

*Site: INCREASE OF THE HYDRAULIC CONDUCTIVITY OF R. TSAPAREVSKA ON THE TERRITORY OF THE VILLAGE OF MIKREVO, MUNICIPALITY. FLOWED THROUGH INNOVATIVE WATER MANAGEMENT METHODS (GEOCELLS) ",*

*Phase: WD, Amendment under Art. 154 according to the Spatial Development Act*

*Part: HEALTH AND SAFETY PLAN*

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## WORKING DESIGN

Amendment under Art. 154 according to the Spatial Development Act

**SITE: "INCREASE OF THE HYDRAULIC CONDUCTIVITY OF R.  
TSAPAREVSKA ON THE TERRITORY OF THE VILLAGE OF  
MIKREVO, MUNICIPALITY. FLOWED BY INNOVATIVE METHODS  
FOR WATER MANAGEMENT (GEOCELLS)"**

**ASSIGNOR: MUNICIPALITY OF STRUMYANI**

**CONTRACTOR: GEOCONSTRUKT LTD.**

**PART: HEALTH AND SAFETY PLAN**

2019

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## **1. Introduction**

The safety and health plan for the subproject is drawn up in accordance with:

- Law on Healthy and Safe Working Conditions / amended SG No. 76 / 20.09.2005 /
- ORDINANCE № 1 OF JULY 30, 2003 on the nomenclature of types of constructions.
- Ordinance № 04/2 of 22.03.2004 - the minimum requirements for healthy and safe working conditions when performing construction and installation work, promulgated SG No. 37 of 4.05.04. in force from 5.11.2004 and its annexes
- Ordinance -201-209 / 22.11.2004. for the rules and norms for fire and emergency safety of the sites in operation
- Ordinance №7 on the minimum requirements for OHS at workplaces and when using work equipment.
- Ordinance № RD-07-2 of 2009 on the terms and conditions for conducting periodic training and instruction of employees on the rules for ensuring healthy and safe working conditions;
- ORDINANCE № 15 on the conditions, procedure and requirements for development and introduction of physiological regimes of work and rest during work
- ORDINANCE for the safe operation and technical supervision of lifting equipment.
- Ordinance № 3 of 31 July on the drawing up of acts and protocols during construction
- Law on Spatial Planning - Spatial Development Act and others depending on the types of work.

The design developments for the site were used as starting materials. The present development refers to the possibility of two-phase implementation of the project, as provided in the hydraulic and structural part. It should be noted here that before the start of construction works in phase 1, a more detailed inspection is needed to identify existing communications, underground and aboveground, which may not be reflected in the project. The guidelines described in this study concern both phases in the construction and installation work.

## **2. General data about R. Tsaparevska**

The Tsaparevska River collects its waters from the Malishevskia Mountain and originates from the southwestern part of the Eolak peak with a height of 1502 m. Tsaparevska, which gather in a common river 2.0 km below the village of Tsaparevo. The river is a right tributary of the Struma River and flows into it after the village of Mikrevo. The total length of the river is 22.5 km with an average slope of 52.5%. Neighboring rivers with similar characteristics of the catchment areas are the river Lebnitsa to the south, the river Breznishka and the river Sushitsa to the north.

The main orohydrographic elements of the Tsaparevska River catchment are shown in the

following table.

*Table 1. Orokhidrographic elements in the catchment area on the river. Tsaparevsk*

<b>№</b>	<b>Characteristic</b>	<b>Measure</b>	<b>Amount</b>
1.	Length of the river	km	22,5
2.	Average slope of the river in the section	‰	35
3.	Catchment area	km <sup>2</sup>	76,0
4.	Average altitude of water. area	m	947,0
5.	Slope of the catchment area in the section	‰	26,0

The catchment area near the village of Mikrevo is  $F = 76.0 \text{ km}^2$ . The high waters for which the correction is measured in the section of the village are  $Q_{1\%} = 48 \text{ m}^3 / \text{sec}$ .

The riverbed in the upper mountain and in the middle part is narrow and stony, and in its lower part it is characterized by gravel deposits mixed with large boulders.

### **3. Brief characteristics of the site**

This project was developed at the request of the contracting authority Strumyani Municipality in order to increase the hydraulic conductivity of the Tsaparevska River in the village of Mikrevo. In the spring of 2013 the high waters of the Tsaparevska River caused partial excavation of the slopes on both banks and a critical situation was created with the danger of flooding residential buildings and properties along the river on a section of 1200 m in the regulation of the village of Mikrevo. At the bottom of the river there are large gravel deposits mixed with boulders and the banks are disturbed. There is a real danger of the current coming out of the riverbed when conducting further high waters in the river.

The technical proposal includes the use of category - A geocells or those with equivalent characteristics. It is envisaged to divert the riverbeds and achieve hydraulic characteristics of the riverbed depending on the accepted in the calculations. The geocellular network is  $h = 10 \text{ cm}$  high. Up to a height of  $1/2$  of the height of the slopes, the aggregate of the geocells will be concrete C16 / 20, and in the rest - earth-rock material from the excavation activities. It is also planned to apply a clay seal and hydroseed over it according to the Hydraulic and Structural part. The geocellular network will be fixed by rigid anchors N14 and polypropylene ropes ( $N > 0.9 \text{ kN}$ ) to the slopes. The total length of the section to be corrected is 1212 m.

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#### **4. Organizational plan**

The purpose of the Organizational Plan (OP) is to cover and clarify the implementation and execution of the construction process, its hazards and risk areas, and moments in the implementation of construction and installation works, and the measures to be taken to prevent, limit and eliminate these dangers and risks. The OP and the schedule (PG) for the implementation of the project are interconnected and are constantly coordinated with each other. Any change in the GHG, such as volume of work, technology of implementation, deadlines, etc., inevitably affects and leads to a change in the OP, as well as any change in the OP leads to changes in the GHG. The organizational plan is aimed at clarifying in as much detail as possible the necessary measures for Health and Safety at Work (OHS) in the implementation of construction and installation work.

