



From
the People of Japan



ASBESTOS WASTE MANAGEMENT PROTOCOL

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for
UNDP CONTRACTORS AND PARTNERS



Disclaimer

This Asbestos Waste Management Protocol was developed by UNDP Ukraine, and is provided in good faith to help reduce the risks associated with the handling of asbestos-containing materials in debris removal and demolition work associated with war-damaged buildings in Ukraine.

It is the full responsibility of the entity or persons planning to handle asbestos-containing materials to ensure there are competent and experienced persons available to manage asbestos safely.

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Table of Contents

Abbreviations.....	4
Relevant Legal Texts in Ukraine.....	5
1. INTRODUCTION	7
2. ASBESTOS USAGE IN UKRAINE.....	8
3. RISK FROM ASBESTOS CONTAINING MATERIALS.....	9
4. APPLICABLE REGULATIONS IN UKRAINE	10
5. DEBRIS MANAGEMENT PROTOCOLS.....	13
5.1 Site inspection for ACMs.....	13
5.2 Sampling regime to confirm ACMs	16
5.3 Site safety and security for debris sites with confirmed ACMs	16
5.4 Personal Protective Equipment for site operations	18
5.5 Debris handling with confirmed ACMs	21
5.6 Segregation of ACMs at site from other debris	22
5.7 Packaging of debris with ACMs.....	22
5.8 Transport of debris with ACMs	23
5.9 Temporary storage of waste including location facilities	24
5.10 Disposal of ACMs, or debris with ACMs	25
6. TRAINING REQUIREMENTS – UNDP DEBRIS CONTRACTORS	26
7. REPORTING REQUIREMENTS – UNDP AND LOCAL AUTHORITIES	27
APPENDIX 1.....	28
APPENDIX 2	29

Abbreviations

ACM Asbestos Containing Materials

APF Assigned Protection Factors

EN European Norm

FFP Filtering Face Pieces

CMU Cabinet of Ministers of Ukraine

HEPA High Efficiency Particulate Air

IARC International Agency for Research on Cancer

MAC Maximum Allowable Concentration

NSRUEO National State Registry of Ukrainian Enterprises and Organizations

PPE Personal Protective Equipment

RPE Respiratory Protective Equipment

UNDP United Nations Development Programme

VRU Verkhovna Rada of Ukraine

WHO World Health Organization

Relevant Legal Texts in Ukraine

Legal Text (date and number)	Registration Reference	Description
Order of the Ministry of Health of Ukraine, dated 05/06/2023 No. 1013	Registered at Ministry of Justice of Ukraine 23/10/2012 (No. 1776/22088) Registered at Ministry of Justice of Ukraine 09/08/2023 (No. 1345/40401)	State Sanitary Norms and Regulations "On Safety and Protection of Workers from the Harmful Effects of Asbestos and Asbestos Containing Materials and Products"
Law of Ukraine No. 2573-IX	Adopted by the Verkhovna Rada of Ukraine, 6/9/2022 (came into force on 1 October 2023)	On the Public Health System
Law of Ukraine No. 2320-IX	Adopted by the Verkhovna Rada of Ukraine, 20/6/2022 (came into force on 9 July 2023)	On Waste Management System
Resolution of the Cabinet of Ministers №1102-2023-н	The Cabinet of Ministers of Ukraine, 20/10/2023 p. (№ 1102)	The National Waste List
Resolution of the Cabinet of Ministers №1102-2023-н	The Cabinet of Ministers of Ukraine, 20/10/2023 p. (№ 1102)	The Waste Classification Procedure
Order of the State Committee of Ukraine for Industrial Safety, Labour Protection and Mining Supervision, dated 04/16/2009 No. 62	Registered at Ministry of Justice of Ukraine 12/5/2009 (No. 424/16440)	Norms for the free issuing of certified special clothing, special footwear, and other personal protective equipment to employees of general professions in various industries
Order of the Ministry of Social Policy of Ukraine, dated 29/11/2018 No. 1804	Registered at Ministry of Justice of Ukraine 27/12/2018 (No. 1494/32946)	Minimum safety and health requirements for workers using PPE at work
Order of the Ministry of Internal Affairs of Ukraine, dated 04/08/2018 No. 656	Registered at Ministry of Justice of Ukraine 11/9/2018 (No. 041/32493)	Approval of Certain Regulations on the Road Transportation of Dangerous Goods
Order of the Ministry of Health of Ukraine, dated 17/03/2011 No. 145	Registered at Ministry of Justice of Ukraine 05/04/2011 (№ 457/19195)	State Sanitary Norms and Regulations for the Maintenance of the Territories of Settlements
Order of the Ministry of Health of Ukraine, dated 12/05/2010 No. 400	Registered at Ministry of Justice of Ukraine 01/07/2010 (№ 452/17747)	State Sanitary Norms and Regulations "Hygienic Requirements for Drinking Water Intended for Human Consumption"
Resolution of the Chief State Sanitary Doctor of Ukraine No. va042282-99	Registered the Chief State Sanitary Doctor of Ukraine 01/12/1999 (№ 42)	Sanitary Norms for the Microclimate of Industrial Facilities State Sanitary Norms 3.3.6.042-99
Order of the Ministry of Health of Ukraine, dated 21/05/2007 No. 246	Registered at Ministry of Justice of Ukraine 23/07/2007 (№ 846/14113)	The Procedure for Conducting Medical Examinations of Employees of Certain Categories



Procedures	Resolution of the Cabinet of Ministers
Procedure for handling waste generated as a result of damage to (or destruction of) buildings and structures due to hostilities, terrorist acts, sabotage, or work to liquidate their consequences	27/9/2022 (No.1073)
Procedure for carrying out urgent work to eliminate the consequences of the armed aggression of the Russian Federation associated with damage to buildings and structures	19/4/2022 (No. 473)
Procedure for dismantling facilities damaged or destroyed as a result of emergency situations, military operations, or terrorist acts	19/4/2022 (No. 474)
Procedure for conducting an inspection of construction facilities accepted for operation	12/4/2017 (No. 257)



1. Introduction

Asbestos was widely used throughout the world until the 1970s. As a natural refractory material, asbestos has been used in the automotive industry, in the manufacture and insulation of pipes, to reinforce ceilings and floors, in roofs, and in finishing materials. Asbestos was even included in household appliances, in particular, heaters. However, chrysotile asbestos was more widely used in the manufacture of slate, which is still used in Ukraine to cover the roofs of houses, and to make fences or outbuildings.

Today it can be declared that Ukrainian legislation is finally coming close to European standards and now protects workers from life-threatening risks associated with exposure to asbestos in the workplace, and the population from the harmful effects of all types of asbestos in everyday life.

The **Law of Ukraine “On the Public Health System”** was adopted by the Verkhovna Rada of Ukraine (VRU) as a whole on 6 September 2022 and entered into force on 1 October 2023. One of the important aspects of this law is **Article 28 (part 3)**, which prohibits the use of asbestos, regardless of its type, the production of asbestos-containing products and their use in technological processes, or its use during construction and installation work on any type of object.

▼

All types of asbestos are classified by the International Agency for Research on Cancer (IARC) as a Group 1 of substances with proven carcinogenicity to humans, causing such occupational diseases as asbestosis, cancer of the larynx, bronchi and lungs, ovaries, as well as malignant mesothelioma of the pleura, peritoneum, and pericardium.

In addition to the above-mentioned law, on 1 October 2023, **the State Sanitary Norms and Regulations “On Safety and Protection of Workers from the Harmful Effects of Asbestos and Asbestos Containing Materials and Products”** (hereinafter – the State Sanitary Norms and Regulations), approved by the order of the Ministry of Health of Ukraine on 5 June 2023, came into force. These State Sanitary Norms and Regulations define the requirements for preventing risks associated with asbestos exposure to the health of employees at workplaces of all types of activities in which employees are or may be exposed to the harmful effects of asbestos dust or dust emitted from ACM.

However, lots of work is still ahead, such as imposing a complete ban on the production, sale, and use of asbestos-cement products on the territory of Ukraine, including the import of such products into the customs territory of the country.

But while such products are still present in our lives, there is a need to properly handle waste from Asbestos-Containing Materials (ACM) and to follow procedures for protecting against the effects of asbestos dust.



