



**DOCUMENT FOR PROJECT ASSESMENT**

***Reconstruction of the local road from the village  
Greshnica to the village DlapkinDol***

**September 2020**

**Municipality of Kichevo**

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## I. PROJECT DESCRIPTION

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### A. GENERAL

The Municipality of Kichevo is located in the western part of the Republic of Macedonia and belongs to the southwestern planning region. Something characteristic for this municipality is that in 2013, with the new territorial organization, there was a merger of five municipalities: Kichevo, Drugovo, Vraneshtica, Zajas and Oslomej, which are now part of the Municipality of Kichevo, whose administrative center is located in the city of Kicevo. The municipality borders with several municipalities: MakedonskiBrod, Plasnica, Krushevo, DemirHisar, Debarca, Debar, Rostusha-Mavrovo, CentarZhupa and Gostivar.

When you add up the number of residents from the previous five separate municipalities, according to the data from the last census conducted in 2002, the total number of residents in the Municipality of Kichevo is 56,739 (Table 1).

Table 1: Number of residents according to the data from the 2002 Census

Kichevo	30138
Drugovo	3249
Vraneshtica	1322
Zajas	11605
Oslomej	10425
Total	56739

The Municipality of Kichevo covers an area of 837 km<sup>2</sup> and there are 79 settlements on its territory. The city of Kichevo is 110 km away from the capital Skopje. Due to the specificity of the area where the municipality is located, and where there is a pronounced transition from high mountain to low valley part, two tectonic units can be distinguished in the relief structure, namely mountain part and hilly-valley part. The Kichevo valley is a clearly formed natural unit, surrounded on all sides by high mountains. It belongs to the upper catchment area of the river Treska. On the north side it reaches the Strazha pass and the mountains Bukovich and Dobra Voda, on the west side the mountain Bistra rises, on the south side the mountains Baba Sach and Musica extend, and on the east side the valley reaches the northern part of Poreche. With its 51,346 hectares of forest area, the Kichevo region is the richest in the Republic of Macedonia. About 3,000 hectares of them are privately owned, and the remaining 48,451 hectares are owned by PE "Macedonian Forests". The most representative species are oak and beech. The Kichevo valley has 12,251 hectares of arable land (arable lands and gardens, orchards, vineyards and meadows) and 15,151 hectares of pastures.

The municipality of Kichevo is rich in water. Several river watercourses are registered here. In the village of Izvor, which is located in the micro-region of Drugovo, we can find the springs of the river Treska, one of the largest river watercourses in the country, which is the largest right tributary of the river Vardar. In the region there are several rivers, watercourses and streams that flow into the river Treska and across the river Vardar in the Aegean Sea: Belichka river, Ehloechka, Cerska, Rabetinska, Tuinska, Tajmishka, Bachishka and Greshnicka river. The springs of the river Studencica can be found in the village of Dobrenoec. The river's spring is captured and provides drinking water for several settlements, through the regional water

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supply system. Apart from the population in the Municipality of Kichevo, the municipalities of Makedonski Brod, Krushevo and Prilep are also supplied with drinking water from this water supply system.

The city of Kichevo is an urban and administrative center, towards which the surrounding settlements gravitate. It is located in an altitude of 620-650 meters. The city of Kichevo is the most densely populated place in the municipality where 52% of the total population in the municipality lives. The population density is 615 inhabitants per 1 km<sup>2</sup>. Regarding the age structure of the population in the city, the average age of the inhabitants is 33.9 years. 61% of the population is younger than 40 years, young people up to 20 years are represented by 30%, and the age category over 60 years is represented by 12% of the population in Kichevo. These data and indicators for the municipality are very similar to the average values in the Republic of Macedonia.

The road connection of the municipality with other regions of the country is good despite the mountainous environment of the region. With the capital Skopje, the region is connected with the regional road Kichevo - Gostivar - Tetovo - Skopje. On the south side of Kichevo there is a road junction that leads to three directions. One direction leads to the Ohrid-Struga tourist region, the other direction through Sopotnica and DemirHisar leads to Bitola, and the third through MakedonskiBrod and the Poreche region leads to Prilep. Apart from the regional roads, Kichevo has a developed railway infrastructure, i.e railway traffic that takes place through the railway line Kichevo - Gostivar - Tetovo - Skopje. According to the State Statistical Office, as of December 31, 2013, there are 292 km of local roads in the municipality, of which 192 km are asphalted, 21 km are macadam, 31 km are dirt roads and 50 km are non-average roads.