A detailed presentation of the organizational plan is provided in the "POIS" part of this study.

### **LIST OF RESPONSIBLE OFFICIALS**

The rights and obligations of individual parties in ensuring healthy and safe working conditions (OHS) are given in Section II of Ordinance №2 on the minimum requirements for healthy and safe working conditions when performing construction and installation work (Art. 5 ÷ Art. 29). as indicated in the attached samples.

The most important of them are the following:

The assignor or the person authorized by him shall appoint safety and health coordinators for the stage of construction execution.

The assignor or the person authorized by him shall not be released from liability with regard to the provision of OHS, regardless of the fact that in the process of negotiation one or more coordinators have been appointed for the implementation of the tasks under Art. 7 and 11.

#### ***The safety and health coordinator for the construction phase:***

1. coordinate the implementation of the general principles for prevention of safety and health protection, according to the Health and Safety at Work Act;
3. update the plan for safety and health under art. 7, item 2 and the information under Art. 7, item 3, taking into account the occurred changes with the progress of construction and installation works;

#### ***The builder:***

1. ensures:
  - a) complex OHS of all employees, incl. the subcontractors and the persons, independently exercising labor activity, during the construction and installation works of the constructions performed by him;
  - b) elaboration and updating of instructions for safety and health according to the specific conditions of the construction site by types of construction and installation works and in the case of the requirement of this ordinance cases;
  - (c) the necessary protective equipment, work clothes and their use in accordance with the regulations and depending on the assessment of the existing risks for each specific case;
  - d) the instruction, the training, the raising of the qualification and the check of the knowledge on OHS of the workers;
  - e) filing and reporting of the performed inspections, tests, technical maintenance and repairs of the equipment and working equipment (electrical and lifting equipment, construction machinery, vehicles, etc.) and their constant control in order to eliminate defects that may be affected the safety or health of workers;

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f) the necessary sanitary premises in accordance with the sanitary and hygienic requirements and the requirements for PSA, duration of construction and human resources;

g) maintaining order and cleanliness of the construction site;

(h) the division and organization of storage areas for different materials, especially in the case of hazardous materials and substances;

(i) requirements for the storage and disposal of hazardous materials used; (j) the collection, storage and transport of waste and debris;

(k) first aid can be provided to victims of accidents at work, fire, disaster or accident at any time;

2. take appropriate precautionary measures for protection of the workers from risks, arising from insufficient strength or temporary instability of the building structure;

3. organize an internal system for inspection, control and assessment of the condition of the safety and health of the workers;

4. determine in writing in job descriptions the obligations of the responsible persons (technical managers, foremen, etc.) and the workers for elimination of the risks in the work process and provide them with the necessary powers and resources; approves the organizational scheme for the relations between them;

5. take into account the instructions given by the safety and health coordinators, assigning their implementation to responsible persons in accordance with the normative regulation, the internal instructions and documents, the type of the construction, the presence of subcontractors, etc .;

6. be responsible for the damages from pollution or damage of the environment as a result of the performed construction and installation works;

7. appoint persons responsible for application of measures for rendering first aid, for fight against disasters, accidents and fires and for evacuation; the number of such persons, their training and the equipment provided to them must be adequate to the specific hazards and / or size of the construction.

In case of necessity of changes in the process of work, the Builder, in coordination with the bodies of the State Agency "Civil Protection" and RS "PBZN", organizes the development and approval of:

1. plan for prevention and liquidation of fires and plan for liquidation of accidents;

2. plan for evacuation of the workers and of those on the construction site.

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(2) The plans under para 1:

1. cover all possible cases of fires and accidents and the causes that caused them and contain the signal, announcing "emergency situation";
2. determine the behavior and obligations of each employee;
3. are placed in visible and accessible places.

(3) With the plans under par. 1, all persons admitted to the construction site shall be acquainted.

***The team leader:***



- determines the composition of the construction - installation team - contractor;
- carries out operational, technical and administrative management in accordance with the design and technical decisions, PIPSMR and the requirements of the Assignor;
- controls the implementation and development of schedules for installation works and quality plans;
- controls the implementation of all activities for transportation, excavation activities and laying of the embankments, provided in the technical design;
- coordinates the work between the individual brigades of the site;
- maintains constant contacts with the representatives of the Assignor for resolving the issues and the problems that have arisen during the execution of the installation works;
- monitors the timely preparation and completion of the technical documentation in accordance with the requirements of the Assignor and the regulatory documents.

***Technical Manager:***

- organizes, manages and controls the execution of the construction works by volume, time and quality / declares the necessary materials, blanks and mechanization /, in accordance with the working design, the working procedures and the quality plan;
- determines the tasks of the brigades on the basis of the calendar schedule and monitors their implementation;
- monitors compliance with the requirements of the technology / instructions / for the execution and installation, the normative documents and the factory documentation during the execution of the types of works;
- organizes the observance of the requirements for hygiene and technical safety at work and fire safety;

***The foreman:***

- receives the production task, studies it and accepts the manner of its implementation, in case of difficulties he consults with the Technical Manager;
- organizes and maintains proper organization and culture of the workplace;
- monitors the correct and quality execution of the types of construction and installation works, according to the working designs, the respective technological instructions and takes care of the protection of the materials and the equipment;
- monitors compliance with the requirements for hygiene, occupational safety and fire protection.

## **5. Restrictive conditions under HSP**

5.1. The location and the limited size of the construction site require a strictly specific organization for implementation, and hence for OHS.

