

Contracting Authority: MUNICIPALITY KAMENO

Contractor: „BORELA“ OOD

Translation from Bulgarian into English

INVESTMENT PROJECT

SITE: "PROVIDING TRANSPORT AND PEDESTRIAN ACCESS TO THE SITE: CONSERVATION, RESTORATION AND SOCIALIZATION OF LATE ANTIQUITY AND MEDIEVAL FORTRESS RUSOKASTRO" FROM AN EXISTING ROAD IN MUNICIPAL PROPERTY PLOT N26, MASSIF 41, , EKATTE 63478 IN THE CADASTRAL SUBDIVISIONS OF RUSOKASTRO VILLAGE, KAMENO MUNICIPALITY, TO THE MAIN ENTRANCE OF THE LATE ANTIQUITY AND MEDIEVAL FORTRESS RUSOKASTRO, KAMENO MUNICIPALITY, BURGAS REGION

SECTION: : FROM KM 0 + 000.00 TO KM 1 + 066.18

LOCATION: REGION BURGAS, MUNICIPALITY KAMENO


PHASE: TIP

PART: ROAD

HEAD DESIGNER:.....
eng. T. VANCHUROV

CERTIFIED BY :		
CONTRACTING AUTHORITY:	Kameno Municipality	
DESIGNERS:		
Road	Eng.T.Vanchurov	
Geodesy	Eng. V.Rusev	
БП	arch.A.Bakalova	
FP	eng.S.Todorov	
ПУСО	eng.V.Angelova	

March, 2018

True with
ORIGINAL 



SITE: "PROVIDING TRANSPORT AND PEDESTRIAN ACCESS TO THE SITE: CONSERVATION, RESTORATION AND SOCIALIZATION OF LATE ANTIQUITY AND MEDIEVAL FORTRESS RUSOKASTRO" FROM AN EXISTING ROAD IN MUNICIPAL PROPERTY PLOT N26, MASSIF 41, , EKATTE 63478 IN THE CADASTRAL SUBDIVISIONS OF RUSOKASTRO VILLAGE, KAMENO MUNICIPALITY, TO THE MAIN ENTRANCE OF THE LATE ANTIQUITY AND MEDIEVAL FORTRESS RUSOKASTRO, KAMENO MUNICIPALITY, BURGAS REGION

PHASE: TIP

PART: ROAD

CONTENT

I. Text part

1. Explanatory note
2. Annex 1
3. Coordinates of the axes of the design axis
4. Tables 1 to 3
5. Quantity sheet
6. Notes 1 to 6

II. Drawings

- 1 Situation and ground plan M 1: 500
- 2 Long profile M 1: 200/2000
- 3-4 Typical cross sections and details M 1:25 (1:50)
- 5-6 Cross sections M 1: 100
- 7 Vertical planning and drainage plan M 1: 500
- 8 Tubular gutter Dia. 150 cm at km 0 + 137 M 1:50
- 9 Tubular gutter Dia. 80 cm at km 1 + 020 M 1:50



SITE: "PROVIDING TRANSPORT AND PEDESTRIAN ACCESS TO THE SITE: CONSERVATION, RESTORATION AND SOCIALIZATION OF LATE ANTIQUITY AND MEDIEVAL FORTRESS RUSOKASTRO" FROM AN EXISTING ROAD IN MUNICIPAL PROPERTY PLOT N26, MASSIF 41, EKATTE 63478 IN THE CADASTRAL SUBDIVISIONS OF RUSOKASTRO VILLAGE, KAMENO MUNICIPALITY, TO THE MAIN ENTRANCE OF THE LATE ANTIQUITY AND MEDIEVAL FORTRESS RUSOKASTRO, KAMENO MUNICIPALITY, BURGAS REGION
SECTION: : FROM KM 0 + 000.00 TO KM 1 + 066.18
LOCATION: REGION BURGAS, MUNICIPALITY KAMENO
PHASE: TIP
PART: ROAD

EXPLANATORY NOTE

I . Main part

1. Reason and purpose of the development

The present development in the Technical Project phase was prepared on the grounds of an approved TOR from the CA and a drawing with a visa.

The purpose of the development is to make a road project providing access to the western entrance of the Rusokastro Fortress. The project site creates a connection from an existing road in municipal property № 26, mass 41 with EKATTE 63478 in the cadastral subdivisions of the village Rusokastro, Deed No. 1 674 / 31.03.2017, to the main entrance of the Rusokastro Fortress.

