



**REPUBLIC OF
SRPSKA CITY OF
TREBINJE**
The Mayor
City administration

TERMS OF REFERENCE

*For the preparation of
MAIN DESIGNS
For the sewage systems in the City of Trebinje:*

- *Main design for the sewage system in the settlement **HRUPJELA***
- *Main design for the sewage system in the settlements **ZASAD and MOSTAĆI***
- *Main design for the sewage system in the settlement **VARINA GRUDA***

Trebinje, June 2025

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1. GENERAL INFORMATION

Investor:	City of Trebinje, 2 Vuk Karadžić St. 89101 Trebinje
Project name :	Sewage system including : • <i>Sewage system in the settlement of HRUPJELA</i> • <i>Sewage system in the settlements of ZASAD and MOSTAĆI</i> • <i>Sewage system in the settlement of VARINA GRUDA</i>
Type of documentation :	Main design
Location :	City of Trebinje including: • <i>Settlement of HRUPJELA</i> • <i>Settlements of ZASAD and MOSTAĆI</i> • <i>Settlement of VARINA GRUDA</i>



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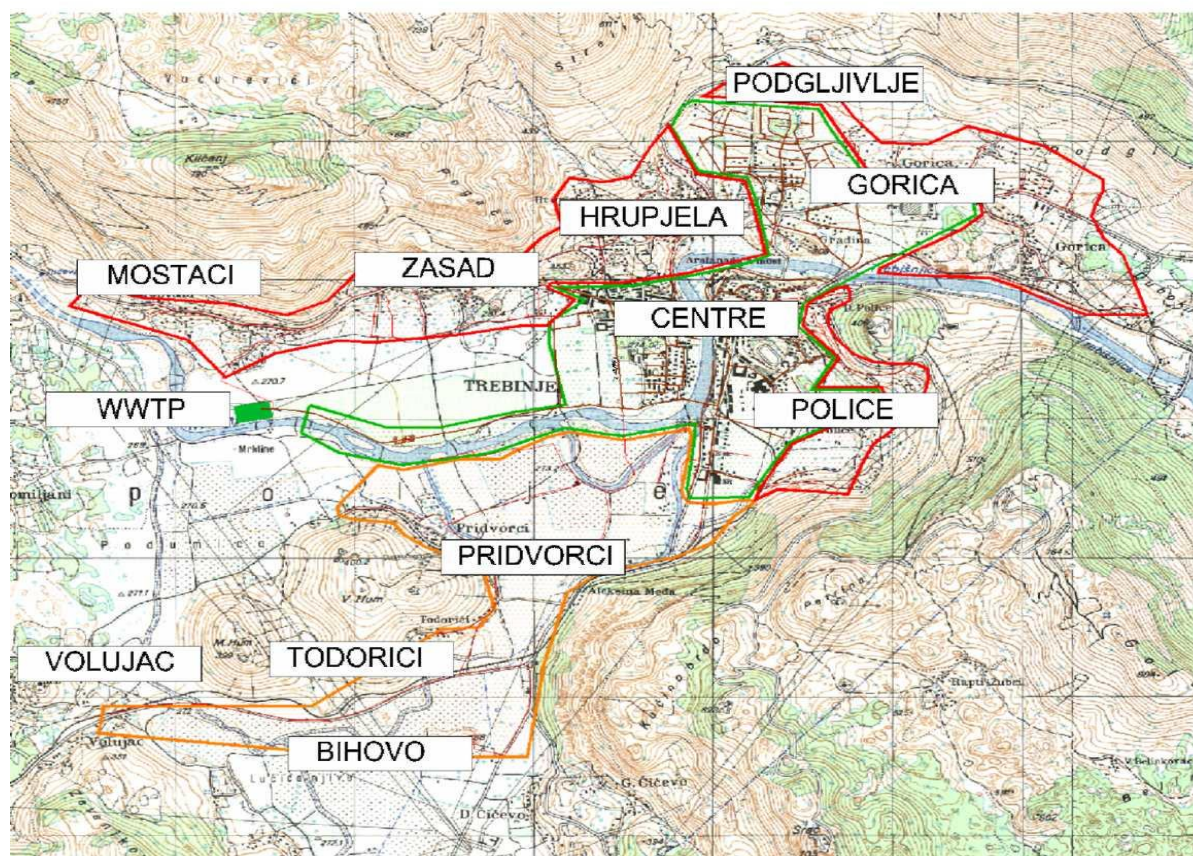


