

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার

স্থানীয় সরকার প্রকৌশল অধিদপ্তর

“প্রোগ্রাম ফর সাপোর্টিং রুরাল ব্রিজেস” শীর্ষক প্রকল্প

আগারগাঁও, শেরেবাংলা নগর

ঢাকা-১২০৭।

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“শেখ হাসিনার মূলনীতি
গ্রাম শহরের উন্নতি”

স্মারক নং- ৪৬.০২.০০০০.৯২৭.১৪.০৮৬.১৯- ৪০৬

তারিখঃ ২৫/০৮/২০২১

প্রতি,

নির্বাহী প্রকৌশলী

স্থানীয় সরকার প্রকৌশল অধিদপ্তর

জেলা (৬১ টি জেলা)।

বিষয় : “প্রোগ্রাম ফর সাপোর্টিং রুরাল ব্রিজেস” শীর্ষক প্রকল্পের আওতায় (i) Rehabilitation (Additional Span Construction), (ii) Capacity Expansion, (iii) Replacement এবং (iv) New Construction ক্যাটাগরিভুক্ত ব্রিজের Digital Topographical Survey এবং Sub-soil Investigation প্রসংগে।

উপর্যুক্ত বিষয়ের প্রেক্ষিতে জানানো যাচ্ছে যে, “প্রোগ্রাম ফর সাপোর্টিং রুরাল ব্রিজেস” শীর্ষক প্রকল্পের আওতায় (i) Rehabilitation (Additional Span Construction), (ii) Capacity Expansion, (iii) Replacement, (iv) New Construction ক্যাটাগরিভুক্ত ব্রিজ সমূহের Detail ডিজাইন, ড্রইং এবং প্রাক্কলন প্রস্তুতের নিমিত্তে Appraisal Format এর পাশাপাশি Digital Topographical Survey এবং Sub-soil Investigation রিপোর্ট প্রয়োজন। এ লক্ষ্যে, Structural Review প্রতিবেদনের ভিত্তিতে শুধুমাত্র উল্লেখিত চার ক্যাটাগরিভুক্ত ব্রিজের ক্ষেত্রে RFQ পদ্ধতিতে সংযুক্ত ToR এবং প্রাক্কলনের আলোকে নিম্নবর্ণিত নির্দেশনা অনুসরণপূর্বক মানসম্পন্ন প্রতিষ্ঠান নিয়োগের মাধ্যমে Sub-soil Investigation ও Topographical Survey প্রতিবেদনসমূহ নির্বাহী প্রকৌশলীর সীল স্বাক্ষর সহ Hard Copy এবং Soft Copy প্রকল্প পরিচালক, SupRB এর দপ্তরে প্রেরণ নিশ্চিত করতে হবে।

