

**Секція 2**

**ІННОВАЦІЙНІ ТЕХНОЛОГІЇ  
У ПРИРОДОКОРИСТУВАННІ Й ЕКОЛОГІЧНОМУ  
РОЗВИТКУ, ГЕОЕКОЛОГІЧНИЙ СТАН МІНЕРАЛЬНО-  
СИРОВИННИХ І ЗЕМЕЛЬНИХ РЕСУРСІВ: ВИКЛИКИ  
ТА ПЕРСПЕКТИВИ**

**PECULIARITIES OF HANDLING DESTRUCTION WASTE  
DURING MILITARY OPERATIONS**

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In the course of hostilities on the territory of Ukraine, a significant number of civilian, transport and or completely destroyed a significant number of civilian, transport and military infrastructure. Many buildings are subject to dismantling. As a result of the rubble removal works, a significant amount of destruction waste that requires proper that need to be handled properly.

Currently, Ukraine is developing mechanisms for the recycling and reuse of and reuse of the so-called construction waste generated as a result of the destruction during the war. The possibility of reusing the reuse of waste in the restoration of damaged facilities, as well as in the in the production of construction materials. Materials unsuitable for recycling and reuse will be stored at specially designated landfills. Specially designated landfills. To this end, the relevant ministries are developing methodological guidelines that will help regulate the management of such waste. Unfortunately, the volume of demolition waste is growing.

Work is already underway to eliminate them. The collected waste remains on the territories of the cities and territorial communities where it was generated. Given the fact that there are currently a small number of construction waste number of construction waste landfills in Ukraine, it can be argued that there are almost no special places for waste storage. The largest construction waste landfill is located in Kyiv, which is overcrowded and not recommended for use. The industrial waste landfill in Kharkiv was destroyed during the hostilities. Allocation of new land plots for temporary landfills or disposal of destruction waste requires significant time and investment in construction. According to the current legislation, landfills must meet the requirements of the State Construction Standards. This means that it is not possible to quickly resolve the issue of building specialised landfills. And in the short term, waste will either be taken to household waste landfills or left at temporarily designated sites.

That is, today, in the absence of specially designated places for temporary storage of waste, there is actually clogging land resources, which has negative consequences for the environment. Disposal of waste at unequipped landfills leads to environmental pollution, the environment. The resulting leachate, which, flowing through the thickness of the waste, can contaminate soil and groundwater with hazardous water with hazardous liquids of multicomponent chemical composition. One of the main problems with the soil cover is its contamination with heavy metals, the content of which often exceeds the maximum permissible concentration. Soil toxicity is caused by compounds of such heavy metals such as lead, cadmium, zinc and copper. Excessive amounts of heavy metals in soils is a very dangerous environmental factor, the effect of which is aggravated by the penetration of heavy metal compounds into groundwater [1]. With regard to the use of waste as a secondary resource for the restoration of infrastructure, road construction, and the manufacture of building materials, such measures also need to be regulated at the legislative level. After all,

Ukraine does not have enough existing regulations, standards, instructions, rules, etc, that would determine the ways of selling and using such materials in the in the future.

For the introduction of a mechanism that will already allow the use of demolition waste as a secondary raw material with minimal negative environmental impact, we propose the following stages of work.

1. Before carrying out work related to the dismantling of rubble, first of all, it is necessary to neutralize the object from explosive substances and obtain a specialist opinion on demining.

2. Settle legal relations with the owners of the destroyed facilities, obtain permission to access the property, as well as to transfer ownership to the waste generated in the course of the work.

3. In the process of waste collection, separate hazardous waste (slate, roofing material, waste electrical and electronic equipment, etc.) Hazardous waste shall be transported to industrial waste landfills, to industrial waste landfills.

4. Safe construction waste should be crushed on site, if possible. dismantling, crush it with mobile crushers. The crushed material shall be transported to household waste landfills.

5. In the absence of mobile or stationary shredders construction waste, we propose to remove the waste to a specially designated for this purpose at solid waste landfills.

It is advisable to use shredded construction waste as an insulating layer when compacting household waste, or for the construction of temporary roads, or to strengthen slopes [2].

Given that a significant number of landfills in Ukraine require reclamation, and in the current economic conditions with insufficient such work is almost never carried out in the current economic environment, construction waste should be used in the reclamation process. Namely, during the technical stage of reclamation, when the landfill dome is levelled and compacted. of the landfill and its compaction.

Thus, the use of waste is possible as a lateral outer insulation layer, intermediate insulation layer, which does not contradict the requirements of state building codes.

Implementation of the proposed method of recycling demolition waste will reduce the need for new land allocation. will reduce the need to allocate new land plots for temporary storage of waste for temporary waste storage, which will reduce the negative impact of waste on land resources.

#### REFERENCES

1. Порядок поводження з відходами, що утворились у зв'язку з пошкодженням (руйнуванням) будівель та споруд внаслідок бойових дій, терористичних актів, диверсій або проведенням робіт з ліквідації їх наслідків. URL: <https://zakon.rada.gov.ua/laws/show/1073-2022-%D0%BF#Text>

2. Державні будівельні норми України. Проектування. Полігони твердих побутових відходів. Основні положення проектування. ДБН В.2.4-2-2005.

### **COMPREHENSIVE APPROACH TO FOOD PRODUCTION WASTES USING AS PART OF COMPOUND FEED**

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Food production wastes using as part of compound feed correspondence to sustainable development goals number 2 “End hunger, achieve food security and improved nutrition and promote sustainable agriculture”, number 8 “Foster sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all”. Such technology helps to reduce: