

THE LATEST TRENDS IN ARCHITECTURE IMPORTANT FOR SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL PROTECTION

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Abstract: In this paper, the emphasis will be on presenting the trends that are dominant in the field of construction in 2017. Includes projections built around the world, from fantastic transport containers that have been adapted and converted into a residential proctor to the skyscraper in the true sense of the word. In addition, the emphasis is on those construction projects that were built with the intention of protecting the environment as well as according to the principles of sustainable development.

Key words: *sustainable development, environmental protection, architecture, bioclimatic design*

1 Introduction

Buildings covered by plants, Incredible transport containers, Gender equality in architecture, Cross-laminated timber buildings have become a reality, Focusing on social housing, Fantasy high buildings, Brutal style buildings are reduced, Reflective pink facades, Interiors inspired by Japanese tradition, Mobile buildings - are just some of the trends in contemporary architecture that mark the second decade of the 21st century. In the following text of this paper they will be spoken of.

2 Sustainable constructions for the 21st century

This year, there were plants covered with plants more than ever before. Among the

10 most important projects, some of which have already begun construction, while others are still only in the stage of architectural design, the "1000 Trees" in Shanghai, projected by Thomas Heatherwick, is highlighted. As the name itself says, this building will be covered with 1,000 seedlings that will be distributed over the facility.

The company *Vo Trong Nghia Architects* continued with the trend of reconstructing houses covered by bamboo in Ho Chi Minh City, one of which won the World Building of the Year 2017 within the World Architecture Festival. Then, Stefano Boeri, who presented the project for the construction of vertical forests that neutralize the smell from Nanjing to the planet Mars.

Figure 1. „1000 Trees“ in the buildings



Although the use of transport containers for some other purposes other than its primary purpose for the transport and traffic of massive products is not entirely new, this year architectural proposals are much more ambitious in comparison with previous years, so they move from converting containers to steam baths and pools, up to the outlined offices in the yard or even football stadiums.

This year's most interesting project in the architectural sense, as well as from the point of view of environmental protection, is a house made of recycled transport containers arranged to resemble a desert cactus. In addition, this house is also located in the California desert.

The great impression of modern sustainable construction was also left by the Brooklyn house made of stacked containers that were recycled and cut to form an object at an angle that seems to be detached from its axis at any moment. However, the constructors took care of all aspects of the safety of life in this building, so it is considered a new wonder of architecture at the end of the second decade of the 21st century.

Figure 2. Building: House "California Cactus"



In 2017, it started promising when it comes to gender equality with Denise Scott

Brown. It is known that she refused to receive the Pritzker Prize, and she won the "Jane Drew Prize" for women in architecture. However, it seems that the progress went wrong, as a result of a series of bad decisions taken within this branch. The conclusion is that only the world's three largest architectural firms have a leader for women.

Buildings of cross-laminated timber have become reality. The first hybrid wooden tower was given a green light for construction in the United States, where Skidmore, Owings & Merrill gave advice on building a wooden structure.

The fatal fire that hit the "Grenfell Tower" building with social housing brought public housing in the United Kingdom, especially post-war. To increase public attention, this building is located near the royal palace of the English queen, so mass insinuations were launched immediately in the press that the fire was actually deliberately provoked.

The discussion continued in Australia by private sale of the Sirius building, and in the UK the demolition of Robin Hood Gardens and the renovation of Park Hill and Thamesmead. "As a strategic view of knowledge management, which considers the union between technology and human factors on survival in the changing environment emphasizes the definition according to which knowledge management includes the most important critical issues of organizational adaptation, survival and competence in dealing with all the growing and rapid changes in the business environment. In essence, knowledge management is the embodiment of organizational processes that seek synergy and combination of data and information that increase the capacity of information technologies, and create and innovate potential human resources. This is the concept of the collective knowledge of an organization whose ultimate goal is the efficient application of knowledge to situations in which decisions are made.