2. Asbestos Usage in Ukraine

Asbestos-cement has been produced in Ukraine for over 100 years. For many decades in Ukraine, chrysotile asbestos was used in space technologies, in the production of friction materials (brake pads and linings for clutch discs in cars), refractory and heat-insulating materials (special panels, fabrics), special technical paper, as well as in the industry of asbestos-cement sheeting, boards, pipes, etc.

The main branches of asbestos applications are (a) the asbestos-cement industry, (b) the asbestos-technical industry, and (c) the production of heat-insulating materials.

In the context of application areas, these are:

- a) *asbestos for asbestos-cement production (corrugated slate, flat slate, pipes)*: 75% to 85% of total consumption of chrysotile asbestos, depending on the year of use.
- b) *asbestos for asbestos-technical production (brake pads, linings, asbestos cardboard, asbestos cloth)*: 10% to 15% of total consumption of chrysotile asbestos, depending on the year of use.
- c) *production of heat-insulating materials*: <5% of total consumption of chrysotile-asbestos, depending on the year of use.

For the period from 2005 to 2015, in total, the enterprises of the asbestos-cement industry produced about 5,000 million conventional slabs (conventional units). At the same time, these products were the most commonly used in the country.

According to experts, in various years the total volume of the domestic market for roofing materials ranged from 80-95 million square meters annually. In the general structure of roofing materials, the share of asbestos-cement slate varies between 70-75%. At the same time, about 90-95% of all slate used is produced in Ukraine, and about 75% of roofs in Ukraine are covered with it¹.

The total area of roofs in Ukraine that are covered with asbestos-cement slates is about 788.3 million m²:

- Residential buildings (587.7 million m²): asbestos-cement slate is used for roofing and wall protection of buildings and constructions.
- Public sector of Ukraine (40.9 million m²): according to the State Statistics Service of Ukraine, the area of premises of preschool educational institutions as of the beginning of 2014 amounted to 4.32 million m² in rural areas. The area of rural general education institutions at the beginning of 2014 amounted to 22.57 million m² (total area – 26.9 million m²).
- Agricultural production facilities (159.7 million m²).

A fall in production activity of enterprises in the asbestos-cement industry has been observed since 2014 due to economic problems in Ukraine after the annexation of the Autonomous Republic of Crimea and the anti-terrorist operation in the Donetsk and Luhansk regions of the country. While the supply of asbestos-cement in 2006 amounted to 108,800 tons, by 2015 it had fallen to 10,200 tons – the volume of consumption over 10 years has decreased by 10 times. At the same time, a significant reduction began in 2006, when the European Union prohibited any production and consumption of asbestos-cement products in member-countries (from 811 million standard slabs in 2005 to 80 million standard slabs in 2015).

The largest consumer of chrysotile asbestos is the asbestos-cement industry of Ukraine. More than 85% of chrysotile imports are used in the production of asbestos-cement products. In the period 2006 until H1 2016, some 556,000 tons of chrysotile asbestos were imported to Ukraine.

¹ <https://stopzaboronushiferu.in.ua/wp-content/uploads/2021/12/NANU-Naslidky-zaborony.pdf>



3. Risk from Asbestos Containing Materials

Asbestos exposure occurs when a person inhales fibres from polluted air in the work/occupational environment, as well as from ambient air near sources of such pollution, or in rooms in which there are fragile asbestos-containing materials.

The highest level of exposure occurs in the process of repacking asbestos containers, mixing it with other raw materials, and in the dry cutting of asbestos-containing materials with abrasive tools. This can occur during the installation and use of asbestos-containing materials and during the maintenance of automotive equipment.

Fragile asbestos-containing materials are still found in many homes and remain sources of human exposure during operation, modification, and removal or demolition.

The following asbestos-containing wastes and materials present the greatest risks to public health, and are divided into:

- asbestos-cement dust
- asbestos dust and fibres
- asbestos-cement waste in lump form
- asbestos waste in lump form
- asbestos paper waste
- asbestos crumb waste
- asbestos sludge not contaminated with hazardous substances
- rubber asbestos waste (paronite, sleeves and gaskets made from it)
- other waste from enterprises, institutions, organizations using and applying asbestos and asbestos-containing materials.

UK parliamentarians in an official letter to the Ukrainian government, state: “In 1906, the British Parliament was first warned of the occupational asbestos hazard by Dr. Montague Murray. It took another 93 years before the country banned asbestos. Even so, we have been left with asbestos fibers in our lungs as well as in our infrastructure; most of our schools, many of our hospitals and residential properties. Buckingham Palace, the House of Commons and the House of Lords contain asbestos material.

Unfortunately, the UK has the highest asbestos-related disease mortality rate in the world. While there is no definitive figure for the total number of lives lost due to asbestos, in recent years there have been 5,000 asbestos deaths every year. Since the asbestos ban was introduced (1999), more than 90,000 Britons have died from asbestos-related diseases.



4. Applicable Regulations in Ukraine

The main document in Ukraine aimed at protecting the health of people working with asbestos and asbestos-containing materials, through implementing measures aimed at creating conditions (including requirements for the technological processes of collecting, packaging, transportation, warehousing, storing, loading and unloading operations) to reduce the incidence and mortality from diseases caused by asbestos dust exposure, is **Order No. 1013 of the Ministry of Health of Ukraine, dated 05/06/2023** (registered at the Ministry of Justice of Ukraine on 09 August 2023 No. 1345/40401) *“On Safety and Protection of Workers from the Harmful Effects of Asbestos and Asbestos Containing Materials and Products”*².

According to paragraph 2 of Section I of the State Sanitary Norms and Regulations, it is prohibited to produce and use asbestos, regardless of its type, and asbestos-containing products and materials in technological processes and during construction and installation works, except for the processing of asbestos and ACM for the purpose of their removal.

ACM that are already in use can continue to be used until they are replaced or removed. Asbestos-containing insulation materials and products of low density (1 g/cm³) have to be replaced and removed.

In addition, paragraphs 4 and 5 of this section specify that compliance with the requirements of these State Sanitary Norms and Regulations is mandatory for business entities and citizens who work with asbestos and ACM, and also apply to all types of work, namely:

- Reconstruction, technical re-equipment, repair, conservation and demolition of buildings constructed with the use of ACM;
- Processing of asbestos and ACM for the purpose of their removal, including technological processes of collection, loading, unloading, transportation, storage of asbestos and ACM;
- Removal, including utilization of ACM waste.

Moreover, in accordance with paragraph 21 of these State Sanitary Norms and Rules, despite the use of technical precautions to limit the concentration of asbestos in the air, the employer shall determine measures to ensure the protection of employees during such activities by providing employees with and using appropriate personal protective equipment.

Law of Ukraine No. 2573-IX “On the Public Health System”³ (adopted by the Verkhovna Rada of Ukraine as a whole on 6 September 2022 and came into force on 1 October 2023) protects the health of builders and residents of new buildings from the negative impact of all types of asbestos. The requirements of **paragraph 3 of Article 28** of this Law completely prohibit the production and use of all types of asbestos, as well as asbestos-containing products and materials, in technological processes and in carrying out construction and installation work at any facilities. Security measures and protection against the harmful effects of asbestos and asbestos-containing products and materials are stipulated in State Sanitary Norms and Regulations.

All those working with asbestos must be provided with special clothing, special footwear and other personal protective equipment against exposure to hazardous and harmful production factors in accordance with **Order No. 62 of the State Committee of Ukraine for Industrial Safety, Labour Protection and Mining Supervision, dated 04/16/2009** (Registered at the Ministry of Justice of Ukraine on 12 May 2009 under No. 424/16440) “Norms for the free issuance of certified special clothing, special footwear and other personal protective equipment to employees of general professions in various industries”⁴ and **Order No. 1804 of the Ministry of Social Policy of Ukraine of 29 November 2018** (Registered at the Ministry of Justice of Ukraine on 27 December 2018, No. 1494/32946) “Minimum safety and health requirements for workers when using PPE at work”⁵, and also in accordance with the **Instructions of the International Labour Organization “Safety in the use of asbestos”** (third edition, 1990)⁶.

