

REPUBLIC OF ALBANIA
ALBANIAN ROAD AUTHORITY

BUILDING RESILIENT BRIDGES PROJECT

Loan No: 94790-AL
Project ID: P174595

Consultancy Selection - Consultancy Firm

TERMS OF REFERENCE

for

DISASTER MANAGEMENT RISK AUDIT FOR BRIDGES

Reference: AL-ARA-351533-CS-CQS

October 2024

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1 BACKGROUND

1.1 Introduction

The Government of the Republic of Albania has received financing from the International Bank for Reconstruction and Development (IBRD) in the form of Loan toward the cost of Building Resilient Bridges Project (BRBP),

Albanian Road Authority (ARA) under the Ministry of Infrastructure and Energy (MoIE) is the implementing agency of the BRB Project. ARA intends to apply a portion of the proceeds of this Loan to eligible payments under the contract for which the Terms of Reference (ToR) is issued for the Consultancy Services.

1.2 Bridge Infrastructure in Albania in contexts of disaster risk

Bridges are critical components of infrastructure, and their design must ensure safety, durability, and resilience, especially in the face of climate change. The design process should integrate both general engineering principles and specific considerations related to the impacts of climate change. This ToR outlines the requirements for developing final bridge designs that incorporate best practices in structural engineering while also addressing climate resilience.

There is a clear and urgent need to increase the resilience of Albania's road infrastructure to natural disasters exacerbated by climate change effects as well as to human induced disasters. This implies an urgent need for a multi risk-based assessment of the physical condition of the existing bridges, adjacent structures (retaining walls, gabions, breakwaters, etc.) and other structures further afield to stabilize the course of the rivers, and their resilience to the expected higher climate change impacts and natural disasters.

2. OBJECTIVES OF THE ASSIGNMENT

2.1 Overall Objective of the Assignment

The primary objective of this consultancy is to provide a comprehensive audit of the detailed designs for priority bridge projects to ensure that they incorporate resilience measures against natural disasters and other external threats. The consultant will assess the Detailed Design of 13 Priority Bridges in Albania, for their capacity to withstand floods, earthquakes, landslides, and other relevant hazards and will make recommendations for improvements where necessary.

The Feasibility Study and Detailed Design for priority bridges in Albania, will consist of undertaken in the following activities:

- In-depth condition survey of Priority Bridges.
- Preparation of a Feasibility Study and Preliminary Detail Design based on the technical, Economics and Environmental and Social Impact Assessments.
- Preparation of Detail Engineering Designs for Priority Bridges
- Preparation of Bidding Documents for the construction works in the Priority Bridges

To ensure that new and existing bridge projects meet the highest standards of resilience ARA seeks to engage a qualified consultant to conduct a detailed audit of the design processes and outputs for bridge construction projects.

The consultant shall coordinate its activities and deliverables with a consultant firm that has been hired by ARA for priority bridges projects.

The consultant will provide inputs and audit the final designs of priority bridges, while a separate consultancy will update the designs for bridges being rehabilitated or upgraded through the World Bank-financed Building Resilient Bridges Project (BRBP). This consultant will integrate resiliency measures into the designs, offering recommendations for further studies, modeling, and adherence to enhanced technical standards.

Additionally, the consultant will review and audit the designs prepared by ARA's hired consultant to ensure that resiliency aspects are effectively incorporated. They will assist the Albanian Road Authority in evaluating and approving the projects for priority bridges, confirming that the final designs meet current engineering standards and are resilient to climate change impacts. In the final design process, the firm engaged by ARA will incorporate structural assessments and climate data to ensure the bridges are both safe and durable. The ARA will provide the consultant with reports (where available) from the World Bank Resilience consultant for “Incorporating Disaster and Climate Risk Management into Albania’s Bridge Investments and Management System”

2.2. Specific Objectives

This consultancy envisages to;

- provide recommendations for the selection and prioritization of bridge investments advising on the inclusion of disaster and climate risk and
- review and verify that all DRM recommendations are incorporated into design studies (under preparation by a hired consultancy for design of priority bridges).