It is particularly important to emphasize that this knowledge should be available with really little work and effort, and it can be applied.”¹

However, although a large part of 2017 was preoccupied with social housing and the current state of social housing, the Royal Institute of British Architects awarded the Royal Gold Medal to Neave Brown, a pioneer in high-quality public housing. In this respect, Serbia does not lag behind the trend in world architecture. By 15 January 2018, it will be commenced with the implementation of social housing in 6 cities in Serbia. For this construction purpose and the construction of "cheap apartments", certain locations have already been determined from Vranje to Belgrade. The price of the square is really minimal and ranges from 400 (in Vranje) to 600 euros per square (in Belgrade).

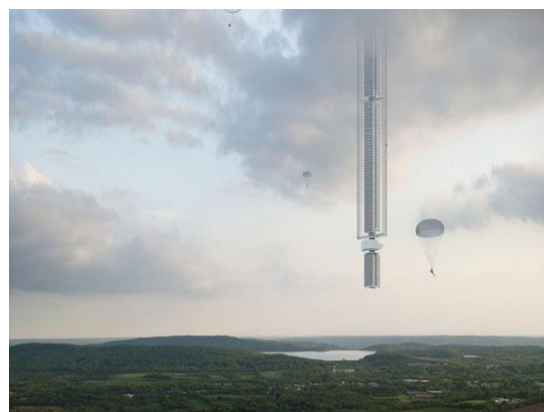
Figure 3. Buildings for social housing in the world



In 2017, they built huge "hanging" buildings that stretch to the sky and with different levels of sustainability. The US company Clouds Architecture Office has proposed a project for the tallest building in the world that would be a sphere with an asteroid in orbit and from which parachute residents can descend to the ground, while Haseef Rafiei predicted a 3D printed

skyscraper that would initiate the construction of modular houses. These are really fantastic design ideas that will be discussed at the scientific and professional level. The same architect made a proposal for a huge "folded tower" in New York that would become the longest building in the world ever built.

Figure 4. An asteroid related building



At the end of 2017, the planned ending of the Robin Hood Gardens is nearing completion. " After many years of delay and a request to preserve the "Alison and Peter Smithson" block in eastern London, it has been demolished now, except for the part of the V & A Museum. Also, the same fate will hit the housing block in Sydney, namely, "Sirius" (residential block in Sydney), handed over for sale for private development of housing construction in this city.

By the end of the year 2017, the trend of colors is followed. Namely, this year also in the trend was the so-called, millennium pink. The millennium of pink color began as a trend first for interior and equipment and later it spread to the facades. (For example, Duggan Morris chose this shade for the Kings Cross facade). Of course, many other pink design projects have also appeared: Simon Astridge has been building an existing pink building in London, Productora has painted the Californian bungalow in this shade, while Extrastudio used a pigmented mortar to make a former winery in southern Portugal gave a new look.

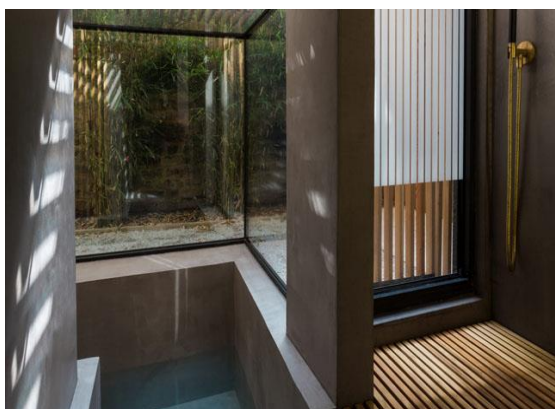
¹ Ljiljana Stošić Mihajlović, KNOWLEDGE MANAGEMENT AND LEADERSHIP - THEIR IMPACT ON CREATING SUSTAINABLE COMPETITIVE ADVANTAGE (2014), (JPMNT) Journal of Process Management – New Technologies, International Vol. 2, No.4, 2014. pp. 102

Figure 5. Trend pink colors design



The Japanese chain of restaurants "Nobu" turned the hotel on a beach from the 1950s in California into a modern Japanese-style hotel, which has triggered a tendency to build Japanese-style buildings and other parts of the world. An example of this is the expansion of a London-style house with a buried Japanese-style bathroom, which is proof that a trend has been launched for an entree-inspired Japanese tradition. Otherwise, this project won the award "Do not Move Improve!" 2017 "for renovating the house. There are still such examples. Thus, one project to renovate a Victorian house in London was inspired by Japanese style, by tattooing matting and smoked oak clad with raw plaster works to indicate the Japanese heritage of clients.