The length of the main sewerage network in the city of Kichevo is 4,150 m. The central network is connected to 2,560m of household networks, 800m of commercial buildings and 300m of industrial sewerage networks. Regarding the rural areas in the Municipality of Kichevo, the primary sewerage network is installed only in three settlements, while in the other villages, the residents build septic tanks near their homes.

The supply of the municipality with the necessary drinking water is mainly done through the water supply system "Studenchica". 360l / sec are provided by this system. The Public Enterprise "Komunalec" - Kichevo is the responsible entity for collection, purification and distribution of drinking water and food water, as well as for the installation of water supply and sewerage networks. In the context of water supply, the data shows that the city is completely covered by a water supply network, as well as most of the rural settlements that have a water supply network which is more than 90% developed. The length of the main water supply system in the city of Kichevo is 3,800 meters, while the distribution (secondary) network is branched out to a length of 13,250 meters. The city has 10000 connections, 50 street hydrants and 6 public fountains. The length of the main pipelines in the system of the surrounding rural settlements in the municipality of Kichevo is 71,075 meters, and the distribution network for rural settlements is 144,297 meters.

## **PROJECT DESCRIPTION**

This project includes reconstruction of a local road that passes from the village of Greshnica to the village of DlapkinDol which leads to upper DlapkinDol in the municipality of Kichevo, namely the installation of new asphalt and construction of a drainage system. The purpose of the task is to obtain sufficient input data as well as to define the programming conditions and parameters for preparation of the basic design.

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The local road from the village of Greshnica to the village of DlapkinDol has a total length of 830.14 m. The existing street, which is the street subjected for work, is initially integrated with an asphalt street in the village of Greshnica. At the beginning, the street is asphalted, and then it is a dirt road along its entire length with a variable width of 2.5-3.5 m. In the end, the street fits with an asphalt road in the village of Dlapkin Dol.

### ***Current situation***

The local road in question is located in CM DlapkinDol, on the territory of the municipality of Kichevo. The street runs through the settlement. There are no buildings along the entire length of the street. The existing road is a dirt road. Residents of the village of DlapkinDol have access to their houses from the highway Skopje- Kicevo, passing through a tunnel under the railway Kichevo - Skopje. This tunnel is low and heavy vehicles such as the Fire Department vehicles and other larger construction machinery cannot pass.



### ***Future condition***

The main goal of the proposed technical solution is to ensure the longevity of the street by maximizing the technical life of the surface to meet the existing standards of local streets and thus meet the needs of the local community.

The goals of the technical solution of the project are the following:

- To provide safety and comfort in traffic, proper placement and safety for pedestrians through reconstruction of the damaged sidewalk as well as the accompanying features;

- To influence the facilitation of traffic on the street and improve the safety and security of both drivers and pedestrians;
- Access of large machinery to the village DlapkinDol for daily work of the residents

The expected benefits from the implementation of the Project are related to increasing traffic safety and comfort, increasing capacity and traffic signals, providing a sense of safety for pedestrians, encouraging commercial activities, which will improve the quality of life in the community. This will also lead to reduction of municipal costs for permanent repairs of local roads, caused by weather conditions, as well as reduction of funds in the budget provided for winter maintenance and rehabilitation.

The expected results of the project are:

- Improving traffic safety and comfort
- Improving the safety of pedestrians and the population
- Modernization and urbanization of the city
- Reduction of depreciation costs for passenger vehicles,
- Improving vehicle flow rate, save fuel, reduce noise and pollution.

**Target groups:**

The population in the village of DlapkinDol with direct access to the street:

- All residents of the village of Greshnica and upper Dlapkin Dol.

**Project beneficiaries:**

Direct beneficiaries after the implementation of this project are the residents of the city of Kichevo, taking into account that due to the nature of the street, it is used by a large number of residents who live there, as well as others who for various reasons move along it.

50 percent of the residents of the municipality use it daily, while the rest, or about 20,000 residents, use it as needed.