Figure 11-5 – Trebinje sub-system expansions (Phase 1 in red, and longer term in orange)

2. DESCRIPTION OF THE EXISTING SEWAGE SYSTEM

The city of Trebinje is situated on the banks of the Trebišnjica River, at an average elevation of 276 meters above sea level.

The city today covers an area of 904 km² and consists of a total of 140 settlements. The total population is approximately 31,150, with around 28,500 living in the urban area of Trebinje. The population density is relatively low, with 37 inhabitants per km².

The sewage system in Trebinje was designed and constructed as a separate system between 1976 and 1982. The city of Trebinje is not fully covered by a sewage network. The existing service area of the sewage system currently covers about 330 hectares. The total number of connected residents is approximately 14,200 (48% of the population in the urban area, or 45% of the total population in the municipality).

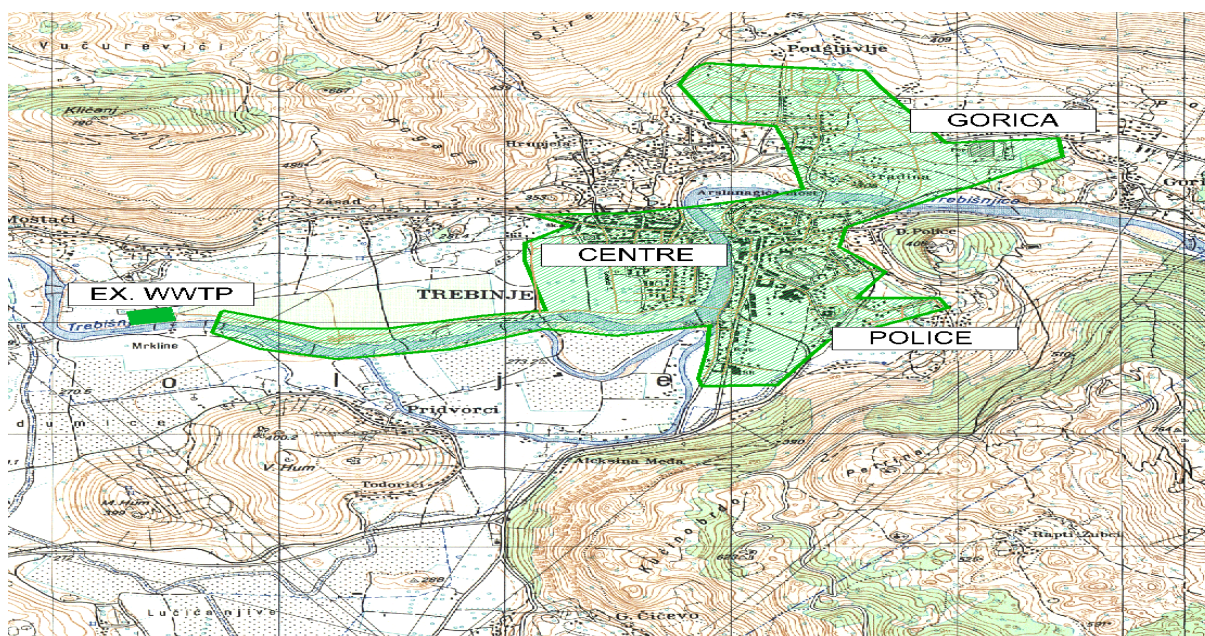


Figure - The existing service area of the sewage system in the City of Trebinje

The urban service area of the sewage system is located at elevations ranging from 270 to 400 meters above sea level.

