

As we see nowadays houses can be built almost of any materials. The question is only how much you trust such innovations, but as we see with time any technology gets only cheaper.

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MODERN TECHNOLOGIES IN BUILDING

For many years humanity as a whole has developed and improved the technologies we use in construction of residences or any other types of architectural structures. Looking back its worth noting how far we have come, previously constructing a building required hundreds of workers and was rather unsafe.

Take for example The Great Pyramid of Giza. How many people have left their lives beneath the sand stone blocks that make up the pyramid, how many souls have withered away? Though somewhat miserable it is still a great achievement and a cultural landmark. But think of what we could do today using modern equipment. As our tools got smarter and sharper, necessities for human labor and injuries have decreased. This is precisely the topic of my essay.

Remember 3D printers? You may think that they are only used for creating iPhone cases and figurines. But you will be surprised by what they can really do. They aren't conventional printers that you might find in someone's home but they still operate in the same manner as their household counterparts, only using construction materials instead of plastic and on a larger scale. Back in 2014 an entire apartment building in China was erected by a 3D printer. The main idea was to print a building that required less time, labor, and was made of recyclable materials, reducing the cost and environmental pollution. Not only did they achieve that but the apartment has proved to be earthquake resistant and provided great heat insulation.

Nonetheless, the apartment was printed off site and assembled later, which brings us to the 3D printer made by Apis Cor which has been used to build several prototype houses in Russia. The printer is capable of constructing houses entirely on site needing only a little of human labor. Though the size of the houses is limited right now, what it lacks in size it makes up in speed and cost efficiency. In just 24 hours it has printed a 100 square meters house that costs only 10,000 dollars.

3D printing technologies can also be used to build small buildings like cabins, bus stops, phone booths, or even structures such as bridges etc. Some interesting objects include:

- the Urban Cabin in Amsterdam by DUS Architects, which is a compact mini retreat in the middle of the city (8 square meters);
- the Bicycle Bridge in Netherlands by the Technical University in Eindhoven. It has not built yet but will measure out to 3.5 meters wide and 8 meters long. It uses a special concrete that keeps its form once laid out, unlike the usual concrete. It means that there will be less waste, which is extremely beneficial to the environment;
- the Pedestrian Bridge in Madrid by the Institute of Advanced Architecture of Catalonia.

Neom, the city of the future. Not only Holland and China work on 3D printers and projects associated with them. Saudi Arabia has invested 500,000,000 dollars in the creation of massive futuristic megalopolis. The city will be built on the border of Saudi Arabia and Egypt, with the area being 26,600 kilometers squared. The megalopolis will be powered only by natural sources of energy generated from solar and wind power plants that surround it. They are going to print an oasis in the middle of a scorching desert. The entire city will be supplied with high speed internet, self driving floating cars and sparkly magical creatures.

In conclusion, 3D printing and other related technologies possess great potential that could perhaps solve several worldwide problems like environmental pollution and lack of housing. It should also be noted that NASA plans to use 3D printing technologies to create colonies on Mars.

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POLYMERIC MEMBRANES AS AN ALTERNATIVE TO TRADITIONAL SOFT ROOFING

From the previous years the roof constructions have been given special attention. Recently a lot of technologies in this sphere have been improved and new materials have also been used.

For several decades housetop has been based on bituminous materials which have been in mass building. This construction way is called «soft roofing». Nowadays these materials are used both in the repair, reconstruction of old buildings and in the construction of new ones. However, a real revolution has been happened in this industry today.

The large number of modified bituminous materials are appeared and they are become more improved with special aids. These materials are produced on the non-rotten basis. Among the new types of the soft roofing are the polymeric membranes, the two-pack coating, etc.

Such materials are available in great number in today's market. The quantity of the polymeric membranes in the market is growing up because they are used when new buildings are built.

The polymeric membranes are special class of materials, which have positive qualities as follows:

- longevity (more than 50 years);
- high technology when it is installed;
- possibility of placing without changing the technology during the year (for example, ruberoid can't be installed at sub-zero temperature);
- high strength;
- elasticity.

A lot of brands of the polymeric membranes are known today. The most popular are Alkorplan (Belgium), Genflex (USA), and Resitrix (Germany). They are representatives of the most common types of the roofing (housetop). Each type is applied taking into account the specific characteristics of the constructed buildings. The polymeric membranes are particular effective and economical on the flat roofs of new buildings and for large industrial and public buildings.

There are several methods of stowing the polymeric membranes. Except for the traditional stowing of the membrane on the heated bitumen some methods have been designed today such as ballast, mechanically fastened, glued systems, "lath in the seam" system. In view of the high level of climate, chemical, biological resistance and the lasting quality, it is expediently to use the membranes when making the exploitable green coating, which is quite relevant in the modern urbanization conditions and gas polluted areas.

Therefore, the variety of the polymeric membranes and elaborate election procedures let us to find the ultimate solution for any coatings. The development and outspread them on the trade market give us the foundation to hope that the new and widely used methods will be found