

**Terms of Reference and Description of Services  
for preparation of Detailed Design  
for rehabilitation of Satsurbliia Cave access road and adjacent infrastructure  
in the town of Tskaltubo, Imereti**

## **Introduction**

The Municipal Development Fund of Georgia (MDF) is a legal entity of public law whose purpose is to mobilize financial resources from donors including international and Georgian financial institutions in order to make them available for investments in local infrastructure and services, while simultaneously helping local self-governments in strengthening their institutional and financial capacity.

MDF implements various regional and municipal development projects, including the Second Regional Development Project (RDP 2) financed by the World Bank Group and the Government of Georgia (GoG). The aim of the RDP 2 is to stimulate economic growth in Imereti region through provision of enabling environment for increased tourist visitation and private investment. Arrangement of public tourist infrastructure in the areas adjacent to the cultural heritage monuments is a type of activity supported by RDP 2.

MDF (the Client) seeks consultant services for the preparation of detailed engineering design for the access road to Satsurbliia Cave and adjacent infrastructure. Present TOR is for this consultant assignment.

## **Objective and Conditions**

The service delivery is targeted at development of design and cost estimate documentation for the rehabilitation-reconstruction of the existing access road and related infrastructure to Satsurbliia cave.

The road is located in Tskaltubo Municipality and is owned by the Municipality. The road passes through the settled site. It is divided into two sections (Please see Annex 4 – Map):

- The first section of the road is about 700 meters long and 6 meters wide (to be confirmed at site). This is an asphalt-concrete paved road with heavily damaged sections. Concrete ditches on both sides of the road are in a good condition.
- The second section of the road is about 350 meters long. The width of the road in some sections is 3.5-4 meters. Current condition of gravel road is unstable and damaged. It has no ditches and, during precipitation, storm water flows through the carriageway.

The house fences located along the last 350 m section of the access road are old and damaged. The other sections require assessment.

## **Scope of Services**

This assignment includes the delivery of services with no limitation and in relation to the following detailed design works:

- 1. Rehabilitation of access road sections to Satsurbliia Cave named above.**
  - a) Road pavement structure should be calculated by axle weight 100kn.
  - b) Asphalt concrete should be applied to road pavement in the first section (road milling and arrangement of the new abrasive layer).

- c) Armored cement concrete should be considered for the second section of the road.
- d) To manage storm water, concrete ditches should be arranged along the road.
- e) Culverts should comply with an 80t wheel pressure (according to design loads AA-11 HK-80).
- f) Connections and yard entrances should be arranged along both sections of the road.
- g) All road parameters shall meet requirements of Georgian Standards for Roads: 2009.

**2. Other infrastructure:**

- h) Provide an assessment, inventory and survey of interface elements within the sub-project area along the road (e.g. fences and gates, facades light posts, etc.) and propose possible design solutions.

## Stages and specific Tasks

Services to be carried out is three phased.

Stage 1 – survey works and design concept development

Stage 2 – draft design preparation.

Stage 3 – detail design and cost estimations

## Tasks and Stages of Service Delivery

### Stage I – Documentation works, survey of the design area and Project Concept

The first stage entails the study and preparation of the following materials and documentation:

- Engineering-geological survey of the design road by the following method: arrangement of 2 pits of 3 transverse profiles with the depth of 3,0m per kilometer and taking soil samples;
- Detailed survey of landslide sections;
- Survey of the base of new pipe culverts by the mechanical, column drilling method, through arrangement of 1, or 2 1,0m deep boreholes per pipe (as required) and taking soil samples;
- On the existing bridge crossings, analysis of the state of the piers' and existing retaining walls' substructures;
- Laboratory research of the soil samples taken from the pits and boreholes and rock bases and analysis of the test results;
- Engineering-geological description of the design road and investigation and analysis of previously conducted geological surveys;
- Conducting topo-geodesic works in UTM coordinate system (GeoCORS);
- Determining new routing, as required;
- Topographic survey of the relief at 50 meters' distance and on both sides of the road axis, which should be elaborated in absolute U coordinate system;
- Stationing of the route;
- Road levelling;
- Surveying transverse profiles in hilly and curvy sections at 20 meter intervals;
- Road layout and bench mark hand-over to the client under the respective certificate;
- Detailed survey of the landslide areas, bridge crossings, and the areas designated for installation of small engineering structures;
- Determining transportation distance from the selected borrow pits to the design road;
- Exploration of the existing road pavement structure;
- Exploration of the existing engineering structures (retaining walls, bridges, culverts etc.);

