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## **3D COMPUTER MODELLING OF ARCHITECTURAL DETAILS BASED ON THE MODERN BIM INVENTORY SYSTEMS**

**Keywords:** *Flexijet inventory, 3D modelling, architectural detail, ArchiCAD.*

The article presents the 3D computer modelling of architectural details based on the modern BIM inventory systems. It discusses the methodology of architectural inventory, which employs laser measurements in ArchiCad programme interconnected with FlexiJet system. The use of this method allows one to create elements of a virtual building (BIM model) with great precision, thanks to its very high measurement accuracy and appropriate software. The application of this system is exemplified by the specified elevation detail of the Royal Palace in Łobzów, currently housing the Faculty of Architecture of Cracow University of Technology.

The paper covers various stages of the work process such as : the basic principles of the FlexiJet system, measurements phase, and finally, the modelling of architectural detail in ArchiCAD programme. The presented methods of creation of detailed individual elements allows one to trace the most common difficulties in their virtual reconstruction. The article also examines different ways of constructing measured details with advanced features of ArchiCAD. Particular attention is given to the options that reduce the size of created files, which has a direct influence on the speed of the modeling, and the time of its visualization. Comparing the possibilities of the various functions of ArchiCAD allow their most appropriate selection in order to speed up and simplify the process of modeling.

Three-dimensional models of architectural details may become a basis for detailed benchmarking as well as reconstruction by means of 3D cutters or printers.

The use of digital tools in inventory with BIM technology can be comprehensively implemented in architectural and conservation studies. The accuracy of such modelling results in a better assessment of both the object's condition and possible renovation.



Fig. 1, 2 Flexijet device. 3D model of facade portal of the Royal Palace in Łobzów and the example of architectural inventory, which employs laser measurements in ArchiCAD programme interconnected with Flexijet system.

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