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Ways for Reducing Concrete Mixture Dehydration and Cracking in Reinforced Concrete Products during their Manufacture

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Annotation. The article presents the results of an experimental study of the ways to reduce the dehydration of the concrete mixture and the formation of cracks in reinforced concrete products during their manufacture.

Key words: Concrete, reinforced concrete, water demand, cracks, fly ash, shrinkage.

Introduction. Reinforced concrete as a structural material is much younger than metal, wood and even plastics. The history of the development of this material is barely 150 years old. Despite such a relatively short period, reinforced concrete "conquered" the whole world and became the most common building material. The volume of production of concrete and reinforced concrete is so great that it ranks second in human activity after water. But cheap, durable and affordable reinforced concrete turned out to be an extremely difficult material for designers. The joint work of two materials with different properties (concrete and steel) turned out to be difficult to understand and create an effective calculation theory. That is why up to the present time they attach and, obviously, will attach exceptional importance to experimental research for a long time to come. Without an experiment, one cannot reveal the mechanism of destruction of a structure, the formation of cracks in it; one cannot comprehend the distribution of forces in sections, and much more.

Methods. It is known that cracks periodically appear during the manufacture of products in reinforced concrete plants, with intensive dehydration of freshly molded concrete.

One of the most effective ways to reduce the dehydration of the concrete mixture and concrete cracking is the introduction of fly ash into the concrete mixture.

The granulometric characteristics of large and small aggregates and cement particles affect the volume of voids and the water demand of the concrete mixture. The introduction of fine particles of mineral additives, usually having a size of 1-20 microns, should increase the effect of Portland cement grains on reducing porosity in the concrete mixture, which reduces the need for water to obtain concrete of a given consistency. It has been found that replacing 30% of cement with fly ash reduces water demand by about 7% at constant slump. When using three types of fly ash with different particle sizes, a decrease in water demand by 5-10% was noted in solutions of equal consistency with the addition of 33, 67 or 133% fly ash by weight of cement. [1].

The ash is characterized by sufficient activity, which, when tested in accordance with the

standard, is 8-9 MPA, the normal density is 25%, the setting time meets the requirements of the standard. The introduction of fly ash instead of 20-30% of cement does not lead to a decrease in the strength of steamed concrete in all periods of hardening.

An experimental reinforced concrete slab covering the trench furnace was made. The concrete in these products is homogeneous; less dehydrated, has good workability during concreting, and also has relatively low evaporation of moisture from the concrete surface, which is especially important for areas with a dry hot climate [2]. However, the complete absence of cracks in the products was not achieved. To find ways to eliminate them, further research was required on plastic shrinkage, which is one of the main causes of early cracking of concrete. In the initial period of hardening in concrete, due to its intensive dehydration under the influence of capillary forces, plastic shrinkage occurs, which significantly disrupts the structure of the hardening concrete and further reduces its basic physical and mechanical properties and durability.

Plastic shrinkage in a dry hot climate is several times higher than similar deformations of concrete hardening under normal conditions. In our experiments for heavy concrete of class B15, this value reached the indicated values and amounted to 4 hours.

Results and discussion. The analysis of the obtained results made it possible to reveal that plastic shrinkage at any time (within 4 hours) can be stopped by starting an effective moisture treatment of molded concrete. With a sudden cessation of moisture care, plastic shrinkage immediately begins to intensively manifest itself, reaching significant values and the greater, the earlier the care of hardened concrete was stopped.

Plastic shrinkage of concrete in the structures resulted in the appearance of more cracks 1.5 hours after the completion of concreting, mainly along the reinforcement. The width of their disclosure reached 1.5-2.0 mm or more. Reducing the plastic shrinkage of concrete is possible with moist care of freshly laid hardening concrete using solar caps.

Thus, it can be recommended that the minimum initial maintenance time for freshly cast concrete should be at least 6 hours.

