



TERMS OF REFERENCE

CONSULTING SERVICES FOR GEOTECHNICAL INVESTIGATION AND DETAILED ENGINEERING DESIGN OF A STEEL PEDESTRIAN BRIDGE ALONG TULLAHAN RIVER CONNECTING BARANGAY NORTH FAIRVIEW AND STA. LUCIA

I. RATIONALE/BACKGROUND OF THE STUDY

Pedestrian mobility and safety are essential aspects of modern infrastructure. In many areas, the lack of safe and reliable crossing facilities contributes to traffic congestion, increased accident risks, and limited accessibility for pedestrians. To address these concerns, the Quezon City Government (QCG) intends to develop a Detailed Engineering Design (DED) for a Steel Pedestrian Bridge across the Tullahan River, connecting Barangay North Fairview and Barangay Sta. Lucia. This project aims to provide a secure, accessible, and long-lasting crossing solution for all users.

The new pedestrian bridge will enhance safety, improve connectivity between communities, and offer a durable, low-maintenance structure that aligns with engineering best practices and standards. To achieve this, QCG seeks to engage a qualified consulting firm to conduct the necessary studies, assessments, and designs to develop a comprehensive and cost-effective engineering plan for the proposed bridge.

The consultancy services will include a detailed site assessment, structural and geotechnical investigations, preparation of technical drawings, cost estimation, and tender documentation. The final design must comply with national and international engineering standards, ensuring a safe, efficient, and sustainable solution for pedestrian mobility.

II. PROJECT DESCRIPTION

The existing pedestrian hanging bridge across the Tullahan River, connecting Barangay North Fairview and Barangay Sta. Lucia, has long served as a vital crossing for residents, particularly students who rely on the bridge daily to get to their respective schools. However, due to years of wear and exposure to harsh environmental conditions, the bridge has become dilapidated and structurally unsafe for continued use.

The situation has worsened following the impact of a recent strong typhoon, which caused significant damage to the structure. During such extreme weather events, the rising water levels of the Tullahan River pose a serious risk to the bridge's integrity, further compromising pedestrian safety. The increasing vulnerability of the existing bridge underscores the urgent need for a new, more resilient, and structurally sound pedestrian crossing.

In response to these concerns, the QCG is initiating the development of a Detailed Engineering Design (DED) for a Steel Pedestrian Bridge to replace the damaged structure. The design will take into account structural stability, and long-term maintenance requirements to prevent future damage and enhance resilience against natural disasters.



The Detailed Engineering Design (DED) will provide the necessary technical specifications, structural analysis, and construction requirements for the new steel pedestrian bridge. It will ensure compliance with national and international engineering standards while addressing site-specific conditions, including seismic and hydrological impacts, and structural load considerations.

III. SCOPE OF WORKS

A. OBJECTIVES

The QCG intends to engage the services of a consulting firm to conduct a site assessment, geotechnical investigation, and structural analysis and to prepare a Detailed Engineering Design (DED) for a Steel Pedestrian Bridge to replace the existing dilapidated hanging bridge along Tullahan River.

The general objectives of the project are:

- I. To explore the sub-surface conditions of the area and provide general data relating to the project.
- II. To analyze the data obtained and give engineering consideration and recommendation on the selection and design of foundation.
- III. To prepare detailed geotechnical investigation for the preparation of the foundation
- IV. To provide a detailed sub-soil technical report.
- V. To provide a design that is effective, cost efficient, and in accordance with the latest National Building Codes of the Philippines, National Structural Codes of the Philippines, DPWH guidelines and other relevant codes and standards.
- VI. To ensure a safe and reliable structure for the residents will be using the steel bridge.

B. SCOPE OF CONSULTANCY SERVICES

The Consultant shall perform required engineering services for the preparation of the following:

A. Site Assessment

The Consultant shall conduct site survey including staking, establishing of horizontal and vertical control points, benchmarks and topographic surveys of the site.