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The envisaged organizational schemes must be strictly observed or updated in a timely manner, which is an obligation under Article 11, item 3 of Ordinance № 2.

Any change should be reflected in writing in a protocol (act) or in the Order book.

5.2. According to Art. 137 of the Spatial Development Act, Ordinance 1, Art. 2 §7, the site is of the first category. The category of the construction and the characteristic features of the construction site allow according to art. 5, para. (1), item 2 of Ordinance № 2 / 22.03.2004, if the construction will be performed by one Builder - not to appoint a Safety and Health Coordinator (CBC) for the stage of construction execution, in which case its functions are performed by the Builder.

In case of more than one builder, according to art. 5, para. (1), item 2 of Ordinance № 2 / 22.03.2004, the Assignor is required to appoint a consultant for exercising construction supervision and a coordinator for safety and health for the construction stage. The name and the necessary personal data of the natural person KBZ must be explicitly to be entered in the contract of the Assignor with the Supervisor or in an annex to the contract, or with exchanged written correspondence. Any necessary change (change) of KBZ is reflected in advance and in writing. The appointed coordinator (KBZ) personally performs all functions provided in Ordinance № 2 of the Ministry of Regional Development and Public Works and the MLSP for the minimum requirements for OHS in the implementation of construction and installation work. These functions are specified in the contract and the job description.

The contract (contracts) with the Contractor (s) and the subcontractor (subcontractors) shall contain an explicit clause for the execution of the orders issued by KBZ related to its tasks for the control of Health and Safety at Work (OHS).

## **6. Stages of implementation of construction, according to the requirements of hswc in two-phase performance of CW**

We conditionally divide the implementation of construction and installation works related to OHS provision into stages, without this division being an obligation for deliveries, agreements with contractor and / or contractors, subcontractor and / or subcontractors, payments for certain activities and / or parts thereof, replacement of executive staff (regardless of the reasons) and other similar situations. In accordance with the calendar schedules for construction of the Site, the organizational stages, into which the specific project can be divided conditionally, are indicated in the part Plan for organization and implementation of the construction.

### **6.1. Hazard classification**

The damages that could occur during the implementation of the activities set in the project, in accordance with the risk assessments, will result from:

- impact (s) from falling objects;
- improper stepping and falling, stumbling, limb injury;
- electric shock;
- accident around construction equipment and tools;
- exaggeration;
- poisoning;
- other, unlisted dangers: fire, accidents, stings, etc.

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The following points describe the main organizational and technological measures during construction and installation work, which must be undertaken by the Builder and subject to control by KBZ, without considering that they are completely sufficient. To carry out any work related to the hazards identified in the risk assessment, the coordinator will require written safety and health instructions from the contractors. A copy of each instruction will be placed in a prominent place in the area of the construction site.

## 6.2. Organizational guidelines for implementation

### 6.2.1. Site preparation, temporary construction

Before starting the excavation works, it is necessary to draw up a Protocol for opening the construction site, for determining the construction line and level - Annex № 2 to Art. 7, para. 3, item 2 of Ordinance № 3 for drawing up acts and protocols during the construction. After drawing up Protocol №2, the construction site can be cleared to start the construction and above-ground and underground lines, networks, stationary devices, etc. can be moved.

The construction site is cleaned of existing waste and other materials stored in the spot of the construction site. In the presence of fertile soil layer (humus) on the site, measures are taken for its removal and storage.

The construction site (for the location of the temporary settlement, graph. Appendix 1 part PBZ, and separate work areas with performed construction works) should be fenced with a solid fence with a height of  $\geq 1.8$  m in accordance with the requirements of Ordinance №2 on the minimum requirements for health and safe working conditions during construction and installation works, Section III "General Requirements", Art. 30 (2). During the construction and installation work, the existing municipal roads along the river will be used for access to the site, as well as the construction of 8 temporary approaches that also provide access to the riverbed.

As the site is located within the village of Mikrevo, the necessary for the operational needs of the Contractor: electricity, drinking and technical water, heating and telephone connection will be provided by selected sites within the village. The construction situation plan indicates: generator, water tank (water carrier), power supply of construction machinery and lighting fixtures will be provided by portable electric generators installed at the site for security and work in the dimly lit part of the day (not provided).

The material and technical supply of the site will be carried out from the nearest warehouses of the construction organization, according to a contract with the Contractor.

The drinking water for the site is planned to be delivered in bottled form and in quantities providing for the needs of the staff of the site provided by the Contractor.

For the location of temporary offices of the technical management, for changing rooms, toilets and washrooms for workers, for storage of construction and agro-technical tools, as well as a first aid station and a fire station, during the planned construction works, can be used as provided for the site, as well as existing premises in the village located in close proximity to the site, according to the organization provided by the contractor.

The situation on the site allows the delineation of limited storage sites for placement and processing of construction materials and blanks, as well as operational sites for construction

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machinery (truck cranes, tractors, trucks, excavators, etc.).

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Special sites must be provided on the construction site to house containers for the separate collection of the various types of waste generated during construction. The waste from these containers must be periodically transported to specialized landfills, and the Assignor must have a signed contract with a company licensed for activities for treatment of construction waste products. All construction and installation activities must be performed in accordance with the cited regulations and ordinances, following the instructions of KBZ.

On the day of signing the Protocol for opening of the construction site under the responsibility and control of the Assignor, the builder must place in a visible place an information board with the following content:

- date of opening of the construction site;
- number and date of the construction permit;
- exact address of the construction site;
- assignor;
- type of construction;
- builder;
- safety and health coordinator;
- planned date for starting work on the construction site;
- planned duration of work;
- planned maximum number of employees on the construction site;
- planned number of builders and persons self-employed on the construction site;
- data on already selected subcontractors.