The wastewater collection system consists of the following main components.

Collector 1, the main collector in the city, extends from Gorica, crosses the river,, and follows the left bank of the Trebišnjica River (AC, DN600-800, S=0.28%, long-term designed flow rate 425 l/s).

Siphon crossing 1 under the Trebišnjica River, near the old railway bridge, goes from Gorica (right bank) to Donje Police (left bank) and continues as Collector 1. The dual siphon consists of DN400 and DN250 mm pipes.

Siphon crossing 2 under the Trebišnjica River, in an area known as "Begov Jaz",

(steel, dual siphon DN300 and DN450, L=110 m).

The collector on the right bank, which passes near the Old Town (AC, L=820m, DN500, S=0.32%), and connects to the main collector towards the WWTP.

Collector 2 (AC, DN400) serves the areas of the center and parts of Hrupjela, and joins the main collector on the right bank, near the old barracks. **The main collector** (AC, DN1000/1300, long-term designed flow 1500 l/s, S=0.15%) runs along the right bank of the Trebišnjica River to the existing wastewater treatment plant (WWTP). The main collector is designed for a maximum flow during dry periods of 1500 l/s (up to 100,000 ES, number of residents connected to system 85,000), and is roughly oversized for both current and future conditions. The average depth of the sewage network is about 3.5 meters, with certain sections reaching up to 4.7 meters.

The total length of Trebinje sewage system is approximately 39 km, with pipe diameters ranging from 250mm to 1300mm. The pipes in the system are mainly made of asbestos-cement, while some recent extensions use PEHD pipes. The system currently contains around 3,000 manholes.

Wastewater treatment

The wastewater treatment plant was built in 1982 at the "Mrkline" location along the right bank of the Trebišnjica River, about 3 km from the city of Trebinje. The installed capacity of the plant, which was constructed in the first phase, is 30,000 ES. From 2018 to 2021, the plant reconstruction was carried out. The scope of the work involved the reconstruction of the existing plant, as well as improvements and the construction of new facilities to optimize and increase the efficiency of the treatment process for Phase 1.

The plant was designed and built for two phases, which are intended to meet the needs of the city for 50,000 ES. Currently, the Phase 1, is operational for 30,000 ES.

Chart - indicator WWTP

Indicator		
Technology of Treatment	conventional	
Degree of Treatment	secondary	
Designed Capacity	30.000	ES
Hydraulic Capacity, Average Daily Flow	4 210	m ³ /day
BOD ₅	1,708	kg/day

The treatment process at the wastewater treatment plant is based on mechanical and biological treatment with activated sludge, aimed at removing organic biodegradable matter, as well as anaerobic stabilization of the resulting sludge.

3. PURPOSE AND OBJECTIVE OF THE PROJECT PREPARATION

The general goal to be achieved through the implementation of this project is the elimination of the risk of pollution of surface and groundwater, and the reduction of health risks to the population. this assignment is implemented within the WB-financed WSS Modernization project (Republika Srpska Water and Sanitation Services Modernization Project).

In addition to the above general goals, the preparation of this documentation aims to achieve the following supplementary goals:

1. Creating the conditions for obtaining the necessary approvals and permits for construction from the relevant authorities in accordance with the legal regulations of the RS,
2. Creating the conditions for a precise cost estimate for the implementation of the project,
3. Creating the conditions for the public announcement of the tender procedure, selection of the contractor, and awarding of the contract for the works.

The purpose of developing the Main Design for the sewage system is to provide technical documentation to create the conditions for the construction of the sewage system in accordance with the legislation of the Republic of Srpska (RS) and Bosnia and Herzegovina (BiH), as well as the standards of RS, BiH, and the EU.

