

3. Green R. *Advances in Bulk Material Handling*. – Elsevier, 2021.
4. Kovalenko P. Yu. *Automation of Bulk Material Mixing Processes*. – Kharkiv: KhNTU, 2019.
5. Wagner S. *Hybrid Mixing Equipment for Industrial Use*. – Wiley, 2021.
6. Ivanov O. *Energy-Efficient Mixing Technologies*. – Cambridge University Press, 2022.

AFTER WAR RESTORATION OF CONSTRUCTION INDUSTRY

ANASTASIA MEDVEDEVA, student

OLEKSANDR V. SHEPEL, Senior Teacher, Language Advisor

O. M. Beketov National University of Urban Economy in Kharkiv

The Ukrainian construction economy is slowly thriving, with a noticeable restoration because of the revival of facilities damaged by shelling. Nowadays, there is no time or facilities for the implementation of restoration projects. Works on the construction of fortification structures are more preferable and underway.

Ukraine has been in a state of full-scale war with the Russian Federation for the fourth year in a row, which significantly affects any industry, including the construction industry. The hostilities caused serious changes in the economic and socio-cultural sphere in all regions of the country. In this context, the construction industry is also going through great transformations and challenges that are worth studying and understanding.

We have identified ten key trends in the construction industry that have emerged during martial law and that need to be taken into account when developing strategies that will help enterprises in this industry effectively respond to the challenges they face.

1. Reduction of the domestic market for building materials With the beginning of the full-scale invasion, most Ukrainian enterprises were forced to suspend or limit production, and some refocused on the needs of the Armed Forces of Ukraine. Many construction enterprises and infrastructure facilities have been damaged or destroyed, many enterprises in the South and East have found themselves in the territories of active hostilities or under temporary occupation, as well as logistics elements, suppliers of raw materials and components. The energy crisis, in particular damage to engineering infrastructure, also negatively affected the production of construction products. The industry experienced an acute shortage of raw materials and building materials – glass, hardware, building mixtures, bricks, etc.

2. Problems of importing building materials. A large share of raw materials and building materials has to be imported, but the volume of imports is also limited, since the port infrastructure practically does not work. Although during martial law, the government adopted a number of resolutions to simplify the import of certain goods, many building materials were still not included in the lists. There is also import substitution and restructuring of logistics links after the rejection of

goods from Russia and Belarus, which were previously predominant in many segments (such as the market of glass wool, bitumen, etc.).

Shortage of personnel in the construction industry There was a reduction in the number of qualified personnel in the industry due to mobilization and emigration abroad. Some design and contracting organisations have ceased or reduced their activities, so the shortage of personnel is noted by almost all market participants.

3. Increase in the cost of construction. The increase in cost is due, not least, to the above-mentioned factors – the rise in the cost of resources against the background of their scarcity (which concerns both the cost of building materials and human resources itself). This also includes exchange rate fluctuations, an increase in the cost of fuels and lubricants, the energy crisis, the actual termination of commodity and commercial lending, the inclusion of additional risks by suppliers in the cost, the restructuring of connections and logistics - all this affects the cost of construction. Some market participants claim that the cost of building facilities has increased several times compared to pre-war levels. In addition, the cost of construction of residential and public real estate will also be significantly affected by the increase in civil protection requirements, primarily for the arrangement of shelters and shelters as part of facilities.

Force majeure At the end of last year, another force majeure circumstance was added to the shelling, destruction, and disruption of logistics – blackouts, which also affected the construction industry. Although most organisations were able to provide themselves with autonomous power sources, this not only increased their costs (for the installation and maintenance of generators, fuel), but also limited the pace and volume of work, since alternative sources do not fully cover the needs of enterprises.

4. Changes in the structure and volume of demand in the field of construction and real estate With the beginning of the full-scale invasion, construction stopped throughout the country, but from the second half of 2022, work gradually began to resume in the territories remote from the front and in the de-occupied territories. It is quite natural that during martial law, construction volumes decreased significantly compared to the pre-war period. This is due to both objective and psychological factors: in conditions of uncertainty, both developers and buyers are not too inclined to make significant investments.

5. Change of potential buyers On the one hand, the purchasing power of the population has decreased significantly. On the other hand, even with the availability of funds, in conditions of uncertainty, buyers find it difficult to dare to invest in real estate, some potential buyers take a wait-and-see attitude. Thus, solvent demand as a whole has decreased very significantly. Due to internal migration, the demand for residential real estate is largely formed by internally displaced Ukrainians, most of whom are still not potential buyers of real estate due to the lack of savings. The launch of the state programme of preferential mortgage "eOselya" does not currently have a significant impact on the market, since the volume of lending is quite insignificant.

6. New features of buyers' choice of housing The war has forced people to be more careful about investing in real estate. Those who still decide to buy housing prefer ready-made apartments or housing with a high degree of readiness mainly in the western or central regions of Ukraine or in Kyiv.

7. Changes in urban planning legislation. The reform of the urban planning industry continues during the war. Since the beginning of the full-scale invasion, many regulations in urban planning have been adopted, some of which regulate legal relations during martial law, and the other will remain in force after its completion. The priority is the reconstruction of the country, the implementation of new security and civil protection standards, the facilitation of permits, the deepening of digitalisation and the further development of the Unified State Electronic System in the field of construction, which should contribute to transparency, legality and the elimination of corruption.

Preparation for post-war reconstruction Thus, it is advisable to start planning the reconstruction of the country without waiting for the end of the war. The process has already begun with the creation of the "Ukraine Recovery Plan", which defines a list of National Programs to achieve key results. U-LEAD with Europe has started providing support to 24 selected municipalities in the development of Comprehensive Territorial Recovery Programmes and Community Recovery and Development Plans. The Programme for the Comprehensive Restoration of the Territory is an analytical and spatial document that defines the main urban planning and socio-economic priorities of the policy of restoring the territory affected by armed aggression. The Community Recovery and Development Plan is a strategic planning document that will include tasks and measures for recovery and development, local development projects

References:

1. <https://clcgroup.com.ua/blog/tendencziyi-v-budivelnij-galuzi-pid-chas-voyennogo-stanu/>

MODERN APPROACHES TO ANALYSIS AND ENSURING THE ACCURACY OF MECHANICAL PROCESSING ON CNC EQUIPMENT

ANDRII MOISIEIEV, PhD student

SERHII TERZIN, PhD student

VOLODYMYR, SOROKIN, Professor, Doctor of Science in Engineering, Scientific Adviser

OLENA L. ILENKO, Professor, Doctor of Science in Education, Language Adviser

O. M. Beketov National University of Urban Economy in Kharkiv

The accuracy of the shape and dimensions of a part manufactured on numerically controlled (NC) equipment depends on a fairly large number of factors [4]. Errors occur at different stages of the life cycle of a technological system but