plant on the vertical plane is at a height of 20 cm. As the roof waterproofing material is used as a stone grit and bitumen-polymer waterproofing and waterproofing PVC membrane.

In order to make the flat roof "breathe" so that moisture doesn't accumulate in the insulation on the roof surface uniformly, we should set aerators. Contiguity to the parapet and plums requires careful execution. For this the junction of heat insulation slab to lanterns roof make the transition bumpers. For insulation of flat roofs we should use rigid insulation materials. And we should lay cables for heating of the roof, so that water near the drain funnels doesn't freeze.

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CALCULATION METHODS OF BENDING MOMENTS ON SUPPORTS IN PRECAST PRESTRESSED HOLLOW-CORE SLABS WITH PLATFORM JOINTS

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Experimental results of intermediate floors strength with precast prestressed hollow-core slabs with platform joints are presented. Precast prestressed hollow-core slabs with ∅5mm reinforcement of high-strength wire are produced by a continuous formless molding method, which imposes particular features on its reinforcement such as absence of transverse reinforcement near joints and danger of its destruction from shear on supports.

Nowadays production of precast prestressed hollow-core formless molding slabs is launched in Belarus. These slabs have longitudinal reinforcement from high-strength wire or strand of S1400 steel. Production technology of such slabs, unlike the aggregate flow production, completely eliminates the installation of transverse reinforcement, horizontal grids in flanges, embedded steel plates and tie-down loops in such slabs, which imposes definite restrictions on the application of such slabs in designing floors.

Singularity of designing floors with platform joints of hollow-core slabs and wall panels is in emergence of bending moment on supports [1], п 6.4. [2]. In hollow-core slabs made by aggregate-flow or conveyor technology emergence of negative bending moment after cracking is perceived by longitudinal bars of upper support steel reinforcement grid and by vertical support steel frames. In precast hollow-core slabs bending moment on supports is generally perceived by concrete cross-section because minimal size of support amounts 80…120mm. Estimated length of zone of stress transfer zone for reinforcement strands and high-strength wire amounts correspondingly 500mm and 330mm. Cracking pattern of similar precast prestressed formless molding hollow-core slabs by "MAX ROTH" production in support zone testifies the danger of destruction from shear near support in the place of normal crack formation.

Herewith [2] it is recommended not to take into consideration appearing bending moments on supports when slabs are supported by masonry walls including monolithic belts made in this types of masonry. At the same time typical series [3] requires to take into consideration appearing bending moments on supports when slabs are supported by block masonry walls.

The value of negative bending moment on supports when using platform joints of precast prestressed hollow-core slabs with wall panels varies in different sources. In [1] bending moment on support for precast prestressed formless molding hollow-core slabs by "MAX ROTH" production which are reinforced by high-strength wire VR-II with 5mm diameter is defined by the coefficient of anchorage degree to the value of bending moment on support which is defined from anchorage condition of the slab in the wall panel. Herewith coefficient K=0.51…0.79 is taken according to anchorage length and stress from pressing of wall panels. In typical series for precast prestressed formless molding hollow-core slabs by "Weiler" (Italy) production which are reinforced by seven-wire steel strands with diameter 6mm, 9mm, 12mm and 15mm [3], bending moment on supports is taken equally to $M_O = ql^2/17$, where q – effective distributed load. In typical series for precast prestressed formless molding hollow-core slabs by "Vibropress" production [4] which are reinforced by high-strength wire made of S1400 steel and with 5mm in diameter bending moment on support should not exceed 11.9…14.9 kNm according to concrete class, otherwise strengthening of supporting zone is required with corresponding reinforcement. In recommendations [2] estimated value of bending moment on support is taken equally to $M_{\sup} = M_1 + M_2$, where M_1 is bending moment from vertical reaction on support, M_2 is bending moment from frictional forces reaction.

Experimental averages of negative bending moments in the platform joint zone in the moment of destruction of experimental samples of platform joint fragments PJ-1 and PJ-2 and also calculated by [1], [2] and [3] are presented in Table 1

Table 1 – Bending moments on support in the moment of destruction

Element	Bending moment on support (experimental average), kN·m	Bending moment on support [1], kN·m	Bending moment on support [2], kN·m	Bending moment on support [3], kN·m	Bending moment on support [4], kN·m
PJ-1	-30	-32,52	-6,08	-11,9	-21,1
PJ-2	-34,56	-33,9	-40,53	-11,9	-21,1
Ancorage	-45,8				
Swivel	0				

Comparison of experimental values of bending moment on supports of platform joint fragments with estimated values shows satisfactory convergence with proposals [1], which consider the influence of pressing on supports on the value of negative bending moment of support in the platform joint zone. Methods described in [3] and [4] evaluate bending moment on support more carefully and with low pressing in [2]. Method [2] with high pressing overestimates appearing negative bending moment on support in the platform joint zone.

Examined methods consider the value of negative bending moment on support only in critical strength state. Methods which consider the actual performance of precast prestressed hollow-core slabs in the platform joint zone and allow to define internal forces and respectively stress-strain state in hollow-core slabs in any time of its load including effective loading. The existence of negative bending moment in hollow-core slabs in the platform joint zone reduces span bending moment and deformations of the floor, enhances crack resistance. It enhances the value of critical force in critical strength state.

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RESTRUCTURING OF HEAT AND AIR SUPPLY SYSTEMS OF BUILDINGS WITH RECYCLING OF LOST HEAT

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The possible options and solutions of the efficient heat and air supply energy of multi-story buildings with exterior fences with increased thermal protection and impermeability in which it is possible to use energy resource efficiency techniques to reduce energy consumption due to the recovery of heat, the heat recovery of the removed ventilation air and the study of the natural heat of solar radiation.