The primary objectives of this assignment are as follows:

- Perform a detailed risk assessment to identify and prioritize potential natural hazards that could impact the bridges, considering geographic environmental and climate factors.
- To conduct a site visit on a selected bridge, to evaluate the current structural designs of bridges to determine their ability to withstand natural disasters, such as earthquakes, floods and high winds.
- Produce draft designs comments that meet or exceed current national and international engineering standards for structural safety and reliability.
- Integrate climate resilience features into the draft and final design to ensure bridges can withstand extreme weather events and other climate-related impacts.

- Ensure the final designs result in bridges that maintain their functionality and safety over their intended lifespan, even under adverse conditions.

Key Objectives of the Resilient Bridge Design Audit are as follows:

- **Identify Vulnerabilities:** Pinpoint specific design and material weaknesses that could compromise the bridge’s resilience to climatic and environmental hazards.
- **Evaluate Resilience Measures:** Assess the adequacy of existing resilience features and suggest enhancements to better withstand future challenges.
- **Ensure Compliance:** Verify that the bridge design meets or exceeds local and international standards for resilience and safety.
- **Optimize Design for Future Conditions:** Recommend modifications to the bridge design that consider long-term climatic changes and potential natural disasters.

3. SCOPE OF SERVICE

3.1. Description of the Assignment

The Consulting firm shall perform the duties and obligations of “The Auditor” and be fully responsible for the audit of the priority bridge project design. This shall include undertaking all the necessary work to achieve a successful project, where all the comments related to disaster risk are reflected.

The Consulting firm shall, in general, in corporation with the other consulting firms hired by ARA exercise the full audit powers for incorporate in final design all the comments and data to make sure that the all the new bridge will be resilient of climate change and natural hazards.

3.2 Specific Activities

- Analyze existing information and create or update zoning maps for the main risks for bridge infrastructure. The consultant shall assess the collected information including the availability of zoning maps of the main hazards for priority bridge infrastructures in the Albanian road network. Since spatial analysis are important for the identification of risks, the consultant shall review existing zoning maps for the main risks for bridge infrastructure and update or create as appropriate to recommend their use for the incorporation of climate and disaster risk considerations in the design. The material “Climate Resilient Road Assets in Albania” 2019 (may be used to develop).
- **Structural Analysis and Load Testing Activity:** Conduct a detailed analysis of the bridge’s structural design, focusing on load-bearing capacities under normal and extreme conditions (e.g., earthquakes, heavy winds, floods). Purpose: Evaluate whether the bridge’s structural components (foundations, piers, superstructure) can withstand both anticipated and extreme loads.

- Hydraulic and Flood Risk Assessment Activity: Analyze the bridge’s hydraulic design and surrounding water bodies to assess the risk of flooding, scouring and erosion.
- Material Durability Testing Activity: Assess the materials specified in the design for their durability and performance under various environmental conditions, such as extreme temperatures, moisture and corrosion.
- Safety and Functional Design Review Activity: Review safety features (e.g., barriers, railings, lighting) and functional elements (e.g., drainage systems, expansion joints) to ensure they meet resilience standards.
- Seismic and Wind Load Analysis Activity: Perform a detailed analysis of the bridge’s design to evaluate its ability to resist seismic forces and wind loads, particularly in regions prone to earthquakes and strong winds.
- Design Standards and Compliance Check Activity: Review the bridge design against current local, national, and international standards for resilient infrastructure.
- Final Audit Report and Recommendations Activity: Compile all findings from the audit activities into a comprehensive final report.

4. IMPLEMENTATION TIMEFRAME AND DELIVERABLES

4.1 Deliverables

Deliverables	Percentage of Contract
Risk Assessment and Preliminary Findings	20%
Draft Detailed Design Audit	30%
Final Audit Report	50%

4.2 Preparation and Initial Assessment

- Kick-off Meeting and inception report: outlining the audits objectives, scope, methodology and timeline
- Collection and Review of Existing Documentation: preliminary review report identifying key areas of focus for the audit.
- Resilient Design Alternatives: Various resilient design options, including preliminary cost-benefit analysis
- Initial Risk assessment: Report and recommendation for areas requiring detailed analysis in the subsequent phases

4.3 Detailed Audit and evaluation

- Structural Resilience Audit: Identification of any design weaknesses or areas for improvement.
- Hydraulic and Environmental Assessment: Comprehensive report on the bridge's hydraulic performance, including flood risk analysis, erosion potential, and drainage effectiveness; Environmental impact audit focusing on the bridge's resilience to climate change impacts.
- Materials and Durability Review: Evaluation of materials used in the bridge design, assessing their durability and suitability under extreme climatic conditions.
- Safety and Functional Design Audit: Assessment of safety features, including barriers, lighting, and pedestrian access, ensuring they meet resilience standards; Evaluation of functional design elements, such as expansion joints, to ensure they can accommodate climatic variations.

