



TECHNOLOGIES FOR CONSTRUCTION OF MONOLITHIC LOW-RISE BUILDINGS AND MATERIALS USED IN THE CONSTRUCTION OF THE REPUBLIC OF UZBEKISTAN

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ABSTRACT

The main direction of development of construction in Uzbekistan is the intensification of production, resource conservation and improving the quality of products. The solution to this problem is possible by using intensive technologies and production wastes, including electricity. Increased volumes of construction, in particular single-story residential buildings, the need to save cement and the shortage of expanded clay for wall materials require the use of new design solutions and industrial construction methods. It is not possible to mechanically transfer into the practice of rural housing construction (represented mainly by manor houses) the methods and techniques of large-panel and volume-block urban housing construction. Therefore, the best option for building rural houses is to build them from lightweight concrete using ashes as a raw material the ablation of thermal power plants.

KEYWORDS: *Buildings, construction of monolithic structures, individual housing, interchangeable formwork, pozzolanic properties.*

1. INTRODUCTION

It is known that the construction of monolithic structures of buildings is carried out directly on the open area. At the same time, special attention is traditionally paid to issues of cost-effectiveness of compositions, technology for preparing concrete mixtures, their transportation, laying, compaction and hardening of molded structures in natural conditions.

In Uzbekistan, monolithic building structures are erected mainly by the cyclic method with the use of interchangeable formwork. When concreting vertical enclosing structures of monolithic buildings and structures, they mainly use inactive and mobile mixtures on lightweight aggregates, mainly expanded clay. For high-rise buildings, it is recommended to use lightweight structural concrete B10 and B20.

Light concrete mix is prepared centrally, or concrete mixer plants are used. Serve in the tubs with a tower crane, stack and compact using the vibratory method using deep vibrators. The mixture is laid in the formwork layer by layer with a thickness of 50 cm around the entire perimeter of the walls. After reaching the concrete formwork strength, the formwork is dismantled.

When performing concrete work in the conditions of a dry hot climate (DHC) of Uzbekistan, it is

necessary to take into account both positive and negative environmental impacts.

For most regions of Uzbekistan, the daily summer temperature is +35 ° C and above, the relative humidity is less than 50%.

2. METHOD OF RESEARCH

High daily amplitude of air temperature fluctuations (up to 30 ° C), the open surfaces of concrete structures are heated cyclically during the day to + 60-70 ° C, which negatively affects. All stages of the technology of erecting monolithic buildings, worsens the workability of the mixture, and contributes to the development of destructive phenomena in concrete, reduces strength and other physical and mechanical properties.

The positive side of SJK is the possibility of intensifying the processes of concrete hardening, concrete work for a long period without special heat treatment.

The seismic activity of the territory of Uzbekistan places high demands on the reliability of buildings. From the point of view of earthquake resistance, monolithic buildings made of lightweight concrete have obvious advantages over others. To obtain concrete with a complex of thermal insulation and structural



properties, lightweight porous aggregates with a low density are used in the world of construction practice. In Uzbekistan, the production of expanded clay mainly from various types of lightweight aggregates has been mastered. Due to the lack of conditioned raw materials, it is produced in small quantities and with a relatively high average density (700-800 kg / m³). Attempts to improve quality have not yet yielded positive practical results. The significant porosity of the lightweight aggregate and, as a consequence, its low strength, a noticeable difference in the densities of the binder and aggregates causes the presence of negative phenomena:

- Complication of the technology for preparing the mixture;
- Water separation and stratification of expanded clay mixture;
- Rapid thickening of expanded clay mixture during transportation, as a result of suction of the liquid phase with a binder aggregate;
- an increase in the duration of mixing expanded clay mixture, because mixers used for the preparation of heavy concrete transmit kinetic energy to the particles of the mixture, insufficient for intensive mixing due to the low average density of expanded clay;
- A decrease in the quality of the concrete mixture due to the heterogeneity of the distribution of components in it, even with prolonged mixing (5-7 minutes);
- increased consumption of cement, especially for mixtures of cast consistency.

Recommendations for improving the compositions and properties of expanded clay concrete are diverse (the use of dispersed fillers, various surfactants), but they are applicable only when using high-quality expanded clay.

In the context of the transition to a market economy and the development of private entrepreneurship, small and medium-sized businesses in the country, and the increase in individual housing in Uzbekistan, the demand for low-rise construction is high. Therefore, at present, it is necessary to continue research in the direction of intensifying the technology of monolithic low-rise housing construction using local raw materials and, above all, waste from various industries.

One of the waste products of the electric power industry is fly ash of thermal power plants, the effectiveness of which for obtaining concrete mixtures has been confirmed by numerous developments.

The use of fly ash as a filler for concrete mixtures should be considered from the point of view of the multistructural theory of composite building materials. In accordance with modern ideas about the structure of composite materials, the introduction of ash into the composition of cement systems is a binder filling, because from the standpoint of the multistructural theory, it allows the use of methods for calculating the optimal filling of a binder and obtaining extreme values of strength indicators.

3. RESULTS

It should be noted the fundamental difference between this approach. Despite a significant number of works devoted to the study of cement-ash systems, the ash in them is considered either as a pozzolanic additive to binders, or as a replacement for part of the cement in concrete and mortar. The chemical reactions occurring in the "cement + ash + water" system in the works are studied in detail. Of course, taking into account the chemical interaction is very important in predicting the expected structure of the cement-ash composite, but along with this, the role of ash as a filler of the cement system should be taken into account, especially in the case of an optimally filled or highly filled composition.

From the standpoint of maximizing the physical technical or operational properties of the composite, it is most rational to obtain optimally filled systems, but in some cases, from an economic point of view, highly filled (or overfilled over optimal values) structures are of considerable interest. Fillers in such systems are usually cheap and affordable industrial waste, and their degree of filling is limited only by the required design properties.

4. CONCLUSION

All of the above fully applies to ashes from burning solid fuels, their pozzolanic properties were established, and widespread use as additives to cements and concrete can be attributed the last century.

Studies on the use of fly ash as a substitute for a part of cement, performed by domestic and foreign scientists, made it possible to establish not only economic efficiency, but also technical feasibility. Chemical affinity between minerals, products of hydration and hydrolysis of cements and fly ash provides hardening and densification of the structure of the ash-cement stone due to the course of the pozzolanic reaction, and increases its durability.

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