- (১) সদর দপ্তর হতে প্রেরিত Priority List এবং জেলার Annual Maintenance Plan (AMP) এ অন্তর্ভুক্ত ব্রিজসমূহ এবং সংশ্লিষ্ট জেলার Structural Review Committee কর্তৃক Structural Review সম্পন্ন এবং রিপোর্ট চূড়ান্ত করার পর Structural Review Committee কর্তৃক সুপারিশকৃত কেবলমাত্র (i) Rehabilitation (Additional Span Construction), (ii) Capacity Expansion, (iii) Replacement এবং (iv) New Construction ক্যাটাগরিভুক্ত ব্রিজ সমূহের Sub-Soil Investigation এবং Digital Topographical Survey করতে হবে।
- (২) সংশ্লিষ্ট নির্বাহী প্রকৌশলীগণ তার জেলাধীন বিভিন্ন উপজেলার ব্রিজ নির্মাণের লক্ষ্যে ইতোপূর্বে সম্পাদনকৃত Sub-Soil Investigation প্রতিবেদন এর অভিজ্ঞতা বিবেচনা করে On land এবং In water এ বিভিন্ন গভীরতায় (Depth) প্রতি Boring এর ক্ষেত্রে একটি নির্দিষ্ট গভীরতা পর্যন্ত Boring এর একক দর নির্বাচনপূর্বক প্রাক্কলন প্রস্তুত করবেন।
- (৩) শুধুমাত্র ৬.০ মিটার এর উর্ধ্ব হতে ১০০.০ মিটার দৈর্ঘ্য পর্যন্ত ব্রিজের Digital Topographical Survey সম্পন্ন করতে হবে।
- (৪) Topographical Survey Map এ Channel/Khal এর ৩(তিন)টি Cross section (প্রস্তাবিত ব্রিজ সাইট, প্রস্তাবিত ব্রিজ সাইট হতে ১৫ মিটার Upstream এবং ১৫ মিটার Downstream) দেখাতে হবে এবং সংযুক্ত Sub-Soil Investigation এর ToR এ অনুচ্ছেদ (৪) অনুযায়ী প্রতিটি ব্রিজের জন্য Bore-hole layout চিহ্নিত করতে হবে।
- (৫) Sub Soil Investigation/Digital Topographic Survey কার্য সম্পাদনের সময় সংশ্লিষ্ট নির্বাহী প্রকৌশলীগণ তার উপযুক্ত প্রতিনিধির (কারিগরি জ্ঞানসম্পন্ন) উপস্থিতি নিশ্চিতসহ তারিখ উল্লেখপূর্বক সাইটের Colour Photograph সংরক্ষণ করবেন। যা পরবর্তীতে Report এ সংযুক্ত করতে হবে।

- সংযুক্তিঃ
- ১। ToR for Sub Soil investigation
 - ২। ToR for Topographical Survey
 - ৩। অনুমোদিত প্রাক্কলন (নমুনা প্রাক্কলন সহ)


(মোঃ আব্দুর রশীদ খান)
প্রধান প্রকৌশলী

ফোনঃ ০২-৫৮১৫২৮০২

pd.suprb@lged.gov.bd

অনুলিপিঃ

- ১। প্রকল্প পরিচালক, SupRB এবং অতিরিক্ত প্রধান প্রকৌশলী (চলতি দায়িত্ব), এলজিইডি সদর দপ্তর, ঢাকা।
- ২। অতিরিক্ত প্রধান প্রকৌশলী, এলজিইডি, বিভাগঃ (৮টি)।
- ৩। তত্ত্বাবধায়ক প্রকৌশলী, এলজিইডি, অঞ্চলঃ (১৯ টি)।
- ৪। তত্ত্বাবধায়ক প্রকৌশলী (ব্রিজ রক্ষণাবেক্ষণ/ ব্রিজ বাস্তবায়ন), এলজিইডি সদর দপ্তর, ঢাকা।
- ৫। নির্বাহী প্রকৌশলী, SupRB, এলজিইডি সদর দপ্তর, ঢাকা।
- ৬। উপজেলা প্রকৌশলী, এলজিইডি, উপজেলা (৪৫৬ টি)।
- ৭। প্রোগ্রাম টিম লিডার, এলজিইডি সদর দপ্তর, এলজিইডি, ঢাকা।
- ৮। BME/QCE, SupRB, এলজিইডি, অঞ্চলঃ (১৯ টি অঞ্চল)।
- ৯। FRE/SS, SupRB, এলজিইডি, জেলাঃ (৬১ টি জেলা)।
- ১০। সহকারী প্রকৌশলী (SupRB), এলজিইডি, জেলাঃ (৬১ টি জেলা)।

Government of the People's Republic of Bangladesh
Local Government Engineering Department
Agargaon, Sher-e-Bangla Nagar, Dhaka-1207.

**Terms of Reference
for
Sub-soil Testing Work for Bridge**

Name of the Project:

Name of Work:

Road Identification No. :

Bridge Identification No. :

Road Name :

Bridge Location Chainage on Road Link :

Upazila: District:

Background of the Program:

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 (PMU) 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 at a cost of USD\$614million.

