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Republic of the Philippines
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
LEYTE 4th DISTRICT ENGINEERING OFFICE
Ormoc City, Region VIII

TERMS OF REFERENCE (ToRs)

Project Title	Geotechnical Investigation in connection with the Construction of Multi-Purpose Building (Cayetano Bldg.), City of College of Ormoc, Ormoc City, Leyte
Location	Ormoc City, Leyte
Appropriation	P 135,926.28
Duration	30 cal. days

1. BACKGROUND:

The Department of Public Works and Highways (DPWH) 4th DEO, Ormoc City has proposed the Preparation of Soil Exploration/Investigation on the above project.

The proposed project is the subject of preliminary and detailed engineering particularly construction of various multi-purpose building subsurface soil exploration work as follows and shall include the Geotechnical reports and analysis.

Item No.	Description	Qty	Unit
B.19	Construction of Multi-Purpose Building (Cayetano Bldg.), City of College of Ormoc, Ormoc City, Leyte	3	Boreholes
	Total	3	Boreholes

The Consultant shall be responsible for carrying out the necessary subsurface soil exploration works in respect to the project stated. After the receipt of the Notice to Proceed (NTP), the Consultant shall coordinate with the Planning and Design Section, DPWH Leyte 4th DEO, Ormoc City, particularly on site of the projects.

Upon completion of the subsurface exploration work activities, the Consultant shall submit their geotechnical report to DPWH Leyte 4th DEO, Ormoc City. The consultant shall be responsible for the reliability of the report presented.

2. OBJECTIVES:

The Government of the Republic of the Philippines (GOP), through the Department of Public Works and Highways (DPWH) Leyte 4th DEO, Ormoc City, intends to engage the services of a Consulting/Engineering Firm (Consultant) to undertake Soil Exploration (Bore hole) and needed for the purpose.

The Consultant shall provide professional services required for the Soil Exploration of **Geotechnical Investigation in connection with the Construction of Multi-Purpose Building (Cayetano Bldg.), City of College of Ormoc, Ormoc City, Leyte** (Borehole) of the Soil Exploration Test by conducting the necessary soil exploration (borehole) and other related data needed for the purpose.

To determine the technical and economic feasibility in terms of the optimum level and timing for improvement of the project areas in particular.

3. SCOPE OF CONSULTING SERVICES/WORK:

The Consultant shall provide professional services required for the Soil Exploration (Borehole) of the **Geotechnical Investigation in connection with the Construction of Multi-Purpose Building (Cayetano Bldg.), City of College of Ormoc, Ormoc City, Leyte** by conducting the necessary soil exploration (borehole) and other related data needed for the purpose.

Drilling and Sampling

1. Location and Number

Three (3) boreholes, at a location shown on the plan per site.

2. Depth of borings and procedures

Number of holes with a depth equal to **16 meters** or extend if necessary depending on the soil classification. In sand, clay and silt materials, the boreholes shall be advanced by the wash boring method in between sampling sections using discharged chopping bits.

Drilling and sampling procedures shall comply in accordance with ASTM Standards.

Drilling borehole shall be done along the proposed alignment until it reach to hard strata. The preparation of samples for testing shall be made in accordance with AASHTO or it shall be undertaken whenever solid information is encountered.

3. Equipment

a. Drilling Machine:

The contractor shall utilized at least two (2) drilling machine and set them up at the project site. The drilling machine shall be in good working condition and shall be of such capacity as to maintain satisfactory progress of work.

b. Bits:

The Contractor shall have an example supply of different types of bits to adopt to varying conditions. Bottom discharge and stepped bits shall also be available. Double tube swivel type core barrels in good condition and obtaining maximum core recovery shall be used.

c. Casing:

The Contractor shall, at his own expense and responsibility, provide casings as required to ensure the stability of the borehole walls. The casings shall be at least of N-size and shall be in good condition. After a hole has been finished the casings shall be retrieved.

4. Handling and Core of Samples:

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

Standard Penetration Test (STP)

Shall be conducted in accordance to ASTM D-1596. This test shall be carried out through ordinary soil encountered to the depths required.

Water Level Measurement

The water level shall be measured daily (before and after) whenever encountered in a borehole.

