**Contract ID** : **24CSBD03**
**Contract Name** : **Consulting Services for Geotechnical Exploration, Municipality of Iguig, Tuguegarao City, Solana, and Amulung, Cagayan Province**
**Contract Location** : **Municipality of Iguig, Tuguegarao City, Solana and Amulung, Cagayan Province**

# REQUEST FOR EXPRESSION OF INTEREST (REOI) FOR

**Contract ID No: 24CSBD03 – CONSULTING SERVICES FOR GEOTECHNICAL EXPLORATION, MUNICIPALITY OF IGUIG, TUGUEGARAO CITY, SOLANA AND AMULUNG, CAGAYAN PROVINCE**

| | |
|---|---|
| Location | : Municipality of Iguig, Tuguegarao City, Solana and Amulung, Cagayan |
| Source of Fund | : EAO 2024 |
| ABC | : Php1,890,000.00 |
| Duration | : 30 Calendar Days |
| Amount of BDS | : Php5,000.00 |

1. The **Department of Public Works and Highways – Cagayan Third District Engineering Office,** through the **EAO 2024** intends to apply the sum of **Php1,890,000.00** being the Approved Budget for the Contract (ABC) to payments under the Contract for **24CSBD03 – Consulting Services for Geotechnical Exploration, Municipality of Iguig, Tuguegarao City, Solana and Amulung, Cagayan.** Bids received in excess of the ABC shall be automatically rejected at the Opening of the Financial Proposals.

2. The **Department of Public Works and Highways – Cagayan Third District Engineering Office** now calls for the submission of eligibility documents for the above mentioned project.

3. Perspective Bidders must submit their Eligibility Documents on or before **9:00 A.M of November 4, 2024** at **Office of the BAC Secretariat, DPWH – Cagayan Third District Engineering Office.** Applications for eligibility will be evaluated based on non-discretionary "pass/fail" criterion.

4. The Terms of Reference (TOR), Request for Expression of Interest (REOI) and Bidding Documents containing the eligibility , Technical and Financial Bid Forms are now available at DPWH and PhilGEPS websites until the deadline of the submission and receipt of bids. The above mentioned documents can be obtained/downloaded free of charge to these websites

5. GPPB Resolution No. 15-2021 states, "*Lifting the Suspension on the Implementation of the Mandatory Submission of PhilGEPS Certificate of Platinum Registration and Membership in Competitive Bidding and Limited Source Bidding; Amending Section 8.5.2, 23.1(a)(ii), 24.4.3, 34.3 and 54.6 of the 2016 Revised IRR of R.A 9184, Items*

6. *IV(G)(1) and V(D)(1)(b) as well as Appendix "A" of Annex "H" thereof, Item 4 and 6 of the Guidelines for the Use of the Government of the Philippines – Official Merchant*

   *Registry, and Item 1 of Sections VIII and IX of the 6th Edition of the Philippine Bidding Documents for Goods and Infrastructure Projects", dated October 14, 2021.* In lieu of the above, prospective bidders shall submit their bid the **updated PhilGEPS Certificate of Platinum Membership** in accordance with Sections 23.3, 24.4.3 and 54 of Republic ACT 9184 (RA9184).

7. The BAC shall draw up the Short Listed Consultants from those who submitted *Expression of Interest and/or Eligibility Documents* and have been determined as eligible in accordance with the provisions of Republic Act (RA) No. 9184, otherwise known as "Government Procurement Reform Act" and its Implementing Rules and Regulations (IRR). The Shortlist may preferably consist of five (5) prospective bidders who will be entitled to submit bids. The criteria and rating system for short listing are:

   **a.) Experience of the Firm (60 Points)**

   **b.) Availability of Required Personnel of the Firm (10 Pts)**

   **c.) Workload (30 Points)**

   In case of a sole prospective consultant, same shall undergo eligibility check and shortlisting process pursuant to Section 36 of the 2016 Revised IRR of RA 9184

8. Prospective Bidders must submit a copy of Notarized Contract Agreement and Certificate of Employment of all the Staff (Key and Non-Key Personnel) as an attachment to the *Statement of the Consultant Specifying its Nationality and Profession* along with their respective Curriculum Vitae (CV).