² <https://zakon.rada.gov.ua/laws/show/z1345-23#Text>

³ <https://zakon.rada.gov.ua/laws/show/2573-20?lang=en#Text>

⁴ <https://zakon.rada.gov.ua/laws/show/z0424-09#Text>

⁵ <https://zakon.rada.gov.ua/laws/show/z1494-18#Text>

⁶ https://www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---sro-moscow/documents/publication/wcms_312434.pdf



In the absence of sufficient, relevant and reliable data on dust levels in a working area, and when making a decision on the probability of the Maximum Allowable Concentration (MAC) of asbestos fibres exceeding the permitted level of 0.1 fibres/cm³ (time-weighted average over an eight-hour period) – asbestos fibres are counted by:

- phase contrast microscopy, according to the method recommended by WHO (Phase Contrast Optical Microscopy (Membrane Filter Method), ISBN 9241544961, WHO, Geneva, 1997), **or according to**
- the methodology for measuring the concentration of asbestos fibres in the air of the working area and atmospheric air by optical microscopy (MBB No. 081/12-0673-10 dated 9 March 2010).

Under the conditions of the legal regime of martial law on the territory of Ukraine (in accordance with the Law of Ukraine “On the legal regime of martial law”) and within 90 calendar days after its termination or cancellation, in order to carry out a range of restoration work to liquidate the consequences of armed aggression and hostilities, the Cabinet of Ministers of Ukraine (CMU) on **27 September 2022 approved Resolution No. 1073 “The Procedure for handling waste generated as a result of damage to (or the destruction of) buildings and structures due to hostilities, terrorist acts, and sabotage, or work to liquidate their consequences”**.⁷ The procedure determines the mechanism for handling waste generated in connection with damage to (or the destruction of) buildings and structures, construction in progress, and improving facilities in order to prevent and reduce the negative impact of such waste on the environment and human health.

Paragraph 24 of the Procedure sets the requirements for the contractor (foreman) for demolition work, with regard to:

- ensuring the removal (separation) of components that may contain hazardous waste (hazardous components of demolition waste, in particular ACMs)
- taking measures to minimize hazardous impacts on human health and the environment, in particular asbestos dust emissions
- ensuring the sorting of waste from demolition for subsequent processing (recycling) and disposal.

Paragraphs 25-29 of the Procedure allow for organizing places for the temporary storage of waste, including ACMs, in compliance with the legal requirements for environmental and fire safety, environmental protection, rational use and reproduction of natural resources, and the necessary sanitary protection zones.

Demolition waste from the buildings and facilities may contain ACM waste, making demolition waste into hazardous waste, that is defined in **Article 1 of the Law of Ukraine “On Waste Management System”** as waste that has one or more properties that make it hazardous waste.

Since July 9, 2023, when the Law of Ukraine “On Waste Management System” came into force, Ukraine has switched to a new waste classification procedure. **The new National Waste List and the new Waste Classification Procedure were approved by the Cabinet of Ministers of Ukraine on 20 October 2023 by Resolution No. 1102**⁸ to harmonize the waste classification procedure in line with European requirements, namely the European List of Waste.

Now, the classification of waste has to be carried out by type and properties in order to properly manage it and prevent its negative impact on human health and the environment. It is carried out in accordance with **the National Waste List** and **the Waste Classification Procedure**, taking into account **the List of Properties that Make Waste Hazardous** (Annex 3 of the Law⁹).

According to Annex 2 “List of Hazardous Waste Components” of the Waste Classification Procedure, **asbestos (dust and fibers)** is such a component and has a corresponding **code – C25**, thus defining demolition waste from buildings and facilities as **hazardous waste**.

Based on **the Article 41 of the Law of Ukraine “On Waste Management System”**, business entities are required to obtain a permit for waste treatment operations prior to commencing their activities. Also, important to note that, in accordance with *paragraph 4 of the Final and Transitional Provisions*¹⁰ of this Law, business entities in the hazardous waste management sector that collecting and treating hazardous waste are required to obtain a licence to carry out hazardous waste management activities within six months from the date of entry into force of this Law.

⁷ <https://zakon.rada.gov.ua/laws/show/1073-2022-%D0%BF#n67>

⁸ <https://zakon.rada.gov.ua/laws/show/1102-2023-%D0%BF#Text>

⁹ <https://zakon.rada.gov.ua/laws/show/2320-20#n986>

¹⁰ <https://zakon.rada.gov.ua/laws/show/2320-20#n798>



Transportation of cargoes of ACM waste and dusty materials is carried out in accordance with the requirements of **the Law of Ukraine “On the Transportation of Dangerous Cargoes”¹¹ and the Order No. 656 of the Ministry of Internal Affairs of Ukraine “On Approval of Certain Regulations on the Road Transportation of Dangerous Goods”, dated 04.08.2018**, registered at the Ministry of Justice of Ukraine on 11 September 2018, under No. 041/32493)¹².

The mechanism of rapid response by authorized bodies, which is aimed to liquidate consequences of the armed aggression of the Russian Federation related to damage to buildings in territories where active hostilities are absent or ended, is determined by the **“Procedure for carrying out urgent work to eliminate the consequences of the armed aggression of the Russian Federation associated with damage to buildings and structures”, approved by Resolution of the Cabinet of Ministers of Ukraine No. 473, dated 19 April 2022**¹³.

The mechanism for the demolition of facilities of any purpose, regardless of the class of consequences and form of ownership, except for facilities of defence and special purposes, damaged or destroyed as a result of emergencies, military operations or terrorist acts, based on the relevant decisions of the authorized bodies, is determined by the **“Procedure for dismantling facilities damaged or destroyed as a result of emergency situations, military operations or terrorist acts”, approved by Resolution No. 474 of the Cabinet of Ministers, dated 19 April 2022**¹⁴.

To ensure proper reporting of completed demolition work at facilities; information regarding the amount and types of waste from demolition that was placed in temporary storage sites for waste from demolition or another waste management facility – state registration of such waste is conducted in accordance with Procedure for demolishing facilities damaged or destroyed as a result of emergency situations, military operations or terrorist acts.

¹¹ <https://zakon.rada.gov.ua/laws/show/1644-14#Text>

¹² <https://zakon.rada.gov.ua/laws/show/z1041-18#Text>

¹³ <https://zakon.rada.gov.ua/laws/show/473-2022-%D0%BF#Text>

¹⁴ <https://zakon.rada.gov.ua/laws/show/474-2022-%D0%BF#Text>



5. Debris Management Protocols

5.1 Site inspection for ACMs

(Potential ACMs with picture cards showing what to look for and competence of asbestos inspectors)

Site Clearance:

The organization and coordination of urgent work is carried out by the executive bodies of the relevant village, township, or city council or, in cases provided for by law, military administrations (hereinafter referred to as the authorized body) on the basis of applications (messages) of citizens, enterprises, institutions and organizations, information received from mass media, central executive authorities (State Emergency Service, National Police), military units, etc.

Urgent work is a set of priority organizational and technical procedures, and measures focused on liquidating the dangerous consequences of the armed aggression of the Russian Federation associated with damage to buildings and structures, construction in progress (hereinafter referred to as damaged objects), preventing the loss of life, and reducing the volume of possible material losses.