The subject on this Technical Design Phase is a road designed to provide transport and pedestrian access to the main entrance of the late Antique and Medieval fortress Rusokastro. The necessity of providing transport and pedestrian access is a necessity for both the continuation of the conservation and restoration activities of the fortress and the subsequent exploitation of the site. Through the project development, the requirements of Ordinance No. 4 from 1 July 2009 for "Design, execution and maintenance of the constructions in accordance with the requirements for an accessible environment of the population, including for people with disabilities" will be ensured. Due the significant natural displacement of the terrain, the route is extremely important for the logistic provision of the activities for conservation and restoration of the fortress and providing transport and pedestrian access to the site. The technical project for the above-mentioned site was developed on the basis of a developed and adopted conceptual design. The project's provisions are that transport access should only be for cars servicing the fortress, middle-class cars and light-high performance vehicles.

During the design the requirements of the Terms of Reference and the following normative documents have been adhered to:

Ordinance № ПД-02-20-2 for planning and designing the communication-transport system of the urbanized territories;

True with
ORIGINAL



Ordinance No. 4 from July 1, 2009 for the design, execution and maintenance of the constructions in accordance with the requirements for an accessible environment of the population, including for people with disabilities.

Existing Technical Specification from the Bulgarian Road Agency.

2. Current research and development.

The project was prepared on the basis of a conceptual design of the route.

3. Transport characteristics.

The planned route will, after its realization, link the future tourist bus parking lot from the east side of the fortress to the entrance at the west side of the fortress, where transport to the fortress is only possible.

The main feature of the road is its service function, including transportation of personnel, delivery of materials, disposal, provision for fire safety. Through the project development, the requirements of Ordinance for the design, execution and maintenance of the constructions in accordance with the requirements for an accessible environment of the population, including for people with disabilities No. 4 from 1 July 2009, will be ensured. Special transport for people with disabilities will be provided.

4. Vehicle traffic forecast.

Given the above, the category of traffic is detriment as "light".

The tourist significance of the fortress determines the seasonal nature of the car movement.

II . GUIDELINES FOR THE TECHNICAL SOLUTION

1. Technical parameters.

According to the design assignment, this project has been developed with the following technical parameters:

Nº	Technical parameters	Unit.	V np= 17km/h
1	Minimum radius of horizontal curve at $q_{min}=2.5\%$	m	20
1.2	Exceptionally	m	15
2	Minimum radius of horizontal curve at $q_{min}=-2.5\%$	m	25
3	One-sided transverse gradient in a straight	%	2.50
4	Maximum one-sided transverse slope in a horizontal curve	%	2.50
5	Maximum longitudinal slope	%	9.0
5.1	Exceptionally - for a section with a length of up to	%	15
6	Minimum longitudinal slope	%	0.5

True with
ORIGINAL



7	Minimum radius of convex vertical curve	m	200
8	Minimum radius of concave vertical curve	m	200
9	Road lanes	Unit	1
10	Width of the road surface in a straight section	m	from 2.50 to 3.50m
11	Pedestrian road		1 x 1.40m
12	Shoulders		1 x 1.00m
13	Category of traffic		light

III . PROJECT PROPOSAL

1. Situation.

The beginning and the end of the site are as agreed with the assignor. The beginning is at the future parking lot on the eastern side of the fortress. The end is at the west entrance. The road is entirely in a municipal property. The project axis is in the middle of the traffic lane. Its length is 1066.18m. The axis consists of straight sections and circular curves, the elements of which are reflected in the "Situation" drawing, and are also tabulated. On the axis, besides the main points of the curves, are broken points of 10 m. The cross section profiles are made in them. Along the length, 20 horizontal curves are located. The smallest curve radius is 15.00m - curves 11 and 18.

In the plot are designed 6 places for over passing.

- landing at km 0 + 164 left;
- landing at km 0 + 320 left;
- landing at km 0 + 480 left;
- landing at km 0 + 615 left;
- landing at km 0 + 797 left;
- landing at km 0 + 940 left;

At the end of section km 1 + 035, there is a road sweeper and 3 parking spaces for cars.

2. Levels

Levels are designed in accordance with the requirements of the Technical Specification (minimum and maximum inclines, minimum radii of vertical curves, spatial combination of elements).

Levels consist of straight and curves of second degree - square parabols.

