SOME METODS OF A OBTAINING FIRE PROOF MONOLITHIC FLOORING

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Abstract: *In present study the effect of construction materials necessary for building it can be acquired without problems – steel bars and concrete can be bought easily, while planks can be later used to build the roof. Furthermore, monolithic flooring can be built in a variety shapes, also including atypical, round or polygonal shapes. It determines the amount of stress the material can take. Concrete strength is determined by measuring the crushing strength of cubes or a cylindrical sample made from a pre-prepared mixture.*

Key words: *floor, monolithic, excellent, fire, material.*

Annotatsiya. *Ushbu ishda uning qurilishi uchun zarur bo'lgan olovga bardoshli qurilish materiallarining ta'sirini muammosiz olish mumkin - po'lat panjaralar va beton, keyinchalik tom yopish uchun taxtalardan foydalanish mumkin. Betonning kuchi kublarning maydalash kuchini yoki oldindan tayyorlangan aralashmadan tayyorlangan silindrsimon namunani o'lchash orqali aniqlanadi.*

***Kalit so'zlar**: zamin, monolit, qattiq, yonish, material.*

***Аннотация.** В настоящем исследовании влияние огнестойких строительных материалов, необходимых для его строительства, можно без проблем получить - стальные прутки и бетон, а позже можно использовать доски для строительства крыши. Прочность бетона определяют путем измерения прочности на раздавливание кубиков или цилиндрического образца, изготовленного из предварительно приготовленной смеси.*

***Ключевые слова**: пол, монолит, добротный, горение, материал*

Despite the presence of many modern and interesting construction solutions on the market, traditional monolithic flooring still has numerous followers. This is caused by a few different reasons. First and foremost, when building monolithic flooring, there is no need to use heavy equipment. Besides, construction materials necessary for building it can be acquired without problems – steel bars and concrete can be bought easily, while planks can be later used to build the roof. Furthermore, monolithic flooring can be built in a variety shapes, also including atypical, round or polygonal shapes. That and it is not too thick (from a few to a dozen or so centimetres) and is characterised by good acoustic and thermal insulation characteristics. If it is built according to the best construction practices, reinforced concrete flooring forms a smooth and even surface on both sides, that is the floor and the ceiling.

Unfortunately, they also have some disadvantages. First and foremost, they are relatively heavy and building them is labour-intensive, since they require full formwork and complicated reinforcement, constructed by a professional. Furthermore, there should be no stoppages during the works – after setting up the formwork and reinforcement, concrete should be poured immediately, of course while remembering to vibrate and cure it properly. Unassisted construction of such flooring is impossible and thus help of excellent professionals should be employed during the mentioned works.

Constructors and designers all over the world rely on concrete as a strong material that provides safety and is easy to handle. It can be found in almost all building types – residential, commercial, multi-floor and even in municipal infrastructure – roads, bridges and many more. Despite its wide range of use, many of its users still do not know about the matters directly connected to ensuring the endurance and high quality of concrete. The term “concrete strength class” means the endurance of concrete against compression, no more, no less. It determines the amount of stress the material can take [1]. Concrete strength is determined by measuring the crushing strength of cubes or a cylindrical sample made from a pre-prepared mixture. After the measuring and strength determining, concrete is assigned a strength class. The European Standard PN-EN 206: 2014 clearly defines the designation of the concrete strength class. It is marked with the letter C and two numbers – e.g. C 16/20. What does this term mean exactly? The letter C is an

abbreviation for the expression *compressive strength*, i.e. the previously mentioned endurance against compression of the material. The first number tells us about the strength marked on the cylinders, while the second number is the endurance test performed on cubic samples. The percentage of cement and the so-called water-binder indicator has a significant influence on the strength of the concrete. This means that the more binder and the less water is in the mix, the higher the class of the concrete.[2] However, this is not without consequence – increasing the amount of cement in the mix results in a negative effect on rheological properties, causing excessive stress. The result may be cracks appearing in the structure. Of course, there is a way to limit them, such as anti-contraction reinforcements or appropriate chemical admixtures.

