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**Government of the People's Republic of Bangladesh  
Local Government Engineering Department  
Program for Supporting Rural Bridges (SupRB)**

**Terms of Reference (ToR)  
for  
Senior Bridge Maintenance Specialist (International)**

**1. Background of the Program**

Bangladesh is a densely populated country and more than 70% of the people live in the rural areas. To access to different social and economic centers and settlements, an extensive rural roads network has developed over the period. The total road network size of the country is roughly 375,000 km. This is equivalent to a road density of approximately 250 km per 100 sq. km. The total rural road network comprises just over 350,000 km (94% of the network). Upazila roads (UZRs) and union roads (UNRs) composed of respectively 11% and 12% of the rural road network. Over a quarter (30%) of the rural road network is paved, with 89% and 70% of the UZR and UNRs, respectively, are paved. The current inventory envisages that a bridge is required for every 4.5km of UZR and UNRs. Over four-fifths of these gaps now have structures, leaving a fifth of them to be bridged. But currently, the Government does not have any dedicated bridge construction and maintenance program. Nonetheless, none of the Development Partners are involved in rural bridge maintenance and rehabilitation activities.

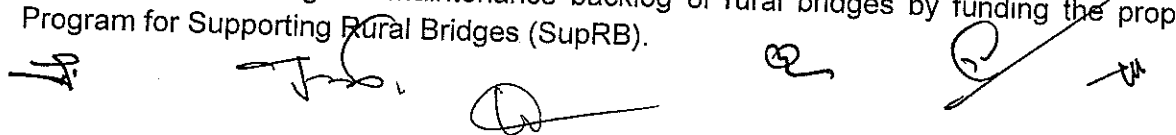
At present, only 23.89% of all rural roads in the Bangladesh are of acceptable quality, while 26.19% are in fair condition and in need of resealing, 22.76% are in poor condition and in need of rehabilitation and 27.17% are in bad condition and in need of upgrading.

To address this situation, Local Government Engineering Department (LGED) has launched the premeditated initiative to improve the quality of the local road network across the country, by providing both financial investments for capital outlay, as well as strengthening the governance processes so that field officials of LGED are themselves able to effectively plan, design, implement and maintain their road networks. The Program addresses the underinvestment in local roads, and improvement of local roads connectivity to increase economic activity, and improve public access to facilities and services.

Efficient, resilient, and well-planned road networks ensure that no one is left behind in the drive for inclusive growth. This is why roads are considered as an important foundation for the Sustainable Development Goals, and a prerequisite for bringing communities together.

Due to a shortage of funds, significant backlog exists in the maintenance of bridges on rural roads. Although the rural road maintenance budget has been steadily increased in the last ten years, it was not sufficient to manage the entire maintenance needs including bridge maintenance. In this context, the Government of Bangladesh has received a loan from the World Bank (WB) toward the cost of the program titled "Program for Supporting Rural Bridges (SupRB)".

The program will be implemented by the Local Government Engineering Department (LGED) through the Project Director's Office and contract administration of civil works will be carried out by LGED District/Upazila offices. The program will be implemented in total 61 districts out of 64 districts of the country, except three hill districts. World Bank has a commitment to contribute in reducing the maintenance backlog of rural bridges by funding the proposed Program for Supporting Rural Bridges (SupRB).



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The program Components include (i) Major and minor maintenance of 85,000 meters of bridges, rehabilitation of 24,000 meters of bridges, Capacity Expansion (Widened) of 5000 meters of rural bridges, replacement or newly construction of 20,000 meters of bridges, technical, fiduciary, procurement, social and environmental capacity improvement of LGED including design and implementation of climate resilient bridges and establishment and operationalize of Grievance Redress System (GRS). This program will provide continuous connectivity between agricultural production areas, growth centers and rural markets located in the program area and enhance earnings opportunities creating uninterrupted access to the commercial institution and basic services like health and education of the rural poor. The impact of the program will be reduced poverty in the intervention area.

The Program has two parts. Part-A is Program for Results (PforR) and Part-B is Investment Program Financing (IPF). PforR is output based and will be linked to the achievement of the Disbursement Linked Indicators (DLI). Program funds for Part-A (PforR) will be directly disbursed to the government treasury upon achievement and verification of results. The controller General of Accounts (CGA) will be responsible for maintaining the program accounts and reporting through iBAS/iBAS++ systems. Program funds for Part-B (IPF) will be directly disbursed to impressed account and report-based disbursements using interim unaudited financial reports will serve as basic withdrawal of funds from the IDA credit.

