

Structural analysis as a supporting method for the research of medieval brick architecture

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ABSTRACT

Chronology of brick historical buildings might be established much more precisely than stone ones due to the architectural and metrical analysis of bricks, mortars and brickworks. Comparison of historical sources allows to reconstruct the previous stages of constructing monuments. Causations between transformations and developments of monuments are usually interpreted as the results of artistic or ideological influence rather than pragmatic decisions. Such explanations neglect, however, the impact of structural disasters and imperfections. Experience, delivered by the previous erroneous solutions or failures, undoubtedly influenced the further development of architecture.

This paper is to present how numerical modelling and structural analysis of complex historical brick buildings might be used as a supporting method for the research of their history. Consequently, modern numerical tools for structural analysis can be also useful in the investigating of the process of creating architectural solutions [1]. Because more accurate historical analyses belong to the qualitative research, there are not possible to examine very wide group of different monuments. Therefore the authors chose for that purpose the homogeneous group of the mendicant orders' medieval churches in the former State of Teutonic Order in Prussia, which had been the subject of authors' in situ research since 2009 [2]. This group is thought to be representative for the medieval techniques of the brick architecture in northern Europe and Baltic Sea Region.

The aim of this research is to find out whether structural analysis might be carried out in the historical building that consecutive transformations partially erased its previous form (reconstructed on the base of the architectural and archaeological research)? The positive answer to that question allows to put another one – if the numerical modelling of the structure of monument might give the additional information of its history? The results of described research might give a new tool for conservators, architects, archaeologists and engineers in their research and other conducting works.

REFERENCES

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