

## **Annex 2**

### **Technical Specification for preparatory works (demolition and earthworks), Construction of the JOBCP Palanca**

#### **B. PREPARATORY WORKS**

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#### **B.1 Demolition Works**

##### **B.1.1 General Layout/planning**

Demolition works will be executed based on planning/adjustment Project of demolition works. Disassembling, demolishing and dismantling works will be executed by means of supporting elements, support for (masonry) and protecting facilities during demolition process (all these works will be done with great caution).

Planning project of the construction foresees the demolition/dismantling of the existing houses/buildings cadastral nr. 8526310210, from outside the built-up areas of Palanca village, rayon Stefan Voda situated/placed on the territory of Border Crossing Point with Ukraine «Palanca».

According to height level, constructive solutions and materials they are made of, the watch houses/boxes (made from steel and PVC profiles), one floor constructions/buildings with a height of up to 4m (walls made by means of masonry), with or without reinforced concrete panels and the roof made from asbestos-cement corrugate boards on steel profiled roof truss and three non-authorized washrooms/toilets will be demolished/dismounted.

A single one floor steel-made construction, height – up to 6m “Kislovodsk” type, will be demolished as well.

Demolition works should start from the highest points and should be done according to up-down principle/process. Concerning each working point, the demolition works should be organized/planned as follows: (i) interior and exterior systems/utilities, chimneys, ventilation channels, power supply equipment/device, etc. (if they exist), are being dismantled; (ii) roof covers of the houses, the parapet, etc., are being demolished; (iii) panels/boards, suspended ceilings, prefabricated elements, etc., are being demolished; (iv) exterior and interior walls up to the whole building height are being demolished;

(v) interior and exterior walls foundations, are being demolished, including excavation works made by means of an excavator (to set free the terrain).

The exterior demolition and dismantling works of the existing constructions/buildings which are being reconstructed will be done after mounting of the scaffolds (fixed on facade boards) and only after verifying (by consultant, executant and designer) the zones which require dismantling and rebuilding.

Evacuation of the construction waste from high points will be done by means of plastic spouts, directly into the load carrying vehicles (closed vehicles).

During building-site planning, execution of the demolition/dismantling works, evacuation of construction waste (parts/materials which appeared after demolition) from the building-site, the following technical regulations will be set up:

- СНиП 3.01.01 – 85 “Planning/management of construction operations”;
- NCM A.08.02 -2014 „Labor Safety Measures/Safety Norms in the domain of construction”;
- NCM E 03-02-2001 – Fire Safety/Firefighting protection of the buildings and installations;
- NCM A.09.02-2005 - Technical service, reparation and reconstruction of the public and social-cultural buildings;

### **B.1.2 Demolition and dismantling of the panels/boards and of the roof**

These works refer to partial or total dismantling of the roof truss type which consists in:

- total dismantling of the roof covers made from flat sheet-metal, or asbestos-cement corrugate boards;
- partial dismantling of the wooden/steel elements (roof timbers, ground beams, etc.);
- dismantling of spouts and water spouts;
- demolition of ventilation channels;
- demolition of reinforced concrete plates/boards.

During partial or total roof demolition process, one should pay attention to:

- recuperation, restoration, reprocessing and managing/operating of the material resources, in certain beneficiary determined conditions (having as basis an economic justification);
- reintegration in nature of non-recoverable materials and having/offering maximum safety working conditions for/to the staff involved in the construction works.

During demolition and dismantling works of the roof, the contractor will keep to the following rules and principles:

- a) Demolition works will start only based on and with keeping to all the regulations from the project documentation;
- b) Building site will be organized – which corresponds to the works range, together with staff training/instructions concerning technological process, operations and labor protection measures/construction safety regulations;
- c) Protection measures of the neighborhood by means of avoiding strong/powerful vibrations or shocks, big dust emissions (avoiding), as well as necessary accesses to these neighborhoods, will be done; circulation and environment protection measures will be taken.
- d) Dismantling of the roof covers will be done as a rule after disassembling the ceiling, which compiles the following phases:
  - stop for the activities from the inside of the construction, meaning the space under the ceiling;
  - interruption of the utilities which block the good evolution of the intervention (power supply cables, phone cables, etc.);
  - providing the technical social overheads with some continuity, if it is the case;

