

Contractor: "GEOLands" Ltd., Haskovo

Principal: Madzharovo Municipality

INVESTMENT PROJECT

Construction of: „EXTERNAL WATER PIPE TO ПИ 000069”
according to the RPP of the town of Madzharovo, Madzharovo

PART: Water Supply and Sewerage

PHASE: WORK PLAN

ВЯРНО СОПЪТОВАНА



Designer:

(dipl. eng. S. Prodanova)

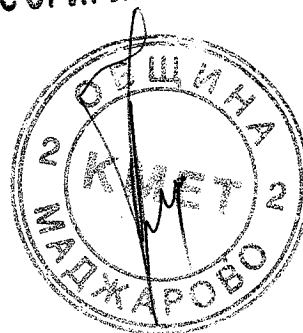
Director:

(dipl. eng. A. Atanasov)

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EXPLANATORY NOTE

Site: External water pipe to ПИ 000069 according to the RPP of the town of Madzharovo
Part: Water Supply and Sewerage
Phase: Work Plan

This project is based on:

- Assignment by Madzharovo Municipality as the Principal
- Geodetic surveying of the route of the water pipe
- Output data from "Water Supply and Sewerage" Ltd. - Haskovo

The following regulatory documents have been observed in the design of the Water Supply and Sewerage installations:

1. Regulations for Design of Water Supply Systems
2. Ordinance 8 of 28.07.1999 on the rules and regulations for the deployment of technical equipment and ducts in the settlements
3. Ordinance No. II-1971 of 29.10.2009 on construction and technical rules and norms for fire safety.

The subject of the present project is the elaboration of a work plan for water supply of ПИ 000069 - a recreation area of Madzharovo Municipality. According to the output data from "Water Supply and Sewerage" Ltd. - Haskovo, there is no street water pipe before the front of the plot. The nearest pipeline operated by the company is the indicated in the output data steel pipeline $\phi 87$. The extent of the project is from the existing steel pipeline to the front of the plot N000069 on the land of the town of Madzharovo. The site water supply of the above-mentioned property is subject to a separate project.

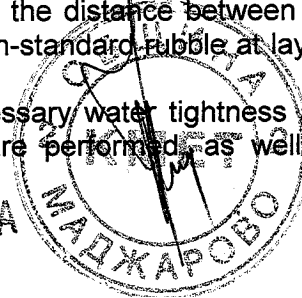
In order to provide water to the property a derivation from the steel pipeline $\phi 87$ is planned. After that a resilient seated gate valve is to be installed. The diameter of the newly designed water pipe is not indicated, but due to the long route - the water pipe is 1089.70 m long and as long as it passes along many other plots of the land and as long as the requirement for the minimum diameter of a street water pipe is $\phi 80$ the diameter of the newly designed water pipe is $\phi 90$ and the material is HDPE. Its route passes through the municipal road to the town and then through municipal land and dirt roads it reaches the front of the recreation area. After the derivation from the existing pipe line, according to the instructions of "Water Supply and Sewerage" Ltd. - Haskovo, A water meter shaft is planned. Inside it there will be a water meter unit consisting of a stopcock $\phi 3$ ", mechanical filter $\phi 3$ ", water meter Ду 50 with a thread with $Q_{nom} = 15 \text{ m}^3/\text{h}$, $Q_{max} = 30 \text{ m}^3/\text{h}$, return valve $\phi 3$ " and a stopcock with drain $\phi 3$ ". The water meter is selected so that it passes a water quantity close to the capacity of the pipe line. The water meter shaft will be filled with concrete blocks and covered with a steel cover with a padlock so that it can be locked. According to the instructions of "Water Supply and Sewerage" Ltd. Haskovo, the pipe line is only for drinking water and household needs and no installation of fire hydrants is planned.

The new water supply network is to be executed in HDPE pipes PN10 with butt-welding. They will be placed in a combined trench - with a vertical part up to one meter and a slope to a greater depth. This applies for a trench up to 2 meters of depth. At greater trench depths, provision of reinforcement is necessary.

The minimum watercourse covering according to the requirements of Ordinance 8 on rules and norms for the deployment of technical ducts and facilities in settlements is 1.50 m. The pipe will be laid on a 10 cm thick sand cushion on a solid foundation. After the pipe line has been laid, tested according to the requirements of the legal acts and disinfected, the pipe will be covered with 30 cm sand over the pipe. After that a signal bar with a metal thread will be laid and it will be covered with soft soil which will be rammed at layers of 40 cm each until 97% of the initial soil density is achieved. In the area of intersection of the roadway, the distance between the sand layer and the base of the road pavement to be filled with a non-standard rubble at layers of 20 cm each that are well rammed to achieve the required density.