#### 6.2.2. Construction of excavations and embankments

#### **General provisions for the construction of excavations and embankments**

Until the start of the earthworks, in addition to fulfilling the conditions of the construction contract and handing over the construction site, the following works are required to be performed:

- permanent geometrical delineation of the axes and geometrical contours in the zones of excavation and embankment works, the routes of other facilities, provided in the project;
- construction of safety barriers and warning signals (according to ORDINANCE RD-07-8 on the minimum requirements for signs and signals for safety and / or health at work);
- implementation of temporary facilities, cleaning of the waste trough.

When performing the earthworks KBZ and the technical manager must ensure compliance with the requirements of "Rules for acceptance of earthworks and earthworks" and Annex № 1 to Ordinance № 2. Earthworks in the outlines of the riverbed are carried out in two ways : mechanized - for mass excavation and embankment and manual - for additional excavation (reaching the design excavation elevation) and shaping of slopes, dikes, as well as for excavations to and around existing facilities.

The choice of excavator is made on the basis of the volume of the excavations, the category of the soil and the nature of the excavation. The excavated mass is loaded on dump trucks and transported to a pre-specified section within the construction site.

The measures and requirements for ensuring OHS during the execution of the earthworks are specified in item 6.2.2.

In the process of filling and compaction, the use of concrete pumps and conventional digging machines is recommended.

When performing the bulk activities, the operators of machines should monitor the presence of unqualified personnel within the scope of the equipment entrusted to them. In the presence of the above-mentioned circumstances, the work should be suspended until the explicit permission of the person in charge for the respective construction process.

### **Excavation**

Before starting excavation works on earth masses, it is mandatory to conduct instruction and provide the necessary equipment for workers. After an inspection, a selection of the most suitable area for starting the excavation works is made, as the main actor and responsible for the excavation activities is the technical manager.

Rights and obligations of the technical manager during excavation activities:

- Permits the start of excavation works only after taking all necessary measures to ensure healthy and safe working conditions;
- Checks the security and safety of the excavation slopes;
- Gives orders for backfills.

Requirements for healthy and safe working conditions in earthworks works

Take the following measures:

- To form the well-prescribed slopes;
- To prevent the risks associated with falling people, products and objects and water penetration;
- To ensure safe access to workplaces;
- The storage of products or earth and the movement of vehicles or construction machinery should be carried out at a safe distance from the excavations and water areas, and if necessary, appropriate fences should be placed.

Before starting the earthworks, the riverbed must be cleaned and the water in the river must be temporarily diverted.

Earthworks at a distance of less than 0.20 m from the underground facilities (if any, within the adjustment section) should be carried out with a straight shovel.

The necessary products for manual earthworks (stairs, shovels, etc.) to be delivered before the start of the implementation.

All fencing and safety equipment must be installed before starting manual excavation work.

When carrying out manual excavation work in earth layers where there is a danger of rapid infiltration of water, take the necessary measures, including the construction of emergency sites, to immediately evacuate workers in the event of a sudden flood and to ensure continuous emergency pumping of water .

Before starting work in excavations with a depth greater than 1.5 m, check the stability of the slopes or reinforcement.

To enter and exit the riverbed, during the excavation activities, to place stairs with a width of at least 0.7 m.

It is forbidden to descend and ascend the slope of the trench without using the ladder.

Excavation works after their temporary suspension or freezing shall be resumed after checking the stability of the slopes and strengthening and elimination of the identified faults and hazards.

The placement of earth mass, construction materials and equipment should be carried out only outside the area of the slopes of the excavations and at a distance of not less than 1.0 m from their upper edge.

Excavation work by undermining is prohibited.

During the performance of the work related to the excavations, the stability of the slopes should be monitored.

Helmets and gloves should be used for manual excavation. When working in muddy and damp trenches, use boots.

The excavation works are stopped at:



- Detection of unknown underground facilities until permission is obtained from their owner;
- Occurrence of conditions other than those provided in the project until the relevant prescriptions are given by the designer and their implementation;
- Detection of explosive materials until obtaining permission from the relevant authorities.

### 6.3. Manner of execution of the main construction works

The Contractor undertakes to implement the project measures envisaged under the BCCI, organization of construction in accordance with the FP and regulations, as well as the requirements of this study. The specific machines, equipment and labor required for the site will be determined by the contractor depending on the stages, season, deadlines and other conditions of the contracting authority.

The technological sequence in the execution of construction works consists of:

- Preparatory work;
- Marking of the routes and division of the whole section, provided for correction, into sub-sections for construction and installation works;
- Delivery and unloading of the necessary materials to the sections of the site;
- Temporary diversion of the river waters;
- Preparation of the river bed and the soil base;
- Execution of excavation and embankment works for shaping the design geometry of the riverbed;
- Formwork, formwork works and concreting of the places determined for bottom thresholds;
- Preparation of the ridge of the slopes;
- Laying of geotextiles;
- Stretching of the sections of geoclets along the slope and anchoring;
- Anchoring the ends of the sections in the bed of the river;
- Laying a filling layer of concrete C16 / 20;
- Applying a filling layer of local materials;
- Landscaping (clay sealing and hydroseeding).

### 6.4. Description of the technology and aspects of the application of a geocellular system in river corrections.

The correct placement of the sections is essential for the functioning of the system and must be confirmed by the contractor and / or engineer.

After the preparatory works described in item 6.4. follows the laying of geotextiles,

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according to the design prescriptions (graph. appendix № 4.1, part: Hydraulic and construction).

Location of the sections along the ridge of the canal



Laying a filling layer - soil

Mechanical filling of the geocell sections in the reverse order of stretching using the appropriate filling material, according to the standard procedures for earthworks and in full compliance with the requirements of the project.

Do not use funds directly on geocells.

