

# Modern consolidation methods for Catholic Church in baroque style from Arad fortress, Romania

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## ABSTRACT

Banat region is situated in the western part of Romania and was once part of the Habsburg Empire. During the Habsburg administration a lot of catholic churches in baroque style were built in this region of the country. There were two types of churches built: worship churches which were used by the Catholic population and military churches which were used by the Habsburg army. Along with the migration of the German population from Banat starting from 1970, the baroque churches started to deteriorate because of the lack of maintenance.

One of these churches is the Franciscan church from Arad fortress. The church was built in the year 1734. Later on the fortress was built around the church and also two lateral wings were added to the church which would be the monks' cells. The main building of the church together with the two lateral wings forms two interior courtyards. The structure of the church is made out of masonry walls, masonry pillars and masonry arcs and vaults. The arcs together with the load bearing masonry walls work together as frame structural elements. The main chamber of the church has the dimension of 24x16m and the height of 20m. The towers of the church are 28m tall. The walls of the church are 1m thick and the walls of the towers are 1.5m thick. After the Second World War the fortress of Arad City was taken over by the communists and the church suffered some unauthorised interventions in the resistance structure.

The church is severely damaged because of poor maintenance and unauthorised interventions on the structure. The structure can also be affected by seismic activity Arad city being situated in an area with the ground acceleration of 0.20g [1]. The roof of the structure is almost 90% destroyed. Because of this there were severe water infiltration all over the structure that led to the collapse of some vaults, the cracking of walls and vaults and damage to the masonry itself. This paper presents a few modern consolidation methods for each degraded element type [2]. The efficiency of some of these consolidation methods was determined using a nonlinear analysis in the TreMuri (3Muri) software [3].

## REFERENCES

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