It is imperative that before burying the water pipe the necessary water tightness and strength tests according to the requirements of the legal acts are performed, as well as

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disinfection of the water pipeline according to the sanitary and hygienic requirements. During execution of the construction work all the requirements of the legal acts for Safety and Hygiene at Work and Fire Safety must be obeyed. Prior to handover of the site, after the flushing and disinfection of the water pipeline, the Regional Inspectorate for the Preservation and Control of Public Health (RIOKOZ) must be called in order water samples to be taken. During execution of the construction, the following requirements must be observed:

- construction must be done on approved and coordinated projects
- the construction site must be fenced and secured
- all the machines leaving the construction site must be washed
- bushes or trees must not be cut without the necessary permission by the competent authorities.

Prior to commencement of construction, representatives of all operating companies must be summoned in order to specify the location of the underground pipelines and facilities along the route of the pipeline.

Digging around the underground pipelines must be done by hand in the presence of representatives of the operating companies.

All revealed underground communications must be reinforced and marked. During the construction, all trenches must be fenced and marked (illuminated at night) and all measures must be taken to ensure safety at work and movement.

All construction works must be carried out in strict compliance with the applicable legal documents such as Regulations for Implementation and Acceptance of Construction Works, Ordinance No. II-1971 of 29.10.2009 on construction and technical rules and norms for fire safety, the requirements for SFWFS, etc.

For all types of hidden work, the necessary protocols and acts must be produced during construction. All input materials must have the necessary quality certificates.

Before stopping water supply for installing pipeline connections all the consumers must be noticed.

All remarks in the drawings and in the explanatory note of the project must be considered an integral part of the project.

Changes to this work plan may be made by the designer only.

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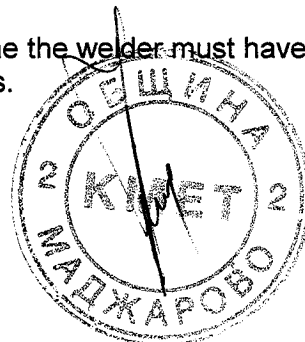
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Explanatory note on Safety and Hygiene at Work and Fire Safety (SFWFS)

1. Input data:
 - a. Diameter of the pipeline: $\Phi 90\text{mm}$ HDPE pipe.
 - b. Mode of operation: pressurized
 - c. Type of the trench: combined - vertical and with slope.
2. Norms, statutes, regulations, etc.
 - a. Labor Safety Regulations for Construction and Installation Works - edition 1982.
 - b. Ordinance No31 on design and safe operation of lifting equipment /S.G.No.33/24.04.1981 /
 - c. Regulations for execution and acceptance of construction and installation works /MCA-77/
 - d. Ordinance on ensuring safety and hygienic work conditions, approved with disposition 187 -MO of the Council of Ministers on 09.05.1968.
 - e. Ordinance N1 on public construction research and design / S.G. No.58 from 1980. /
 - f. The safety instructions given in the passport and the user manual of each of the machines used, taking into account its specific features.
 - g. Standards for design of sewerage systems - edition 1989.
 - h. Standards for design of water pipeline systems - edition 1986.
 - i. Ordinance No. II-1971 of 29.10.2009 on construction and technical rules and norms for fire safety.
3. Documents based on which the design is being carried out:
On demand of the Principal – Madzharovo Municipality
4. Technical data for the site:
 - a. Capacity: water pipe $\phi 90\text{mm}$
 - b. Justification of the adopted designs and decisions: instructions of the Principal
5. Deviations from the legal documents: None
6. Security of the facilities:
 - a. The ducts must be designed to the maximum water pressure.
 - b. All input materials must have quality certificates.
7. Description of what is planned according to the SFWFS
 - a. Air purity (03) - Entry into facilities is only permitted after checking for the presence of poisonous and explosive gases and their removal by natural or forced ventilation.
 - b. Lighting (04) - The regulations for illumination of workplaces must be observed.
 - c. Noise and vibrations (05) - Pump bases must be separated from the construction of the facilities (buildings), the instructions for working with vibrating tools must be observed.
 - d. Sanitary and household service (07) - furnishing and maintenance of a sanitary unit.
 - e. Specific factors (03) - railings must be installed on the landings and passages in the facilities, around the mounting holes, on the vertical ladders, etc. The necessary signposts must be installed on the electrical panels. All the metal parts in the installation manifolds must be earthed. Normal passage must be provided in the facilities. When working in the vicinity of power lines, the power must be disconnected by the operating plant. In the case of repairs, the necessary signaling must be laid to ensure safe movement.
 - f. Fire safety (09) - all the regulations in Ordinance No. II-1971 of 29.10.2009 on construction and technical rules and norms for fire safety must be observed.
 - g. Personal protective equipment (10) - are determined depending on the type of the network.
 - when entering shafts, galleries, manifolds, etc. the worker must have rubber boots, rubber gloves, waterproof clothing, safety belt, safety rope, electric torch.
 - when cleaning water ponds, the worker must have rubber boots and gloves, clothing made of waterproof fabric, electric torch.
 - when working with oxygen acetylene torch or electric welding machine the welder must have a tarpaulin safety helmet with dark goggles, tarpaulin jacket and trousers.
8. List of the personal protective equipment:
 - rubber boots
 - rubber gloves
 - tarpaulin gloves