The recommended height from which to apply the filling layer in order to prevent damage to the cell walls is 1m (100cm).

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**Note:** Do not use vehicles directly on geocells.



**Note:** The recommended height from which to apply the filling layer, in order to prevent injury to the cell walls is 1m (100 cm).



#### Filling layer of concrete

The slopes are filled to 1/2 of their height with concrete C16 / 20. The procedures for performing a concrete filling layer are performed by means of a concrete pump or gutter. No formwork is required.

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Geocells should be fixed with rigid J-shaped anchors N14 and polypropylene ropes ( $N > 0.9\text{kN}$ ) to the slopes. Due to the large thickness of the anchor rods (N14), in case of difficulty in bending them in the intended J-shape, the same rods can be properly cut into parts and welded in an L-shape, while maintaining the intended design length. The fixing of the anchors will be done with the help of workers and the use of a manual pneumatic perforator (drifter);

#### Landscaping and vegetation (hydroseeding)

The application of hydroseeding on the slopes of the riverbed is an essential element of soil stabilization and erosion control solution. The implementation of the envisaged measures should be carried out according to the requirements of the project.

### **7. First aid measures**

In case of accidents and incidents, the injured persons should be provided with pre-medical medical care on the spot, if they cannot be moved to the sanitary premises, which are designated and equipped for this purpose. Pre-medical care should be provided only by a person who has undergone training in first aid. In case of broken bones, immobilize the affected part of the body, and in no case try to adjust. In case of bleeding of the limb, make a bandage. In case of internal bleeding, the victim should be left alone and a doctor should be called quickly. In case of sand in the eyes it is necessary

rinsing with a stream of clean water. In case of gas poisoning, take the following actions:

- The poisoned person should be removed from the gassed situation immediately;
- If the victim is poisoned with carbon monoxide, give artificial respiration, if it is another gas, do not perform artificial respiration with motor procedures. In case of loss of consciousness (for any reason) until the arrival of a doctor, the following actions should be taken:
  - Lay on your back, with your head slightly raised or lying on your side;
  - When vomiting, the head should bend to one side at body level;
  - In case of respiratory disorders to apply mouth-to-mouth breathing and to apply other techniques of artificial respiration, mastered in courses for help and mutual aid.

## **8. Disassembly of facilities**

Disassembly work can be performed in two ways: disassembly with the possibility of subsequent use and disassembly without the possibility of subsequent use. The choice of the method of dismantling works will depend on the specific requirements of the Assignor and trial dismantling, in which to assess the possibility of subsequent use.

All activities related to the dismantling of existing facilities should be monitored directly by the technical manager and the supervisor of safety and health of workers. Do not allow outsiders, and all with access must have been instructed and have appropriate equipment (helmet, work gloves, boots, etc.).

Prior to the commencement of the dismantling works, the builder shall appoint by a written order a person responsible for the safe operation of the lifting and transport machines, the assembly tools and devices and the rigging means:

The elements and structures when moving with a crane are secured against rotation and movement.

During downtime and breaks at night, the mounting mechanisms are stabilized in order to prevent accidents due to wind or other causes.

In case of insufficient bearing capacity of the soil, shields, slabs or sleepers are placed under the supports of the cranes.

When cutting elements for structures, technological equipment or pipelines, measures are provided against accidental falling of the cut part, which would lead to a risk for the workers or for the equipment.

Disassembled items or equipment are stored in a stable position. It is not allowed:

- vertical and horizontal transportation and installation of prefabricated elements in adverse weather conditions and strong winds;
- workers to be on the elements and structures during their movement with a crane; stay of people under raised for installation elements, constructions, formwork and etc .;
- simultaneous dismantling of elements on two or more adjacent levels.

## **9. Cleaning of the site and commissioning of the site**

After the completion of the construction and installation works and activities daily and finally, the site of the site should be cleaned of construction, metal, wood, plastic, electrical insulation and other waste. They must be collected separately in specially located containers (construction-situational plan), from which they must be transported to the respective landfill for construction and / or household waste. During the implementation of the activities, in the project all waste generated during the process to be transported with a pre-concluded contract with an operator. Determine the time range for their periodic use.

## **10. Plans for elimination of fire and / or accidents during the construction**

For the reconstruction, the supply of materials that are highly flammable (membranes, petroleum products, timber, etc.) is envisaged. The Fire Safety Measures to be taken at the site are set out in the regulations, namely:

The territory of the construction site is categorized as PB and means with signs and signals according to the regulatory requirements.

In prominent places on the construction site are placed signs with:

1. the telephone number of the local service for fire safety and protection of the population (PBZN);
2. the address and telephone number of the local medical service;
3. the address and telephone number of the local rescue service.

Flammable materials and flammable liquids are stored in the relevant premises and warehouses (pre-defined by the technical manager and the safety officer) meeting the regulatory requirements for PB.

To create an organization for PB on the site the builder:

1. develops and approves instructions for:
  - a) safe performance of fire works and other fire-hazardous activities, incl. work areas and places;
  - b) fire-safe use of heating, electric heating and other electrical appliances;
  - c) provision of PB during non-working hours;
2. issue orders for:
  - a) appointment of a fire technical commission;
  - (b) designation of smoking areas;
3. monitor the observance of the requirements for prevention and liquidation of fires, as well as for evacuation of the persons working and located in the fire zone.

When performing construction and installation work on the territory of sites in operation, the rules and norms for PB of such sites are observed.

In the event of a fire or accident involving subsequent fires, the builder or technical manager shall immediately notify the relevant PBZN service.

A specialized commission carries out at least two inspections a year of the condition of the PSA on the construction site.

A representative of the builder is appointed as the head of the commission.

For the implementation of the measures determined by the commission for improvement of the PB on the construction site, the builder issues an order, in which the respective responsible persons and the terms for implementation are indicated.