- Analysis of the surface water diversion measures;
- Determining state of existing underground and overground utilities and their mapping on the general location plan;
- Description of the trees and plants existing in the design road buffer zone, which in future will be included in the cost estimations.
- Determining number and types (agricultural, etc.) of land plots falling under the right-of-way of the design road, as required;
- a survey of all lateral accesses to the road (both private and public) up 3-5 meters from the main road;
- Identification of any potential safety hot spot;
- Examination of the road adjacent and potentially impacted physical environment (geology, geomorphology, hazardous geological processes, erosion, soil, landscapes, climate, hydrology, hydrogeology, water quality, flora, fauna, cultural heritage, archeology, etc.); The Consultant shall conduct environmental and social surveys and collect the information that is needed for evaluation of the environmental and social impacts. The Consultant will acquire and provide information that is needed for evaluation in case any potential resettlement/land acquisition might be required (pre-evaluation of land ownership and scale of impact), as well as number of potential beneficiaries. Resettlement and/or land acquisition should be avoided to the extent possible and, if absolutely necessary, minimized as much as possible. The Consultant shall carry out consultations with Tskaltubo Municipality Gamgeoba for Identification of potential sites for disposing excess material (mud, soil, rocks) and construction waste, prepare brief description (including cadastral information) and maps of suggested sites. The consultant shall identify location and distance to the nearest licensed borrow pit and review all existing underground and surface communications within the road corridor.

### **Desk Work**

Upon completion of research-survey works, the Consultant shall develop a project concept for the entire road and present to MDF and other relevant stakeholders for discussion and approval before initiating the detailed designs. The project concept might include proposals for traffic-flow management in the narrower/one-lane and steeper section of the road (e.g. provision of pull-out or driveway area, signage to define right of way, speed reducing solutions, etc) and parking/drop-off solutions at the cave entrance.

Office works should provide with consideration of the terms as follows:

- Lay-out plan for the road route in case of complicated relief from the standpoint of designing, Scale: 1:1000; in case of crossed relief the Scale to be as follows: 1:2000;
- Longitudinal profile of the road in case of crossed relief: Scale 1 :2000 \_ 1:200, whereas in case of complicated relief the scale will be as follows: 1 : 1000 \_ 1 : 100;
- Lateral profiles in case of complicated relief. Scale: 1:100 in levelled off locations: Scale 1:200;
- Topographic plans in ordinary conditions: Scale: 1:1000; In case of complicated relief the Scale will be as follows: 1:500;
- The situation on the route plan and longitudinal profile shall be provided by applying of conditional marks determined under construction regulations;
- Topographic plans for design and existing situation shall comprise the layout for registered land plots with indication of cadastral borders and codes;
- All drawings shall include the surnames and signatures of persons in charge and authors of the documents.

Consultant should also provide an assessment, inventory/survey of condition of elements of interface of the sub-project area with private properties along the road (e.g. fences and gates, building, light posts,

accesses, etc.) and propose possible design solutions for review and discussion with MDF and stakeholders (Agency of Protected Areas and Tskaltubo Municipality) to agree on final solutions.

The design research shall incorporate the existing assignment, technical survey and road design, traffic analysis, economic and social analysis, arguments on resettlement issues, archeological researches and project implementation. It has to reflect environmental impact and possible land take and resettlement issues (as required).

Following completion of exploration-survey works and upon submission of the respective reports, rehabilitation methods and concept, the Client will specify project scope and parameters, and likely solutions (including to ensure road safety), which will be followed by decision on commencement of the next stage works. After initial survey, the Client may come up with a decision to suspend works services on any of the components, based on the findings and recommendations.