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- working clothing made of waterproof fabric
- tarpaulin jacket and trousers
- safety helmet with dark goggles
- gas mask
- safety belt with rope
- electric torch

9. Inventory for instructions:

I. When carrying out earthworks - trench laying

- a. Prior to commencing construction, the construction site must be enclosed by a solid fence at least 1.80 m high.
 - b. Admission to work for uninstructed according to Safety and Health Protection personnel that uses special work clothes and personal protective equipment is prohibited.
 - c. Lighting for shifts is installed on the premises if lighting at night and bad weather conditions is required.
 - d. The electric panels must be locked and the wagons with lighting - earthed. The electrician is the only person who has the right to work on electrical panels and electric machines.
 - e. In the working process, the machinery must be technically sound and the sound and light signals must be checked before starting work.
 - f. There must not be any people within the working range of the machine.
 - g. At the construction site the self-propelled machinery must be run at a speed of not more than 20 km/h.
 - h. When working with the construction machinery the min. distances to the power lines according to Art. 129 of Work Safety Act must be strictly observed.
 - i. The storing of building materials, equipment and the movement of construction machinery must take place outside the zone of natural bursting of the slopes and at a distance of not less than 1.00 m from the upper edge of the trench. The landfills provided for in the regulations must be observed in regards to the dug soil.
 - The necessary precautions against collapsing must be taken
 - The stones on the slopes must be removed
 - Undermining is prohibited.
 - j. Tools in good working order and suitable for the soil type must be used.
 - k. The intersections with underground facilities must be marked with signs indicating the depth of the facility to be crossed.
 - l. Levers, picks or wedges must not be used in the vicinity of electrical cables, communication cables, water pipes, heat pipes, gas pipelines, etc. The work must be done by hand carefully without the harsh blows using spades, and in the presence of the technical supervisor and a specialist of the company whose facility is being crossed.
 - m. The temporary pedestrian crossing bridges must be fenced.
- II. When working with an oxygen acetylene torch, there is a risk of electric shock, irradiation from the electric arc and fire.

- a. The personal protective equipment is described in art. 8 and art. 9
- b. For fire protection all flammable materials must be removed from the work area.
- c. In the event of a fire barrels containing urea, diesel, petrol and turpentine must not be extinguished using water but using carbon dioxide fire extinguishers.

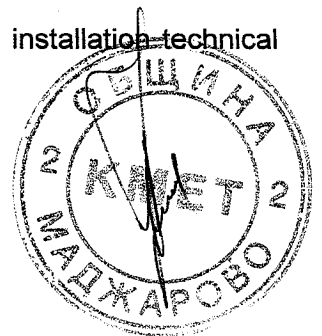
III. Electrical safety

- a. All electrical appliances must be kept in good working order, well insulated and protected so that it is not possible non-insulated wires to be touched.
- b. Turning on and disconnecting electricity from the mains must be done by means of good and insulated switches.
- c. Installation, servicing, use and repairs of electrical installations must be carried out by qualified electricians only who are well acquainted with the rules of SFWFS.

IV. The following conditions must be met during installation:

- a. Prior to commencing work with cranes or other machines, the installation technical staff must have a work plan in place.
- b. Only machines in good working order must be allowed to work.
- c. Before the start of the installation the crane operator is obliged:
 - to perform an external inspection of the crane

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- to check all idling mechanisms
- to check the condition of the ropes, their attachment to the drums, the jib and the pulley blocks.
- to check the performance of the lighting and the signaling system
- to work with licensed slingers
- to alert at every manipulation
- when moving the crane to make sure that there are no people in the work range
- to always obey the "stop" signal regardless of who handed it to him
- to put pads and adjust the triggers depending on the load
- to stop work at wind speed above the allowable
- d. The crane operator is forbidden:
 - to let the crane to unlicensed crane operators
 - to hoist frozen, concrete covered or snow-covered load
 - to pull loads with the hook
 - to hoist loads together with people
 - to overload the crane
 - to hoist loads with unknown weight
 - to work with the crane in the presence of cracks in the metal construction, in case of unacceptable wear of the ropes and deformation of the hook.
- e. The slingers are obliged:
 - to review the attachments before commencing work
 - to know how to tie and hang the loads
 - to place the loads so as to ensure unimpeded pull of the slings
 - to remain in a safe place during lifting, moving or lowering loads with the hoist unit - to use inventory or specifically made devices with their load capacity marked for holding the pipes.

Before commencement and during work all the excavating, hoisting and rigging devices must be checked and tested according to the Labor Safety Regulations.

Lifting and assembly devices must be registered and periodically supervised by the State Technical Supervision Authorities.

V. Instruction for the workers

a. Any worker who starts work for the first time or is being transferred to a different one must be thoroughly instructed on the SFWFS.

b. Instruction is introductory, production and periodic.

c. There must be an instruction book on the site with the following requirements:

- No.
- name of the person being instructed
- position
- type of the instruction
- volume of the instruction
- assessment of the learning during the instruction
- date
- signature of the person being instructed
- instructor
- notes

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