The Consultant shall have inspected the site of works and its surrounding and orient himself pertaining the project - location and nature of work; climatic conditions; nature and condition of the terrain; geological conditions at the site; transportation and communication facilities; availability of materials, labor, water, electric power and roads; the locations and other factors that may affect the cost, duration and execution of the work.



B. Conduct Soil Boring Tests, Laboratory Analyses and Preparation of 1) Soil Investigation Report, and 2) Geotechnical Evaluation Report for the site.

The works involved here shall be conducted in three (3) stages-Field Data Gathering; Laboratory Analyses; and Report Writing.

a. Field Investigation/Data Gathering

I. Borehole Location

The geotechnical investigation shall also include a geotechnical assessment of the site with at least two (2) boreholes to be taken at each bridge support.

Additional boreholes shall be drilled when there is a significant difference between boreholes or in areas where subsurface condition is complex or variable. This shall be made upon the instruction of the Geotechnical Engineer.

II. Borehole Depth

If foundation type has not been specified, boring shall be carried out to a minimum depth of 20 m in ordinary soil or to 3 m into sound rock if rock is encountered above the depth. In case bearing layer is encountered and/or upon the instruction of the geotechnical engineer.

III. Procedure

- i. Depth drilling with Standard Penetration Test (SPT) shall be conducted at the left side, right side and center of the span of each building at a distance that varies depending on the span of the building. Minimum Depth shall be determined based on confirmation of hard strata or bed rock. Drilling can be stopped after three (3) meters into hard strata or bed rock.
- ii. The consultant shall perform analysis and testing on disturbed and undisturbed soil samples. These analysis and testing shall be performed in accordance with AASHTO and ASTM standards.
- iii. The soil samples for foundation design shall be tested for the determination of the main characteristics (grain size distribution and classification, moisture content, Atterberg limits, etc.)
- iv. Submit design recommendation, foundation condition scheme, bearing capacity and settlement, groundwater table, hydrological influences, excavation stability, seismic design considerations and liquefaction potential.
- v. Geological structure, especially active faults which might traverse the area, should be delineated and potential mass movement areas should be identified. Analysis for liquefaction potential during earthquake and consolidation due to soft ground should be included.



IV. Handling of Core Samples

The consultant shall provide all the materials, equipment and labor necessary for preserving samples.

b. Laboratory Testing

The preparation of samples for testing shall be made in accordance with AASHTO. The following tests shall be made on samples obtained from boring and drilling.

1. Standard Penetration Test

C. SUBMITTALS

The Consultant shall submit the following:

- | | |
|---|--------|
| • Site Investigation and Survey | 2 Sets |
| • Material Test Results | 2 Sets |
| • Geotechnical Investigation Report | 2 Sets |
| • Design Calculations, Technical Specifications | 5 Sets |
| • Structural Drawings (A3)
Duly Signed and Sealed by a Structural Engineer | 2 Sets |
| • Bill of Quantities/Cost Estimates | 2 Sets |
| • Electronic files of each document | 1 Set |

D. OWNER PROVIDED ITEMS

In the execution of the work, the following items shall be provided by the QCG:

- Clearance in surveying the building, and access to various parts of the building; and
- Building technical personnel to provide site assistance and support throughout the duration of the site works.

E. CHANGES

All instructions for revisions to the drawings and other documents shall be authorized and issued under Quezon City Department of Engineering (QCDE).

Revisions to the drawings and other documents, at no fault of the CONSULTANT, during any Phase that will substantially affect the scope of the delivery of the services, as determined and agreed upon by both parties, shall be implemented by the CONSULTANT within the corresponding and reasonable extension of the period concerned at no additional cost to the QCG.

Major revisions may be pursued as a separate contract subject to the applicable provisions of the IRR of RA 12009.