4.4 Final Reporting and Recommendation

- Final Risk Management and Mitigation Strategy
- Final Audit Report

5. LOGISTICS AND DURATION OF THE ASSIGNMENT

5.1. Location

The assignment of the Consulting Firm's experts shall take place in the Tirana, where the Consulting Firm should ensure that its experts have the operational basis, in a decently arranged and self-equipped setting.

5.2. Commencement Date and Phases Implementation Period

The Consultant firm is expected to conduct the services for a maximum duration of five (5) months from Notice to Commence issued to the Consulting Firm offering the approximate level efforts of sixteen (16) man/months for essential staff.

The intended commencement date is November 2024, depending on completion of service contract award procedure.

6. REQUIRED QUALIFICATIONS AND EXPERIENCES

6.1. Consultant's Profile

The Consulting firm (which may be a single firm or a Joint Venture -JV) shall comply with the following qualifications:

- 1) The Consultant should be a qualified firm or JV with at least 10 years of national or international experience with projects in DRM auditing for both road and bridge, with a proven track record in completing successful projects similar scale and scope to the services described in these TOR.

- 2) The consulting firm should have successfully implemented at least 2 similar contracts within the last 5 years.

The consulting firms participating to the bid will be assessed in order to determine a shortlist comprising the most qualified candidates. The criteria to be used for shortlisting will be the following:

- Core business and years in business (30 points)
- Past experience in similar assignments (60 points)
- Firms organization and staffing (10 points)

6.2 Team Composition

In order to execute his obligations, the Consulting Firm shall provide suitable, experienced and qualified experts for the assignment with experience in works supervision, to provide sound advisory and technical services to the ARA/PIT and shall prepare a work program, and a corresponding manning schedule, showing the timing of activities and the corresponding staff input required for execution of the services.

All experts who have a crucial role in implementing the contract are referred to as key experts and their CVs should be submitted in the proposal. The CVs of Key experts will not be evaluated during the ranking process. They will be evaluated after the issuance of the Request for Proposal to the first ranked consultant.

The estimate of the key professional staff requirements is only indicative and could be construed as skill mix requirements for these Services. The Consultant shall employ only such key staff whose CVs have been approved by the ARA/PIT. In addition to the key personnel, the Consultant shall determine the support staff to assist with on-site supervision of the works.

The Consultant shall provide in the proposal duly signed CVs and copies of professional registration for all professional key staff including the duration in man-months during which the staff will be deployed under the Contract.

The working language of the project is English. Day-to-day communication language with the ARA/PIT will be either English or Albanian language.

6.3 Expert Requirements

- **KE 1: Team Leader - Structural Engineer:**
 - **Experience:** A minimum of 15 years of international experience in structural engineering, with experience in bridge design, design audit and construction.
 - **Qualifications:** A Master's degree or higher in Structural or Civil Engineering.
 - **Language:** Excellent Knowledge of English language (in speaking and writing)
- **KE 2: Disaster Risk Management expert**
 - **Experience:** A minimum of 10 years of relevant work experience in the natural hazards field, preferably dealing with hydro-geomorphological processes and ground

instability; and expertise on susceptibility/hazard analyses and risk assessment studies, preferred on road and infrastructures projects.