The development of main designs for the sewage system in selected settlements will support the City of Trebinje in expanding and upgrading its wastewater infrastructure, as more than half of the population currently relies on individual septic tanks. For the successful implementation of this initiative, the technical documentation must comply with the World Bank's Environmental and Social Framework (ESF) for the WSSM project and the relevant Environmental and Social Standards (ESSs), specifically ESS3 (Resource Efficiency and Pollution Prevention and Management) for environmental sustainability and pollution control, and ESS4 (Community Health and Safety) for mitigating public health risks.

4. TECHNICAL REQUIREMENTS, SCOPE OF WORK, AND PROJECT PARAMETERS

1. The project documentation must provide a solution for the wastewater sewer system (stormwater is not included) from all existing and potential users of the relevant settlements, as well as connection to the existing sewage collectors of the City of Trebinje, specifically:

	Area	Number of inhabitants	Tentative length of the pipeline (primary and secondary)	Connection to the existing sewer system of the City	Average water consumption (l/person/day)
<i>Hrupjela</i>	55ha	1644	7900m	Yes	170
<i>Zasad and Mostaći</i>	75ha	2324	10900m	Yes	
<i>Varina gruda</i>	P=13ha	1409	1700m	Consider two options: A) Connection to the existing sewage system of the City. B) Connecting all buildings to a decentralized system for the collection and treatment of wastewater. It is necessary to design a biological treatment unit – SBR (Sequencing Batch Reactor) of appropriate capacity.	Note: The investor will decide which option to accept after considering both variants.

* The designer will obtain from Water supply company Trebinje the average water consumption per settlement, daily and seasonal variations, and the connection manholes to the existing sewer system, as well as other necessary data and documentation for the execution of this task.



2. The project documentation must address the primary and secondary sewer network (fecal wastewater only, stormwater is not included), as well as the house connections, ensuring the system is technically correct and compliant with applicable regulations, and compatible with the existing infrastructure.
3. During the design process, all limitations and requirements arising from the applicable spatial planning documentation for the project area must be considered.
 The designer/the consultant, for the purpose of preparing the design solution, will obtain all relevant available documentation from the Investor. Within the preparation of the design base, the Investor will provide the designer with all previously developed project documentation related to Trebinje sewage system and other infrastructure facilities essential for the development of the Main design, specifically:
 - Planning documentation (Urban Development Plan of Trebinje, Regulatory and Zoning Plans for this area)
 - Study – Development of the Water Supply and Sewage System of Trebinje
 - Cadastre of the existing primary water supply network and sewage network
4. Proceed with the design of the project with minimal use of wastewater pumping systems.
5. The entire system for the collection and drainage of wastewater must be waterproof. The condition of impermeability must be ensured by selecting the appropriate pipe material and choosing the execution technology in the project documentation.
6. **Selection of pipe material:** up to DN=500mm (corrugated PE pipes for sewer network and PVC pipes for user connections).
7. **Sewer manholes:** Sewer manholes made of prefabricated elements. The

inspection shafts are covered with a lid and frame made of cast iron. They are installed at all junctions of the pipes, at points where the pipeline direction changes, where the profile changes, changes in slope, as well as on straight sections approximately every 160D (D being the diameter of the collector), or at a maximum distance of 50 meters. It should be foreseen that house connections are made through sewer manholes.