## **II. TECHNICAL DESCRIPTION**

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The Municipality of Kichevo prepared a basic traffic project (construction part) for reconstruction of a local road from the village Greshnica to the village. DlapkinDol - CP115, CM DLAPKIN DOL, Municipality of Kichevo. The existing road, which is the subject road for work, is initially integrated with an asphalt road in the village of Greshnica. At the beginning, the road is asphalted, and then it is a dirt road along its entire length with a variable width of 2.5-3.5 m. In the end, the road is integrated with an asphalt road in the village of Dlapkin Dol.

### **I .SUBJECT AND AIM OF THE TASK**

The subject of the task is the preparation of project documentation in the phase of the basic construction project (civil engineering) for reconstruction of a local road from the village of Greshnica to the village of DlapkinDol, namely the installation of new asphalt and construction of a drainage system.

The purpose of the task is to obtain sufficient input data as well as to define the program conditions and parameters for the preparation of the basic design and to improve the safety of the participants in traffic.

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## **II. GEODESY**

For the preparation of the basic project, a geodetic base was used - an updated picture of the existing condition which was made on the basis of a recording, recorded cross-cut profiles with detailed points both positional and from height. The field data is recorded with a distomat with automatic software registration, and the data with processed software with the software package.

## **III. BASES FOR PROJECTING AND PROJECT CONDITIONS**

All of the available bases, from which the necessary data and information about the current area have been collected, have been used as bases for projecting:

Project task from the Investor

Geodetic base - updated footage

Co-recognition of the terrain

Valid legal and technical regulations

By-laws (regulations, standards and norms) that perform regulation of the matter covered by this project task.

## **IV. HORIZONTAL SOLUTION**

The recorded geodetic situation was used as a basis for making the horizontal solution - an updated basis from the existing terrain.

The axis is designed along the existing road in order to observe the spatial constraints and accordingly 19 horizontal curves are designed for projected speed  $V_p = 30$  km / h and level of service (D). The horizontal axis for the local road from the village of Greshnica to the village DlapkinDol is made of 39 elements, 20 directions and 19 circular curves. The horizontal radius is  $R_{min} = 10.0$ m, and  $R_{max} = 600.0$ m. The width of the lane on the local road from the village of Greshnica to the village DlapkinDol is designed with a width of 3 m in order to increase the width of the street for safety, and while observing the spatial constraints, a shoulder (roadside) with a width of 1 m is designed.

## **V. VERTICAL SOLUTION**

The finished level of the local road from the village of Greshnica to the village of DlapkinDol is designed to be approximate as the existing one, in order to observe the spatial constraints. At the beginning and at the end of the road, the level is in line with the current condition of the intersection with the asphalt street.

In order to have efficient drainage of the road, the minimum slope of the finished levels is designed to be  $i = 1.0257\%$  and the maximum  $i = 14.0765\%$ . On the local road from the village of Greshnica to the village DlapkinDol, 16 (sixteen) refractions and vertical curves are projected in the limits:  $R_{min} = 30.0$ m,  $R_{max} = 1300.0$ m. The cross-cut slope of the local road from the village of Greshnica to the village DlapkinDol is one-sided and is  $i = 2.50\%$  except in the part of the inclusion of km. 0 + 815.00 to 0 + 830.14 where it ranges from  $i = 2.5\%$  to 12.40% in order to fit the existing asphalt.

## **VI. LANE CONSTRUCTION**

The construction of the lane on the local road has been adopted from previous experiences and the following lane construction has been proposed: For the street:

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- BNHS 16A d = 7 cm

- Crushed stone buffer as a leveling layer d = 30 cm

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### **VIII.DRAINAGE**

Drainage of surface water at the chainage from 0 + 000.00 to 0 + 165.00 is enabled with longitudinal and transverse slopes of the street that lead to the existing ditches.

From 0 + 165.00 to 0 + 705.00 the surface water drainage is solved with asphalt gutters with concrete curbs with a width of 0.5 m. which are projected at the end of the left and right edges.

From 0 + 165.00 to 0 + 326.96 the surface water is taken in gutters and drained in existing ditches, from 0 + 326.96 to 0 + 705.00 the surface water is taken in gutters and drained with discharges in the field .

Surface water drainage ditches are provided and installed due to space constraints and terrain conditions along the local road on the left and right side.