To manage the activities of the program one Senior Bridge Maintenance Specialist will be hired as individual consultant and will work within their respective LGED offices and are embedded in the LGED teams. Who will be the focal person to deliver capacity development interventions on bridge maintenance and management. It will be a short-term engagement with possibility for extension depending on the results of the interventions.

The overall objective of these consultants is to prepare and monitor the implementation of long and medium long-term bridge maintenance plans and work programs.

The consultant has a good understanding of bridge deterioration, works effects and economic development. S/he will work with computer systems or use paper systems with excel spreadsheet programs to forecast the deterioration of the bridges and to determine the most opportune moment to carry out the most appropriate maintenance operation.

LGED is in the process of developing software systems for managing the bridge assets. The adoption of these software systems will enable LGED to centralize the production of the Maintenance Rural Road Master Plans and rolling work programs.

The Dhaka based consultants will together form the Bridge Maintenance Coordination Team. The Bridge Maintenance Coordination Team will be embedded within the Bridge Maintenance Unit.

It will be responsible for the production of realistic strategic plan and guidelines for Bridge Management System of the country. The Maintenance Coordination Team works under the direct management of the Additional Engineer Maintenance. A Superintending Engineer shall manage the team on a day to day basis.

The Maintenance Coordination Team is responsible to:

1. Review the usefulness, appropriateness of Rural Bridge Information and Management System (RuBIMS), set standards for implementation of a modern Bridge Asset Management System (IT and modern Software base);
2. Controls that bridge maintenance work programs comply with the approved BMMPs;

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3. Quality control of the bridge maintenance work programs;
  4. Formulate and implement strategies to increase funding envelopes for bridge maintenance;
  5. Formulate new and revise DPPs, including executing the approval processes;
  6. Coordinate with donors (organize donor coordination meetings, prepare project proposals and so on).

## 2. Objective of the Assignment

The Senior Bridge Maintenance Specialist (International) is part of the Bridge Maintenance Coordination Team and shall manage the regional bridge maintenance engineers, national bridge maintenance specialists and junior bridge maintenance specialists. Together they will form the Bridge Maintenance Team. The Bridge Management Team is responsible for the production of the multi-year forward maintenance, rehabilitation and reconstruction work program. To achieve the foregoing, the engagement of a Senior Bridge Maintenance Specialist shall seek to achieve the following:

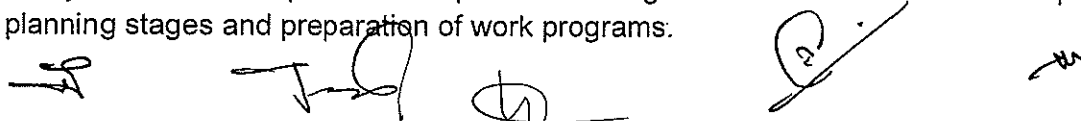
- (i) Address knowledge gaps on Bridge Asset Management among concerned engineers, working at head quarter and field level of LGED through the conduct of training activities and workshops;
- (ii) Build capabilities and cascade learning through the development and distribution of knowledge products, such as the Bridge Maintenance Management Manuals and Bridge Asset Management training modules and tools;
- (iii) Develop capacities of implementers through other interventions necessary towards adoption by BMU of Bridge Asset Management principles and practices;
- (iv) Preparation of the 5 year bridge maintenance work programs with annual updates; and
- (v) Developing LGED's technical and planning capabilities to prepare the 5 year bridge maintenance work programs.

## 3. Overall Scope of Services

The Senior Bridge Maintenance Specialist will be responsible for enhancing the capacity for Bridge Asset Management in Bangladesh by developing an understanding of the current capability of Bridge Asset Management, and then providing robust solutions primarily through effective training programs to resolve them effectively. The Sr. BMS will also be responsible for devising a suitable but low-cost Bridge Asset Management System for use by the LGED. S/he will also be responsible for integrating all bridge maintenance plans, work programs. S/he will also advise the DPD/XEN Maintenance (Bridge) regarding the production of the maintenance plans and work programs for small assets by the district offices.

Carry out load tests, non-destructive tests and back-calculations to be carried out. S/he shall prepare the tender documents, like specifications and TORs and review the technical proposals and EOs. S/he shall review these reports and conclusions to make adjustments to the five-year work programs as required.

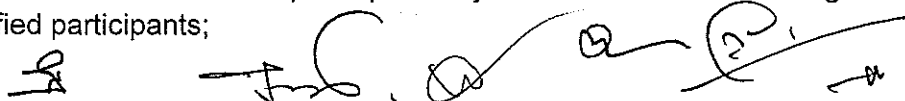
A key function is the prioritization process among the needs from the various Upazilas at all planning stages and preparation of work programs.