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).

The specific project will require the services of the firm that will conduct detailed subsoil investigation of selected bridges sites to rationalize structural design for each bridge.

Objective:

The basic objectives of soil test is to:

- Find out the sub-soil condition of the selected bridges
- Find out soil bearing capacity of bridge site;
- Ensure safe bridge design

The sub-soil investigation firm shall have good reputation. The firm shall have its own soil testing laboratory and a professional Geotechnical Engineer registered in the Bangladesh Professional Engineers Registration Board (BPERB), Institute of Engineers Bangladesh (IEB).

The Sub-soil Investigation work shall be carried out following Standard Practices as stated below:

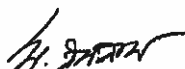
1. Prepare a work-plan showing the time schedule for conducting sub-soil investigation and submit the same to the Project Director and concerned Executive Engineer LGED.
2. Mobilize and start sub-soil investigation work with prior written information to Executive Engineer and Upazila Engineer.

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[Signature]

3. The sub-soil investigation equipment shall be checked by Upazila Engineer and Laboratory Technician. They will check dimension of Shelby tubes & functional capacity of auto release hammer, Liquid Limit of Bentonite Powder (LL>350) and the mix ratio (4%-6%) of Bentonite with water for preparation of Slurry.
4. The borehole layout plan should be shown in the Digital Topographical survey map in x, y, z Co-ordinate. The 'z' co-ordinate shall be in respect to SOB/PWD BM.
5. Conduct sub-soil investigation work using 100mm exploratory boring for SPT test and soil sample collection.
6. For single span Bridge at least two nos. and for multiple span Bridge at least three nos. bore-hole should be made.
7. Take at least 3 (Three) digital Photographs of each boring operation in presence of LGED's representatives and the firm's Engineer (Graduate Civil Engineer from Govt. accredited institution).
8. For each bore-hole, minimum depth of boring shall be 25m. if poor quality soil encountered (say SPT value<20) the depth shall be extended upto 35m or more. For soft soil regions the average SPT value for half of the bottom depth should be minimum 20.
9. Standard Penetration Test (SPT) shall be conducted in accordance with specified under ASTM D 1586. Normally SPT is taken @1.5m interval, but SPT must be taken @ 1m interval upto top 6m depth.
10. If clayey soil encountered at any depth during boring, undisturbed soil samples must be collected with the help of shelly tubes.
11. Soil sample collected by SPT spoon from each depth of the borehole must be divided into 02 (two) parts in sufficient quantity for laboratory test. One part must be preserved with proper tag in safe custody of the concerned Upazila Engineer (UE) and other part to be kept to the firm for performing laboratory tests.
12. The following laboratory tests must be carried out on the samples taken:
 - Unconfined compression for cohesive soil (C)
 - Direct shear (ϕ)
 - Grain size analysis,
 - Natural Moisture Content,
 - Atterberg Limits
13. All boreholes shall be properly logged and drawn showing the thickness of each layer, the color, the type and visual description of each layer, depth below the surface, depth of water level etc. Classification of soils shall be made in accordance with AASHTO M145
14. Submit an electronic (soft) copy and two (2) hard copies of preliminary/draft Soil Test Report. The following information shall be included within the report.
 - Description of soil investigation work
 - Geological background of area investigated
 - Detailed description of the manner, in which the drillings, in-situ tests and laboratory tests have been carried out
 - Summary of investigation results
 - List of coordinates, elevation and depth of boreholes
 - Borehole location maps
 - Taking 3(Three) cross-sections of the channel/Khal (i) Along the center line of the proposed bridge alignment (ii) 15m ahead from the proposed bridge alignment at upstream and (iii) 15m ahead from the proposed bridge alignment at downstream. Spot levels on channel/Khal cross section to be taken at 3.0m intervals.
 - Borehole logs; Bore log shall contain N-Value, soil type, Water table Level (RL), EGL (SOB/PWD BM) of Borehole Top, Date & time of commencement and completion of each borehole shall be mentioned clearly and duly signed by the Upazila Engineer or his representative.
 - Soil Profiles