Figure 6. The building and the Japanese-style interior



Another innovation in construction is fascinating designers and architects around the world. Namely, the handles and motors

that drive and turn the building are no longer just the futuristic dreams of the designer. Thus, the "Fosun Foundation" in Shanghai has a bronze curtain façade, while "Dubai Apple Store" has swivel "solar wings". These objects are built with the intention that the building be completely self-sustaining in terms of meeting the needs for energy and water. Also, to build his studio, Fernando Abellanas chose an unexpected location - the lower side of the bridge that is covered with graffiti and is located in Valencia. The self-taught designer used a concrete structure to make the roof and walls. While Olson Kundig designed a house in West America with a seven-meter-sided glass wall, which can be moved with the help of the engine, the hammer and the handle. This practice are proof that both constructors and architects, as well as people who are dealing with completely different occupations, really take care of sustainable construction."In modern transport models, which were developed in Europe, is very important output indicator is to analyses the impact of transport on the environment. Through this indicator provided an overview of the share of emissions of greenhouse gases and noise in some parts of the transport system."²

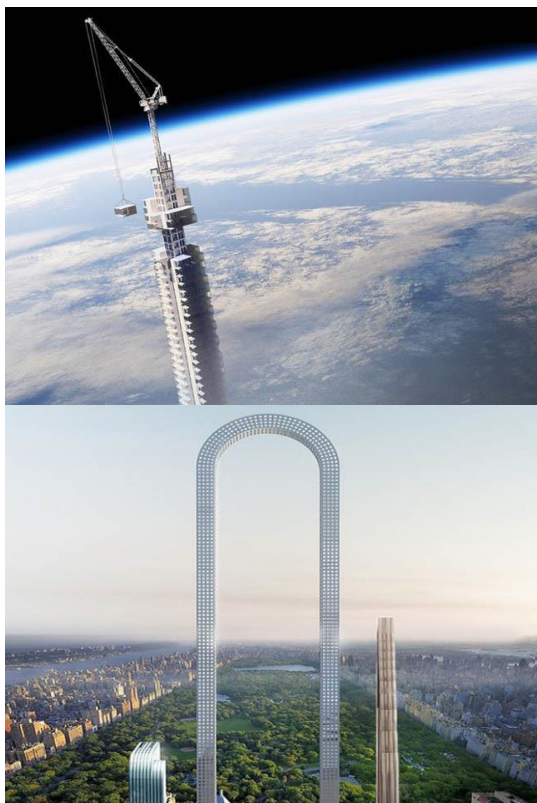
3 Interesting examples of architecture in 2017

This year was fascinating and enchanting when the conceptual architecture was in question, so we witnessed the imaginative, still unrealistic proposal for a skyscraper hanging above the ground attached to an artificial asteroid, whose full realization can be expected with further scientific technical innovations and improvement.

² Ljiljana Stošić Mihajlović (2015) APPLICATION OF THE PRINCIPLES OF SUSTAINABLE DEVELOPMENT OF TRANSPORT INFRASTRUCTURE AND LOGISTICS AS AN ECONOMIC SYSTEM, (JPMNT) Journal of Process Management – New Technologies, International Vol. 3, No.2, 2015, pp. 38

Another similar to this is the case of a folded tower, which resembles a large merger, which is already now or in due course can be practically realized for housing.