A key challenge is to ensure that the plans and work programs are financially sustainable and maximize the social and economic impact of the rural road network across the whole country.

The Senior Bridge Maintenance Specialist shall provide policy advice to the Additional Chief Engineer Maintenance and Superintending Engineer concerning includes, but not limited to, the following:

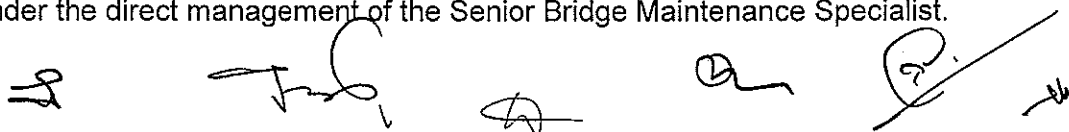
- Review LGED's current capabilities for bridge inventory and asset management and the methodologies and systems that are in use and identify weaknesses and strengths;
- Review the usefulness, appropriateness of Rural Bridge Information and Management System (RuBIMS), set standards for health inspection of bridges, implementation of a modern Rural Bridge Infrastructure Management System (IT and modern Software base);
- Identify various issues in implementation of Rural Bridge Information and Management System (RuBIMS) and prepare possible solutions to those issues;
- Identify and set standards for different types the Bridges and determine the Level of Services which will be affordable for LGED and its subsidiary offices to make it sustainable;
- Set standards for measuring the performance of RuBIMS and develop a performance mechanism including four types measures Input, Output, Outcome and Efficiency both qualitatively and quantitatively (Inspection, Data Collection, Data storage, Data Management, Analyses and Reporting);
- Prepare and pilot-test the Bridge Maintenance manual, training modules and tools on Bridge Maintenance for LGED, preceded by a draft Rural Bridge Infrastructure Maintenance framework;
- Prepare the bridge maintenance plans and work programs and integrating all maintenance plans, works programs etc.;
- Prepare Quality Control and Quality Assurance plan for schemes, implemented for bridge design, maintenance and construction;
- Comprise and update a disaster mitigation strategy (essentially flooding) component into the LGED's capability by close coordination with the Climate Change Adaptation consultants,
- Travel to collect field data, conduct reviews, monitor construction progress, conduct design meetings, and participate in public hearings;
- Carry out an economic evaluation of the preferred engineering solution identifies above to establish whether the proposed remedial works, or construction of an entirely new bridge, are economically justified;
- Determine the present, actual bearing capacity of the bridge, taking into consideration various load combinations, such as (i) a number of smaller loads (light goods vehicles); and (ii) one large load (a heavy goods vehicle train), and assuming the existing defects are repaired;
- Organize and conduct of trainings and related activities to build capacities on Bridge Maintenance to be participated by LGED's central level engineers and other identified participants;



- Organize and conduct of workshops and related activities to consolidate learning, suggestions and proposed enhancements on the manual, modules and tools on Bridge Maintenance;
- Advice LGED regarding improvements to the BMS especially regarding prioritizing maintenance needs due to budget constraint;
- Coordinate all aspects of the program with project stakeholders to inform and ensure the program is complementary in nature to the country-wide effort to achieve durable Rural Bridge Infrastructure;
- Develop bridge design, construction and maintenance standards to be applied to all bridgeworks within the LGED, including contributing to the bridge related items in the LGED Standard Technical Specification;
- Prepare recommendations for any proposed bridge replacement, major repairs and provision of new bridges including commissioning reviews of environmental, ecological, hydrological and social impacts of the proposals;
- Procurement of consultancy services required for inspection, feasibility studies and geotechnical, hydrological & topographical surveys of bridges;
- Carry out principle inspections on bridges constructed by others (including special projects) and reporting on their acceptability for inclusion in the LGED bridge stock;
- Ensure the management and maintenance of the Bridge Database (RuBIMS), including monitoring and checking data from annual bridge condition surveys, updating inspection procedures, data entry etc.;
- Provide support the concerned official in effective and timely response to emergency situations involving bridges (floods, cyclones, earthquakes and collapses);
- Assist with organizing and mobilizing donor assistance for Rural Bridge Maintenance;
- Carry out checks as instructed by the Superintending Engineer-Bridge Design Unit and after any necessary amendment sign the Design as Checked;
- Support concerned officer of LGED by improving efficiency of sector management including institutionalizing clear job description/responsibilities of LGED at central and region levels;
- Support concerned officer of LGED by strengthening rural bridge maintenance management systems to improve reliable road connectivity in the Upazilas;
- Support concerned officer of LGED by taking steps in case of large emergencies and natural calamities.