9. Bidding will be conducted through open competitive bidding procedures using non-discretionary "pass/fail" criterion as specified in the 2016 Revised IRR of RA 9184.

   a. Bidding is restricted to Filipino citizens/sole proprietorships, partnerships, or organizations with at least sixty percent (60%) interest or outstanding capital stock belonging to citizens of the Philippines

10. The procurement and employment of Corporation(s) as consultant(s) for the project is **NOT ALLOWED.**

11. The Procuring Entity shall evaluate bids using the **Quality-Cost Based Evaluation/Selection (QCBE/QCBS)** procedure. The **Technical** and **Financial Proposals** shall have weights of **Sixty-Five Percent (65%)** and **Thirty-Five Percent (35%),** respectively. Shortlisted bidders whose technical proposal pass the minimum technical score of **Seventy-Five Percent (75%)** shall be invited for the opening of financial proposal and negotiation. The criteria and rating system for the evaluation of bids are provided in the Instruction to Bidders

12. The contract shall be completed within **Thirty (30) Calendar Days**

13. Bidders are **PROHIBITED** from making or accepting any communication with Members of the BAC, its staff and personnel, Secretariat, Technical Working Group (TWG) and/or observers, regarding matters connected to their bids from submission and receipt of bids until approval by the Head of the Procuring Entity (HOPE) of the ranking of bidders per section 33.1 of 2016 Revised IRR of R.A 9184. However, the BAC, through its Secretariat, may ask in writing the bidder for a clarification of its bid. All response to request for clarification shall be in writing

14. The **Department of Public Works and Highways – Cagayan Third District Engineering Office** reserves the right to reject any and all bids, annul the bidding process, or not award the contract at any time prior to contract award, without thereby incurring any liabilities to the affected bidder or bidders

15. For further information, please refer to:

**PERDITO A. DAYAG**
Engineer II
OIC-Head BAC Secretariat

**VALERICO E. BADUA, JR.**
Chief Quality Assurance Section
BAC-Chairman

October 14, 2024

# TERMS OF REFERENCE

## I. INTRODUCTION

### A. PROJECT BACKGROUND

The Department of Public Works and Highways (DPWH), Cagayan Third District Engineering Office has prepared these guidelines to assist the consulting services in the planning, cost estimating and reporting of geotechnical and geological survey investigation of four (4) road projects for Cagayan Third District Engineering Office Implementation. The specific projects will require the services of the Consultant that will conduct detailed geotechnical and geological investigation which includes field and laboratory testing to determine the surface and subsurface condition of the projects identified by the DPWH.

### B. OBJECTIVES

The main objective of the services is to determine the arrangement of the soil strata or soil profile and engineering properties of the underlying soils, establish its compressibility strength and other characteristics, as well as the soil bearing capacities of the projects identified by DPWH.

The result of the sub surface exploration which among the basic data input/requirements in the detailed engineering design of infrastructure projects in order that a safe and economical foundation and slope protection works maybe designed.

### C. SCOPE OF WORK

| **PROJECT NAME: Consulting Services for Geotechnical Exploration, Municipality of Iguig, Tuguegarao City, Solana, and Amulung, Cagayan Province** | **NUMBER OF HOLES** | **DEPTH OF BOREHOLE (m)** |
|---|---|---|
| **Locations:** | | |
| 1. Iguig Bypass Road Phase VI, Cagayan | 3 | 25 |
| 2. Tuguegarao North Diversion Road (DOH Section), Cagayan | 4 | 25 |
| 3. Jct. Cagayan Valley Rd - Sampaguita-Warat-La Suerte-Catarauan-Afusing Rd Phase IV, Cagayan | 3 | 25 |
| 4. Maddarulug to Cadaanan Road leading to Ecotourism Park, Solana, Cagayan | 2 | 5 |

The Consultant shall provide all the labor, instrument/equipment materials and supplies, vehicles, bunkhouse etc., necessary to perform satisfactorily the geotechnical investigation:

A. Field Works
B. Laboratory Testing
C. Soil Investigation and Preparation of Report
D. Geotechnical Evaluation Report

The Consultant shall be held solely responsible for the result of this Geotechnical Exploration and other activities under this Terms of Reference (TOR).

## II. SCOPE OF SERVICES

### A. GENERAL

The scope of consulting services shall involve the conduct of the subsoil investigation and preparation of the Geological/Geotechnical Report and is the subject of this Terms of Reference (TOR).

The Consultant's scope of work shall cover but not necessarily be limited to the items listed hereunder.

The Consultant shall (a) perform field reconnaissance of the study area with regards to existing situation of the project site and relevant site situation under study, (b) coordinate with the DPWH Cagayan 3rd DEO - Planning and Design Section (PDS) through Chief prior to the conduct of geotechnical and geological surveys and investigations at the specified sites, (c) identify areas with geological problems and difficulties, and water bearing stratum causing subsurface discharge, which could affect the stability of the structure, and (d) based on the result of item (a), (b) and (c), provide detailed report of the field activity and recommend technical solutions with appropriate technical justification, taking into considerations the proposed structure on the site.