- 8. The minimum excavation depth of the collector :** terrain up to category IV, profiles up to 400 mm, minimum depth 1.2 m; Terrain Categories V or VI, profiles up to 400 mm, minimum depth 1.0 m. For larger profiles, the minimum depth should be adopted in accordance with the recommendations in the existing literature.
- 9. The minimum trench width** should be determined based on the adopted nominal diameter of the pipe and the trench depth;
If the canal routes are parallel to the water supply line in any part of the system, or if there is a pipe crossing, the sewage system should be designed in such a way that it is at least 1.0 m horizontally from the water supply pipe and at least 0.5 m below the water supply pipe.
- 10. The minimum diameter of the collector** for the street sewage of wastewater is DN 250 mm. The minimum diameter of the pipe for connecting house hold installations to the street sewage system is DN 160 mm.
- 11. The minimum slope of the collector's bottom** The minimum slope of the collector's bottom and the maximum allowed slope of the channel's bottom are determined based on the flow velocity, which depends on it. The flow velocity, depending on the channel's filling, should range from 0.4 m/s to 0.8m/s. At steep terrains, maximum up to 2.5-3.0 m/s
Sections that do not meet the recommended flow velocities must be specially marked in the hydraulic calculation annex.
The minimum allowed flow velocity corresponds to the minimum allowed pipe slope.
In sections of the collector with small or reverse terrain slopes, the sewage network should be designed with the minimum allowed slopes.
- 12. Power supply and automatic operation/automatic control system and/or SCADA,** as well as lightning protection for the pumping stations (if any) must be done at the level typically required for the Main design, which should include the necessary diagrams and drawings for the power supply and automatic operation of the facilities. The SCADA system must be harmonized with the existing system and configured in such a way that it is an integral part, as a separate section (electrical phase project book), in full compliance with applicable laws, standards and regulations. This system applies only to objects such as pumping stations (if any), objects, facilities and industrial facilities with electrical power supply (if any). In the case of system design without previously mentioned facilities, it is not necessary to design a SCADA system.

5. SCOPE AND CONTENT OF THE PROJECT-TECHNICAL DOCUMENTATION

The technical documentation should be prepared from the technological, technical, social, and economic aspects, as well as from the environmental protection aspect, in the manner defined by the Law on Spatial Planning and Construction ("Official Gazette of the Republic of Srpska", no. 40/13, 106/15, 3/16, 84/19), and the Rulebook on the Content and Control of Technical Documentation ("Official Gazette of the Republic of Srpska", no. 101/13).

The technical documentation must be materially consistent with the requirement of the World Banks Environmental and Social Framework (ESF) and the 10 Environmental and Social Standards (ESS), as well.

Designer's Obligations

During the project development, the Designer is obligated to:

- 1.) Align the technical solution with existing regulations, standards, and laws.
- 2.) Prior to developing the Main Design, the Designer will prepare a **Conceptual Design**.

The Conceptual Design should include:

Proposal for the route of the main and secondary collectors.

Locations of pump stations (if required).

Proposal for the capacity and types of pipes in accordance with calculations.

Option analysis for the settlement of Varina Gruda, as per requirements set in the preceding table in Section 4 Coordination with other infrastructure facilities (water, etc.).

Note: After coordination and approval of the Conceptual Technical Design by the investor, including the best option for the settlement of Varina Gruda the Designer will proceed with the development of the Main Design.

- 3.) provide, at its own expense, all necessary documents (geodetic and cadastral maps, as well as data on public operator installations and other installations).

4.) **Geodetic documentation**

The preparation of geodetic surveying maps for the purpose of developing the Conceptual and Main Design includes the acquisition or collection of appropriate geodetic plans and field surveying of the routes, along with the preparation of a geodetic report. The geodetic surveying maps used for the preparation of project documentation must be up-to-date, not older than six months, and certified by the authority responsible for survey and cadaster affairs. When selecting the route for the sanitary sewerage system, public areas should be used to the greatest extent possible, while taking into account existing utility installations. The preparation of geodetic base maps is the responsibility of the Contractor – Designer.

- 5.) After agreeing upon and accepting the Conceptual Technical Design by the investor, the Designer will prepare the Main Design.

Content of the Main Design:

The main design should tentatively include:

➤ General documentation

- a) Decision on registration of the legal entity
- b) Appointments of the responsible designer
- c) Statements
- d) ToR (signed)
- e) Licenses and certificates for the legal entity, responsible designer and designers
- f) The other relevant documentation (if any)

➤ Textual Documentation

Textual documentation includes:

- g) Table of contents;
- h) General section with legally required attachments for this level of project documentation;
- i) Technical description;
- j) Technical conditions for design and execution of works;
- k) Excerpt from the Study on applied occupational safety and fire protection measures, geotechnical report;

➤ Numerical Documentation

- a) Relevant hydraulic, mechanical, electrical, geotechnical, static and other necessary calculations.
- b) Material specification
(tables of main works – earthworks and other materials; detailed specifications of the designed equipment and materials, and equipment/materials in terms of fulfilling the intended functions).
- c) Bill of Quantities and Cost Estimate of Works
with a proposal for phased and complete implementation. The bill of quantities should include a detailed description of all works, with detailed descriptions of the designed equipment and materials. The bill of quantities should also cover the connection pipelines from the street pipelines to the connection point of the consumer, addressing the mass "individual or group" connections depending on the location of the facilities being connected.