Laboratory Testing and Analysis

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

2. Split-Spoon Analysis

e. Visual Soil Description

f. Mechanical Analysis, AASHTO Designation T88

g. Liquid Limit, Plastic Limit and Plasticity Index, AASHTO Designation T89 and T90

h. Group Index and Soil Classification, use Unified Soil Classification

4. DATA, REPORTS AND TIME SCHEDULE:

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 to DPWH -Planning and Design Section.

Monthly Progress Report shall consist of the ff.:

-Overall summary of accomplishment

-Core drilling progress

- Laboratory tests accomplishment
- Schedule of work
- List of equipment used
- Organizational chart
- Detailed progress of charts.

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.

The Consultant shall submit **Three (3) copies (hard bound) and soft copy** of the Geotechnical Report to the **Department of Public Works and Highways (DPWH) 4th DEO, Ormoc City**. This shall include the compiles final **boring logs, Geological Profile, Laboratory Test Result**, and **Geotagged Photos** taken at each borehole during the fieldwork.

All the works, including laboratory and office preparation of data shall be completed in **30 calendar days** after issuance of Notice to Proceed (NTP).

FIELD WORKS:

- a. Title of Investigation, location, period and name of investigation team
- b. Location Plan (include Boreholes)
- c. Arrangement of Geotechnical Investigation, method and process
- d. Boring Data
 - d1. Ground elevations at boring point
 - d2. WGS84 coordinates at boring points
 - d3. Data, elevation and depth of layers. Ground water elevation
 - d4. Thickness of layer, graphic symbols, classification by field observation, description of soil and rock.
 - d5. N-values and depth by standard penetration tests and graphs of N-values.
 - d6. Whole core box sample photograph in field (spit core)

LABORATORY TESTING:

ACTIVITIES

- Hole to hole transfer and equipment set up
- Penetration through ordinary soil
- Standard Penetration Test (SPT)
- Undisturbed Soil Sampling
- Rock Coring/Drilling
- Core box & Soil Containers

LABORATORY

- Mechanical Sieve and Hydrometer
- Liquid and Plastic Limit

Nature Moisture Content
Specific Gravity
Consolidation Test for undisturbed sample
Triaxial Compression
Unconfined Compression per test

The consultant shall prepare Boring Logs, Photographs showing the borehole/grilling and sampling at each proposed sites.

The consultant is required to submit partial reports consisting of completed results of boring.

10. PERSONNEL/MANPOWER REQUIREMENTS

The Consultants shall be composed of qualified staff with experience in the conduct and preparation of infrastructure feasibility studies including preliminary design, traffic, and social, economic and environmental impact assessment. It shall provide the required expertise in all fields of specialization required in the conduct of the study such as buildings, flood control and bridges for the satisfactory and quality performance of the services.

The Technical staff:

a) Project Manager

- 5 years experience
- Bachelor Degree or higher level of education in Civil Engineering Experience
- Professional license and relevant Minimum five (5) years of experience in geotechnical/soils investigation
- Prepares operation plan and supervised all aspects of the project to ensure geotechnical/soils investigation compliance with the objectives and maintain progress in accordance with the contract time schedule.

b) Geotechnical Engineer

- 3 years experience
- Bachelor Degree or higher level of education in Civil Engineering Experience
- Professional license and relevant Minimum five (5) years of experience in geotechnical/soil investigation
- Collect, evaluate, investigate of the geological information on the project sites and the physical properties of materials to facilitate the design structures. Perform necessary subsoil investigation on each section with samples to be taken at suitable intervals.

c) Technical Manager

- 3 years experience
- Bachelor Degree or higher level of education in Civil Engineering Experience
- Supervise the laboratory technicians and prepares accomplishment reports of the laboratory works. Check the encoded laboratory test results and handles the printing

of the report.

d) **Laboratory Technician**

- 3 years experience
- Bachelor Degree or higher level of education in Civil Engineering Experience
- Relevant experience in conducting laboratory tests
- Investigate the physical properties of materials to facilitate the design of structures and performs laboratory tests

e) **Field Engineer**

- 3 years experience
- Bachelor Degree or higher level of education in Civil Engineering Experience
- Supervise the field drilling and sampling.

f) **Senior Core Driller**

- 3 years experience
- Relevant experience in drilling operations
- Handles the drilling machine during field sampling

g) **Engineering Assistant**

- 3 years experience
- College level of education in Civil Engineering Experience
- Assist the field engineer in supervising the drilling and sampling

h) **Engineering Aide**

- 3 years experience
- College level or any-course related to Civil Engineering
- Assist the field engineer in supervising the drilling and sampling

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