The consulting services shall be performed in accordance with accepted professional standards utilizing sound engineering evaluation practices and environmental and social requirements. The Consultant shall adopt the guidelines stated in the DPWH Design Guidelines, Criteria and Standards (DGCS) latest edition and abide with relevant issuances and references of the Department in the conduct of geological and geotechnical investigation. The Consultant's scope of services (Section II. SCOPE OF SERVICES) shall cover what is stated in the general scope (A. GENERAL), and shall not necessarily be limited to the items listed in Section B. THE SERVICES, of the TOR.

### B. SERVICES

In General, the Consultant shall conduct the following:

1. **Geological Survey and Investigation**, consisting of, but not limited to the following:
    a. Location map of project with geographic/grid coordinates system;
    b. Geohazard Assessment Report;
    c. Discussion on Geology of the Project Area;

- Regional Geology of the project area
- Geologic Map (Scale of 1:50,000 or more detailed) showing soils/rock formation, geologic structures such as faults, beddings, folds, fractures, etc., including orientation (e.g. strike and dip), etc.;
- Field Photographs of Geologic Mapping (showing outcrops, geologic structures)

d. Discussion on Seismicity of the Project Area;
   - Active Fault Map (Determine the 3 nearest active faults and its distance from the site)
   - Historical Records of Seismicity within the area (3 nearest earthquake source)
   - Length of Active Fault (based on PHIVOLCS Map)
   - Deterministic Seismic Hazard Approach (DSHA) using Fukushima and Tanaka Equation from Design Guidelines and Standard (DGCS). Volume 2A (Ground motion parameters: Peak Ground Acceleration (PGA), Seismic horizontal coefficient (Kh), Seismic vertical coefficient (Kv)

e. Discussion on Geomorphology, Topography, Climate and Vegetation of the Project Area
   - Geomorphologic Map
   - Topographic Map
   - Climate Map;

f. Discussion on Geohazard Susceptibility
   - Volcanic Hazard Maps
   - Rainfall-induced landslide Map
   - Earthquake-induced landslide Map
   - Flood Hazard Maps and Discussion on Fluvial Hazards
   - Liquefaction Hazard Map
   - Tsunami, Seiches and Storm Surge Hazard Maps
   - Mining Tenement Maps (Locations of Previous Open Pits, Underground Portals, etc.)
   - Karst Hazard Map;

g. Discussion on Problematic Soils
   - Expansive Soils
   - Fills
   - Highly Compressible Soils
   - Contaminated Soll
   - Collapsible Soil;

h. Liquefaction Assessment
   - Liquefaction Assessment of Soil Layers based on the results of Geotechnical Investigation (as per BSDS 2013 and DGCS Volume 2A)
   - Preliminary Screening Analysis (based on grain size analysis & Atterberg limit test)
   - Calculation of Cyclic Resistance Ratio and Cyclic Stress. Ratio (based on geotechnical parameters of soil);

i. Rock Mass Classification
   - Rock Mass Rating (RMR);

j. Geologic hazards (volcanic/geothermal activity, earthquake, landslides and slope movement, river action and flooding, marine action, soil erosion, waste disposal, groundwater pollution, mining surface subsidence and sinkholes;
k. Geological map of the existing ground formation(s) along the project site specifically at slope disaster areas by conducting field investigation;
l. Geological survey for Improvement/rehabilitation of project structure necessary for detailed engineering;
m. Geological Structures, especially active faults within the cut slope and/or proximal to the area, should be delineated;
n. Detailed mapping of in-situ slope showing the orientation (strike and dip) of bedding, faults, folds, fractures, other geologic structures, etc.;
o. Identification and classification of slope failure (rock slide, rock fall, creep, circular failure, etc.). The potential slope failure surface must be delineated if visible in the slope.

**2. Geotechnical Investigation**, consisting of, but not limited to the following:

**2.1 Reports**

a. Auger boreholes/test pit/borehole location plan and soil profile to the proposed project including reference information such as station, coordinates (PRS92), reference elevation of hole, MSL, etc.;
b. Discussion on results of Geotechnical Investigation and Laboratory Testing:
c. Duly signed results of the test conducted;
d. Evaluation of results;
e. Recommendation (foundation type and required geotechnical parameters for design), Type of Recommended Foundation should be drawn adjacent to boring log with SPT Graph;
f. Analysis for Liquefaction Potential during earthquake and consolidation due to soft ground;
g. Idealized Soil Profile Plan
h. Ground Improvement Technique(s), if necessary;
i. Geotechnical Parameters;
j. Summary of Test Results from Field and Laboratory Tests;
k. Global Stability Analysis (Slope Protection);
l. Evaluation and Recommendation;
m. Geotechnical report duly signed by the geotechnical engineer;
n. Geotagged field photographs and sample photographs (related to geologic/ geotechnical investigation such as project location, boring operation/ sampling, samples in core boxes, etc.);
o. Others (i.e. soil Improvement, presence of boulders and other obstructions, etc.)