## **Stage II**

Preparation of the draft design documentation and their agreement with the stakeholders.

## **Stage III**

Preparation of the detailed design documentation.

## **Deliverables**

Design-cost estimate documents shall comprise of but not limited to the documents indicated below. These documents shall be prepared in accordance with the requirements stipulated by Georgian Standards for Roads: 2009 and other standards and construction regulations being effective in Georgia. In case of necessity of any deviations within the regulations, either provision or restriction of any specific regulation shall be agreed with the Client in advance.

### **Stage 1**

Report, without being limited to the following:

1. Explanatory Note (including detailed description of problematic issues);
2. Topographic survey of the site (Topographic plan through UTM System of Coordinates: Scale 1: 200);
3. Cadastral documentation (including project and actual situation on topographic plan, layout of registered land plot(s) with indication of cadastral borders and a code);
4. Outcomes of engineering-geological survey – technical report, conclusions and recommendations (assessment of physical-mechanical features of soil, laboratorial analysis of samples, elaboration and conclusion of results);
5. Report on engineering-technical survey, including the information and schemes concerning connection to the utilities - water, sewage, electricity, gas;
6. Hydrological report;
7. Layout plan for location of the project site - Scale: 1:1000 or 1:500;
8. Initial study of art historians and recommendations, including landscape context, accompanied with proper schemes, photographic materials, connections, and routes;
9. A project concept – with specified project site parameters, structural and technical solutions, including the overall site plan;

10. Feasibility study covering all possible options, analysis of problems and risks, parameters and scales of the sub-project (including financial scales along with estimated budget), estimated method and schedule of implementation;
11. Classified photo material: general views of the project site, façades, interior, valuable elements from architectural-art standpoint, photos reflecting general and local damages (photos of high quality and resolution) – TIFF/JPEG expansion file).

Following completion of exploration-survey works and upon submission of the respective reports, rehabilitation methods and concept, the Employer will specify sub-project scope and parameters, and likely solutions, which will be followed by decision on commencement of the next stage works. After initial survey, the Employer may come up with a decision to suspend works services on any of the components, based on the findings and recommendations.

## **Stage 2**

Report, without being limited to the following:

1. Explanatory Note (providing description of existing situation and arrangements stipulated by the project);
2. Topographic plan including cadastral borders and code(s);
3. Cadastral documentation (to include in the design and status quo topographic plans the registered land plot(s) outline with indication of cadastral boundaries and codes);
4. Layout plan for location of the project site - Scale 1:1000 or 1:500;
5. General location and master plans of the project site (scale 1:2000; 1:10000; 1:500);
6. Master plan, with topographic mapping of the design area, with showing of red lines scale 1:500; 1:1000;
7. Drawings (plans, sections, facades);
8. Solutions: graphic and textual material – layouts, sections, elevations;
9. Structural solutions;
10. Report on Environmental/Social survey without being limited to the following: Brief conceptual summary of the Project; Map of Project implementation site with cadastral information; photos for site; Topographic, geological and hydrogeological information (description of relief, geology and soil, based on archive data and as a result of visual survey; information shall provide conclusion regarding existence or probability of hazardous geological processes, necessity for conducting of explosive works; depth of location of ground water etc.); Vicinity to the river or other surface waters (lakes, channels etc.); Brief description of climate conditions; Description of vegetation and flora species along the road to be rehabilitated. Identification existence of Red Listed species in the vicinity of the road; Review all existing underground and surface communications within the road corridor; Information on potential sites for disposing excess materials and construction waste; Information on sources of inert materials; Land ownership and land utilization issues: a) Cadastral data on the project implementation site. b) Formally attested information whether the project impacts on privately owned, or leased land plots or not (temporal disturbance; loss of the part of the land plot or whole land plot by the owner; loss of the property being on the land plot; loss of income etc.)