- evacuation of the movable inventory (inventory objects, furniture, equipment, etc.), out from the immediate space under the ceiling;

e) Dismounting of the roof covers, framework and plates/boards, will be made without affecting the resistance of the construction and without compromising the demolition process. The materials from the demolition works should not be deposit/accumulated on small surfaces; this is done to avoid labor accidents, and logical solutions for supporting elements will be given, if it is the case. If the construction has different quotas, then the works will start from the highest quota/point;

f) Dismounting process will be executed according to the logical order of the operations, starting from superior part or roof crest to the overhang/rain shadow, starting with accessories dismounting, and going on with roof covers, from exterior part to the interior part of the construction, then roof truss and finishing with plates/boards;

g) Safety norms, safety and health protection which are in normative documents will be taken into consideration while making demolition works;

h) Taking into consideration the fact that the roof is a much-in-demand construction element, the damage state of the components will be analyzed to establish a working way for recuperation, rebuilding and total or partial recycling.

i) It is forbidden to overcharge the plates/boards which are under the covers by means of accumulated dismantled materials.

j) After releasing the covering surface from boards or dismantled asbestos-cement panels, the dismantling of roof boarding will start. Taking into consideration that the ordinary inclinations of the covering boards or asbestos-cement panels are relatively small, between 15cm/m and 50cm/m, the dismantling of the roof boarding can be done through the ceiling and roof boarding as well. The dismantling through ceiling is the most suitable and without any risk of producing accidents by falling down from high points operation.

k) It is recommended that the workers should be anchored by means of safety belts.

l) The transportation and evacuation of construction waste (dismounted materials from roof and plates) will be done in a way not to destroy them, using spouts, containers as well as suitable/corresponding facilities/equipment. The materials gathered from demolishing process will be selected, recovered and deposited accordingly.

### **B.1.3 Masonry Demolition**

Demolition of parapet masonry and of exterior / interior walls (taking into consideration total or partial demolition for masonry and creation of free space for doors) will be made according to technical norms of safety and health protection.

All the necessary operations for total or partial demolition will be performed, such as:

- mounting, dismantling works and removal of steel scaffolds, as well as of waste evacuation spouts;
- total or partial demolition for making the free spaces (for the doors), according to text plates which indicate the position of the walls and of the zone which will be demolished;
- masonries demolition will be done manually/hand-made;
- a great attention will be paid to materials managing (materials/parts which come from demolition process), selection and bricks/blocks transportation to the building-site deposit area, for their further evacuation.

Demolition or dismantling works and existing masonry breaking for masonry/brickwork back or free space creation will be done with great attention, together with fixing and supporting elements/facilities.

Masonry demolition will be done manually/hand-made, one by one/step by step, to make possible the connection of the maintained masonry with the masonry which will be rebuilt.

Demolition will be done in sections, together with partial supporting of the walls.

#### **B.1.4 Safety Norms and Labor Safety Rules**

During roof demolition and dismounting, one should comply with the following labor safety rules and accident prevention regulations:

- a) Before starting the demolition works, the resistance of all component roof elements will be verified: roof timbers, roof boarding, etc.;
- b) the construction where the roof is going to be demolished, should be fenced at a distance of minimum 2m from the building itself, and warning billboards will be fixed on each section of the fence;
- c) The access to the roof will be done by means of stable and easy/practical to climb ladders. It's forbidden to block these accesses by means of different parts/materials which come from demolition process.
- d) The platform on which the materials/parts are brought and after will be placed down by mechanical and manual means, should be solid/stable and equipped with adequate balustrade, which can stop the falling down of the workers and working materials/parts from the high points. The access of the workers (who transport working materials/parts) to the platform, should be done only through safe pass-ways which are well marked.
- e) It's forbidden the execution of roof covers demolition when there is fog, silver thaw, strong wind, heavy rain and heavy snow outside.
- f) It's forbidden to stay/stop or walk on the roof covers if they are not fixed well by means of good/stable supporting elements (roof boarding or concrete). It's not allowed the excessive depositing of construction material on the roof covers. Special platforms which can resist heavy loads of demolished materials and which can stop their sliding (materials' sliding) should be constructed.
- g) Demolition of the roof covering elements which are mounted on the strips should be done only from the well-fixed and anchored ladders. For this, the executor should give details and clear instructions how to execute/fix by means of a planning project.
- h) It's not allowed to throw the working tools and parts/materials out from the roof. Daily, at the end of the working process, all the materials/construction parts which come after demolition should be evacuated from the building site.
- i) The workers should wear protection helmets fixed under the chin, safety belts and no slipping shoes.
- j) Dismounting of the spouts and waterspouts should be done from a suspended scaffold which is well anchored on solid parts of the building or from a tele lift.
- k) During demolition works it is forbidden: - to make interior works in the places with no working platforms, ladders, balustrades, etc.; - walking up and down (for the workers) on the ladders/staircase with no protection balustrades; - walking up and down (for the workers) directly on construction elements without ladder; - passing through window free/empty spaces (for the workers), coming from or staying on the building parapets and walls, leaving the objects/tools on the wall, window sills, etc.; - throwing out the working tools or construction materials from the higher points; - staying on rotten girders or boards/plates which were not fixed – preventive consolidated; - making the roof works during strong wind, storm, if the wind velocity/speed is more than 12m/s, on ice, foggy weather, etc.; - making the roof works if the slope is more than 20°, without safety belt which is hanged on safety cables or supporting elements of the building; - coming down or up (for the workers) into the inspection chambers, wells or closed rooms without doors or windows; - passing by of the heavy loads over the working places of the workers; - working on the same level where the mounting construction works are done on superior floors;