Smoking is allowed only in places designated by order, marked with the appropriate signs or plates and equipped with non-combustible containers with water or sand.

The internal fire hydrants of sites and buildings in operation, on which there is a separate construction site, are located in accessible places, equipped with hoses and nozzles and closed in sealed boxes.

Fire panels are equipped with hand-held appliances and equipment in accordance with the specifics of the construction site and the requirements specified in Part Fire Safety.

Handy fire extinguishers and equipment on the construction site:

1. shall be assigned to persons, appointed by the technical manager for persons in charge of PB, to whom the control and the responsibility for maintenance and adjustment of these devices and facilities shall be assigned;
2. are periodically checked by the technical manager, as the results shall be noted in a special diary;
3. are not used for economic, production and other needs, not related to fire extinguishing.

Continuous access is provided to the hand-held fire extinguishers and equipment, fire hydrants and hydrants, buildings, warehouses and facilities on the construction site.



The devices and equipment under par. 1 shall be marked with the respective signs and shall be maintained suitable for work in winter conditions.

It is not allowed to leave and store materials, parts, equipment, machines, etc., as well as to park mechanization and vehicles on the roads and approaches to the fire-fighting devices, equipment and installations for fire alarm and fire extinguishing.

When working with construction products that emit flammable or explosive vapors, gases or dusts, smoking, the use of open flames or fire, heating appliances, vehicles without spark arrestors, tools that can be obtained during operation are not allowed. sparks, as well as electrical equipment and work equipment whose degree of protection does not correspond to the class of the fire or explosion hazard zone in the room or the external equipment.

It is not allowed:

1. the use of non-standard heating and heating appliances and equipment and of other combustion devices;

2. the storage in the construction machines and in the vicinity of oxygen cylinders of flammable, combustible, fire- and explosive substances in vessels, quantities and in ways, contradicting the requirements of PB;

3. the delivery, use and storage on the construction site of flammable and combustible liquids, except when the necessary conditions for this have been created in compliance with the respective normative requirements and the instructions of the manufacturer;

4. the lighting of an open fire, regardless of the climatic conditions and the part of the day, as well as the smoking in places, categorized or determined as fire- or explosive;

5. the heating of the internal combustion engines of the construction machines, as well as of the frozen water supply, sewerage and other pipelines, with open fire, electric heating appliances, etc .;

6. the hanging of clothes, towels and other combustible materials on contacts, insulators or other parts of the electrical installations, as well as their drying on heating or heating appliances;

7. the use of paper, cardboard, fabrics or other combustible materials for making lampshades for lighting fixtures.

The Emergency Safety Measures to be taken at the site are set out in Section VI of Ordinance 2, and more specifically in Art. 73 ÷ Art. 75, namely:

In case of an accident, the builder declares an emergency situation and monitors the implementation of the measures set out in the plan for prevention and elimination of accidents.

In the event of accidents, the consequences of which may endanger the health and safety of persons outside the construction site, the builder or the technical manager shall immediately notify the relevant civil protection service.

When submitting an emergency signal, the technical manager or a person designated by him shall immediately take the following measures:

1. evacuate all workers in the fastest and safest way;
2. terminate the performance of any works at the place of the accident and in the neighboring endangered sections of the building or the facility;
3. turn off the voltage supplying any type of equipment in the emergency section;
4. as soon as possible inform the workers, who are exposed or may be exposed to serious or immediate danger from the available risks, as well as about the actions for their protection;
5. take actions and give orders for immediate termination of the work and leaving the jobs;
6. organize liquidation or localization of the fire or the accident by using protective and safe tools and equipment;
7. order the removal in a safe place of the workers, who do not participate in the fight against the fire or the accident;
8. place on-duty security at the entrances and exits of the construction site;
9. does not resume work while there is still a serious and imminent danger.

The builder shall revoke the emergency situation after the final elimination of the causes of the accident, in case of impossibility for its recurrence, spread or expansion, as well as provided that all necessary measures have been taken for the complete safety of the persons and means during the restoration of work.

Located on the territory near the section of the Tsaparevska River, which is subject to correction, the workers working on it are included in the measures for localization and liquidation of disasters and accidents, according to the approved rules for protection of personnel in case of disasters, accidents and catastrophes. ) Plan for management and administration of rescue and emergency disaster recovery works in case of disasters, accidents and catastrophes.

## **11. Measures and requirements for ensuring health and safety working conditions**

At each workplace and at each stage of project implementation, certain health and safety

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requirements should be observed, and the aim is to create conditions for safe work during the implementation of the activities set in the project. It is necessary for all workers to be acquainted with the basic requirements of Ordinance № 2 of 26.02.2004 on the minimum requirements for healthy and safe working conditions during construction and installation works. Based on the cited ordinance, the builder's management is obliged to develop and update safety instructions in the process of work. The persons appointed by the Assignor and the Contractor to monitor compliance with the requirements of "Ordinance №5 on the procedure, manner and frequency of risk assessment." Periodically perform a risk assessment:

- classification of labor activities;
- hazard identification;
- employees exposed to hazards;
- risk assessment ( $P = B * E * P$  - practice for defining risk (P) as a quantity composed of the product of three parameters - probability (B), exposure (E) and consequences (P))

Regularly carry out activities to wet the surface of road connections by means of a water carrier and in order to reduce emissions of dust particles into the air.

The water tank should be filled every day, and reserve quantities of drinking water should be provided for drinking needs on the site.

During the operation of the site the normative documents specified in item 1 must be observed.

## **12. General requirements for the construction site when construction works**

The general requirements are developed in detail in Section III of Ordinance №2 on the minimum requirements for healthy and safe working conditions when performing construction and installation work (Art. 30 ÷ Art. 59). The construction site is determined and opened under the conditions and by the order of the Spatial Development Act.