- **Qualifications:** A Master’s degree or higher education in the fields of natural sciences, engineering or technology, Certifications: Professional engineering, economics or related fields certification (e.g., PE, CEng).
- **Language:** Excellent Knowledge of English language (in speaking and writing)
- **KE 3: Geotechnical Engineer:**
 - **Experience:** At least 10 years of experience in geotechnical engineering, particularly related to bridge foundations.
 - **Qualifications:** A Bachelor’s degree in Geotechnical or Civil Engineering, with a preference for a Master’s degree.
 - **Language:** Excellent Knowledge of English language (in speaking and writing)
- **KE 4: Road/bridge designer**
 - **Experience:** The Road Design Engineer shall be a qualified Engineer with a relevant degree (BSc/MSc) in civil engineering. The Consultant shall have at least 10 years of relevant work experience in road and bridge.
 - **Qualifications:** A Master’s degree or higher in Civil Engineering with a preference for a Master’s degree in architecture.
 - **Language:** Excellent Knowledge of English language (in speaking and writing)

6.4 Estimated Input for Key Staff

The allocation of person-months for the respective phases of consulting services is as shown in Table below

Staffing		Number of staff	Total m/m
Key Staff			
KE 1	(Team Leader) Lead Structural Engineer	1	5
KE 2	Disaster Risk Management expert	1	4
KE 3	Geotechnical Engineer:	1	4
KE 4	Road/bridge designer	1	3
Total for Staff		4	16

7 SELECTIONS

Selection will be made in accordance with the CQS method set out in the World Procurement Regulations for IPF Borrowers under Procurement in Investment Project Financing Goods, Works, Non-Consulting and Consulting Services” dated July 1, 2016, revised on November 2017, August 2018 and November 2020. The contract will be lump-sum.