➤ Graphical documentation (in the usual scale for this level of elaboration)

- a) Overview situation, R-1:2500, with marked system objects, pipeline routes
- b) Detailed situations with marked pipeline routes and objects in an appropriate scale, presented in accordance with the selected method of integrating project documentation, R-1:1000 (500);
- c) Detailed situation of objects (pumping stations), R-1:250 (100);
- d) Longitudinal profiles of pipelines, in an appropriate scale, with details and descriptions of objects and technical characteristics of the pipelines.
- e) Characteristic cross-sections of existing roads with the marked positions of the designed pipelines and other underground installations, in an

- appropriate scale;
- f) The required number of foundations and cross-sections of construction details, with form work plans for key objects (pumping station), in an appropriate scale – architectural drawings;
 - g) Detailed drawings of inspection chambers in an appropriate scale – architectural drawings;
 - h) Normal profiles of the trench for pipelines , in an appropriate scale;
 - i) Details of the connection of objects to street pipelines;
 - j) Details of the connection to the existing system;
 - k) Formwork and reinforcement plans;
 - l) Other attachments and necessary details commonly required for documentation at the level of the Main Design;
 - m) Power supply and automatic operation/automatic control system and/or SCADA with lightning protection for the pumping stations (if any) - connection, power supply, low voltage network, single-pole scheme, grounding, optical network distribution, additional interface configuration, etc.

Each drawing or graphic attachment must contain: the designation of the legal entity authorized for design work that created the project; the type of facility; information about the investor; the designation and number of the project or its part; the type of technical documentation; the type of drawing; the designation and number of the graphic attachment; the scale at which the drawing is made; the date of creation; the name and signature of the designer and the chief designer, as well as the seal, in accordance with the Law.

Notes: The design shall be fully in accordance with the Rolebook on the content and control of technical documentation in RS, in force. All above documentation shall be signed by responsible and licensed designer.

6. SUBMISSION OF PROJECT DOCUMENTATION

The contract implementation deadline is 180 days.

The technical documentation shall be prepared in Serbian language.

The technical documentation should be submitted in printed form and in electronic form in original editable files (DWG, Word, Excel, etc.).

Type of project	Deadline	Number of copies
Conceptual design		
<i>Hrupjela</i>	within 30 days from the date of signing the Contract	two printed copies and one electronic copy (editable document format)
<i>Zasad and Mostaći</i>	within 60 days from the date of signing the Contract	
<i>Varina gruda</i>	within 90 days from the date of signing the Contract	
Main design		
<i>Hrupjela</i>	Within 60 days from the date of delivery of the Urban Planning Conditions and the location permit by the Investor.	Two printed copies of the complete project and one electronic copy (editable document format), which the
<i>Zasad and Mostaći</i>	Within 60 days from the date of delivery of the Urban Planning Conditions and the location permit by the Investor.	