## **Stage 3**

Report, without being limited to the following:

1. Explanatory Note;
2. Layout of the access road;
3. Longitudinal profiles across the road axis which shall consist of project (red), earth (black) and working marks, kilometer performance, picketage and distances between characterizing points, graphical reflections of longitudinal slopes, vertical and horizontal curves along with numerical indexes, projected and existing artificial structures with the parameters.
4. Lateral profiles shall be surveyed (shot) in each 20 m (in case of requirement) and at characterizing points and shall comprise of project (red), earth (black) and working marks, distances between characterizing points, graphical reflection of lateral slopes along with numerical indexes and situation being in the vicinity of the sub-project site. There shall be provided also the project and existing artificial structures along with the parameters).
5. The roadbed structure with consideration of respective reports (in coordination with the Client);
6. Design for water diversion and drainage structures;
7. Road signage and safety measures (in relation to safe traffic flow in narrow section, crossing of pedestrians from private properties, side accesses, if relevant, and for potential landslides).
8. Hydrological report for rivers and run-off water;
9. Design of bridge crossings considering calculation of anticipated maximum loads;
10. All required registers (in accordance with the design);
11. Construction schedule;
12. Work activity (construction) management;
13. Cost estimate of construction;
14. Technical specifications for Bidding Documentation that are to be enclosed separately to the design-cost estimate documents and shall include general indications and recommendations for Bidders (participating in construction Bidding)/Contractor. Also Detailed Specifications (with indication of all required standards) for applied material and machinery, aimed at controlling methods and quality of works' performance/testing.
15. Economic analysis (should include capital expenditures required for project implementation as well as average annual operation and maintenance costs. The named data should be provided for each possible alternative solution of project design (based on technical specifics of the project, at least two alternative technological solutions should be presented). The deliverables should also include methodology of each alternative of cost calculation with respective clarification and reference to the data sources.

## **Additional conditions**

### ***Author's supervision:***

In the process of construction activities, even upon expiration of Contract date for preparation of design documents, the Consultant is obligated to participate in specifying of design decisions and in case of need, preparing-coordinating of draft documents, quantities of construction works and other relevant amendments to the Contract. Participation of the Consultant in above-mentioned activities is considered aimed at providing compliance between quality of accomplished works and detailed design documents. Involvement of the Consultant is also envisaged in supervision over progress of construction works as per request of the Client and execution of arrangements envisaged under the Annex to the Terms of Reference.

During the construction period, once a month or upon MDF's request, the consultant or his representative will visit and monitor the construction progress on site. Following the visit, the consultant will prepare and submit a progress report to the Client, which will cover the situational analysis on site, list any deviations observed or variations needed, supported by argumentation.

## Reporting and Schedule

- a) Stage 1 - Within 3 (Three) weeks from the commencement of service provision, the Consultant will provide the Client survey works and design concept development;
- b) Stage 2 - Within 6 (six) weeks from the commencement of service provision, the Consultant will provide Draft Design documentation;
- c) Stage 3 - Within 8 (Eight) weeks from the commencement of service provision Consultant will provide Client Final Detailed Design documentation and document confirming that the project had been agreed with the local Municipality and with Agency of Protected Areas.
- d) During construction, monthly progress report to the Client to report on findings of the site visits and recommendations.

At every stage, within one-week period following submission of the documentation, the Employer will furnish the consultant with its remarks. The consultant shall consider the above-mentioned for the following stage and introduce the respective amendments to the design documentation

## Contribution of the Client

The Client will provide the Consultant with all available material that may be required for service execution.

## Duration of the assignment

Tentitive time for this assignment is 8 weeks except construction supervision stage.