Shoulders (roadsides) are designed on the road with a width of 1m on the left and right side of the road, on the chainage from 0 + 015.00 to 0 + 165.00 and on the chainage from 0 + 720.00 to 0 + 825.00. On the chainage from 0 + 015.00 to 0 + 165.00 and on the chainage from 0 + 720.00 to 0 + 825.00 shoulders (roadsides) are designed on the road with a width of 1m on the left and right side of the road.

At chainage 0 + 825.00, a concrete canal is projected with cast iron stepping grid D400 which is placed transversely in relation to the designed road, in order to maintain an existing canal that passes transversely to the road.

### **III. TECHNICAL SOLUTION**

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The technical conditions that are subject to the works covered by this basic design are based on the applicable regulations and laws of the Republic of Macedonia. The performance of the construction works envisioned by the bill of quantities, i.e the technology for performance of the construction works envisioned by this project to be according to the technical conditions for the performance of construction works for the roads in Macedonia, in all aspects. In accordance with the above-written, it can be concluded that all standard positions need to be performed in full compliance with the applicable standards (ICC), both in terms of technology of performance of works and in terms of meeting all prescribed norms that the individual materials used (for the construction of the lower line of the parking lot, the upper line - the road construction, the quality of the concrete for the concrete works, etc.) should satisfy those standards. From here it can be said that for a successful realization of this project during its construction in full compliance with the prescribed conditions, the relations Contractor, internal control (Contractor's laboratory) and Supervisory body (representative of the Investor) should be established. In the further presentation in the most general outlines the description will be given, as well as the manner of the technical conditions under which certain construction works envisioned by this project should be performed, and given in the same order as given in the bill of quantities.

**The technical solution for reconstruction of the street envisions performance of the following activities:**

- Marking and insurance of the route

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- Excavation of soil in a wide excavation of the route

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- Making a subsoil

- Making a bed

- Making a buffer layer of crushed stone

- Making embankments

- Cleaning and drainage of the main road

- Production of bituminous load-bearing layer BNS

- Production of AB layer AB

- Making prefabricated concrete curbs

- Production of prefabricated concrete behaton plates.

### **III. INFLUENCE ON THE ENVIRONMENT**

Starting from the basic points and urban settings, the road is placed in the space so as to satisfy all the functions that are intended for it. Here, first of all we mean the connection of regions, the communication between all residents with other parts, as well as other places in the municipality and the wider region, tourist and other attractive areas, natural rarities and more.

Our experiences and practices in the construction of this infrastructure project and its impact on environmental protection is most often reflected in the following:

- Guiding the route is undoubtedly a great challenge for the designer if they strive to apply elements that will meet the parameters in the design, while preserving the natural ambience, i.e the landscape.
- At the beginning of the construction, the small access roads are neglected as it is not a problem in the reconstruction of the existing road, and any use of materials other than those defined in the project will mean disruption of the natural relationship with influences on morpho-aesthetic characteristics.

The execution of the works causes disturbances in the environment due to the noise of the demolition machines, dust production, destruction of the land, etc. The geotechnical eco-risk that is most present in the construction of such infrastructure projects is part of the general risk and the task of geotechnical research is to quantify its part in the general risk, in order to quantify its acceptable level. However, since the general performance risk is not defined quantitatively (how much pollution or degradation is allowed), the geotechnical risk cannot be expressed quantitatively, but we could quantitatively express the hazards that imply the possibility of exposure to adverse impacts that could lead to damage, i.e risk.

### **IV. FINANCIAL DATA**

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Estimated project value is **4.935.754MKD without VAT.**

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	Item	Price without VAT in MKD	Total sum without VAT in MKD
	Reconstruction of the local road from village Greshnica to the village DlapkinDol	<b>4.935.754</b>	<b>4.935.754</b>

## V. FINAL PROVISIONS

The basic design is in accordance with the positive regulations, i.e all applicable laws, secondary legislation and standards of construction and urban planning in the area of streets. It is worth mentioning that the municipality of Kicevo proposes this street for reconstruction as a high priority defined on public opinion and various complaints from citizens; with the construction of this road the citizens of the village Dlapkin Dol will be provided access to large machinery that currently have no access due to the railway Kicevo - Skopje.

Municipality of Kicevo

Mayor,

Fatmir Dehari

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