IV. PROJECT STANDARDS AND REQUIREMENTS

i. KEY PERSONNEL – QUANTITY AND QUALIFICATIONS

The Consultant shall provide the following key staff positions:

I. STRUCTURAL ENGINEERING TEAM:

- **Principal Structural Engineer** – One (1) Registered Civil Engineer with at least fifteen (15) years of experience in the field of Structural Engineering. Must be an active member of ASEP (Association of Structural Engineers of the Philippines) and have completed at least five (5) similar structural investigation and retrofitting projects.
- **Senior Structural Engineers** – At least two (2) registered Civil Engineers with at least fifteen (15) years of experience in the field of Structural Engineering. Must be an active member of ASEP (Association of Structural Engineers of the Philippines) and have completed at least five (5) similar structural investigation and retrofitting projects.
- **Junior Structural Engineers** – At least two (2) registered Civil Engineers with at least five (5) years of experience in the field structural engineering, and should have completed at least five (5) similar structural investigation and retrofitting projects.

II. GEOTECHNICAL ENGINEERING TEAM:

- **Senior Geotechnical Engineer** – One (1) Registered/Licensed Civil Engineer with specialization in the field of geotechnical engineering and with at least ten (10) years of experience in the field of geotechnical investigation.
- **Geotechnical Engineer** – One (1) Registered Civil Engineer specializing in Geotechnical Engineering, with at least five (5) years of experience in geotechnical investigation.

III. DRILLING & FIELD INVESTIGATION TEAM:

- **Drilling Rig Supervisor** – One (1) individual with a recognized certificate (e.g, TESDA Crane Operator (NC II) National Certificate Level II) or equivalent, and at least one (1) year of experience in geotechnical investigation.
 - **Drilling Rig Operator** One (1) individual with a recognized certificate (e.g, TESDA Crane Operator (NC II) National Certificate Level II) or equivalent, and at least one (1) year of experience in geotechnical investigation.
 - **Drilling Rig Crew** – One (1) individual with a recognized certificate (e.g, TESDA Crane Operator (NC II) National Certificate Level II) or equivalent, and at least one (1) year of experience in geotechnical investigation.

IV. SUPPORT STAFF:

- **Surveyor** – One (1) licensed Geodetic Engineer (if surveying is required for structural/geotechnical assessments).
- **CAD Technician** – One (1) individual with a recognized certificate (e.g., TESDA Technical Drafting (NC II) National Certificate Level II), and at least one (1) year of experience in AutoCAD, Revit, or



equivalent software for preparing engineering drawings.

Notes:

i. Software Requirements:

The Consultant shall have complete computer facilities and related software for structural and geotechnical analysis. All structural modeling, analysis, and design shall comply with the latest edition of the National Structural Code of the Philippines (NSCP) and other applicable international standards.

The Consultant shall use structural engineering software that allows the application of NSCP design parameters for seismic, wind, and structural load analysis. The following industry-standard software, or equivalent, shall be used:

- Structural Analysis & Seismic Design: ETABS, STAAD, SAP2000, or other software capable of applying NSCP load combinations, seismic parameters, and structural design requirements.
- Geotechnical Analysis & Foundation Design: PLAXIS, GeoStudio, or equivalent software for soil-structure interaction, slope stability, and foundation design.

All computational models and simulations shall be accurate, well-documented, and verifiable to support design decisions in compliance with the latest NSCP.

ii. Field Surveys & Investigations:

- The Consultant shall provide the necessary staff and equipment to conduct all required field surveys, geotechnical investigations, and structural assessments to ensure the accuracy and integrity of the analysis.

ii. Deliverables

The Consultancy Services shall prepare three reports in three copies each that shall serve as supporting documents in their billing statement: (1) Inception Report; (2) Soil Investigation and Geotechnical Study Report for all proposed sites; and, (3) Structural Analysis and Design for each proposed building.

a. Inception Report (15%)

The Consultant is required to submit one (1) month after commencement of services. It shall outline a detailed work program and briefly describe the methodology and project schedule (GANTT and S-Curve) proposed to meet the terms of reference. The report shall include the initial findings as well as preliminary layout of the forms to be used for various investigations and calculations. Inception Reports shall be submitted in soft-bound copy with title of the report written at the spine.



b. Soil Investigation and Geotechnical Study Report (35%)

The Consultant shall prepare the final report in 3 bound copies to be submitted after the completion of consulting services/works. It shall include, but not be limited to the following:

- I. Field Investigation and Methodology
- II. Borehole Drilling and Sampling
- III. Laboratory Testing
- IV. Regional Geology
- V. Vicinity Maps in scale of 1:50,000
- VI. Final Boring Logs (BL)
 - i. Job, boring, hole number, date, time, boring/drilling foreman and supervisor
 - ii. Weather condition
 - iii. Depth of water level
 - iv. Method of penetration and flushing system -Description of soil strata encountered
 - v. Depth of soil boundaries
 - vi. Size, type and depth of samples and sample number
 - vii. Type and depth of in situ test
 - viii. Standard Penetration Tests Resistance, 'N' values
 - ix. Detailed notes on boring/drilling procedure, casing sizes and resistance to driving, description of wash water or spoil from boring/drilling tools
 - x. Depth of boring
 - xi. Other relevant information such as RQD, percent core recovery, etc.
- VII. Final Laboratory Test Results (FLTR)
- VIII. Borehole Location Plan in scale of 1:250
- IX. Soil Profile along structures showing boring/drillings logs
- X. Recommendations if called for, such as type of proposed countermeasures/structures to address geological/geotechnical problems and foundation type.
- XI. Other relevant data
 - i. Photographs showing the borehole drilling and sampling at each proposed site shall be taken by the Consultant and form part of the report. The photographs to be taken shall depict the following:
 - Equipment used
 - Core drilling operation
 - Water level measurements
 - Performance of SPT sampling
 - All cores and SPT sample placed in core boxes
 - Date photographs were taken
 - Location or station



c. Structural Analyses and Design (50%)

The design and specifications shall conform to, but shall not be limited to the following standards set by the:

- I. National Building Code of the Philippines (NBCP), latest edition
- II. National Structural Code of the Philippines (NSCP), latest edition
- III. ASEP Earthquake Design Manual
- IV. ASEP Handbook on Computer-Aided Analysis and Design of RC Buildings
- V. ACI-318 2014, Building Code requirements for Structural Concrete

With respect to the actual implementation, applicable rules and regulations prescribed by the following agencies/and or embodied in the following shall be observed:

- I. Department of Public Works and Highways
- II. Department of Education
- III. Bureau of Fire Protection
- IV. Applicable Building Laws in the Province of Bataan/Local Government Unit

V. PROJECT DURATION

The Consultant's contract period for undertaking the geotechnical investigation and structural analysis is 60 calendar days and the Consultant shall commence work upon receipt of Notice to Proceed (NTP)

A. Schedule of Activities

Activities	Days					
	1-10	11-20	21-30	31-40	41-50	51-60
Site Assessment						
Inception Report						
Drilling						
Laboratory						
Soil Investigation and Geotechnical Report Writing						
Structural Analysis and Design						

The project must be completed in **SIXTY (60) CALENDAR DAYS**, starting upon issuance of the Notice to Proceed. A detailed schedule of work and activity plan shall be prepared and submitted together with the Consultant's Proposal.

No Price Adjustment

The project cost shall be fixed and there shall be no price adjustments applicable for the duration of the contract except when the operations costs are increased by more than 10% as a result of any extraordinary circumstances as determined by the National Economic Development Authority (NEDA). Pursuant to the provisions of RA 12009 and its IRR on contract price escalation, all contract price escalation shall be approved by the Government Procurement Policy Board (GPPB).



VI. APPROVED BUDGET FOR THE CONTRACT

The approved budget is shown below in respective to phase(s) which includes the cost of all taxes, such as but not limited to value added levies and duties. Any and all taxes, charges, imposts and other legal exactions due or that may become due under this contract shall be for the account of the contractor / Consultant. The Implementing Agency shall withhold applicable withholding taxes, if any, from its payment to the Contractor/Consultant in accordance with the requirements of the law.