The Senior Bridge Maintenance Specialist (International) shall prepare training documents for LGED officials, national consultants and contractors that may in the future work on structure maintenance. These trainings may include activities but are not limited to condition monitoring, non-destructive tests, reversed structural engineering, BMS application, designing repair, rehabilitation and reconstruction options and their implementation. S/he will act as a resource person in training organized by LGED.

S/he will also act as a Master to LGED appointed apprentices. These apprentices shall work under the direct management of the Senior Bridge Maintenance Specialist.



#### 4. Duration of the Assignment

Total duration of the assignment will be 12 months at 3 times within 3 years. Duration of each time will be 4 month.

The target start and completion dates shall depend on the actual date of hiring and may change depending on finalization of LGED Bridge Maintenance Unit and other logistical considerations.

#### 5. Required Qualification and Experience

##### (a) Educational Qualifications:

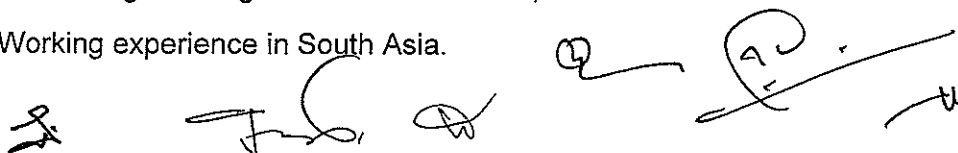
- B. Sc in Civil Engineering from any reputed University in Structural Engineering or Bridge Design or equivalent;
- Candidate with Masters Degree in Structural Engineering or Bridge Design, Construction Management or equivalent will get priority.

##### (b) Experience:

- Minimum 20 (twenty) years of overall experiences, out of which 10 (ten) years progressive relevant international and local experience rural bridge maintenance and management and at least 5 years of experience in inspection, inventory, M&E, management or similar assignment;
- He should have proven leadership and project management capability, personnel management and interpersonal skills, work skills in multi-disciplinary and multi-cultural team environments, excellent report preparation skills with computer literacy;
- With experience in writing manuals, policy papers, training modules and/or other technical writing work;
- Has demonstrated capacities in providing and facilitating capacity building interventions and technical assistance on Rural Bridge Maintenance and Management System;
- Excellent written and oral communication skills in English fluently.

##### (C) Appropriateness:

- Computer skill (MS word, Excel, Power point, etc),
- Recent Training Certificate in relevant areas,
- Experience with load rating, non-destructive test analysis and bridge inspection is preferred,
- Experience with setting up and managing of Rural Bridge Maintenance and Management System,
- Experience with developing training materials and providing training as well as conducting Training Needs Assessments,
- Working experience in South Asia.



## 6. Institutional arrangements

The individual Consultant will work directly with the Project director of the "Program for Supporting the Rural Bridge program" and support the officials of LGED at PMU especially RMRSU, LGED Headquarters, in order to achieve the objectives of the program.

## 7. Logistics and Facilities provided by Client

LGED may provide Computer/Laptop, printer and necessary consumables. LGED also provide office accommodation and necessary office support staff. All payments of necessary support staff will be made from specialist monthly payment as reimbursable item.

## 8. Reporting Requirements

The consultant's will submit the following reports to LGED:

- 8.1 Inception Report: Inception Report within 30 days of mobilization. The report will provide details for procurement activities with specific detail for the initial 12 months including work plan;
- 8.2 Half-Yearly Reports: summarizing briefly the accomplishment over the previous six months including details progress, capacity building and training, and consultant's activities, any issues and resolution of these, and a work plan for the following three months;
- 8.3 Annual Reports: Annual reports covering all details of the Quarterly Reports summarizing all activities to date, any issues and methods for resolution of these, and planning to achieve future targets, annual bridge maintenance work program;
- 8.4 Draft Task Completion Report: The consultant will submit the Draft Task Completion Report (DTCR) after completion of services but within two months of contract end; and
- 8.5 Final Task Completion Report: After approval of the Draft Task Completion Report (DTCR), the consultant will submit Final Task Completion Report (FTCR) within the contract period.

## 9. Expected Deliverables

- 9.1 Inception Report which includes relevant policies, guidelines and practices on bridge maintenance and management;
- 9.2 Draft Bridge Maintenance manual and Operational Manual for LGED;
- 9.3 Rural Bridge Maintenance Framework;
- 9.4 Training modules and tools for LGED on Bridge Maintenance;
- 9.5 Prepare bridge maintenance standards by compiling relevant international reputed standards.

