UDC 69.057.45+424.012

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FEATURES OF THE FLOOR-LIFTING METHOD USAGE FOR BUILDINGS ERECTION WITH PRECAST-MONOLITHIC REINFORCED CONCRETE FRAMES OF «KUB» OR SIMILAR FRAME SYSTEMS

Usage of the floor-lifting method for buildings erection with precast-monolithic reinforced concrete frames of «KUB» or similar frame system was reviewed in article. Analysis of technological features of proposed method was done. Advantages and disadvantages of proposed method usage were listed. Opportunity of floor-lifting method of reinforced concrete frames buildings erection in dense areas usage was justified. Usage of the floor-lifting method for erection of buildings with precast-monolithic reinforced concrete frames of «KUB» or similar frame system allows to reduce the works complexity due to the complete refusal to use the equipment for the verification and temporary fixing of slabs individual elements and the operations exclusion associated with the retrieval and temporary fixing floor slabs elements

Keywords: *floor lifting method, "KUB" system, precast-monolithic frames.*

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ОСОБЛИВОСТІ ВИКОРИСТАННЯ МЕТОДУ ПІДЙОМУ ПЕРЕКРИТТІВ ДЛЯ ЗВЕДЕННЯ БУДІВЕЛЬ ІЗ ЗБІРНО-МОНОЛІТНИМ КАРКАСОМ СИСТЕМИ ««КУБ»» ТА СПОРІДНЕНИХ СИСТЕМ

В статті розглянуте використання методу підйому перекриттів для зведення житлових будівель із збірно-монолітним каркасом системи ««КУБ»» та споріднених систем. Виконаний аналіз технологічних особливостей використання такого методу зведення будівель. Наведені переваги та недоліки використання такого методу. Обгрунтовано можливість використання запропонованого методу в умовах будівництва у щільній міській забудові.

In the last decades of the last century and at the beginning of this century, housing construction with the use of precast-monolithic frame system "KUB" and related systems has

become widespread [1, 2, 3]. Residential complexes and districts are being built using this constructive system. Advantages of these systems include: wide possibilities for designing, free planning and redevelopment of premises, high unification of elements, resistance to seismic influences, the possibility of erection of buildings with a surface up to 24 floors, construction speed and other [4].

An analysis of the floor lifting method usage for the residential buildings erection with a "KUB" precast-monolithic frame system and other related systems are given in the paper. Coverage of the floor lifting method usage advantages and disadvantages for the this type buildings construction are showed. Possibility analysis of the proposed method buildings construction in conditions of dense urban area were under investigation in the paper.

Temporary fastening and checking is carried out with the help of mounting supports. To fix one slab, four supports are used. It is necessary to install about 500 temporary supports for the construction of a 500 m^2 ceiling. After filling and solidifying the concrete in the joints, all these supports must be dismantled and moved to the next floor. The labor complexity of works related to the temporary fixing of ceiling elements is up to 50% of the total labor complexity of ceiling construction.

One of the methods for the construction of framed buildings with a monolithic or prefabricated monolithic frame is a method of floor lifting (Figure 5). The sequence of a frame construction in this way consists of the following operations: 1 – installation of foundations; 2 – installation or creation of first level columns; 3 – erection of underground building part; 4 – creation of monolithic ceiling above the building underground part; 5 – after concrete hardening and creation of the distribution layer, on the surface of the slab floor over the cellar performed creation of the whole floor slabs package from the first to the last floor. Plates are separated by a separating layer. Each next slab created after the concrete of previous slab has reached of required strength. 6 – installation on the first level columns the lifts for slabs lifting, the slabs are raised to an intermediate position and fixed. 7 – concreting of the second level of columns or installation of columns; 8 – the rising of the slabs continues after the column`s concrete has reached of required strength. The last two items are repeated before finishing of the concreting or column`s last level installation and the all slabs lifting in the project position.

The usage of the floor lifting method for the "KUB" system frames and related systems construction can reduce the work complexity on the floor slabs construction due to the complete refusal of the equipment usage for the verification and temporary fixing of individual floor slabs elements and the exclusion of operations associated with the verification and temporary fastening of floor slabs elements. The usage of the proposed method allows to transfer majority of assembly operations to the ground floor level. It can significantly increase the level of industrial safety, improve the work quality and control quality.

References

1. *Deltabeam Composite beam: designer manual // Peikko group – Canada, 2013. – 18 p. – [Rezhym dostupu – http://goo.gl/pNuG5].*
2. *Deltabeam Installations Instructions // Peikko group – Canada, 2009. – 8 p. – [Rezhym dostupu – http://goo.gl/EqL8K].*
3. *Suchasni konstruktyvni systemy budivel iz zalizobetonu: Monohrafiia./ Pavlikov A.M., Baliasnyi D.K., Harkava O.V., Dovzhenko O.O., Mykytenko S.M., Pinchuk N.M., Fedorov D.F.; Za red.. A.M. Pavlikova. – Poltava: PoltNTU, 2017. – 120 p.*
4. *Kobzar I.I. Tekhnolohiia budivelnoho vyrobnytstva: navchalnyi yposibnyk / I.I. Kobzar, H.H. Ostashevska, N.M. Zolotova. – Kharkiv: KhNAMH, 2011. – 171 p.*