SCOPE OF WORKS	BUDGETARY ESTIMATES (PHP)	DURATION (CALENDAR DAYS)
1. Site Investigation and Survey	8.33%	5
2. Geotechnical Investigation (2 Boreholes)	25.00%	15
3. Structural Design Analysis and Calculation		
4. Structural Drawings	50.00%	40
5. Technical Specifications		
6. Bill of Quantities/Cost Estimates		
7. Construction Support		
8. Attendance to Coordination Meeting / Assistance during Construction Phase / Approval of Shop Drawing	16.67%	As Needed
GRAND TOTAL	100.00%	

The Approved Budget for the Contract is **SIX HUNDRED THOUSAND PESOS ONLY (Php 600,000.00)** inclusive of all government taxes/fees.

VII. BID EVALUATION METHODOLOGY

For the purpose of procuring the services of Consultant / Contractor for this undertaking, the New Government Procurement Act (Republic Act No. 12009) shall govern. An "Instruction to Bidders" (ITB) shall be issued detailing the requirements and procedures as provided in the IRR, which includes the following:

a. Quality-Cost Based Evaluation/Quality-Based Evaluation

Quality-Based Evaluation Procedure

- i. A two-stage procedure shall be adopted whereby each consultant shall be required to submit his technical and financial proposals simultaneously in separate sealed envelopes.
- ii. After receipt of bids, the technical proposals shall first be opened and evaluated. The BAC shall rank the consultants in descending order based on the numerical ratings of their technical proposals and identify the



- Highest Rated Bid: Provided, however, That the Highest Rated Bid shall pass the minimum score indicated in the Bidding Documents.
- iii. The HoPE shall approve or disapprove the recommendations of the BAC within two (2) calendar days after receipt of the results of the evaluation from the BAC.
 - iv. After approval by the HoPE of the Highest Rated Bid, its financial proposal shall then be opened. The BAC shall, within three (3) calendar days, notify and invite the consultant with the Highest Rated Bid for the opening of financial proposal for the purpose of conducting negotiations with the said consultant. In the letter of notification, the BAC shall inform the consultant of the issues in the technical proposal the BAC may wish to clarify during negotiations.
 - v. Negotiations shall be in accordance with Section 33.2.5 of the IRR of RA 9184: Provided, That the amount indicated in the financial envelope shall be made as the basis for negotiations and the total contract amount shall not exceed the amount indicated in the envelope and the ABC as stated in the Bidding Documents.

Quality-Cost Based Evaluation Procedure

- i. The technical proposal together with the financial proposal shall be considered in the evaluation of consultants. The technical proposals shall be evaluated first using the criteria in Section 33.2.2 of the IRR of RA 9184. The financial proposals of the consultants who meet the minimum technical score shall then be opened.
- ii. The financial and technical proposals shall be given corresponding weights with the financial proposal given a minimum weight of fifteen percent (15%) up to a maximum of forty percent (40%). The weight of the technical criteria shall be adjusted accordingly such that their total weight in percent together with the weight given to the financial proposal shall add to one hundred percent (100%). The exact weights shall be approved by the HoPE upon the recommendation of the BAC and indicated in the Bidding Documents. The BAC shall rank the consultants in descending order based on the combined numerical ratings of their technical and financial proposals and identify the Highest Rated Bid.
- iii. The HoPE shall approve or disapprove the recommendations of the BAC within two (2) calendar days after receipt of the results of the evaluation from the BAC.
- iv. After approval by the HoPE of the Highest Rated Bid, the BAC shall, within three (3) calendar days, notify and invite the consultant with the Highest Rated Bid for negotiation in accordance with Section 33.2.5 of the IRR of RA 9184, except for the financial proposal under item (e) thereof.



b. Shortlisting Requirement

i. Minimum Eligibility Score

The minimum Eligibility Score is 70%.

ii. Number of Consultant/s to be Shortlisted

The BAC shall draw up the short list of consultants from those who have been determined as eligible in accordance with the provisions of this IRR. The number of short-listed consultants, which shall be determined in the pre procurement conference, shall consist of three (3) to seven (7) consultants, with five (5) as the preferable number. Should only one (1) or less than the required number apply for eligibility and short listing, pass the eligibility check, and/or pass the minimum score required in the short listing, the BAC shall consider the same.