Construction sites in urban areas, roads or on the territory of existing enterprises, including excavations for the implementation or repair of underground networks and facilities, are fenced with temporary solid fences according to the requirements of the relevant municipal administration and signaled with appropriate signs and plates. necessity - and with light signals.

The necessary fences on the construction sites and the excavations of the linear engineering networks outside the urbanized territories are solved with the investment project.

At the entrance to the site and in other suitable places, diagrams shall be placed indicating the location of the individual subprojects and the routes for the movement of road vehicles and pedestrians.

The movement of construction machinery and pedestrians on construction sites, if necessary, is regulated by road signs in accordance with the regulatory requirements for signaling of roads with road signs. The areas dangerous for traffic are fenced off or the respective signs are placed on their borders, and in case of limited or reduced visibility - also light signals. Safety pedestrian bridges are used for pedestrians to cross the ditches, which are illuminated during the dark part of the day.

The premises for sanitary and medical services are used for:

1. preparation and consumption of food and soft drinks;
2. changing, storing and drying the work and personal clothes;
3. short rest;
4. overnight stay of the construction, when this is required by the technological process;
5. medical care;
6. provision of personal hygiene (toilets, bathrooms, washbasins, etc.).

In cases where the contracting authority provides the builder for temporary use with completed buildings located near the site, they are adapted to the sanitary and hygienic requirements and the requirements for FS.

The distances from the sanitary premises to the warehouses, in which materials dangerous for the health of the workers are stored, including fire- or explosive, comply with the sanitary-hygienic requirements and with the requirements for safety.

Sanitary facilities are located in places where there is a minimal risk of soil collapse and exposure to chemical, physical and biological agents.

Dining places are located at a distance of up to 500 m from the farthest workplace on the construction site or provide transportation for employees.

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The toilets are located at a distance of up to 75 m from the farthest workplace on the construction site and are connected to the sewerage network, and if impossible, a chemical toilet is located.

Taps for industrial water are marked with a ban on its use for drinking.

The heating rooms and the places for instructing the workers are equipped with benches, tables, first aid kits and stretchers for first aid to the victims.

The type of heating, the way of air exchange and the implementation of the heating and ventilation installations in the rooms for undressing and rest must meet the sanitary-hygienic requirements and the requirements for FS.

The sewerage system of the construction site must ensure the drainage of surface water to prevent flooding of roads, paths, passages, railways, crane tracks, places designated for parking of railless construction machinery, open warehouses, loading and unloading sites and etc.

Construction waste is stored in an appropriate manner on a specially equipped site. The builder shall determine in writing for each construction its location, the specific waste management activities and the persons responsible for their implementation.

Construction waste should be stored temporarily in specially designated places, using cranes, hoists, closed gutters or other suitable devices and appropriate packaging.

Do not allow dusting or contamination of the working and environment.

In the danger zones, the access of persons not performing construction and installation works is appropriately restricted.

When the danger zone extends beyond the boundaries of the construction site, as a result of which traffic is restricted, hindered or stopped, it is determined by a scheme for temporary organization and traffic safety.

To secure the work equipment on the construction site, permanent or temporary fences (railings, shutters, nets, screens, etc.) are used, applied to shafts, stairs, platforms, overpasses, footpaths, protruding parts and parts with sharp edges and edges, moving machines and equipment, blanks of materials, spraying or spilling liquids, flying particles, metal shavings, sawdust, etc.

Passages, approaches and entrances to construction sites located in hazardous areas of work equipment shall be provided at least 1.0 m outside

their size with stable and stable coatings (protective floors, visors, etc.) according to the specific conditions.

Danger areas where loads may fall when moving with a crane are signaled by warning

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signs and signs. In these areas, access by outsiders at least 5.0 m from the vertical of the lifted loads is prohibited.

In case the danger zone under par. 1 reaches the fence of the construction site, a protective canopy is built on it.

In case the danger zone under par. 1 goes beyond the fence of the construction site or covers other construction facilities, the work in it shall be organized according to the plan for safety and health.

It is not allowed to lift, move or lower any type of cargo, mounting elements, equipment, etc. over habitable buildings falling within the danger zone of a lifting (assembly) facility.

Holes in building and structural elements that pose a risk of falling from a height:

1. are secured by railings, fences or strong covering, which can withstand the respective load;
2. are marked and / or signaled in an appropriate manner.

When performing construction and installation work over water or in the immediate vicinity of the water level, the work sites are fenced with safety railings, and when this is technically impossible, safety belts are used and the necessary organizational and technical rescue measures are carried out, incl. vehicles.

The installation and removal of means of collective protection shall be carried out with the use of a safety belt attached to a special safety device or to the construction of the construction, in compliance with a technological sequence to ensure the safety of workers.

Removed during operation safety equipment, fences, coatings, etc. are restored by the builder who removed them.

In the event of hazardous conditions (landslides, unexpected occurrence of gases, submission of the base under scaffolding, machinery and equipment, unacceptable deformations, rupture of electrical wires, detection of explosive substances, etc.) work is stopped and workers leave the hazardous places without order. The work is resumed by order of the technical manager after elimination of the respective danger.

Construction and installation works in confined spaces (wells, tunnels, trenches, closed and semi-closed vessels, etc.) are carried out according to safety and health instructions developed for each specific case.

Construction and installation works near the slopes of excavations are carried out after inspection by the technical manager for security and safety.

