system of external walls. A wide range of stone materials were used for the construction, however rammed earth was also used for the interior parts of the wall. A special technique was used to prepare the walls. Historic mortars are still visible on the external part of the tower. Stone, render and rammed earth material were studied on site using various techniques. Schmidt hammer and Duroskop were applied to measure surface strength, while moisture content was detected with a portable device (GANN Hydromette UNI 1). Vertical profiles were examined and moist or wet zones were identified. Lithotypes were identified on site, micro-fabric and textural elements were detected with a portable microscope. According to lithological mapping the prevailing lithotypes are basaltic tuffs, well cemented limestone and travertine. Smaller amount of Miocene porous limestone, travertine and sandstone were also found. The condition assessment of stone elements revealed that the volcanic tuffs suffered the most. Surface loss is significant; disintegration and cracking are common decay forms. This study with the documentation and condition assessment help understanding the medieval construction techniques and provide information for the reconstruction and preservation of medieval fortresses of Central Europe.