- Photos of drilling and testing sites
- Soil Bearing Capacity, Pile bearing Capacity

15. A technical presentation by the firm may be required as per instruction by the competent authority of the department for review and comment.
16. On approval of the preliminary/draft report by the competent authority of the department, an electronic (soft) copy and three (3) hard copies shall be submitted covering all the information as required in preliminary/draft report with the modifications or additional data suggested by the department.

Duration of the Assignment:

The duration of the assignment may 15 days.

Facilities to be provided by XEN, LGED:

- Necessary data and information.
- Identification of location and area for the bridge.
- Necessary checking and inspection.
- All necessary co-operation and suggestion for the assignment.

Submission requirement:

- 1 copy draft report and 4 copies Final Soil Test report.



Government of the People's Republic of Bangladesh
Local Government Engineering Department
Agargaon, Sher-e-Bangla Nagar, Dhaka-1207.

**Terms of Reference
for
Digital Topographical Survey for Bridge**

Name of the Project:

Name of Work:

Road Name:

Road Identification No. :

Bridge Identification No. :

Bridge Location Chainage on Road Link :

Upazila:

District:

Background of the Program:

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 (PMU) 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 at a cost of USD\$618million.

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).

The specific project will require the services of the firm that will conduct detailed Digital Topographical Survey of selected bridges sites to rationalize structural design for each bridge.

Scope of work:

The scope of work will include, but not limited to, the following:

1. Detailed topographic survey by using Real Time Kinematic Global Positioning system (RTK-GPS) and Total Station. Latitude, Longitude and altitude (X, Y, Z) values of all points need to be taken at 4 m interval with an accuracy of at least 10 cm in both horizontal and vertical;
2. Use of well-known brand equipment will be preferred (for example Trimble/ Leica/ Sokkia/ Spectra Precision/ Ashtech);
3. A north direction shall be prominently shown.
4. All the physical features, such as road network, ponds, permanent structures, drains, hills, wells shall be shown at their exact locations.
5. (a) One river/ channel/ khal cross section to be exclusively taken along the center line of the proposed bridge alignment and other sections at distances of 0.5, 1, 1.5 and 4 times channel widths at upstream and at distances of 0.5, 1 and 1.5 times channel widths at downstream. Spot levels on river cross section to be taken at 3.0m intervals or as necessary.
(b) The length of each cross section should cover the full channel width(minimum 100m) plus same length of left & right banks.
4. Road cross sections to be taken along approach road at both ends of the proposed bridge. Four road sections at each end of the bridge @25m interval shall be taken. Spot levels on road cross sections to be preferably taken at 1.0m interval.
5. Bank line survey of both sides of the channel shall be carried out minimum 300m towards upstream and downstream of the river course way.
6. All details within the area as instructed by the client to be surveyed which shall show summarized information about road alignment, side slope, bridges, homesteads, government/ non-government offices, Important or historic buildings or structures, trees, electrical installations markets, community center and other public places.
7. Sufficient spot levels to be taken at the rate of one per 16sqm area i/c river bank, road edges and embankment toes.