**2.2 Boring Logs**

a. Borehole number;
b. Project Name, address of project, client name/implementing office;
c. Date of start and completion of boring;

d. Station, coordinates and elevation of borehole;
e. Type of drilling equipment and casing information;
f. Thickness of soil layer;
g. Standard penetration test (SPT);
h. Sampling and coring information;
i. Description of materials penetrated (i.e. color, shape, etc.);
j. Classification of soil in accordance with AASHTO M145 and USCS;
k. Sample recovery and RQD for rock strata;
l. Indicated depth to groundwater or seepage zones;
m. Elevation of the top and bottom of the hole and the top of rock formation in meters above sea level (masl);

**2.3 Laboratory Soil Test**

a. Specific Gravity
b. Natural Moisture Content (NMC)
c. Mechanical Sieve Analysis
d. Liquid Limit (LL)
e. Plastic Limit (PL)
f. Plasticity Index (PI)
g. Shrinkage Limit (SL)
h. Unit Weight
i. Unconfined Compression Test
j. Triaxial Compression Test
k. Consolidation Test
l. Atterberg Limit
m. Compaction Test
n. Swell index Test
o. Permeability Test
p. Soil/Rock Strength Test
q. Hydrometer Test
r. Soil Bearing Capacity

**2.4 Geological/Geotechnical Plan**

a. North arrow
b. Name of project/location
c. Borehole location plan
d. Borehole designation
e. Borehole log reflected according to ground elevation
f. Type of recommended foundation drawn adjacent to boring logs with SPT graph
g. Groundwater table elevation
h. Appropriate signatories in the title block

| Table 2: GEOTECHNICAL REQUIREMENTS FOR DESIGN | | |
|---|---|---|
| BORING REQUIREMENTS FOR EACH PROJECT CATEGORY | | |
| Type of Project | Spacing | Depth |
| Road Projects<br><br>•New Road (New Road / Widening / Existing Earth Road) | •For new roads, test pitting shall be made along the proposed alignment at an average interval of 500 meters for homogenous strata, and 250 meters for loose or heterogeneous strata or lesser (i.e. based on the recommendation of the geotechnical engineer) for soft marshy portions.<br><br>•One (1) at every proposed slope protection structure with a vertical height of less than 5.0 meters, to be located at the highest vertical point or at an identified critical location. Additional intermediate borehole for every 100 meters.<br><br>**or as stated in the D.O. 75 s2024* | •For larger embankment across the marshland or where subsurface information indicates the presence of four (4) to five (5) weak layers, the depth shall depend on the topography and nature of the subsoil; soft clays may be extended to a deep of 20-25 meters, and the base of the soft clay must be identified.<br><br>Where deeper cuts (i.e. greater than 1.0 meters) are to be made, the depth shall be two (2) meters below the proposed subgrade.<br><br>•Extend boring depth from 0.75 to 1.50 times the height of the wall.<br><br>**or as stated in the D.O. 75 s2024* |

| | | |
|---|---|---|
| •Active Slope Protection Structures (Retaining Structures such as Crib Wall, Gabion Wall, Mattresses, Etc.)<br><br>**or as stated in the D.O. 75 s2024* | | |

Disturbed and undisturbed soil and rock samples obtained shall be subjected to physical and mechanical tests and soil mechanics analysis to include shear strength tests necessary for slope stability analysis. Geotechnical investigation may be carried out using inclinometers and piezometers, if necessary, at rock formation and mountainous sections and at areas where ground movement and/or settlement and subsidence, have been observed.

All geological and geotechnical investigation results and reports shall be subject for review and evaluation for conformity with the DPWH Design Guidelines, Criteria and Standard (latest edition) and other relevant issuances and references.