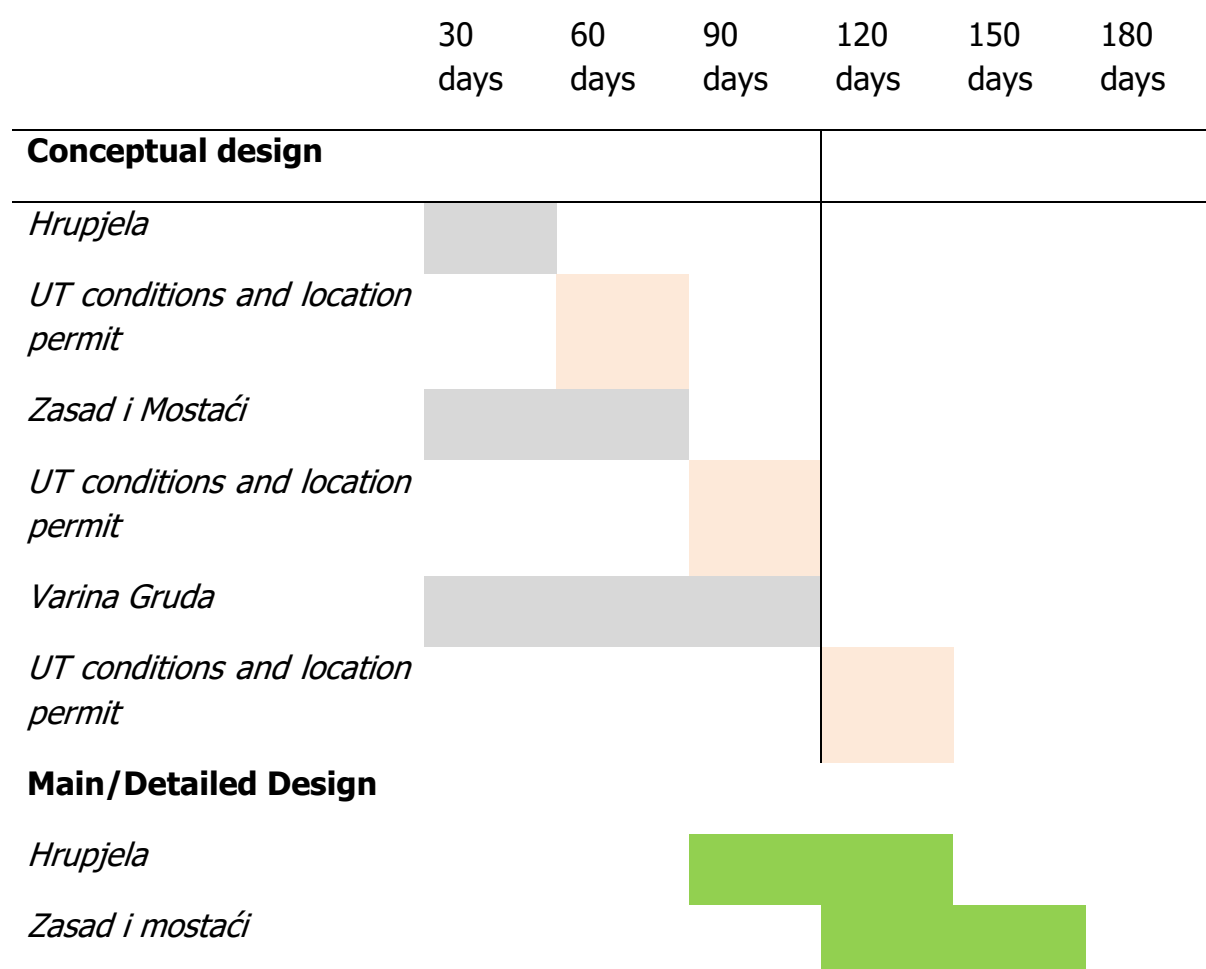
Varina gruda

Within 60 days from the date of delivery of the Urban Planning Conditions and the location permit by the Investor.

Investor will then forward to the Reviewer.

- After the positive report from the Reviewer, the Designer will deliver an additional four printed copies of the project to the Investor and two copies in electronic form (in editable document format).
-

A Tentative work plan/Gantt chart:





The Designer is obliged to establish a quality cooperation with the Auditor/Reviewer of the Main/Detailed Design and make corrections until full alignment with their requirements, within a period that cannot exceed 30 days.

Prepared by:

Investor: City of Trebinje

Department for Capital Investments:

Mayor:

Siniša Vučurević

Mirko Ćurić