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3D PRINTING IN INNOVATIVE HOUSE-BUILDING

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Problem statement. 3D printing will soon become the most important tool in the construction industry around the world, so architects and designers are creating new housing projects that can be simply printed on a printer [1; 2].

Italian bureau Mario Cucinella Architects has unveiled an innovative house, designed on the principle of a wasp nest and 3D printed from clay with the addition of adobe.

Purpose of the study. Development of housing of the future with minimized negative impact on the environment.

Main results. A printed clay house can become an effective model of economically profitable and environmentally neutral housing in the face of a rapid increase in the world's population (each year it increases by 80 million people who need to live somewhere). Clay was named by architects as an ideal building material – fully recyclable, widely available, cheap and non-waste, with the possibility of almost universal use (fig. 1).



Fig. 1. Innovative House "Wasp's Nest"

Outside, the "wasp" TECLA house has soft, rounded shapes, converging upward with a dome; the internal layout can consist of any number of residential and common premises in an arbitrary layout. The printed prototype shows an apartment with a living room and a separate bedroom. A huge window in the dome vault provides all rooms with natural light (fig. 2).



Fig. 2. Internal layout of the house "Wasp's nest"

The architects of the project argue that TECLA houses can be built both in the existing structure of the urban environment, and in the form of isolated and completely energetically autonomous eco-friendly settlements surrounded by wind turbines and solar farms, gardens and vegetable gardens.



Fig. 3. Eco settlement based on a house "Wasp's nest"

References

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2. Sustainable housing and human settlement. Materials for 3D construction printing : monograph. Editors: Savytskyi M., Konoplanik O., Unchik S., Dukat S., Savytskyi A. Under the general editorship Savytskyi M. Dnipro – Bratislava : SHEE "Prydniprovsk State Academy of Civil Engineering and Architecture" – Slovak University of Technology in Bratislava, 2018, 263 p. (ISBN 978-966-323-182-2).