- presence of the people on construction elements during their demolition, lifting, transportation and mounting; - leaving the lifted elements in a suspended position.

**Note:** *The above measures are not limitative; the contractor should take any necessary measure to prevent labor accidents.*

#### **B.1.5 Fire Safety Measures/Firefighting measures**

a) While organizing/planning the building site for demolishing and dismantling of the roof, the following fire prevention regulations will be taken, according to NCM E.03.02-2001 «Protection of the buildings and installations against fire»:

- to establish an operation way, regulations, prevention and firefighting measures which should be respected during working process into the working instructions;

- to establish a way/mode and plan on how to store goods and materials which are of high fire and explosion risk

- to equip the working place with necessary prevention and firefighting facilities/tools according to norms, adequate laying out and maintaining them in perfect working conditions

- to organize the alarm, alert and proper intervention to extinguish the fire on the working place and to form the intervention teams and responsibilities;

- to organise the evacuation of the staff and goods and to make an evacuation plan in case of fire;

- to establish/make out intervention schemes and suppositions for fire extinguishing of installations of high risk;

- to make security inscriptions and indicators, to spread materials/information about firefighting.

b) Before starting the technological process of dismantling, the workers should be trained to respect all the firefighting rules. The workers should know the escape ways in case of fire as well, these ones should be marked by means of visible panels.

c) The evacuation staircases from the terraces and upper floors should have the proper protection against smoke and fire spreading and should make possible the evacuation of the staff on the ground level.

d) During working process the technical instructions concerning demolition technologies as well as prevention fire norms should be strictly respected.

e) At the end of the working process the following operations will be done:

- switching off the illumination, except the safety one;

- evacuation of the waste, fuel materials out from the inside

- removal of all the open fire sources;

- evacuation of the materials out from the safe spaces between construction and installations.

f) Storing of substances and materials which result from dismantling processes, their transportation to another place will be done taking into consideration the fact how they (substances/materials) are exposed to open fire, and not to block the access way to water and firefighting facilities and safety spaces between buildings.

g) The order of the dismantling operations will be established according to characteristics of the constructions, in a way that while cutting or welding of some non-dismantling elements we'll not create fire danger for the flammable elements of the building.

h) It's forbidden to work with open fire at a distance of less than 3m to the flammable elements or materials (carton or bitumen membrane, polyester, wood, etc.) without taking specific protection measures (isolation, screening, etc.). Daily, after finishing the working program, the roof is being cleaned out from waste materials. Flammable materials and substances are stored in special adjusted places, without any risk of having fire.

- i) During works at the roof trusses and flammable roof coverings, it's forbidden open fire or smoking. The building site should have a fire post equipped according to up-to-date regulations.
- j) During roof coverings works in cold weather, it is forbidden to clean snow and ice by means of open fire.

## **B.2 Earth/ground works**

### **B.2.1 Terrain Set-up/planning Works**

Before starting the ground works/earthwork, the following preparation works are being done:

- cleaning out the terrain from tree leaves, branches, grass and herbs;
- soil digging and storing of the vegetal soil;
- taking out the stones and other materials from the terrain.
- dismantling the pipes and other underground networks;
- building-site works organizing – fencing the building site, making the temporary access road, construction/building-up temporary infrastructure objects.

Cleaning out the terrain from tree leaves, branches, grass, herbs and other materials is being done on the whole surface territory.