1. Work to inspect damaged facilities is carried out in territories where there are no active hostilities or where active phases of hostilities have ended, after a set of measures have been taken to:
 - ▶ rapidly respond to cases of the detection of explosive objects, carry out inspections (demining) and pyrotechnic works related to the neutralization of detected explosive objects, with the involvement of units of the State Emergency Service, the National Police, and, if necessary, units of the Armed Forces and the Security Service of Ukraine
 - ▶ carry out work on the primary demolition of parts of facilities or their individual structural elements (if necessary) to provide access to damaged objects to civil protection forces for emergency rescue and other urgent work
 - ▶ conduct searches for injured and dead people by specialists of the State Emergency Service, with the involvement of public utilities and specialized civil protection services, and transport the bodies (remains) of the dead
 - ▶ carry out operational and investigative actions by law enforcement agencies under criminal proceedings.
2. To conduct preliminary visual inspections of damaged facilities and develop an inspection work plan, the inspection specialists specified in paragraphs 2, 2¹ and 2² of the **Procedure for conducting an inspection of construction facilities accepted for operation, approved by the Resolution No. 257 of the Cabinet of Ministers of Ukraine dated 12 April 2017** can be involved. Specialists from units of the State Emergency Service, the National Police (by agreement), and, if necessary, units of the Armed Forces and the Security Service of Ukraine can also be involved.
3. Inspections of damaged facilities are to be carried out under a decision of the authorized bodies by means of a commission inspection conducted in accordance with paragraph 8¹, and / or a technical inspection conducted in accordance with paragraph 9 of the Procedure for carrying out urgent work to eliminate the consequences of the armed aggression of the Russian Federation associated with damage to buildings and structures – in accordance with the approved work plan.
4. Based on the results of the commission's inspection, an act will be drawn up on the inspection of an object damaged as a result of hostilities caused by the armed aggression of the Russian Federation (hereinafter referred to as the commission inspection act).
5. Based on the results of the technical inspection of damaged facilities, the contractor for the inspection is to prepare a report on the technical inspection in accordance with paragraph 8¹ of the aforementioned Procedure. This report is also to be accompanied by the technical inspection act, which should contain, in particular, information about the specific categories of damage to the object, based on the results of the inspection (in accordance with the quantitative and qualitative characteristics of the damage).



6. The authorized body is to consider the commission inspection acts, reports, and acts of technical inspection, and on their basis develop and submit the following lists to the Regional Commission for Technogenic and Environmental Safety and Emergency Situations:
 - ▶ potentially hazardous facilities that need urgent work regarding the partial demolition of parts of the facility or individual structures thereof;
 - ▶ hazardous facilities that are to be demolished and/or liquidated.
7. The Regional Commission for Technogenic and Environmental Safety and Emergency Situations immediately, but no later than five days from the date of receipt of information from the authorized body, is to consider and approve the lists of objects listed in the previous paragraph, taking into account information from law enforcement agencies.
8. Based on the Regional Commission for Technogenic and Environmental Safety and Emergency Situations, the authorized body:
 - ▶ approves the lists of potentially hazardous facilities requiring urgent partial demolition of individual parts and / or structures and hazardous facilities subject to dismantling or liquidation, and determines the sequence and timing of the demolition work;
 - ▶ organizes demolition work in accordance with Procedure for demolishing facilities damaged or destroyed as a result of accidents, military operations or terrorist acts;
 - ▶ organizes the collection, preliminary sorting, and separation of hazardous waste (if possible), and the transportation and temporary storage of waste generated as a result of demolition work, in accordance with the Procedure.

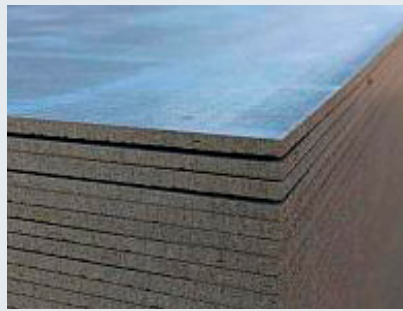
Site Inspection:

1. Inspection of the facility for the presence of ACMs is carried out after the completion of rescue and other urgent work aimed at eliminating dangerous factors, saving lives and preserving people's health, and localizing emergency zones, in accordance with the [Code of Civil Protection of Ukraine](#), after conducting inspections of the facility for the presence of explosive objects, as well as in accordance with a decision of the authorized body based on the previous decision of the Regional Commission for Technogenic and Environmental Safety and Emergency Situations.
2. The key components of ACM waste from demolition are:
 - ▶ Asbestos-containing building materials – corrugated slate, flat slate (asbestos cement board), pipes.
 - ▶ Asbestos-containing insulating materials and low-density products (1 g/cm³) – asbestos fabric, asbestos cardboard, asbestos cord, paronite.
3. A work plan for the removal of ACM waste must detail:
 - ▶ the work sites;
 - ▶ the type of work and the estimated duration of the work;
 - ▶ the type of asbestos in removed materials, and an assessment of their technical condition;
 - ▶ the approximate amount of ACM waste generated as a result of the work carried out;
 - ▶ ways to remove ACM waste, as well as types and methods of work;
 - ▶ ways to eliminate or limit asbestos dust emissions into the air;
 - ▶ necessary measures to protect the health and safety of employees;
 - ▶ characteristics of equipment used for: protection and decontamination of persons conducting work; protection of other persons present at or near the workplace;
 - ▶ principles for informing workers who are exposed to asbestos dust on what to do, and the necessary protective measures in this situation.
4. The employer has to notify the interregional territorial body of the State Labour Service and the Centre for Disease Control and Prevention of the Ministry of Health of Ukraine (the relevant administrative-territorial unit) regarding the plan specified in the Paragraph 23 of the State Sanitary Norms and Regulations before the start of the proposed work.
5. The detailed work plan must be made available to all workers involved in the process of disposal of ACM waste or those who may be in the immediate vicinity of the place of their use.
6. The employer has to provide professional training to all employees who are exposed or may be exposed to dust containing asbestos in accordance with paragraph 26 of the State Sanitary Norms and Regulations.

Table 1 – Key ACMs in Ukraine



Corrugated slate



Flat slate



Asbestos-cement pipe



Asbestos fabric



Asbestos cardboard



Asbestos cord



Paronite (Paronite coating)



Paronite gasket (broken)



7. Training has to be understandable for workers and provide them with the opportunity to obtain the necessary knowledge and skills in the field of precautions and safety regarding:
 - a. the properties of asbestos and its health effects, including the synergistic effects of tobacco smoking;
 - b. types of products or materials that may contain asbestos;
 - c. activities that may lead to exposure to asbestos and the importance of precautions to minimise exposure;
 - d. the organisation of work related to the removal and minimisation of contact with ACM;
 - e. equipment, tools, controls, including protective equipment;
 - f. the proper functioning, selection, location, limitations and proper use of respiratory equipment;
 - g. emergency procedures;
 - h. Decontamination procedures;
 - i. waste disposal;
 - j. requirements for medical examinations.
8. Relevant training is provided at regular intervals to employees at the expense of the employer in order to significantly contribute to reducing the risks of such exposure.

5.2 Sampling regime to confirm ACMs

(With which laboratories to use and how to take samples, including the chain of custody)

1. For any activity that poses a risk of exposure to asbestos dust or dust emitted by ACMs, the employer has to carry out a risk assessment to determine the nature of the exposure, including the mineralogical type of asbestos and fibre size, and the level of exposure of workers to asbestos dust or dust emitted by the ACM.
2. Depending on the results of the initial risk assessment and to ensure compliance with the asbestos fibre limit of 0.1 fibres/cm³, the amount of asbestos fibres in the air of the working area should be measured regularly.
3. The collection of work area air samples is carried out by personnel with the necessary qualifications, after consultation with employees responsible for health and safety at the enterprise or institution.
4. To decide on the probability of exceeding the MAC of asbestos fibres of the level of 0.1 fibres/cm³ (time-weighted average over an eight-hour period), it is first necessary to identify the allowable concentration of asbestos fibres in the air of the working area.
5. Sampling of dust generated by ACMs should reflect their individual impact on workers.
6. The duration of sampling must be such as to reflect typical exposure over an 8-hour reference period (one work shift) using measurements or time-weighted calculations.
7. Asbestos fibres are counted by phase contrast microscopy according to the method recommended by WHO (Phase Contrast Optical Microscopy (Membrane Filter Method), ISBN 9241544961, WHO, Geneva, 1997) or according to the methodology for measuring the concentration of asbestos fibres in the air of the working area and atmospheric air by optical microscopy (MBB No. 081/12-0673-10 dated 9 March 2010), or any other method providing equivalent results.

▼
For the measurement of asbestos in the air, only fibers **with a length of more than 5 µm, a width of less than 3 µm and a length/width ratio of more than 3:1** are taken into account.

5.3 Site safety and security for debris sites with confirmed ACMs

(Including cordoning off, air monitoring, site signage etc.)

Workplace safety:

1. In the working area and in a prominent place, it is necessary to place information stands with the following content: **“Attention, danger! Asbestos”** and **“Work with the use of respiratory protection equipment”** and notices restricting access to persons who are not directly involved in the work being carried out.