8. HFL need to be provided with reference to the PWD/SOB Bench Mark (BM).
9. All RLs to be taken with respect to SOB/PWD Bench mark available near by the bridge site and location of TBM to be clearly shown on the map.
10. All survey data to be submitted in an appropriate electronic form suitable for inputting in to design software being used by the Engineer.
11. Survey data must be prepared in GIS shape file using Bangladesh Universal Transverse Mercator **BUTM** projection system where X,Y,Z values of the all features and necessary attribute information (such as name, type etc.) need to be provided;
12. Survey data shall also be submitted in print format **(with seal and signature)** with suitable text in a **suitable scale** as required by the Engineer, showing all the topographical features surveyed, spot levels with x, y, z, such that these can be used to establish Digital Terrain model (DTM).
13. Three permanent spots near each bridge site shall be marked with Global Co-ordinates (Longitude & Latitude) and Elevation.
14. Digital photographs at daylight condition shall be provided which shall show, Canal/River/khal/approach/access road to the site and other important features around the site.
15. Co-ordinate (longitude & latitude) of both ends of all cross section of Roads and River/Canal/khal shall be shown on Topographic Survey Map. A satellite photograph (taken from Google earth) shall be provided and these co-ordinates shall also be identified properly on it.
16. Total job shall be carried out up to the satisfaction of the Design Unit, LGED.
17. In addition to the above requirements if any other special parameters are needed for a particular project site that shall be invariably incorporated.
18. Before submission, the topography map and physical feature map need to be duly checked and signed by the concerned local official of LGED.

Eligibility Capacity:

The consulting firm would need to have field experience in digital topo survey and production of digital maps at least 5 years including having sufficient experiences of preparation of GIS database with topo survey information.

Duration of the Assignment:

The duration of the assignment will be 15 days.

Facilities to be provided by XEN, LGED:

- Necessary data and information.
- Identification of location and area for the bridge.
- Necessary checking and inspection.
- All necessary co-operation and suggestion for the assignment.

Deliverables:

(I) Softcopy

- GIS format data of topographic survey
- Digital Elevation Model (DEM)
- All survey data in digital format (such as CAD etc.)

(II) Hard copy report-3 sets including following maps (Map shall be in A3 paper):


- Features Map (GIS & CAD format)
- Dimension map of all features in CAD format
- Spot level map of survey area in CAD format
- Map of Digital Elevation Model of survey Area in GIS format
- Contour Map of survey area in GIS format
- Google Earth image covering area of the bridge
- Photograph both printed and soft copy in JPEG format


H. HART

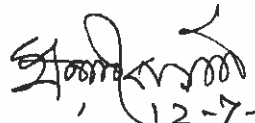
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Unit Rate for Sub-soil Investigation of Bridges under "Program for Supporting Rural Bridges"

Item no.	Brief Description of Item	Unit	Rate(Tk)
SupRB-01	<p>Sub-soil investigation at the actual locations of each abutment and pier positions in accordance with the specifications of ASTM D 1586 and D 1587. The bore holes shall have a minimum diameter of 100mm and shall be lined throughout and shall be minimum 25m to 45m deep or to a depth as specified in the ASTM/ AASHTO or as directed by the E-I-C from the existing GL and taking all cautions and steps to collect the disturbed and undisturbed samples and making the bore holes. The item is inclusive of mobilization & demobilization, proper method of borings, arrangement of boat/barge all cost of materials, labourers, field and laboratory tests including report and records. (The Testing Party will be selected taking prior approval of Procuring Entity)</p> <p>[Attached Terms of Reference(ToR), Version: July, 2020]</p>	No.	
	(a) Test on Ground Surface		
	i) Up to 25 m depth		33,919.00
	ii) Up to 30 m depth		35,049.00
	iii) Up to 35 m depth		36,224.00
	iv) Up to 40 m depth		37,647.00
	v) Up to 45 m depth		38,933.00
	(b) Test under water		
	i) Up to 25m depth		60,500.00
	ii) Up to 30m depth		61,632.00
	iii) Up to 35m depth		62,808.00
	iv) Up to 40 m depth		64,230.00
	v) Up to 45 m depth		65,516.00


 মোঃ এনামুল হোসেন
 পরিচালক (SupRB)


 12/07/20
 মোঃ রেজাুল করিম
 নির্বাহী প্রকৌশলী (SupRB)


 12-7-20
 (মোঃ শাহজাহান মোল্লা)
 প্রকল্প পরিচালক (SupRB)