Figure 7. Buildings of the future designed in 2017



The trends that mark in 2017 are related to the construction of wooden skyscrapers and buildings covered with plants (buildings with green facade). Architect and designer Stefano Boeri, known for vertical-like towers, continued to impress with new projects, and what seemed like a dream a few years ago has actually started to become reality in some parts of the world. The project of the Italian architect "Forest City" in Ljudju in China is ongoing and it is interesting that the plan is to be completed by 2020. "Ecological architecture - is an architecture which is more or less a part of the natural environment, which does not disturb the

natural course of which using natural materials without causing any harmful effect on humans and the environment. Green architecture - which has minimal negative effects on the environment and is maximally energy efficient. Solar architecture - a name for the architecture that is designed to advantageously use direct solar energy to customers' needs: heating, cooling, ventilation."³

Figure 8. Forest city



However, in our opinion, the best and most beautiful futuristic building that can be built in the next decade is the Nautilus building project. Make any word pictures speak for themselves!

"The attribute "smart" office building gets its parameters by adjusting the external environment and the entire organization with employees and customers who spend time in it.

³ Ljiljana Stošić Mihajlović, Marija Mihajlović, Svetlana Trajković (2017), BIOCLIMATIC URBAN DESIGN – GENERAL, ECOLOGICAL AND ECONOMIC ASPECT, (JPMNT) Journal of Process Management – New Technologies, International Vol. 5, No 3, 2017, pp.17

The need for automating business residential facilities primarily is resulting from efforts to save energy, given that about 45% of our world's energy is consumed by administration in commercial and residential buildings. The necessary investment is about 2% of the total investment, and the first results saving and cost reductions are visible after a few months.”⁴

Figure 9. Nautilus buildings



“The new economy or the economy of a new era or a new millennium, she found it in a state of economic science, it seems, the great disintegration on the one hand, and narrow economic specialization of scientific disciplines. Note that, in principle, such a situation is not specifically related only to the social

sciences and in particular the economy. The situation is similar with other so-called classical scientific disciplines. Namely, the classic scientific disciplines: physics, biology, chemistry or group of humanities, as is the case in sociology and economics, organizational sciences and law, and of course the others are set aside specifically developed rope, narrow expert specialized scientific disciplines such as nuclear physics, quantum physics, molecular biology, neurophysiology, number economies that social phenomena are viewed in the light of the natural limitations and sustainable development. Such a development of scientific disciplines has resulted in a huge fund of scientific results, especially perfected scientific methodology, and an entirely new, the development of new scientific disciplines an appropriate terminology.”⁵

“This is only part of what architects around the world intend to present to their world in their ideas when building sustainable buildings that are complemented by the concept of sustainable development in question. It is certain that the started trends will continue and future will fascinate and inspire people around the world, but also to become new wonders of the modern world. In today's modern city as the center of the region and to the technological, commercial, industrial sense, using the maximum reliance on development based on fossil fuels and energy resources, in terms of more obvious the need for professional specialization and high levels of social organization, or simply weaken they even destroyed the limitations that local environmental conditions affect the level of human security.

⁴ Stanka Djuric, Marija Mihajlovic (2017) ECONOMY "SMART BUILDINGS" HOUSING, (JPMNT) Journal of Process Management – New Technologies, International Vol. 5, No 1, 2017, pp. 1

⁵ Ljiljana Stošić Mihajlović, Svetlana Trajković (2016) MODERN ECONOMY: FEATURES AND DEVELOPMENTS (JPMNT) Journal of Process Management – New Technologies, International Vol. 4, No.2, 2016. pp.17, www.japmnt.com

In developed countries, the exploitation of natural resources, and in relation to that higher level of pollution have led to contamination and a large impact on forest ecosystems; loss of biodiversity; depletion of fish stocks; land degradation; pollution and water scarcity; more frequent contamination of humans, plants and animals, chemicals and radioactive substances; climate change, general warming accompanied by an increase in global sea level.”⁶

Conclusion

Conceptual architecture relies on a building project, but it can also be an extremely unrealistic design project as if it came out directly from a science fiction movie. During 2017, we witnessed a large number of architectural solutions, and in this work and gallery of images, they were shown the most exciting, which left the strongest impression from the point of view of sustainability and environmental protection.

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