Vegetal soil digging is being done on the whole surface territory, but when other inappropriate products appear then they will be store in a store house definitively. The vegetal soil will be brought in a temporary store house to reuse it later.

In the places where the water can flow out to the working territory, it should be stopped by means of guard channels which will collect and evacuate the water out from the working territory.

The materials/construction parts which derive from demolition process will be gathered to be later evacuated to the nearest store house, the transportation will be done/offered by the contractor.

All the empty spaces which derive from underground pipelines demolition will be filled up with soil – a good one for embankments according to regulations and will be compacted methodically to obtain the compaction level/degree which is stipulated in the working project.

The contractor will not start the ground/earthworks until the project manager (consultant) accepts the execution of planning works which are in the present subchapter. This acceptation should be mentioned (in an obligatory manner) in the Terms of Reference of the Construction Works.

### **B.2.2 Earthworks and embankments**

#### **a) Earthworks**

Earthworks are the following: earth digging, charging/loading into the vehicles, transportation facilities, discharging and spreading, leveling and compaction of the soil in order to make the foundations and underground installations from the inside parts of the civil and industrial buildings and of the surrounding zone which can influence resistance / exploration conditions of these constructions. Before starting the earthworks, the contractor will execute the lay-out according to tracking plans of the guiding marks and of the important points on the track. Together with lay-out making, outside of the axes (embankments for river banks and roads reshape, etc.), the contractor will fix by means of pins/hobs and moulds the followings:

- height of the embankment in the axel;
- intersection points of the slopes with the natural terrain (territory);
- incline of the slopes/embankments.

The contractor is responsible for conservation of all lay-outs and guiding marks and restoration/re-establish if it is necessary. If it's necessary, taking them out from the working territory is done by the contractor, on his/it's expenses and responsibility. This operation cannot be done without project manager's (consultant's) written approval, minimum 24 hours in advance.

For lay-out, all the underground and aerial, power supply, telecommunications or of another nature installation which are on this working territory will be identified in order to remove or protect them according to technical documentation and conditions of the networks' owners.

After removing the vegetal layer, a surface mapping (ground survey) of the working territory will be done by the contractor and presented to the project manager (consultant) in order to compare with the data from the project.

In case if soft soil or water sludge (the fact which will be registered by means of a report signed by parts and project designer) appear on the working territory, the depth/layer of the material will be removed by means of excavation works; the treatment way of this zone will be indicated by project designer for each case apart.

Earthworks will not be done/executed in rainy or snow weather.

#### **b) Execution of embankments**

The embankments on the river banks and platforms will be done from local material (sand-clay) of important geotechnical characteristics:

\*volume weight -  $\gamma = 1.65 \text{ t/m}^3$  ;

\* internal friction angle -  $\phi = 38$  degree

Organic soil, mud, water sludge, vegetal soil, soil of reduced consistence (which have the consistence index less than 0.75) as well as soil with more than 5% of organic material, will not be used. Parts of frozen soil or soil with rotten organic material (tree leafs, branches, roots, etc.) will not be introduced in the embankments.

The used soil can be excavated over and under the water level. Those excavated from under water level will be stored on the river bank, for losing the excess of water until they have optimal compaction humidity.

The way of embankments making is the following:

- spreading of the embankment material (clay) in uniformed layers;
- compaction process in layers of 25-30cm depth;

Manual spreading is being made in narrow places (which are not accessible for spreading machines/devices) in uniformed layers of 10cm-30cm depth by workers by means of shovel.

Mechanical spreading is being made in large spaces, in uniformed layers of 15cm-30cm depth, by means of a bulldozer placed on a caterpillar tractor of 100÷180HP (horse power).

Compaction of the soil will be done on the whole terrain surface by means of a compaction cylinder, in layers of not more than 20-30cm depth and optimal humidity  $W=0.17$ . Samples will be taken from each layer to obtain the necessary density of the compacted soil  $\gamma = 1,65 \text{ t/m}^2$ .

Compaction of the embankments (executed in layers or inclined) by means of a manual/hand sledge hammer will be done in non-accessible for mechanical compaction devices places. Embankments in successive layers of 20÷30cm depth will be compacted by means of mechanical sledge hammer.

The layer can be considered compacted if the compaction degree is  $\geq 95\%$  , but the medium one  $\geq 98\%$  from the obtained value by means of previous try on the respective material.

The executor of the works (by means of the accredited laboratory and accepted by the project manager / consultant), will verify the quality of the earthworks compaction during execution of the embankments and the results will be registered in test data and in Terms of Reference of the Construction process. Any disaccord of project regulations and of the present terms of reference will be reported to the project designer and to the project manager (consultant).