2. The technological areas for storage, treatment, reloading and sorting of ACM on the work site territory have to be organised taking into account the following requirements:
 - ▶ preventing the flow and spread of asbestos-containing dust and other harmful substances to other areas that do not have sources of their formation;
 - ▶ provide for a minimum number of transshipment units;
 - ▶ minimise the number of routes for the movement of the ACM.
3. The carcinogenic nature of asbestos dust necessitates the preparation of lists of exposed workers and the work performed by them.
4. Employees who are hired and employees engaged in work related to asbestos exposure have to undergo preliminary (at the time of hiring) and periodic (during employment) medical examinations in accordance with [the Procedure for Conducting Medical Examinations of Employees of Certain Categories, approved by Order of the Ministry of Health of Ukraine No. 246 dated 21 May 2007](#).
5. The technical and personal protective equipment, and places that can be used in work related to the removal of ACM waste are as follows:
 - ▶ materials used to designate/separate the area where such work is carried out – tapes, fences, designations, warning signs;
 - ▶ materials used to protect the territory from pollution – polyethylene wrap of the required thickness, plastic, wood, metal frame elements;
 - ▶ a vacuum cleaner with a HEPA filter and the dust collection devices necessary for it;
 - ▶ properly labelled bags and containers for ACM waste;
 - ▶ personal protective equipment – disposable jumpsuits, easy-to-wash footwear, and respiratory protective equipment designed for working with asbestos;
 - ▶ cleaning equipment and supplies;
 - ▶ sanitary and physical hygiene equipment to flush out contaminants;
 - ▶ storage areas for work clothes and protective clothing, separated from lockers for everyday wear;
 - ▶ shower rooms, which are located between the cloakroom for soiled clothes and the cloakroom for clean clothes in case of dusty work;
 - ▶ a storage room for respirators;
 - ▶ places where smoking is prohibited;
 - ▶ places where employees can eat food without the risk of asbestos dust contamination;
 - ▶ places for checking and cleaning equipment after each use, repairing or replacing defective equipment before the next use.
6. If the company does not clean its own clothing, it is possible to launder it in appropriately equipped facilities outside the company. In this case, the clothing must be transported in closed containers.
7. In case of significant contamination, the working area must be closed. Depending on the type of work, the fencing can be:
 - ▶ full fences – for large scale work such as the removal of insulation;
 - ▶ no fences – fencing is generally not required for asbestos-cement removal operations, such as rubble removal.
8. In cases where fencing is not used, particular attention should be paid to carrying out risk assessments to identify necessary measures to prevent the spread of asbestos, and there should be thorough cleaning of the working area.

Actions after work is completed:

1. It is necessary to apply security measures to ACMs waste from demolitions and store it in a specially designated and safe place.
2. Workplaces, communication routes, machines and tools must be cleaned of asbestos dust using a wet method or using vacuum filtering and ventilation equipment.
3. Work clothes and footwear, as well as personal protective equipment must be cleaned of asbestos dust using high-performance filtration and ventilation equipment or by a wet method, so as to prevent dust from getting into living areas and environments.



4. Floors, walls, equipment of dressing rooms and showers must be decontaminated after each work shift.
5. Wet cleaning of workplace and utility rooms, as well as equipment and tools from asbestos-containing dust is carried out by water that must satisfy the requirements of the **State Sanitary Norms and Regulations “Hygienic Requirements for Drinking Water Intended for Human Consumption” (2.2.4-171-10), approved by Order of the Ministry of Health of Ukraine No. 400 dated 12 May 2010.**
6. Used filters from filtration devices and disposable personal protective equipment should be packed in sealed bags and disposed of in the same way as ACM waste.
7. Change of clothes only in the wardrobe for clean clothes.

Prohibited:

1. Activities related to the removal of ACM waste that do not comply with the plan for their removal, with the exception of actions aimed at saving the health and lives of people.
2. The removal of protective clothing and respiratory protective equipment in an area contaminated with asbestos dust.
3. Changing the filter elements of respiratory protective equipment in an area contaminated with asbestos dust.
4. Use of work clothes and footwear intended for work on the removal of ACM waste outside the work site.
5. Eating, drinking, smoking, keeping personal items, and staying for an unnecessarily long time in work areas where there is a risk of exposure to asbestos dust.
6. Changing clothes in the wardrobe for clean clothes.
7. Dry sweeping or cleaning with compressed air of premises, working tools and tools after completion of work in an area of asbestos dust exposure.
8. Mixing ACM waste with other waste.

5.4 Personal Protective Equipment for site operations

Personal Protective Equipment (PPE):

1. Personal protective equipment (PPE) includes:
 - ▶ respiratory protective equipment (respirators, gas masks, pneumatic helmets, pneumatic masks)
 - ▶ special clothes (overalls, semi-overalls, jackets, trousers, suits, aprons, vests, over-sleeves, gowns, raincoats, sheepskin coats)
 - ▶ special footwear (boots, semi-boots, shoes, galoshes, shoe covers)
 - ▶ hand protection (gloves)
 - ▶ eye protection (safety goggles).
2. Before starting the work, suitability testing and training in the use and inspection of PPEs should take place.
3. There must be checks made on the proper and mandatory use of PPE, its cleaning, storage and keeping in good condition.
4. Defective PPEs should be replaced as soon as a malfunction is detected.
5. Employees who do not have the necessary PPE, or have PPE that is in a defective condition, are not allowed to work.
6. It is necessary to protect the eyes from possible damage, hence workers must be provided with individual protective devices (glasses, shields, masks), the choice of which depends on the specific conditions of the work process.
7. Disposable gloves may be used to protect hands. If latex gloves are to be used, they must be free of low protein powder.
8. Used gloves must be disposed of as asbestos waste.



Respiratory Protective Equipment (RPE):

Providing and using:

- a- At the entrance to working premises, zones, or work areas where the concentration of asbestos-containing dust exceeds or may exceed the established MAC of the level of 0,1 fibre/cm³, safety signs must be installed with the inscription: **“Work with the use of respiratory protection”**.
- b- All workers engaged in work where the dust content of the air is above the MAC level must be provided with RPE. Workers with a medical contraindication to the use of RPE are not allowed to do this type of work.
- c- For any period that requires the use of RPE, breaks for rest are provided depending on the physical needs of workers and climatic restrictions; if necessary, this should be coordinated with health specialists in the area, and labour safety specialists at the work site.
- d- An adequate supply of RPE must be available at the workplace.
- e- Workers must be informed of the occurrence of situations in which airborne asbestos concentrations reach MAC levels.
- f- Workers who are required to wear protective equipment must be fully instructed and trained in its proper use.

Choosing equipment:

- a- Taking into account the maximum level of dust concentration measured at a workplace, and the dust retention factor characteristic of the type of RPE, suitable types of respirators have to be selected for each workplace.
- b- Only those types of RPEs that are agreed with managers and/or specialists who have previously been assigned with specific responsibilities and who have knowledge of health and safety conditions in the work area can be used.
- c- The most common **disposable RPEs** are:
 - ▶ respirator ШБ-1 «Пелюстка –200» (“Petal-200”) – for protection against harmful aerosols with particle diameters of up to 2 µm, at concentrations that exceed the MAC by 200 times
 - ▶ respirator ШБ-1 «Пелюстка –40» (“Petal-40”) – for protection against harmful aerosols with particle diameters of up to 2 µm, at concentrations that exceed the MAC by 40 times
 - ▶ respirator ШБ-1 «Пелюстка –5» (“Petal-5”) – for protection against harmful aerosols with particle diameters of up to 2 µm, at concentrations that exceed the MAC by 5 times
- d- The most common **reusable RPEs** are:
 - ▶ respirator «АСТРА –2» (“Astra –2”) – for protection against harmful aerosols with particle diameters of up to 2 µm, at concentrations that exceed the MAC by 30 times
 - ▶ respirator «Ф-62Ш» – for protection against harmful aerosols with particle diameters of up to 2 µm, at concentrations that exceed the MAC by 10 times
- e- Use appropriate RPE with an **Assigned Protection Factors (APF) of 20 or higher**:
 - ▶ disposable respirator according to EN 149 standards (FFP3 type) or EN 1827 (FMP3 type)
 - ▶ half facepiece respirator (in accordance with the EN 140 standard) with a P3 filter
 - ▶ a semi-disposable respirator (according to EN 405) with a P3 filter.

