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ANALYTICAL REVIEW OF REHABILITATION METHODS FOR
REINFORCED CONCRETE HOLLOW-CORE ROOF SLABS

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Due to the frequent need to rebuild and reinforce hollow-core roof slabs, it is necessary to identify and investigate the technical solutions used in this area of reconstruction.

Different methods are used to rebuild hollow roof slabs, with certain advantages and disadvantages. The first and most commonly used method is to reinforce the normal section by inserting metal beams from below. The positive sides of this solution are low labour intensity and high reliability. In addition, the structural integrity is not compromised. The disadvantages of this method are the high metal consumption and the high labour requirements. For example, this type of reinforcement can only be used on roofs that are supported by walls. In addition, the aesthetics of the lower rooms are impaired.

The second frequently used method is the embedding of reinforcement bars into voids. The advantages are that the dimensions and appearance of the slab are maintained and metal consumption is reduced compared to the first method. The disadvantages are high labour intensity, an increase in the inherent weight of the slab.

The third (less common) method involves the installation of additional reinforcement bars in polymer mortar in the grooves located between the voids. Important advantages are the retention of all dimensions of the structure, low metal consumption and the possibility of reinforcement in certain areas. The disadvantages are the high labour intensity of the preparatory work, the high cost of the polymer mortar and the inadequate fixing of the additional reinforcement. In addition, this method is impractical for most wide-span roofs. A fourth promising method is the reinforcement of external reinforcement with composite materials (fibre-reinforced plastics). The main advantages are a slight increase in overall dimensions, maintaining integrity and ease of fabrication. The main limiting factor is the high cost of the materials. After analysing the selected technical solutions, we have assessed each method preliminarily and have divided them into two main groups: traditional and innovative. Traditional methods have many disadvantages, but are very often used nowadays. The main reason for the popularity of traditional methods is the mature technology of work and the relatively low price of materials. We hope that in the future the price of composite materials for external reinforcement will decrease and innovative technologies will gain more popularity.

The final choice of the technical solution is to find the optimal method of reinforcement, taking into account the advantages and disadvantages of each of the considered options in the conditions of a particular object.