Basic verification of the compaction will be done by means of volume weight and humidity determinations, by means of samples taking for each soil type and for each compacted layer in the works. Points, in which verifications are made, will be uniformly relocated into the area of works.

Together with quality compaction verification, granularity and plasticity of compacted soils are being determined.

It will not go to the next layer if the verified layer doesn't fulfill the prescriptions of the project and of the terms of reference.

The project manager (consultant) can ask for additional verifications, in case if visually the compaction quality is not good.

In the narrow spaces near the concrete-made constructions, mechanical sledge hammers frog type with 3-5 passing by on the same track, velocity/speed - 0,4km/h for layers of 0,25 ÷ 0,30m depth can be used. Compaction on an inclined plan of the platform embankments will be done by means of a street roller or an excavator equipped with an appliance sledge hammer type, mounted on the lever.

Concerning the width of the embankments platform and execution quotas, the limited deviations from the project are the followings:

- at the platform width  $\pm 0.05\text{m}$  towards the axe;  
 $\pm 0.10\text{m}$  at the whole width;
- at the leveling quotas:  $\pm 0.05\text{m}$  except the quota in the embankment's, where no negative tolerances are accepted.

The water from Nistru river which doesn't have organic substances will be used as necessary water for earthwork compaction. Some additional products for compaction procedure will be added only after project manager's (consultant) approval, and the ways how to use will be specified as well.

Execution of embankments should be interrupted in case if their minimum qualities, defined by project and the present terms of reference will be compromised by bad weather conditions. Execution can be started again only after the project manager (consultant) fixed a certain time at the proposal of the contractor.

### **B.2.3 Maintenance and final reception of the earthworks**

#### **a) Earthworks maintenance**

During guarantee time, the contractor will have to execute in a reasonable time and on his own expenses the necessary works to ensure the water flow out from the versant, reparation of the drains and to make the compactions which result from a bad execution of the works. Despite of this, the contractor will have to execute, on the same period and at the written request of the project manager (consultant), all the additional works which will be necessary as a result of degradations of which the contractor will not be responsible.

#### **b) Final reception of the earthworks**

Earthworks will be submitted to some receptions during works (receptions on execution phases) and to a final reception.

At the reception phase (of hidden works), it will be verified if the part of the works which are under reception were executed according to execution project and norms from the present terms of reference.



After verifications made by project manager (consultant) and by site engineer/construction manager together with the project designer, a reception report of the hidden works where it's confirmed that it is possible to start the next phase (signed by three parts) will be made.

The reception on phases will be done in an obligatory manner for the following works:

- mould making and lay-out works;
- execution of the foundation hole;
- compaction of the foundation terrain;

The last two are considered to be determined phases and the project manager (consultant), project designer and a representing person from State Inspection in Construction will take part.

At the finishing of the earthworks or of one part, the following works will be verified during the final reception of works done:

- the accordance of the works done with the regulations from present terms of reference and execution project;
- the nature of the soil from the platform;
- the accordance of the compaction degree with the regulations from the terms of reference.

The works will not be received if:

- the quotas and dimensions foreseen in the project are not achieved;
- the compaction degree at the level of the bank's/dam's bed, as well as on each layer apart (attested by reception report on phases) is not achieved;
- transversal slopes and the platform surface were not kept;
- cracks on the earthworks, unstable phenomena, etc., are noticed.

The defections will be established and the way and terms as well.

#### **B.2.4 Covering with vegetal soil and grass planting**

The protection works of the embankments will be done immediately after finishing them (profiling). Filling up with vegetal soil, planting will be done as many times as it is necessary to protect the soil against germination and developing of the vegetation.

Leveling of the vegetal soil on the embankment is being made through steps of leveling. The execution of leveling steps is made from up – down, but vegetal soil will be placed from down – up.

The thickness of the vegetal soil layer is 10cm. The vegetal soil should be shredded, cleaned out from stones, roots or grass and watered before spreading.

After laying out the vegetal soil, the grass seeds (seeding) will be planted. The recipe for the seeds will be established in each case apart, depending on the nature of the soil, climate, etc.

After seeding, the embankment is raked and settled by means of a flat sledge hammer.

The laying out of vegetal soil is suspended/stopped when it's raining.

If there is no rain for a longer period – minimum 30 days, then it's obligatory to maintain the humidity of the soil by watering it.