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## 3D MODELING OF EXTREME EVENT SCENARIO SELECTED HERITAGE BUILDING

Michal HULIAK<sup>1\*</sup>, Michal MIŠKE<sup>2</sup>, Dominik ŠPILÁK<sup>3</sup>

<sup>1,2</sup> University of Žilina, Faculty of Security Engineering, Univerzitná 8215, 010 26, Žilina, Slovakia

<sup>3</sup> Department of Fire Protection, Faculty of Wood Sciences and Technology, Technical University in Zvolen, 960 01 Zvolen, Slovakia

\* **Corresponding author.** Email address: [michal.huliak@uniza.sk](mailto:michal.huliak@uniza.sk)

**Abstract** – Preserving the load bearing elements of heritage timber structures is essential for their survival during extreme-event scenarios such as fire. However, the application of fire protection systems can compromise the building’s historic appearance, making it important to determine when such measures are necessary. This study used Ansys Mechanical to model the response of a heritage timber structure to extreme fire conditions, simulating heat transfer and estimating the resulting charred cross section. Model inputs were derived from medium scale fire tests on original timber beams. The results identified fire scenarios in which structural elements retain sufficient load bearing capacity without additional protection, thereby pinpointing which components require supplementary measures and minimizing unnecessary interventions.

**Keywords** – *3D modeling; extreme event scenario; fire modelling, fire test; heritage timber buildings*

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