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Addai Kusi Teddy Gyamfi, postgraduate

M.Yu. Bilokin, student 301 BP

O.O. Dovzhenko, PhD, professor

National University
«Yuri Kondratyuk Poltava Polytechnic»

CONTACT JOINT OF FLOOR SLAB WITH WALL PANELS IN LARGE PANEL BUILDINGS

Large-panel construction is undergoing a renaissance stage, which is accompanied by its significant modernization: the use of three-layer wall panels with high heat-technical properties, increasing the distance between bearing walls to improve spatial planning decisions, and the use of multi-hollow formwork-free slabs as floor slabs. When using such slabs, the question arises about the bearing capacity of the node connecting them to the wall panel.

In a traditional platform joint, a transverse force and a bending moment arise in the support zone of the slab due to pinching of the slab. Since there is no longitudinal and transverse reinforcement in this zone, a concrete cross section is considered. To prevent the formation of cracks in it, the calculation should be performed in the elastic stage. For low-rise buildings, the value of the moment in the support section of the slabs does not exceed the moment of formation of cracks in the concrete of the support zone, which is associated with a small degree of pinching of the support section. For multi-story buildings, the load on the ends of the slabs and the pinching coefficient increase, the supporting moments may exceed the limit values, as a result of which cracks are formed in the concrete of the supporting zone, which is not allowed by the norms.

In experimental studies, the schemes of failure of multi-hollow slabs in the area of the platform joint in the form of normal and inclined to the longitudinal axis cracks near the supports confirm the danger of their failure at the support due to tear and shear.

Based on the reliability of the join and the ease of construction of buildings, a combined joint is considered the most rational.

A contact-platform joint is known (Fig. 1), in which the ends faces of the floor are extended beyond the wall. Slabs are mounted on mounting support elements, which are dismantled after gaining the design strength of concrete. The keys on which the flor is hung are reinforced with frames installed in the voids of the slab from below on the construction site. The frame is fixed in the wall with a plastic plug. During the installation process, the frame together with the plug is inside the void, and after installing the slab in the design position, it

is extended to the required length, since the joint of the slabs is accessible and wide enough (from 160 to 240 mm).

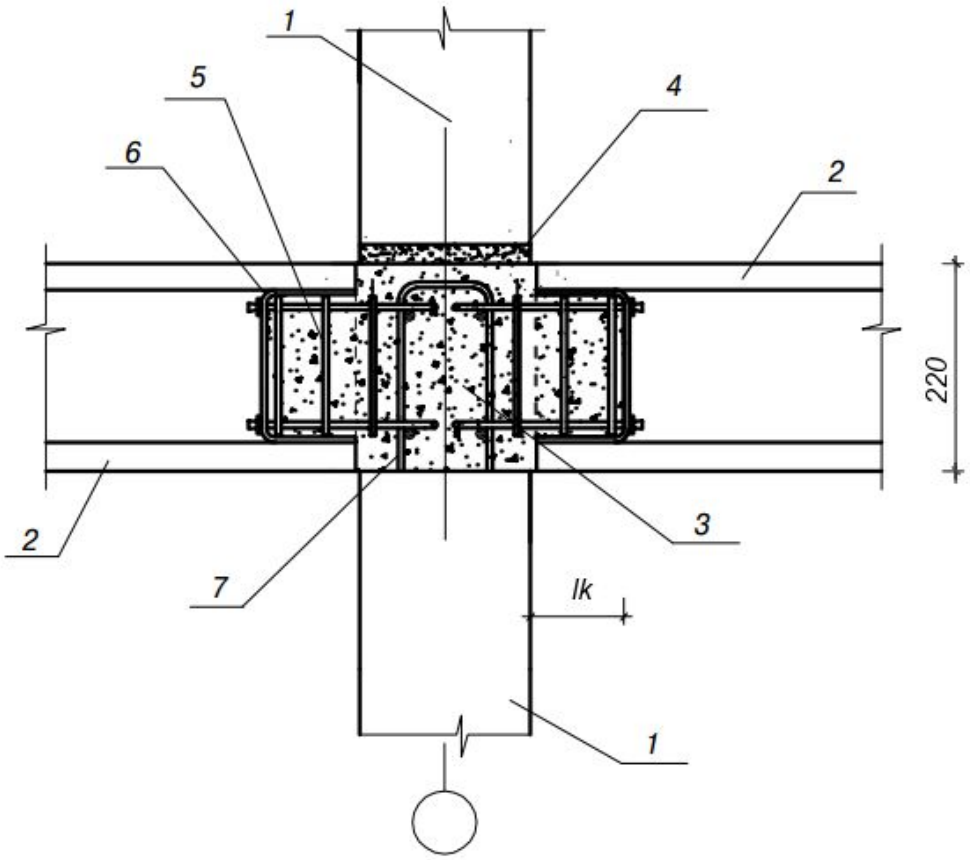

Fig. 1 Combined joint of multi-hollow slabs with wall panels:
1 – wall panel; 2 – floor slab; 3 – cast-in-place concrete; 4 – mortar; 5 – key reinforcement frame; 6 – plastic plug; 7 – reinforcement outlets from wall panels; l_k – the length of floor suspension (calculated value)

The contact-platform joint has a greater bearing capacity than the platform joint, this is quite relevant for high-rise buildings. At the same time, the dry installation of the floor on the vertically aligned mounting corners allows you to obtain a sufficiently even surface of the floor. The number of reinforced keys and the cross-section of the reinforcement is selected by calculation.

At the National University «Yuri Kondratyuk Poltava Polytechnic», the construction of the joint was modernized by using keys for reinforcing cylindrical frames, and a method for calculating their bearing capacity based on the variational method in the theory of concrete plasticity was developed.

The method of calculating the joints takes into account the character of their failure and the main determining factors: concrete strength characteristics f_{cd} and f_{ctd}, the ratio of the depth l_k and height h_k of the keys, the shape of their cross section, the shape of the profile, reinforcement, the number of keys.