c. Eligibility Evaluation

i. Criteria and Rating System

The Eligibility criteria and rating system for short listing of consultants:

1. Applicable experience of the consultant and members in case of joint ventures, considering both the overall experiences of the firm or, in the case of new firms, the individual experiences of the principal and key staff, including the times when employed by other consultants.
2. Qualification of personnel who may be assigned to the job vis-à-vis extent and complexity of the undertaking and;
3. Current workload relative to capacity.

ii. Weights for Each Criterion

CRITERIA	WEIGHT
Experience of the consultant	50%
Qualification of personnel	30%
Current workload relative to capacity	20%
TOTAL	100%

iii. Passing Score

The minimum Eligibility Score is 70%.

d. Technical Evaluation

i. Criteria and Rating System

The technical proposal together with the financial proposal shall be considered in the evaluation of consultant / contractor. The technical proposals shall be evaluated first using the following criteria:

1. Quality personnel to be assigned to the project, ensuring the suitability of key staff to perform the duties required. This includes the general



qualifications, competence, education, and training of key personnel, particularly Registered/Licensed Civil / Structural Engineers (CE/StrE) with expertise in structural auditing, analysis, and retrofitting; Registered/Licensed Civil Engineers specializing in Geotechnical Engineering, with expertise in soil investigation, foundation analysis, and geotechnical design;

2. Experience and capability of the Consultant / Contractor which include records previous engagement and quality performance in similar and in other projects; relationship with the previous and current clients and overall work commitments, geographical distribution of current / impending projects and attention to be given by the Consultant / Contractor. The experience of the Consultant / Contractor to the project shall be considering both the overall experiences of the firm and the individual experiences of the principal and key staff including the times when employed by other consultants; and
3. Plan of approach and methodology with emphasis on the clarity, feasibility, innovativeness and comprehensiveness of the plan approach and the quality of interpretation of the project problems, risks and suggested solutions.

ii. Weights for Each Criterion

CRITERIA	WEIGHT
Quality personnel	50%
Experience and capability of consultant/contractor	30%
Plan of approach and methodology	20%
TOTAL	100%

iii. Passing Score

The minimum Technical Score is 70%.

e. Calculation of Rating

i. Weights for Technical and Financial

1. The financial proposal of Consultant / Contractor who meet the minimum technical score shall be opened; and
2. In identifying the Highest Rated Bid, the Technical Proposal shall be given a weight 60% while the Financial Proposal shall have 40%.

All conditions for recommendations shall be in consideration with the minimum disturbance to the occupants both on the subject structure and other nearby buildings;

All procedures shall be able to satisfy the "**LIFE SAFETY OBJECTIVE**" since the structure is one of the essential facilities;



VIII. BASIS OF PAYMENT

Payment to the CONSULTANT shall be made in three tranches as follows with the corresponding schedule and deliverables:

PAYMENT	PERCENTAGE OF CONTRACT AMOUNT	DELIVERABLE	SCHEDULE
FIRST Partial Payment	15%	Inception Report	Not earlier than 5 days nor later than 10 days after receipt of NTP.
SECOND Partial Payment	35%	Soil Investigation and Geotechnical Study Report	Not earlier than 30 days nor later than 45 days after receipt of NTP.
LAST Partial Payment	50%	Structural Analyses and Design	Not earlier than 50 days after nor later than 60 days after receipt of NTP.



IX. CANCELLATION/TERMINATION OF CONTRACT


A. PENALTIES FOR BREACH OF CONTRACT

Failure to deliver the services according to the standards and requirements set by the Quezon City Government shall constitute an offense and shall subject the Supplier to penalties and/or liquidated damages pursuant to RA 12009 and its revised Implementing Rules and Regulations.

B. TERMINATION

The guidelines contained in RA 9184 and its revised IRR shall be followed in the termination of any service contract. In the event the City terminated the Contract due to default insolvency, or for cause, it may enter into negotiated procurement pursuant to section 53 of RA 9184 and its IRR.

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