

Packers supplements increase water resistance of concrete through the use of water-soluble inorganic or organic substances. As used mill ground and mineral supplements from fine raw materials granulated blast furnace slag, fly ash and slag FCS. The effect of these additives is mainly to reduce mudding capillaries in concrete, and other leaks section greater than 1 mm, through which the moisture migrates. Such additives when soaking swell and clog the pores of the cement stone. Mineral supplements are considered waste and therefore cost-effective, but they increase the water resistance of concrete is negligible.

Water-soluble additives, concrete sealing materials include the following materials: iron chloride, sodium and potassium silicates, calcium nitrate, sodium aluminate, etc. [5].

Most cheap, simple and effective supplement is calcium nitrate (NC). At a dosage of 0.5 – 1% by weight of cement concrete water provides the best intensifies the strength development and increases the ultimate strength of 20 – 30% [6].

Hydrophobic additives – substances imparting hydrophobic properties of concrete and reduce water absorption of concrete [7].

They are adsorbed onto the cement grains in the form of a thin (monomolecular) layer to form on the surface a water-repellent film. However, they affect the curing process, contributing to the formation of cement with more homogeneous and fine-grained structure.

For water-repellent additives include abietates, sodium oleate, silicone water repellents (NGL), bitumen emulsion, etc.

Complex additives – chemicals that are multi-functional activity and containing in its composition two or more single-component additive [7].

The most used and effective complex supplements include a comprehensive waterproofing additive “Mabel” crystal- additive for water-resistant concrete Betocrete C-17 (C-17 Betokret (BFAU)).

Work on the technology of water-resistant concrete cost is many times cheaper than the device difficult, time consuming and costly waterproofing. This technology greatly affects the quality improvement structures extend their service life, and positively affect other properties of the concrete.

In Polotsk State University carried out the work on a method to improve the water resistance of concrete under the brand waterproof W18 – W20.

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STRENGTH OF MASONRY WITH RETICULAR REINFORCEMENT

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The results of the research of the strength of masonry with transverse reinforcement are given. The coefficient of the effectiveness of reinforcement and the coefficient of the utilization of armature are defined. New dependence by determination of the durability of the squeezed elements is offered.

Masonry is a monolithic anisotropic building material. A difficult tension arises in it under the influence of loading. It is caused by different strength and deformation characteristics of brick and solution. Masonry is widely used in the constructions working for compression. At the same time the increase of durability of separate parts of buildings (columns, walls, etc.) is often required. Mesh reinforcing can be used for it.

The norms [1, 2] are developed in accordance with the dependences received in the 30-60th of the past century. They are published since then practically without adjustments [3]. At the same time the production technology of brick and the idea of masonry tension were changed, other types of solutions and reinforcement appeared. All these facts demand of the specification of existing techniques of design and calculation.

In Polotsk State University the researches of stressedly-deformed condition of masonry with transverse reinforcement are conducted. The examples in the form of prisms were made from brickwork. The part of the examples were made as not reinforced, the other part was reinforced by grids of two types. The grids of "Type A" are in the form of a flat spiral; the grids of "Type B" are from being crossed cores.

The characteristic of the examples are represented in tab. 1.

Table 1 – Characteristics of the samples

Series	SI	SII	SIII	SIV	SV	SVI
Designations	K1, K2	K3, K4, K5	K6, K7, K8	K9, K10	K11, K12, K13	K14, K15, K16
Brick Solution	M150 M75	M150 M75	M150 M75	M200 M75	M200 M75	M200 M75
Type	–	Type B	Type A	–	Type B	Type A
The percentage of reinforcement μ , %	0	0,407	0,407	0	0,19	0,19

Tests were conducted in accordance with our program and taking into account [4]. Longitudinal and transverse deformation was measured. Stresses in the rods of reinforcing mesh were determined.

The character of the destruction of reinforced masonry is identified [5]. Failure occurs in the shearing of the outer layer and crushing rows of masonry. Only area A_{eff} was worked in the latter stages, see fig. 1. Stresses in the armature class S500 reached 350MPa. Such a way, the utilization rate: $350/500 = 0.7$ (in the normative documents – 0.6).



Fig. 1. Character of destruction reinforced samples, division section on A_{eff} and A_0

A single value of the coefficient of the effectiveness of reinforcement of masonry “K” for all types of brick $K = 2$ established in [1, 2]. “K” is 3.8 ... 5.4, calculated by [6] – 10, based on [18], an average of 8 according to the results of experiment. The quantity of “K” was a 3 ... 4 and decreased to 2.2 at 0.8. 1.6% in experiments of V.A. Kamejko [17]. see fig. 2.

In the calculations of reinforced concrete structures:

- the coefficient “K” depends on the present of reinforcement, concrete strength and armature [8 – 10, 11];
- in the norms [12 – 16] “K” is assumed to be a single number;
- the percent of reinforcement is defined only for area of section A_{eff} .