The wide use of concrete, which was then prepared from cement and volcanic ash, was already discovered as far back as the Antique. Called “artificial stone”, it has high compressive strength, but very little resistance against stretching. For this reason, for many centuries, compressed elements, i.e. walls and columns, were made of this material. However, almost 200 years ago, the idea to use metal bars in constructions to strengthen bent elements appeared – that was when a real revolution was put in motion. From that moment on, the structural elements can be additionally reinforced with rods and steel security nets [3] At this point, the objective of the steel is to take over the stretching stress, while the concrete only works on the selected base.

Concrete is a non-flammable material and cannot catch fire by itself. Of course, its surface can burn, e.g. when it is covered with a flammable material – fuel, varnish or plastic, etc. Nevertheless, concrete alone is not combustible in the same manner as, among others, wood [4]. This does not mean, however, that it is completely resistant to the effects of fire. True, a concrete wall provides excellent protection against flames, but, unfortunately, it can also get pretty hot. The less free space filled with air there is in such concrete, the better it transfers heat, which means that it heats up faster concrete This is why autoclaved aerated concrete is so popular. Due to the presence of empty space inside of it, it has good thermal insulation properties and, at the same time, heats up much slower than traditional solid reinforced. Furthermore, let us not forget about the issue of fire resistance [5]. Concrete does

not burn, but high temperatures will surely have a negative impact on its structural properties, in particular in its surface zones.

This is caused by the presence of traditional aggregate, which increases its volume significantly in temperatures exceeding 500°C. Because of that basalt, pumice or diabase aggregates are, for example, used to manufacture fireproof and heatproof concrete, since they withstand high temperatures much better. Furthermore, special ceramic reinforcements are placed in the concrete, which increase its durability in high temperatures (exceeding, e.g., 1000°C.)

To preserve and protect existing historic buildings from the effects of father time, the best solution is to use GRC concrete. The application of this type of concrete in the renovation of monuments is a common practice among conservators. Due to the favourable material properties: high resistance, durability, flexibility among others, GRC concrete is becoming more and more popular in architecture and reconstructive procedures. Materials used in the renovation of fire.

By adding glass fibre to the basic concrete mix, the material produced becomes much lighter and more resistant to stretching. It still has the features of ordinary concrete, however, improved by an additional layer of material that increases its plasticity and flexibility. This feature enables the use of GRC concrete e.g. in the renovation of monuments, in the creation and reconstruction of various details and architectural elements, decorations and ornaments.The production of GRC concrete consists of mixing cement, water, small aggregates, pieces of fiberglass and other additives until it becomes a liquid concrete mixture, which will then be printed on the prepared form. High tensile strength and compression makes GRC concrete reliable for the production of thin but strong building elements, such as: panels, facades, claddings, ceilings, domes or decorative columns.

GRC concrete is strong in both the compressive and the tensile aspect.

It is more flexible and plastic, which makes it possible to model any shape consistent with the maintenance plan:

1. 2.It is much lighter than ordinary concrete, so you can use it to create thin walls, panels and ornaments
2. It is resistant to both fire and weather conditions – this advantage is one of the most important in the case of renovation of old and historic buildings.
3. Easy to manufacture – just add glass fibre to the basic mix.

4. Waterproof – resistance to moisture extends the life of each mortar.
5. A smooth surface can easily be obtained by using GRC concrete.
6. GRC concrete gives the possibility of easily forming any shape, according to the customer’s wishes and the requirements of the conservator.
7. This type of concrete is easy to care for.
8. In terms of finish, GRC concrete can be painted in any colour or left in its original form as exposed material.

For several decades, concrete has been the favorites building and architectural material almost all over the world. However, despite its durability and resistance to weather conditions, damage can occur in it, caused by the human factor, unfortunately. Graffiti can effectively spoil not only ruin your day, but also an unprotected facade, penetrating deeply into the material structure. However, there are ways to protect yourself from vandals and save time for.

Among building enthusiasts, it is said that the facade is the face of the building. It has an undeniable influence on the appearance and reception of urban architecture – building facades are variable and individual, just like human faces. To maintain their value and aesthetic look, they must be under the best possible care and treated with an individual approach. What if someone decides to destroy the facade, covering it with colorful, but unsightly inscriptions? There is no sure-fire way to prevent such actions, but you can use solutions that will protect the surface from damage and allow you to effectively wash the graffiti off. Concrete preparations that form a protective anti-graffiti coating are there for the rescue. The effect of the protective agents is that the paint contained in the spray does not penetrate into the structure of the material to be protected, but instead bonds itself to the layer of protection.

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