Preparation:

- a- All workers who are required to wear RPE must be instructed on the rules of its use.
- b- A briefing must be conducted, and address the following topics:
 - ▶ the reasons for using the equipment, and the importance of its conscientious use
 - ▶ the conditions under which the equipment must be used, and how to recognize these conditions
 - ▶ operating principles of the equipment
 - ▶ the correct method of using the equipment and checking that it fits
 - ▶ methods for checking the correct operation of the equipment
 - ▶ the need for regular equipment maintenance.



Cleaning, maintenance, and storage:

- a- RPE maintenance is carried out with the use of detergents and disinfectants in accordance with the **Order No. 1804 of the Ministry of Social Policy of Ukraine, dated 29 November 2018**, (Registered with the Ministry of Justice of Ukraine on 27 December 2018, No. 1494/32946) “Minimum safety and health requirements for workers to use PPE at work”.¹⁵

Protective Clothing and Footwear:

Providing and using:

- a- Places/objects/areas where levels of asbestos concentration in the air necessitate the use of RPE – also require workers to obtain and wear special protective clothing and footwear.
- b- Protective clothing, including footwear, must be adequate and appropriate.
- c- To be adequate and appropriate in the circumstances, protective clothing should:
 - ▶ be of the correct size for the user
 - ▶ be of sufficient size to avoid the stretching and tearing of seams
 - ▶ be comfortable and, if appropriate, allow for physical effort
 - ▶ be suitable for low ambient temperatures
 - ▶ prevent the ingress of asbestos fibres
 - ▶ have elastic details on the cuffs, ankles and on the hood of the jumpsuit, providing a snug fit on the wrists, ankles, face, and neck
 - ▶ not have pockets or other parts in which asbestos dust can accumulate
 - ▶ be easy to decontaminate or dispose of.
- d- Protective special clothing should completely cover all work clothes so that after removing the protective special clothes, asbestos dust does not remain on the work clothes of workers.
- e- If the protective clothing does not have cuffs, the ends of the sleeves must be taped to the arm. The ends of the trousers must be pulled over the boots and preferably covered with duct tape to prevent the ingress of asbestos dust. The hood must cover the straps of the respiratory protection equipment.

Choosing:

- a- If possible, protective clothing should be disposable, and made of dust-proof material.
- b- Type 5 disposable jumpsuits must be used (EN ISO 13982-1:2009)¹⁶.
- c- For outdoor work, the employee may be provided with moisture-proof protective clothing.
- d- Protective footwear must be easy-to-wash and without laces.

Cleaning:

- a- Disposable jumpsuits used in areas with ACM waste should be treated as asbestos waste and properly disposed of after each shift. Disposal of jumpsuits after one use may not be necessary if they are used only occasionally and in cases where the risk of contamination is low.
- b- When workers are provided with reusable protective clothing or reusable work clothing, separate locker rooms should be allocated to ensure that contaminated clothing is stored separately from personal clothing.
- c- Those who work with asbestos, including workers in areas where asbestos dust may be present, should de-dust their protective clothing daily after a shift, using devices equipped with dust collectors.
- d- Using compressed air for de-dusting work clothing is strictly prohibited.
- e- Vacuum cleaners for de-dusting of protective clothing or work clothing should be located at the entrance to the locker rooms where such clothing is removed and stored.
- f- A used respirator should only be removed after it has been completely cleaned of dust.
- g- Workers should be provided with showers or washing facilities between the locker rooms for contaminated and clean clothing.

¹⁵ <https://zakon.rada.gov.ua/laws/show/z1494-18#Text>

¹⁶ http://online.budstandart.com/ua/catalog/doc-page?id_doc=59694



- h- Personal clothing should be removed, stored, and put on only in clean locker rooms.
- i- To ensure that asbestos dust accumulation does not occur, regular cleaning and checking of locker rooms for contaminated clothing should be carried out.
- j- Special protective clothing must not be worn outside the workplace or in the locker room for contaminated clothing.
- k- Reusable protective clothing and towels should be thoroughly laundered after each shift. If there is no capacity or qualified staff for washing clothes contaminated with asbestos available, the clothing must be sent to a specialized laundry.
- l- Before being sent to the laundry, asbestos-contaminated clothing should be placed in bags that dissolve in hot water and that can be loaded into a washing machine without opening. These (inner) bags are to be placed in a second bag which is labelled and strong enough to keep in dust during transport and handling.

5.5 Debris handling with confirmed ACMs

(Wetting down, bagging, or loading straight into trucks with covers...)

Actions during execution of work:

- a- The planning of work related to the disposal of ACM waste should be carried out in such a way that the number of people involved in this process is limited to the necessary minimum.
- b- Work related to the disposal of ACM waste should be carried out by the most effective methods or combinations of methods that minimize the emission of asbestos fibres, reduce the time of direct contact the employee with ACM and thus thereby reduce the impact to a minimum level.

Working methods that reduce dust emissions:

- ▶ moistening of ACM waste with water before deconstruction and removal
 - ▶ dismantling of all ACM waste (slate, slabs, pipes, etc.) without damaging them
 - ▶ ACM waste that is tightly bonded to foundations should be removed using a handheld tool or low-speed/low-rotation tools
 - ▶ avoid the improper use of automatic tools and devices
 - ▶ do not sweep up debris and waste
 - ▶ clean the fine waste fraction with a vacuum cleaner with HEPA filters.
- c- For all technological processes and operations, it is necessary to provide tools for automation and mechanisation of the main and auxiliary production operations that minimise manual labour.
 - d- ACM waste must be placed in appropriately labelled bags; wrapped or packed in packaging which, once sealed, ensures that asbestos fibres cannot be emitted into the air.
 - e- Large pieces of asbestos-cement waste cannot be broken, cut, or shredded in other ways to minimize their volume during further storage in plastic bags. Asbestos cement waste must be disposed of without destroying it.
 - f- Before starting transportation, ACM waste must be placed in a closed container or transported in a covered cargo compartment, or wrapped in polyethylene.
 - g- If it is suspected that the MAC of asbestos dust in the working area may have been exceeded, air monitoring should be carried out.
 - h- If the MAC of asbestos dust in the air has been exceeded, work should be stopped and taken measures to reduce the concentration of dust.
 - i- All sites and equipment used in the handling of the ACM must be cleaned regularly and effectively and maintained in good condition.

Loading and unloading operations:

- a- In the course of planning, organising and carrying out technological processes, the collection, loading, unloading, transportation and storing of ACM for the purpose of their removal should be provided:
 - ▶ Loading and unloading of ACM waste must be carried out in a way that prevents the formation of dust.



- ▶ Reducing the time of direct employee contact with ACM through the use of complex mechanisation, automation, and remote control of technological processes and operations;
 - ▶ Use of continuous production processes, sealing of equipment, use of equipment with built-in local dust extractors.
- b-** All lifting and transport vehicles used for loading and unloading of ACM waste must be thoroughly cleaned by wet cleaning or by means of devices equipped with dust collectors.
- c-** It is forbidden to carry out loading and unloading of ACM waste into open cargo compartments of vehicles or other types of transport that are involved in the further transportation of this type of waste if the waste is improperly packaged.