A new dependence for determining the breaking load than [1, 2] was proposed:

$$N_u = m_g \varphi (R_u A + \frac{KR_{sn}\mu}{100} A_{eff}) \tag{1}$$

where m_g – the coefficient taking into account the effect of long-acting loads;

φ – the coefficient of buckling;

R_u, R_{sn} – the tensile strength of masonry and normative resistance of armature, respectively;

K – the coefficient of the effectiveness of reinforcement.

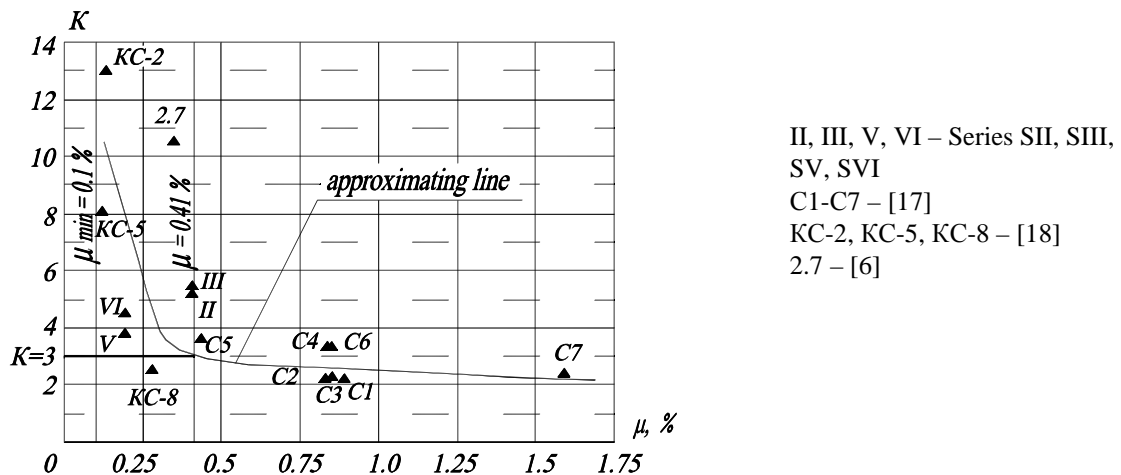


Fig. 2. Dependence of “K” on μ

Comparison of values N_u obtained in an experiment with N_u by [1, 2] and (1) is satisfied in tab. 2

Table 2 – Results of calculation

Series	*	R_u , MPa	R_{sn} , MPa	K	N_u , кN	$\frac{(N_u - N'_u)}{N_u} 100\%$
II, III	A	5	300	2	887	14,1 (18,6)
	B	4,95	350	3,8...4,9	1033(1090)	–
	C	5	350	3	1023	1,0 (6,1)
V, VI	A	4	300	2	930	40,8 (42,5)
	B	4,43	350	5...5,4	1572 (1617)	–
	C	4	350	3	1181	24,9 (27,0)

* A – по [1, 2]; B – the experiment results; C – of (1)

Suggested dependence (1) corresponds to the mechanism of destruction of masonry with mesh reinforcement. Calculations according to (1) give good agreement with experimental results.

It is possible to use new methods of calculation with the development of computer technology. For example, using the finite element method, we plan to create finite element models and their comparison stress state with experimental data. Also we consider the development of methodology for calculating cross sections of arbitrary shape and reinforcement using both equilibrium equations external and internal forces, deformation diagrams, deformation conditions section.

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THE FOUR TEMPERAMENTS IN INTERIOR DESIGN

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Designers and architects pay special attention to the psychological type, especially, temperament. There are four human temperaments in psychology. They have great influence on creating the interior for each person.

Modern interior design – is an amazing art, which describes architectural and artistic building space. It talks about organization and combination of lines, shapes, textures, furniture, lighting and color in a room. As a result, there is a particular environment of a man, characterized by functional convenience, safety, climate, comfort and artistic appeal.

Since people spend most of their time in rooms, well-designed interior plays an important role in ensuring their psychological comfort. Interior design effects on productivity, helps save money, provides health and safety of people.

For each person concept convenience and comfort are different. That's why all the interiors are fundamentally different from each other. They have their own distinctive features or characteristics.

The first and the most important step in creating interior spaces is the study of the character of the owner, his preferences, tastes, interests, work, etc.

Definition of temperament is a major factor in shaping the future of the interior from the psychological point of view.

Temperament – a complex of individual personality features of the host.

Only after determining the dominant temperament of the owner an architect can move to the next step: the development of conceptual design.

There are four temperaments in psychology. They are phlegmatic, choleric, melancholic, and sanguine. Each temperament has its own positive and negative characteristics.