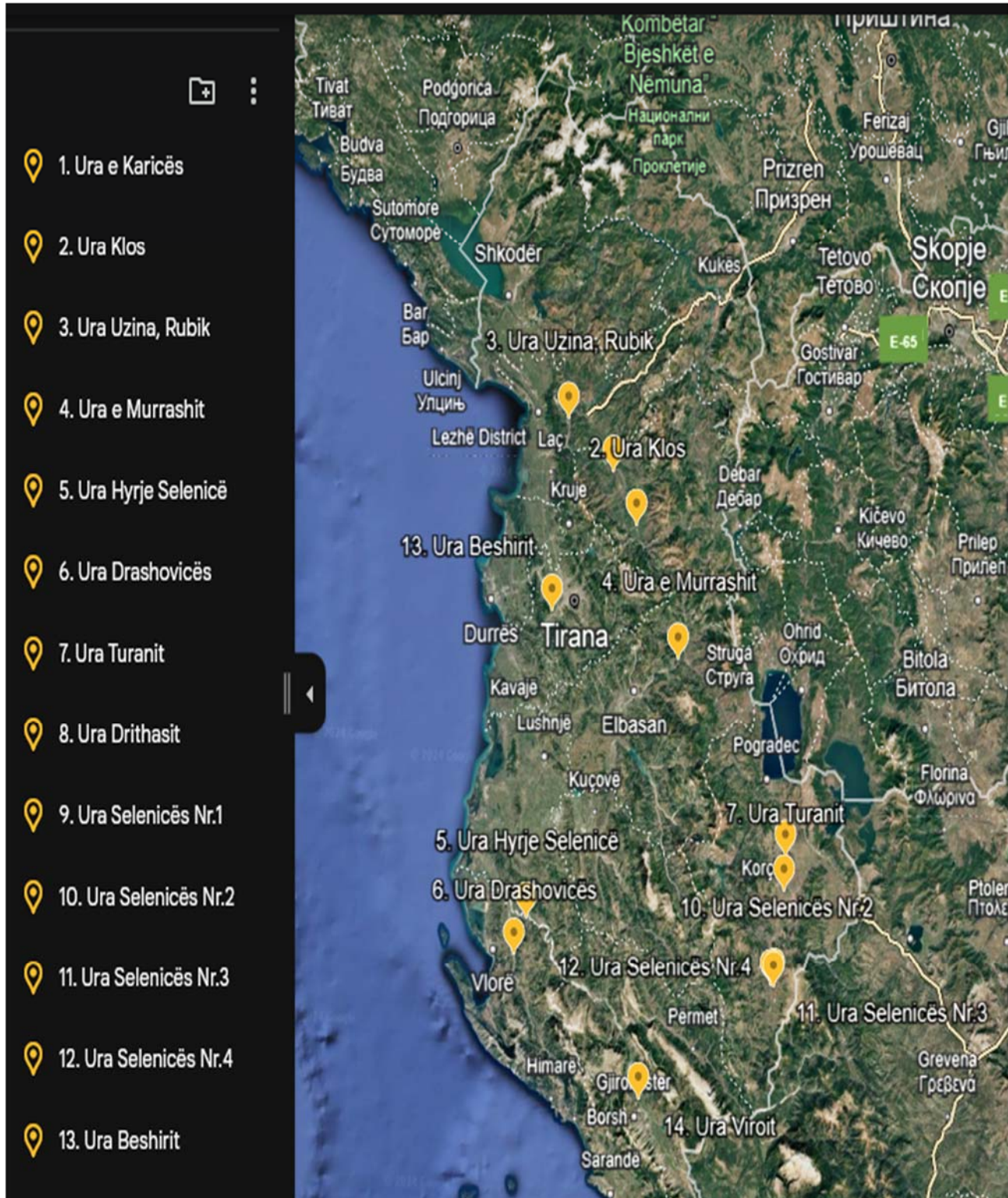
Annex A: List of priority Bridges

The following annexes provides detailed information about the priority bridges subject to the Disaster Management Risk (DMR) assignment:

No.	Name of Bridge	Coordinates		No. of Spans	Total Length (m)	Description
		Longitude	Latitude.			
1.	Lokaliteti Klos	20.09273	41.49753	3 (7m each)	21	Concrete slab on masonry piers and abutments
2.	Karica	19.98152	41.63609	2 (15m each)	30	Isostatic bridge, 10 main girders for each span. Central concrete pier with variable section and concrete abutments
3.	Uzina (Rubik)	19.78153	41.76416	5 (20m each)	100	Isostatic bridge, 5 main precast girders for each span. Concrete piers (2 columns and pier cap) and abutments
4.	Murashi	20.27369	41.18202	4 (20m each)	80	Isostatic bridge, 6 main girders for each span. Concrete wall piers (round nose) and abutments
5.	Ura hyrje Selenice	19.63543	40.53717	3 spans (10m each)	30	Concrete slab bridge on solid wall piers and abutments
6.	Ura e Drashovices	9.58434	40.44692	9 Spans (15m max)	96	Girder concrete bridge. Four main girders for each span. Concrete wall piers (sharp nose) and abutments.
7.	Ura e Turanit	20.73672	40.62261	5 spans (11m max)	51	Girder concrete bridge. Four main girders for each span. Concrete pier caps on square driven piles and abutments
8.	Ura e Drithasit	20.74105	40.70560	5 spans (11m max)	51	Girder concrete bridge. Four main girders for each span. Concrete wall piers (round nose) on square driven piles and abutments
9.	Ura Selenices Nr.1	20.69896	40.39391	2 Spans (6m each)	12	Two span continuous bridge, 3 main girders for each span with variable height (maximum on the pier and the abutments)
10.	Ura Selenices Nr.2	20.69890	40.39341	4 spans (6m each)	24	Four span continuous bridge, 3 main girders for each span with variable height (maximum on the pier and the abutments). Solid wall piers with round noses
11.	Ura Selenices Nr.3	20.69883	40.39298	4 spans (6 m each)	24	Girder concrete bridge. Four span continuous bridge, 3 main girders for each span with variable height (maximum on the pier and the abutments). Solid wall piers with round noses.
12.	Ura Selenices Nr.4	20.65898	40.38547	3 spans (6 m each)	18	Girder concrete bridge. Four span continuous bridge, Three main girders for each span with variable height (maximum on the pier and the abutments). Solid wall piers with round noses.
13.	Beshiri Bridge	19.72495	41.29356	6 spans (2x29.5 m + 4x30 m)	179	The new bridge to be constructed will feature six spans, comprising two spans of 29.5 meters each and four spans of 30 meters each, totaling a length of 179 meters. Additionally, the bridge will include two pedestrian pathways, each 1.0 meter wide.

Annex B – Bridge Location Map

This map provides a visual overview indicating the locations of priority bridges subject to DMR and their distribution along the Albanian National Road Network.



Annex C – List of documents Available

List of documents that ARA can provide to the consultant:

- Guidelines on how to incorporate resiliency aspects in the feasibility studies and final bridge infrastructure designs
- Guidelines for incorporating climate and disaster considerations into Albania's BMS
- Methodology for DLD's incorporation into Albanian's BMS and collected DLDs for long list of 100 bridges