5.6 Segregation of ACMs at site from other debris

- a-** Before starting work on dismantling and clearing a territory (except in cases of emergency, where there is the collapse of an object or large structural elements), the contractor (executor) of these works must ensure the removal (segregation) of components that may be hazardous waste (hazardous waste from demolition, in particular asbestos-containing waste)¹⁷.
- b-** While dismantling and clearing the territory, measures should be taken to minimize the hazardous impacts to human health and the environment, in particular those associated with possible emissions of asbestos dust.
- c-** While dismantling and clearing the territory, it is necessary to sort or separate waste from demolition (their individual components) directly at the place of their formation for their further processing (recycling), use as secondary materials or energy resources, and disposal.
- d-** In places of temporary storage, it is only allowed to carry out operations for the processing (recycling) of the main components of waste from destruction (parts (fragments, breakage) of building structures, door and window blocks, engineering networks, sanitary appliances, etc.) that do not contain and /or that are not contaminated with hazardous waste.
- e-** Operations for the processing (recycling) of the main components of waste from demolition are the separation, crushing and fractionation of these components.
- f-** The authorized body is obliged to take measures to reuse the main components of demolition waste (after their processing (recycling) – if necessary) in the implementation of construction projects, and to promote the use of demolition waste by other construction customers.
- g-** The list of components of waste from demolition and possible ways for their reuse in construction, the industry of building materials (production of building products) is given in **Appendix 1¹⁸ of the Procedure for handling waste generated in connection with damage (destruction) to buildings and structures as a result of hostilities, terrorist acts, sabotage or work to liquidate their consequences.**

5.7 Packaging of debris with ACMs

(With specific instructions such as double or triple bagging with specific type of bags etc.)

- a-** ACM waste that generates dust during handling must undergo packaging.
- b-** The choice of materials for packaging ACM waste should take into account requirements for strength, tightness, dust penetrability and resistance to ultraviolet radiation from sunlight.
- c-** Depending on the type of asbestos-containing waste, the following requirements must be observed for its removal from the working area, through properly fulfilling the packaging conditions¹⁹:
- ▶ **Asbestos-containing building materials – corrugated slate, flat slate (asbestos cement board), pipes:**
 - Thoroughly moisten this type of ACM waste and store it in a wet state until packing for further transportation.
 - Minimize the cutting, breaking, or shredding of waste to be packaged.

¹⁷ <https://zakon.rada.gov.ua/laws/show/1073-2022-%D0%BF#n67>

¹⁸ <https://zakon.rada.gov.ua/laws/show/1073-2022-%D0%BF#n99>

¹⁹ <https://www.asbestos.vic.gov.au/in-the-home/find-manage-remove-dispose/homeowner-removal/packaging-asbestos>



- For packaging, use of two layers of polyethylene sheeting approx. 200 microns (0.2 mm) thick. The bags should be relatively small for ease of transportation. The necks of bags with ACM waste must be securely tied, sealed with adhesive tape, or fixed by any other method, and marked with a warning sign **“CAUTION ASBESTOS!”**
 - In the case of loading ACM waste directly into the cargo compartment of a vehicle, it is necessary to carefully place the waste on two layers of polyethylene sheeting at a height of less than 1 m, completely wrap it up, and seal it with tape. Mark the packaging with a warning sign **“CAUTION ASBESTOS!”**
 - ▶ **Insulated lagged pipes, boilers, heaters, and equipment:**
 - For packaging, use of two layers of polyethylene sheeting approx. 200 microns (0.2 mm) thick, securely tied, sealed with adhesive tape, or fixed by any other method.
 - Mark the packaging with a warning sign **“CAUTION ASBESTOS!”**
 - ▶ **Friable asbestos and asbestos dust:**
 - Store this type of waste wet (unless wetting is not possible), in a polyethylene drum or container.
 - Securely fix the lid of the drum or container using the provided clamps, screws, or bolts.
 - Mark the packaging with a warning sign **“CAUTION ASBESTOS!”**
- OR**
- Store this type of waste in double polythene bags approx. 200 microns (0.2 mm) thick. The maximum bag size used should be 1200 mm (length) x 900 mm (width). The bagged dust should be wetted before the bags are tied and the loaded weight should not exceed 30 kg. Bags should only be filled half-full.
 - Each bag should be tied, tightly twisted, and their necks folded over and sealed with tape.
 - Mark the packaging with a warning sign **“CAUTION ASBESTOS!”**
 - ▶ **Asbestos sludge, not contaminated with hazardous substances:**
 - Store this type of waste in a polyethylene drum or container.
 - Securely fix the lid of the drum or container using the provided clamps, screws, or bolts.
 - Mark the packaging with a warning sign **“CAUTION ASBESTOS!”**
 - ▶ **Asbestos tiles, gaskets, brake linings, clutch plates, acoustic insulation, non-bonded textiles, gloves, protective clothing, and respirators:**
 - Store this type of waste in double polythene bags approx. 200 microns (0.2 mm) thick. The maximum bag size should be 1200 mm (length) x 900 mm (width).
 - Each bag should be tied, tightly twisted, and its neck folded over and sealed with tape.
 - Mark the packaging with a warning sign **“CAUTION ASBESTOS!”**
 - Place the bags in a closed container for further transportation (triple protection).
- d-** In case of violation of the integrity of the package with ACM waste, it is allowed to eliminate the damage with the help of adhesive tape, followed by repacking in a sealed container.
- e-** While preparing for the transportation of packages, packaging units (bags) with ACM waste must be securely fixed on a pallet, or if not on a pallet, by using shrink wrap or the equivalent.
- ▶ Asbestos-free bags are not allowed to be reused. They may be shredded and then melted down (for recovery operations).
 - ▶ The bags (or other containers) that contained loose asbestos fibres have to be removed by packing them in tight cable stacks in a specially designated place (room) marked with warning signs indicating personal protective equipment.

5.8 Transport of debris with ACMs

- a-** Cargo containing ACM waste must have a warning: **“Use personal protective equipment during mechanical processing of cargo. During mechanical processing indoors, take measures to prevent the spread of dust outside the premises.”**
- b-** ACM waste, dust-forming materials and products must be transported in a packaged form:
 - ▶ for overland transportation – in covered railway wagons or vehicles.
 - ▶ for water transportation – in closed cargo holds or containers.



- c- For all processes and operations related to the transportation of ACM waste, it is necessary to provide automation and mechanization tools for the main and auxiliary operations, which exclude or minimize heavy manual labour.
- d- Transportation of unpackaged ACM waste in open cargo compartments of vehicles, or on railway platforms or in railway wagons is strictly prohibited.

5.9 Temporary storage of waste including location facilities

Temporary storage conditions:

- a- When a large volume of work is planned with ACM waste that can be a source of dust, a separate room (part of a house) or part of a territory should be allocated for storing waste at the construction site.
- b- Storage of ACM waste and dusty materials must be carried out in closed warehouses that can exclude the ingress of various kinds of pollutants.
- c- Until the moment of their removal/transportation, ACM waste should be stored in places depending on the fraction:
 - ▶ solid fraction – stored in places where there is no danger of their destruction
 - ▶ bulk fraction – in impermeable bags and/or containers
 - ▶ liquid fraction – in special containers, tanks or settling tanks, which must be periodically cleaned and protected from accidental spillage and/or drying of the fraction.
- d- Containers (bags, packages) with ACM waste must be marked appropriately and stored in a controlled access area. Storing ACM waste in sealed and air-tight containers is a temporary solution.
- e- If outdoor temporary placement (outside the warehouse) cannot be avoided, then ACM waste should be protected by tent, black plastic covers or other types of covers.
- f- ACM waste must be stored in places where there is no danger of their destruction before they are removed/transported.
- g- Before storing ACM waste, all containers must be carefully checked for damage. If damaged containers and / or packaging is found, it is necessary to promptly rectify the damage or replace containers with new ones.
- h- Temporary storage of ACM waste in bulk without packaging is strictly prohibited.