REFERENCES:

1. Sattikhodjaevich, B. Z., & Abdumanon, K. (2022). The Use Of Solar Energy In Heating Systems. Journal of Pharmaceutical Negative Results, 1028-1034.
2. Buzrukov, Z., & Khamrakulov, A. (2020, July). Joint work of a flat frame and pile foundations under dynamic impacts. In Materials Science and Engineering Conference Series (Vol. 883, No. 1, p. 012213).
3. Buzrukov, Z., Yakubjanov, I., & Umataliev, M. (2021, April). Features of the joint work of structures and pile foundations on loess foundations. In E3S Web of Conferences (Vol. 264, p. 02048).
4. Бузруков, З. С. (2020). ВЫБОР РАСЧЕТНОЙ СХЕМЫ СИСТЕМЫ «ПЛОСКАЯ РАМА-РОСТВЕРК-ГРУППА СВАЙ» ПРИ ДИНАМИЧЕСКОЙ НАГРУЗКЕ. Universum: технические науки, (12-1 (81)), 86-91.

5. Бузруков, З. С. (2020). ОСОБЕННОСТИ ПРОЕКТИРОВАНИЯ ФУНДАМЕНТОВ ВЫСОТНЫХ ЗДАНИЙ С УЧЕТОМ ГРУНТОВЫХ УСЛОВИЙ. Вестник науки и образования, (22-1), 79-85.
6. Alimov, K., Buzrukov, Z., & Turgunpolatov, M. (2021). Dynamic characteristics of pile foundations of structures. In E3S Web of Conferences.–EDP Sciences (Vol. 264, p. 02048).
7. Бузруков, З. С. (1993). Исследование совместной работы плоской рамы и свайных фундаментов при динамических воздействиях.
8. Sattikhodzhaevich, B. Z. (2022). WAYS TO SOLUTION THE UNLOADING OF THE TRANSPORT NETWORK IN MODERN CITIES. INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE, IT, ENGINEERING AND SOCIAL SCIENCES ISSN: 2349-7793 Impact Factor: 6.876, 16(3), 14-19.
9. Alimov, K., Buzrukov, Z., & Turgunpulatov, M. (2021). Dynamic characteristics of pilot boards of structures. In E3S Web of Conferences (Vol. 264, p. 02053). EDP Sciences.
10. Sattikhodjaevich, B. Z., & Abdumanon, K. (2022). The Use Of Solar Energy In Heating Systems. Journal of Pharmaceutical Negative Results, 1028-1034.
11. Nabijonovna, B. F. (2020). Business activity and its economic indicators. ACADEMICIA: An International Multidisciplinary Research Journal, 10(3), 151-161.
12. Nabijonovna, B. F. (2020). THE ECONOMIC CONTENT OF SMALL BUSINESS AND ENTREPRENEURSHIP. International Engineering Journal For Research & Development, 5(4), 3-3.
13. Nabijonovna, B. F. Development of Innovative Entrepreneurial Activity. JournalNX, 88-93.
14. Кабилов, Ш. & Байбобоева, Ф. (2020). Развитие предпринимательства как ведущий фактор подъема экономики. Общество и экономика, (12), 100-108.
15. Байбобоева, Ф. Н. (2015). Методы привлечения негосударственных инвестиций для развития средне специального образования. Журнал научных и прикладных исследований, (8), 21-23.
16. Байбобоева, Ф. Н. (2015). Международный опыт создания эндаумент-фондов. Научная перспектива, (8), 50-52.
17. Bayboboeva, F. (2021, March). CULTURE OF UNDERSTANDING ENTREPRENEURSHIP DEVELOPMENT. In INTERNATIONAL SCIENTIFIC AND CURRENT RESEARCH CONFERENCES (pp. 73-77).
18. Nabijonovna, B. F. INNOVATION-ENTREPRENEURIAL COMPETENCE.
19. Bayboboeva, F., & Saidnugmanov, U. (2015). Методы привлечения негосударственных инвестиций для развития высшего профессионального образования. Iqtisodiyot va innovatsion texnologiyalar, (6), 119-126.
20. Bayboboeva, F. N. (2020). Innovation-entrepreneurial competence. European Journal of Research and Reflection in Educational Sciences, 8(2), 170Eournal.