## Format and place of Service delivery

- The reports for all stages of service shall be submitted in writing.
- Final documents of design-cost estimate along with the Bidding material shall be prepared in Georgian and English language and submitted in soft copy format (MS Word and Excel, whilst the graphical part will be submitted in AutoCAD or ArchiCAD formats). It is mandatory also the drawings to be provided in PDF format. The documents shall be provided on CDs (either CDs or DVDs). These documents are to be provided also as albums - 4 (four) copies (formats: A4 and A3).
- 1 (one) copy of approval documents for design-cost estimate documentation shall be submitted in Georgian language (if the document is prepared in foreign language, then the original shall be accompanied with its translation into Georgian, certified by Notary).
- Report for the service stage, final design-cost estimate documentation, approval documents and Expert Opinion shall be submitted at the address as follows: #150 D. Agmashenebeli Avenue, Tbilisi City, LEPL Municipal Development Fund of Georgia.

## Annex 1: Consultant's Personnel and Schedule of Rates

In order to provide for the top-level performance of the assigned task, the Consultant shall mobilize the qualified staff (key personnel as well as the support staff). All the specialists shall be well-recognized professionals in their respective fields with at least 5-year experience in the similar work environment.

The consultant should mobilize the following personnel:

N	Consultants	Number	Month	Input, person/month
Key Experts				
1	Team leader	1	2	2
2	Road engineer	1	2	2
3	Topographer	1	2	2
4	Geotechnical Engineer	1	1	1
Non-Key Experts				
5	Environmental Specialist	1	1	1
6	Architect	1	1	1
8	Quantity surveyor	1	1	1



## Annex 2: Narrative Qualification Requirements for Experts

Title	Specific experience (Years)	Area of Specialization, Qualification	Main Responsibilities, but not limited to
Team Leader/ Road Engineer	5	Civil Engineering - Road Design Management, experience of implementation of similar size and type projects (design services); Minimum bachelor's degree in civil/road engineering;	<ul style="list-style-type: none"> <li>• Overall responsibility for elaboration of the road design and managing the Consultant's team;</li> <li>• Monitor performance, deadlines, progress, and manage risks to ensure timely and quality delivery of outputs;</li> <li>• Coordinate and liaison with Local Government/Client;</li> <li>• In-depth overall knowledge in detailed design for medium sized road projects;</li> <li>• Knowledge of the local and international standards for construction/rehabilitation works;</li> <li>• Report writing and oral presentation in English or Georgian (will be tested).</li> </ul>
Road Engineer	5	Civil Engineering - Road Designing, experience of implementation of similar size and type projects (design services); Minimum bachelor's degree in civil/road engineering; Experience in traffic and pedestrian safety organization	<ul style="list-style-type: none"> <li>• Elaboration of road design;</li> <li>• In-depth overall knowledge in detailed design for medium sized road and projects;</li> <li>• Knowledge of the local and international standards for construction/rehabilitation works.</li> </ul>
Geotechnical Engineer	5	Civil Engineering — Geotechnical Engineering; Minimum bachelor's degree	<ul style="list-style-type: none"> <li>• Ground and soil investigations;</li> <li>• Checking of designs of foundations, slope and embankment construction;</li> <li>• Laboratory and in-situ testing;</li> <li>• Preparation of geological report.</li> </ul>
Topographer	5	Civil Engineering – land survey, topography and geodesy, experience of implementation of similar size and type projects (design services); Minimum bachelor's degree in topography and geodesy;	<ul style="list-style-type: none"> <li>• Topo and Geodetic survey;</li> <li>• Preparation of survey report and drawings</li> </ul>
Architect	5	Architect/Recreation and urban area design/landscaping, experience of implementation of similar size and type projects; Minimum bachelor's degree in civil engineering	<ul style="list-style-type: none"> <li>• Conducts the research on the existing building and the surroundings;</li> <li>• Plans and prepares all the architectural project documentation;</li> <li>• Preparation of design report and drawings</li> <li>• Knowledge of the local and international standards for construction/rehabilitation works.</li> </ul>

### Annex 3: Payment Schedule

Deliverables	Submission Date	Language	Payment (% of the total contract cost)
Final Detailed Design Documentation	Within 8-weeks from commencement of services	Georgian/English	90%
Design supervision (at least once a month during the construction phase, providing progress reports)	After Completion of civil works	Georgian	10%

Annex 4: Map