The following values have been achieved by elements:

Minimum radius of concave vertical curve: 220 m.

Minimum radius of convex vertical curve: 200 m.

Maximum longitudinal slope: 13,000% on a 60m long sector.

Minimum longitudinal slope: 1.414%

TRUE WITH
ORIGINAL



3. Cross-section

The main gauge of the road is 3.50 / 6.15 m, in these:

- traffic lane - 1 lane 3.50 m wide.
- sidewalk - 1 to the right with a width of 1.40 m.
- berm - 1 right to the width of 0.25 m.
- shoulder - 1 to the width of 1.00 m.

Basic eg. curb slope - one-sided 2.5%.

The transverse slope of the sidewalk is 2.5%.

The transverse slope of the shoulder is opposite the traffic lane - 6%.

Transverse sloping of landing sites - 4%.

Modification of the main gauge is made in the curves where widening of the traffic lane is necessary - curves 11, 15, 17 and 18.

The breadth of 0.25m in 0.50m is made at the high embankment sites, where a sidewalk tubular girder is provided.

The width of the shoulder is modified at the locations of the two provided gutters, as shown in the drawings.

In addition to the "Transverse Profiles" drawing, the finite path elevations in the axle, left and right edges are given in Table 3 through 5m for more accurate roadwork.

4. Geological and hydrological characteristics

No engineering and geological research has been done on the site.

The area where the site falls is located in Southeastern Bulgaria, Burgas Lowland, 25 km from the Black Sea coast. The relief has a hilly character with rounded shapes, which in some places are disembodied in ravines and gullies. The altitude varies from 39.00 to 95.00 m. The site's territory falls to the Black Sea coastal rivers lands in southern Bulgaria from the Black Sea Basin area with direct outflow of rivers to the Black Sea. The annual flow rate is 1.0-2.0 l/sec/km². The river feed is predominantly rain - over 55% of the total water volume. The average annual rainfall for the area is 550-600 mm, which is less than the average for the country.

No landslides and debris have been seen in the area.

Predominant rocky soil.

5. Road construction

The flooring is paved from middle size pavement 10/10/10 cm, for category of traffic "light". It consists of the following layers:

- Earth basis - $E_0 = 60\text{MPa}$
- Pavement (natural stone) - 10 cm
- Sand - 5 cm
- Unsorted bulk. min. - 20 cm, $E = 325\text{Mpa}$

Height of construction: 35 cm.

True with
ORIGINAL



The freezing depth of the soil in the open field - z' , in this area is 45 cm, but the earth foundation is rock and there is no danger of swelling and deformation of the road surface. The embankment up to 0.50 m under the road structure (when the road is in the embankment) is made of material A-2-4 or A-2-5, according to TC (zone material "A"). The pavements and the shoulder design are given in the drawing "Common cross profiles and details". The overtaking landings are constructed with the shoulder design.

6. Drainage

Drainage of surface water from the roadway will be succeeded through transverse and longitudinal slopes.

Drainage is free through banquets and slopes on the road. Surface water either drain freely on the skate (sloped drainage) or collect in trenches near the road body. The holes take the waters to the appropriate places on the terrain where they can drain away or to facilities (culverts) when the water is off the road.

The drainage of surface water is given in Drawing 9 "Drainage Plan".

7. Facilities

7.1. CULVERTS

Along the whole length of the road section, according to the character of the terrain, 2 culverts are placed. Hydraulic sizing of the gutters is done according to the "Instruction for the determination of the openings of the gutters", 1998.

The defined catchment areas of the drains can be seen in the enclosed "Appendix 1" diagram.

Results:

Nº	км	F km ²	L km	Jcp ‰	Hp mm	Øp	Fp	U	En	S(En)	Qmax m ³ /s	Gutter type and aperture	Градиент max
1	0+137	0.160	0.50	120	109.17	0.90	0.15	0.13	64.12	19.0	2.91	Tubular Dia. 150cm	3.8%
2	1+020	0.011	0.12	83	109.17	1.00	0.01	0.05	40.01	29.0	0.35	Tubular Dia. 80cm	15.0%

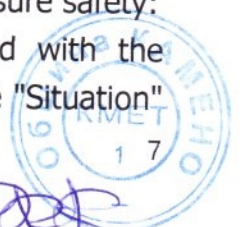
The following building system was used for the design of the tubular drains: "Construction system for prefabricated pipe drains - CTB'81". The execution is made of ready-made reinforced concrete pipes. The front walls and wings are poured in a single piece of concrete. Drawings for tubular drains are provided with the necessary data for their construction.