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During excavation and underground works and during the construction of wells, tunnels and other similar facilities, appropriate safety measures shall be taken, which shall include:

1. preliminary establishment and respective minimization of the dangers of underground networks and facilities;

2. formation of slopes or use of appropriate reinforcement;

3. prevention of risks related to falling of people, products and / or objects and / or with penetration of water;

4. providing ventilation at the workplaces;

5. ensuring safe access to the workplaces;

6. evacuation of the workers to a safe place in case of fire, accident, backfilling or flooding;

7. (amended, SG No. 102/2006) storage of products or land mass and movement of vehicles or construction machinery at a safe distance from the excavations and water areas, and, if necessary, installation of appropriate fences.

Construction products, products and equipment:

1. are delivered to the construction site after its preparation for their storage;

2. are transported and stored on the construction site in accordance with the instructions of the manufacturer and the instructions for operation.

The rules for storage and warehousing of products and articles, the size, composition or other properties of which may cause damage to the health of workers, are developed in the instruction on safety and health.

Cylinders with propane-butane, oxygen and the like under pressure are stored separately in



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ventilated rooms in quantities for shift work.

Outdoor construction is suspended in adverse weather conditions (thunderstorm, heavy snowfall, heavy rain and / or wind, dense fog, during the dark part of the day or when the artificial lighting is interrupted, etc.).

The builder promptly informs the workers of the constructions for which he is responsible about the expected sharp changes in the climatic conditions.

Access and pedestrian roads and workplaces on the construction site are constantly cleaned of snow and sprinkled with suitable anti-icing materials.

At the places for laying crane tracks and for installation of machines and mechanisms, construction scaffolding and inventory sanitary facilities, the snow and ice on them are removed in advance. In case of subsequent snowfall or icing, additional strengthening measures are taken.

The formed ice pendants above the entrances, sidewalks, places of passage and passages are cleaned in time, after fencing.

To avoid collapses, the roofs of the premises (vans) are periodically cleaned of snow, and dangerous places are pre-fenced.

A sink is provided on the construction site for washing vehicles and construction machinery before they go on the street and road network, when this is required by the relevant municipal administration.

Energy distribution installations and facilities, especially those exposed to climatic influences, are subject to periodic control and maintenance of their technical and operational characteristics in accordance with regulatory requirements.

The existing installations, networks and facilities existing on the territory of the construction site before its opening shall be identified, clearly marked, checked and controlled. Before the start of construction and installation work, one of the following measures shall be applied to the existing overhead power lines on the construction site:

1. displacement of a safe distance from the area of the construction site;
2. switching off the voltage in them;
3. in case of impossibility for disconnection shall be placed:
  - (a) barriers (signs) or signs and signals so as to ensure a safe distance to the power lines;
  - (b) appropriate warning devices and suspension guards if vehicles are to pass under them.

Construction works are not allowed, as well as placement of production bases, warehouses and sanitary facilities in the easement / security zone of power lines, gas pipelines and other product pipelines.

When performing lifting operations with:

1. ceramic, stone and aerated concrete blocks, bricks, tiles and other similar construction products with lifting equipment must be packed in containers, pallets or packages;
2. different types of solutions (lime, for plasters, etc.) are used vessels, not allowing overturning or spilling of the material;
3. heavy oversized elements of and from vehicles, the workers must leave them in advance and move away at a safe distance from them.

It is not allowed to guide or hold the lifted materials with your hands and the standing of the workers under or in the immediate vicinity of the load.

The loads are released from the gripping devices after their stable placement in the respective place.

It is not allowed to use construction machines and lifting equipment (except for rammers, vibrators and tools) without proper sound and / or light operational signaling.

When working with machines and tools that create a danger zone, warning signals are given.

Hand signals and / or verbal communication are used, where required, to guide workers performing risky or dangerous maneuvers.

The signalman uses the movements of the hands (wrists) to direct the maneuvers or to indicate the way of maneuvering a worker (operator, driver, etc.) who receives the signals.

The signalman shall be able to observe all maneuvers visually without being exposed to danger. When this condition is not met, one or more signalmen shall be additionally deployed.

The signalman must wear one or more brightly colored objects on which he can be easily identified by the operator and other workers.

The operator shall interrupt the maneuvers and request new instructions when he is unable to perform the received instructions, in compliance with the necessary security requirements.

The signs used on the construction site must comply with the requirements of "Ordinance" RD-07/8 of 20.12.2008 on the minimum requirements for signs and signals for safety and / or health at work must be placed consistently with suitable places.

### **13. Places with specific risks and safety and health requirements**

In case of an unfavorable scenario of occurrence of an event (unusually high water levels in the river) during the execution of construction and installation works, a change in the volume of the individual stages of construction and installation work is possible. In this case it is necessary to re-geodetic survey and optimization of the individual quantities and technologies, on the individual positions for the execution of construction and installation works.

The places with specific requirements for the construction are:

- work around the slopes of excavations
- work on installation of the fortification system
- work on filling the geocellular system

The measures and requirements for HS are described in Annex № 1-7 of Ordinance 2 on the minimum requirements for HSWC when performing construction and installation work and in Information Sheets. The HS coordinator and the technical manager must not allow workers to work uninstructed for the above dangers and without personal protective equipment, as well as in bad weather conditions.

#### **14. Transport works**

The storage of the materials will be limited in the on-site open warehouses with a pre-specified schedule for delivery and use. The transport of the materials will be done by flatbed trucks, dump trucks and trailers. The transport and laying of the concrete on the site will be carried out by concrete trucks. External transport covers the removal of earth masses and construction waste, the supply of construction materials, elements and blanks and will be carried out as follows:

- for earth masses, river stones and construction waste - dump trucks;
- for materials - trucks and flatbed cars;
- for concrete mixtures and mortars - concrete truck

#### **15. Provisional organization of the movement when performing construction works**

According to Chapter Five, Section III, Art. 62 (2) the site is signaled with warning signs "ATTENTION! CONSTRUCTION SITE". The plates must meet the requirements of BSS 1517.

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