
Maintenance and Strengthening of the Cross-Shaped Barracks Building

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Brief Description of the Presented Case Including Project Aims and Challenges

The Cross-Shaped Barracks building is a cultural monument and one of the 100 National tourist attractions in Bulgaria. It is situated in Vidin, which is a Bulgarian city on the Danube River. The building was constructed in 1801 by local ruler Osman Pazvantoglu for the deployment of the Ottoman troops (*Fig. 1*). The designers, if there were any, are unknown. After the liberation of Bulgaria from the Ottoman Empire, the building was used as a court and barracks of Bulgarian troops. The building is famous for its specific cross shape in plan (*Fig. 2*). The building structure is of brick and stone masonry (*Fig. 3*). The foundations are constructed as dry stone masonry. The roof and the floors are timber structures. The building had not been maintained properly, and a settlement of the south section corner had occurred due to moistness of the soil and caused substantial cracking of the walls. Moisture was observed in all the walls up to 1 m above the ground, which had caused damage to the external plaster as well as several cracks in the internal walls. The building is situated in a region of grade 7 seismic activity according to the Bulgarian seismic code. The project aimed to rehabilitate the existing structure and adapt the building to an ethnographic museum for the region. Before the rehabilitation of the walls, the masonry was processed using polymer materials to act against the moisture and in order to fill in the cracks. The strengthening itself was designed to be carried out by means of steel elements to be anchored to the walls and sequentially sprayed with concrete (*Fig. 4a*). The chosen design solution provided for the best possible preservation of the architectural authenticity.