7.2. ACCESSORIES

The following types of accessories are provided in the project design to ensure safety:

- Tapered rail with dimensions of one panel 1800/1000 cm. It is stabilized with the foundation of the vertical supports. The locations of placements are shown in the "Situation"

True with
ORIGINAL



drawing. The method of foundation is given in the drawing "Typical cross sections and details".

- Steel rail in detail, given in the drawing "Typical cross profiles and details". It is dimensioned to take a great lateral load. It is placed on the front walls of the drains, on the side of the banquet.



8. Crosscuts and discharges

None in the section.

9. Roads for temporary stopping of traffic during construction

There is no need to stop traffic, as there is no such present except occasional cars and machines in connection with agricultural or other work. Such cars and machines will be let through. If necessary, only separate technological road sections will be built.

10. Organization and facilities for maintenance

The road section will be maintained by the Municipality Kameno.

11. Affected sites of other organizations

The project area does not have facilities of other organizations - built or designed.

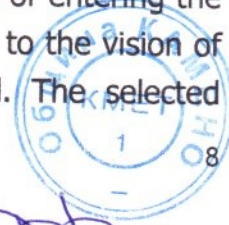
12. Alienation

The road project is prepared in digital format. The contours of the road servitude are combined with the land cadastre data. The road is located entirely in a municipal property. No alienation is required.

13. Materials

When selecting materials and technology of construction, the principle of entering the project into the concept of the overview project and the maximum approach to the vision of the Late Antiquity and Medieval Fortress Rusokastro has been observed. The selected

True with
ORIGINAL



materials are pavement of natural granite, natural rock aggregates, minimal intervention in shaping the road bed and its approach to the existing dirt rural road.

14. Requirements for health and safety at work at the construction site

The execution of all construction works to meet the requirements of Ordinance No. 2 on the Minimum Requirements for Health and Safety at Work for Construction and Assembly Works.

The CA or a person authorized by him / her in the process of negotiating the construction process to designate health and safety coordinators for the site and to provide their names to the Contractor prior to the opening of the construction site, the Safety and Health Plan annexed to this project.

Before commencing work on the construction site and completing the construction, the builder is required to carry out a risk assessment. The risk assessment covers all stages of contracted construction, the choice of working equipment and all parameters of the working environment. When carrying out a workshop on the territory of a working enterprise, the risk assessment shall be carried out jointly with its manager. If substantial modifications to the initial plans occur during the implementation of the RMM, the risk assessment shall be updated. When performing a risk assessment, make measurements of the working environment parameters.

The obligation of the builder is to provide and perform:

- The execution of construction and assembly works in technological sequence and deadlines set in the investment project and in the safety and health plan;
- Complex health and safety at work for all workers, incl. subcontractors and self-employed persons, in carrying out construction works on the construction works;
- Elaboration and updating of safety and health instructions according to the specific conditions of the construction site by type of construction works;
- The choice of the location of workplaces, subject to the conditions for safe and convenient access to them and the identification of transport routes and / or transport areas;
- The necessary protective equipment and workwear and their use in accordance with the legal framework and depending on the assessment of the existing occupational risks in each case;
- Instruction, training, upgrading and verifying the knowledge of workers' health and safety at work;
- Filing and reporting of the examinations, tests, maintenance and repairs of the equipment and work equipment (electrical and lifting equipment, construction machinery, means of transport, etc.) and their permanent control with a view to removing defects that may affect safety or health of workers;

TRUE WITH ORIGINAL



- The necessary sanitary and sanitary facilities in accordance with the sanitary and hygiene requirements and the fire and emergency safety requirements (PAM), the duration of the construction and the human resources;
- Maintenance of order and cleanliness of the construction site;
- The separation and organization of storage areas for different materials, especially where dangerous materials and substances are involved;
- The collection, storage and transport of waste and debris;
- Adaptation of the stages or types of construction works to their actual duration, taking into account the current status of the construction activities;
- The interaction with the industrial activities on the territory of or near the building site;
- At any time, first aid may be given to victims of an accident at work, fire, disaster or accident;
- Elaborates and approves internal documents (orders, specimens, etc.) to provide health and safety at work, according to the specific conditions.

Prepared:

(eng. T. Vanchurov)

Done with
ORIGINAL