Places for temporary storage of waste:

- a- The authorized body is responsible for determining the place for storing waste generated as a result of damage to facilities or carrying out demolition work, in accordance with the procedure.
- b- Under the conditions of the legal regime of martial law on the territory of Ukraine and within 90 calendar days after its termination or cancellation, in the case of the generation of waste from demolition in the relevant territory (territories) in volumes exceeding the capacity of the existing waste management facilities, or in the absence of such facilities – a decision is made on the placement of temporary storage sites in the respective territories.
- c- Places of temporary storage should be organized in compliance with the requirements of environmental and fire safety, environmental protection, rational use, and protection of natural resources, as well as the necessary sanitary protection zones, namely:
 - ▶ 2 kilometres – from water fund facilities
 - ▶ 0.5 kilometres – from residential and public buildings, social infrastructure facilities
 - ▶ 0.2 kilometres – from agricultural land, public roads and railways of the general network
 - ▶ 0.05 kilometres – from forests.
- d- Places of temporary storage are organized in compliance with the following requirements regarding the availability of:
 - ▶ a solid and levelled base (coating), in particular of concrete, asphalt or compacted soil, covered with a geomembrane layer at least 1.5 mm thick, protected from mechanical damage by a layer at least 0.5 meters thick

- ▶ organized drainage of rainwater (if necessary)
 - ▶ a fenced perimeter (if necessary)
 - ▶ area lighting (if necessary)
 - ▶ equipped entrance and access roads, allowing the unhindered passage of vehicles.
- e- In the process of organizing temporary storage sites, there should be areas set up for temporary storage, sorting, processing (recycling), the temporary storage of the secondary raw materials obtained (including for the placement of crushing and screening plants, as well as temporary structures necessary for the implementation of waste management operations).
- f- Different types of demolition waste must be stored in different areas.
- g- Waste storage should be carried out in a way that ensures the possibility of unhindered loading onto a vehicle for removal from their temporary storage sites.
- h- The placement of other types of waste is not allowed in places of the temporary storage of demolition waste.

5.10 Disposal of ACMs, or debris with ACMs

(Including locations in Ukraine that can accept ACMs)

Recycling and/or disposal:

- a- European standards prohibit the recycling and reuse of ACM waste. There is a need to ensure the proper handling of ACM waste through complying with the stringent regulations governing the proper collection, packaging, and transportation of such waste, and its disposal in specially designated landfills that have been prepared for such purposes.
- b- Issues related to the disposal of ACM waste at a landfill have to be agreed upon and approved by the authorized bodies taking into account the requirements of current waste management legislation.
- c- At the place of their disposal, ACM waste must be covered with an insulating layer (soil, clay, crushed construction waste, etc.) with a thickness of at least 0.75 meters to prevent the destruction of the upper layer, which might lead to further emission of asbestos micro-particles.
- d- From an engineering point of view, a landfill for household waste, as well as for non-hazardous waste, should be equipped with the following systems as a minimum (Annex 1 to Directive 1999/31/EC²⁰ on the landfilling of waste of 26 April 1999):
- 1) A lower filtration screen with a filtration coefficient of $1.0 \cdot 10^{-9}$ m/s, which may consist of:
 - a layer of uncompacted clay with a height of 1 m
 - a layer of compacted clay with a height of 0.5 m and a geomembrane with a thickness of at least 2.5 mm and a filtration coefficient of $1.0 \cdot 10^{-9}$ m/s;
 - a layer of bentonite mats with a density of at least 3600 g/m² and a geomembrane with a thickness of at least 2.5 mm and a filtration coefficient of $1.0 \cdot 10^{-9}$ m/s.
 - 2) Leachate extraction and disposal system;
 - 3) Environmental impact monitoring system.
- e- If there are frequent cases of burning or arson of waste in a landfill area, ACM waste must be transferred to separate cells to prevent the emission of its particles into the air.

²⁰ https://zakon.rada.gov.ua/laws/show/994_925#n259



6. Training Requirements – UNDP Debris Contractors

1. The employees of a contractor engaged in the removal of ACM waste and persons managing these employees and supervising the relevant work (labour safety inspectors); contractor workers who assist in the repair of damaged buildings and/or who are involved in any work where exposure to asbestos is possible; as well as the staff of the enterprise directly involved in the implementation of the project – must have certificates of training in the proper handling of ACM waste at all possible stages of contact with it.
2. Training must be validated prior to the participation of the contractor's personnel in any activity that involves the handling of ACMs.
3. Certificates on the successful completion of training in the proper handling of ACM waste should include the following sections:
 - ▶ General information: types of asbestos and its use, use of asbestos-containing goods and materials in households and industry, risks of negative impact of ACM waste on human health.
 - ▶ Minimization of the risks of the negative impact of ACM waste on human health, including options for its safe handling in the household and at a facility/construction site/work area.
 - ▶ Work area risk assessments and safety measures.
 - ▶ Personal protective equipment, tools, and their correct handling.
 - ▶ Procedures for the removal/extraction/segregation of ACM waste and its proper handling, depending on the nature of the work, the type of waste, and the procedure for its disposal.
 - ▶ Safe transportation, temporary storage, and disposal of ACM waste in the absence of officially designated disposal sites.
4. Workers are not required by law to have a training certificate before they can work with asbestos-containing waste and materials. The certificate is not proof of competence to complete the work, but its presence indicates that a worker has been properly trained, and the certificate is part of their educational record.
5. Persons with professional training, confirmed by a certificate on their right to work with hazardous substances, and who do not have medical contraindications, are allowed to handle hazardous waste. The admission of employees to work is provided by the relevant official of the enterprise/institution/organization. During demolition waste management operations, fire safety and labour protection rules must be observed, in accordance with national legislation.

7. Reporting Requirements – UNDP and Local Authorities

1. After the completion of dismantling works, a Dismantling Act is drawn up, exclusively in electronic format, using the Register of construction activities of the Unified State Electronic System in the field of construction²¹ (hereinafter referred to as the Register of Construction Activities). The form of the act (as seen in **APPENDIX 1**) is approved under the **Procedure for dismantling facilities damaged or destroyed as a result of emergency situations, military operations or terrorist acts**.
2. The Dismantling Act is:
 - ▶ signed by the customer – through the customer's own electronic account (subparagraph 11 of paragraph 144 of Decree No. 681 “Procedure for maintaining the Unified State Electronic System in the field of construction”²²);
 - ▶ created and signed by the contractor's employee through his own electronic account;
3. Dismantling Acts for facilities that are subject to the Law of Ukraine “On State Secrets” are drawn up in compliance with the requirements of this Law in paper form, in accordance with the form seen in **APPENDIX 1**;
4. In the case of the complete dismantling of an object, the Dismantling Act is the basis for the cancellation of the technical passport and the exclusion of the object from the real estate register;
5. State accounting of demolition waste is carried out at the place of their generation or at places of temporary storage, or other waste management facilities, in accordance with the form seen in **APPENDIX 2**, as approved by the **Procedure for handling waste that is generated in connection with damage to (destruction of) buildings and structures as a result of hostilities, terrorist acts, sabotage, or work to liquidate their consequences**.

²¹ <https://e-construction.gov.ua/>

²² <https://zakon.rada.gov.ua/laws/show/681-2021-%D0%BF#n606>



Appendix 1

The Dismantling Act²³

By this act we testify that the dismantling of a building (structure, part) has been carried out at the following address: _____

destroyed as a result of an emergency, military action or a terrorist act, and owned by right of ownership (use) _____

Dismantling was completed on “_____” _____ 20____ year by the business entity _____

_____ (code according to NSRUEO _____),

by order of _____

_____ (code according to NSRUEO _____),

based on a survey report prepared by _____

_____ (code according to NSRUEO _____),

qualification certificate, series _____ N° _____).

(Surname, name authorized officer of the customer)

(signature)

“_____” _____ 20____ year.

(Surname, name contractor manager)

(signature)

“_____” _____ 20____ year.

²³ <https://zakon.rada.gov.ua/laws/show/474-2022-%D0%BF#n86>



Appendix 2

FORM of accounting for waste from demolition²⁴

Serial number	Name of components of demolition waste	Unit	Volume	Location (place of temporary storage of demolition waste / other waste management facility)
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- Notes:
1. Information is indicated on the demolition waste that is located at a temporary storage site for demolition waste or another waste management facility.
 2. Name of components of demolition waste in accordance with Appendix 1 of Resolution No. 1073 of the Cabinet of Ministers of Ukraine, dated 27 September 2022, "The Procedure for handling waste that generated in connection with damage (destruction) of buildings and structures as a result of hostilities, terrorist acts, sabotage or work to liquidate their consequences".
 3. The volume of demolition waste is indicated in tons or cubic meters. The appropriate unit of measure is indicated when filling out the form.

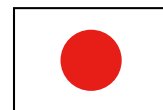
²⁴ <https://zakon.rada.gov.ua/laws/show/1073-2022-%D0%BF#n102>



ASBESTOS WASTE MANAGEMENT PROTOCOL

for **UNDP CONTRACTORS AND PARTNERS**

Version 5.0 | November 2023



From
the People of Japan