## II. IMPLEMENTATION

### A. STAFFING

#### 1. Preparation and Submission of Reports/Deliverables

**1.1 Monthly Progress Report (MPR)**
During the period of the contract, the Consultant shall prepare Monthly Progress Report (MPR) in a form to be approved by the DPWH qualified representative and submit them to DPWH Cagayan 3rd DEO-PDS on the 25th day of each reporting month

The MPR shall consist and/or discuss, but shall not be limited to the following:

a. Overall summary of accomplishment
b. Core drilling progress
c. Laboratory tests accomplishment
d. Schedule of work
e. List of equipment used
f. Detailed progress of charts

### 1.2 Partial on Investigation Results

The Consultant is required to submit partial reports consisting of completed results of boring in the form of a final boring log and soil profile for immediate use in the preliminary design work.

### 1.3 Draft of Final Report

The Consultant is required to submit a draft of the final report consisting all the data, results and discussion in format and guided by Section 1.4 of this TOR. Submitted draft of the report will be evaluated by Planning and Design Section Personnel for its completeness before requiring the Consultant to submit final report and electronic copy.

### 1.4 Final Report

The Consultant shall prepare the final report in 1 original bound copy, 3 bound machine copies and an electronic/scanned copy in DVD (all colored with signatures) after the evaluation of the draft of final report done by PDS Personnel. The final report shall consist of the data and results of the services conducted in the SECTION B of this TOR with Recommendations if called for, such as type of proposed countermeasure/ structures to address geological/geotechnical problems and foundation type.

## B. SUB-CONTRACTING

The consultant may sub-contract portions of the Consulting Services to an extent as may be approved by the Procuring Entity, provided that the Consultant shall directly undertake, using Its own personnel and resources, not less than eighty percent (80%) of the contract works in terms of cost.

## C. DURATION OF CONSULTING

The Consultant's contract period for undertaking the Geotechnical and Geological Survey shall not be more than twenty-four (30) calendar days and the Consultant shall commence work within seven (7) days after receipt of Notice to Proceed (NTP).

## D. PAYMENT

There should be no Advance payment for Consultancy. The payments made under the contract will reflect changes based on actual conditions encountered. The final payment shall be made only after the final report and a final statement, identified such, shall have been submitted by the Consultant and approved as satisfactory by the Procuring Entity.

## E. VARIATIONS

If variations are identified during the course of the project, the Consultant must notify the Chief of Planning and Design Section immediately, including detailed documentation and evidence of the variance.

## F. MANPOWER REQUIREMENTS

The Consultants shall be composed of qualified staff with experience in the conduct of geological and geotechnical investigation.

| Position/Key Staff | No. of Staff | Job Description/ Responsibility | Required Qualifications |
|---|---|---|---|
| Geotechnical Engineer | 1 | •Study and determination of items and method of soil investigation and laboratory test<br>•Perform necessary subsoil investigations on representative sections of the road with samples to be taken at suitable intervals<br>•Investigate the physical properties of materials to facilitate the design of structures | •BS in Civil Engineering; Doctoral or MS in related field in an added advantage;<br>•Duly licensed/registered civil engineer;<br>•At least 5-year experience on soil, sub-surface and geotechnical survey and study of roads, bridges and related structures; |
| Geologist | 1 | •Collection and evaluation of geological information on the project sites<br>•Investigate and classification of slope failure type<br>•Perform Rock Mass Rating (RMR) | •BS in Geology or Geological Engineering; Doctoral or MS related to Engineering Geology or related field<br>•Duly licensed/ registered Geologist<br>•At least five (5) years of experience in structural geology, geohazard mapping particularly in landslide hazard assessment |

| | | | |
|---|---|---|---|
| Civil Engineer | 2 | •Oversee the progress of works<br>•Supervision of field staff and the methods of works<br>•Assist the Geotechnical Engineer in the collection of necessary data and information, in carrying out detailed soil investigations along the identified borehole locations | •BS in Civil Engineering; Doctoral or MS in related field in an added advantage;<br>•Duly licensed; registered civil engineer;<br>•At least 3-year experience on soil, sub-surface and geotechnical survey and study of roads, bridges and related structures; |

## G. ASSISTANCE TO BE PROVIDED BY THE CLIENT

In connection with the task of the Consultant that require inputs and assistance from other government agencies as well as NGO's, members of the Congress and officials of the regional/provincial branches on national government agencies, the DPWH shall ensure that the Consultant has access to all relevant Information necessary to the performance of the above services. The Consultant is expected to provide office space and equipment and all other resources necessary for completing the services.

## H. DESIGN REVIEW BY THE PLANNING & DESIGN SECTION OF THE DPWH CAGAYAN 3RD DEO.

Prepared by:

CHESTER T. FRONDA
Engineer II

Reviewed by:

JAYLORD A. DE ASIS
Chief, Planning & Design Section

Approved by:

ESMERALDA O. DE GUZMAN
OIC – District Engineer