PROJECT TITLE : **ENGINEERING DESIGN AND CONSULTANCY SERVICES for the PROPOSED RETROFITTING WORKS OF PGH BUILDINGS**

SUBJECT : **SCOPE OF WORKS AND SPECIFICATIONS**

Division 1 - General

01000 General Requirements

1. The Contractor shall furnish all materials, equipment, tools, apparatus, transportation, labor and supervision required for the implementation of the contract.

2. All Contractors submitting proposal for this project shall first examine the site. All proposals shall take into consideration all such conditions that may affect the work under this contract.

3. The Contractor shall coordinate his work with all parties to ensure proper phasing or schedule of works. The Contractor shall engage under him, a registered Engineer to supervise his works. He shall remain at all times in the construction site.

4. A logbook shall be available at the site. It shall contain the daily activities in the site, including weather condition, delivery, manpower and other matter pertaining to the condition of the project. It will also serve as data for Contractor and the Project Inspector.

5. Identification Card of construction workers and engineer/representative shall be supplied by OETS with corresponding fees; it should be worn at all times while inside the building/campus premises. Those without IDs shall not be allowed to enter the premises for security purposes.

6. No alteration or additional work that will result in an additive or deductive cost change from the Contract shall be allowed without the approval of the Director.

7. Regular coordination meeting shall be conducted with OETS, Contractor and End-user for proper project monitoring.

8. After completion of all works, the Contractor shall promptly remove from the premises, all equipment, apparatus and tools and restore all areas that were damaged or affected by the works and leave the site clean to the satisfaction of the Project Inspector or his representative and the End-user

9. All materials removed from the area shall be properly documented.

DIVISION 2 - Site Construction

Section 02200 Site Preparation

Mobilization/Demobilization

- This work includes mobilization process, provision for warning signs, including barricades, temporary facilities, temporary fences, warning lights and similar safeguards shall be provided by the Contractor as they required for protection of his manpower and others during the execution of the project.
- Demobilization procedure shall include clearing of the affected areas from all rubbish, trash, debris and oil superfluous building materials and restore all areas that

were damaged as directed by the works and leave the site clean to the satisfaction of the Project Inspector or his representative and end-user.

SECTION 02230 Site Clearing

- Clear the area from all obstructions or as affected by the works, except those structures indicated by the Project Engineer and End-user to be left standing. It shall be properly protected from incidental damage due to the work by the section of suitable barriers upon approval of the Project Engineer and End-user.
- The Contractor shall be responsible for the accuracy of his work and any necessary chiseling, drilling, coring, cutting and patching or other works required due to plugged or misplaced conduit shall be done at the expense of the Contractor, including the restoration on the damaged part of the building finishes

SECTION 2290 Site Monitoring

- The monitoring shall be a must to the Contractor for the effective implementation of the project, any discrepancies on plans and actual site conditions shall be properly coordinated with the Project Engineer concerned for verification.
- Regular coordination meeting shall be done between the Contractor or its representative and the Project Engineer.

Section 02500 Utility Services

Utility Service/ Consumption

- Provision of Electric and water meter shall be included in the quotation to be charged to the Contractor's overhead cost. All utility consumption shall be provided with meter to limit the usage of such during working period. Payments of bills shall be made through the Cashier's Office after the Contract period presenting the Statement of Account issued by the Accounting Office upon recommendation of the Chief of OETS. End-user shall be furnished with the copy of the official receipt.

DIVISION 3- Soil

Section 03100 Soil Testing

A. Geotechnical Investigations and Analysis.

Provide personnel and equipment to conduct geotechnical investigations outside the building including, but not limited to:

- Undisturbed shallow and deep soil borings using fixed piston sampler for both 3-inch and 5-inch diameter samples
- Standard penetration test
- Soil classification testing (e.g., moisture content, organic content, unit weight, Atterberg limits, grain size distribution, and pH testing, etc.)
- Strength testing (e.g., unconfined compression – UC; triaxial - UU)
- Settlement testing (e.g., consolidation test, settling column test, low stress consolidation test, etc.)
- Subsurface profiles (e.g., strength profiles, geologic profiles, etc.)
- Detailed engineering reports with analyses and recommendations

B. Typical Deliverables

1) Technical reports and presentations
2) Boring logs and field notes
3) Laboratory analysis results
4) Geophysical survey data and interpretation
5) Quantity calculations

DIVISION 3 - Concrete

Section 03100 Concrete Testing

Preparatory Works

- Provide scaffoldings to ensure proper implementation of the testing/extraction of specimen, restoration works and for the safety of manpower during the duration of the works.

Notations

- Test location shall be identified by the designated structural Engineer of the Contractor/Consultant.
- Presence of OETS Project Engineer, Technical Consultant of PGH and End-user shall be required on the execution of the on-site testing.
- Actual testing of the specimens at the office at the Contractor/Consultant shall be done in the presence of OETS Project Engineer, Technical Consultant and End-user.

Non-destructive testing

- Non-destructive tests would include refinements in concrete outline drawings showing the location of columns, walls, slabs, beams and girders. This method would utilize equipment to locate reinforcing bars by means of magnetic detection.

1. Site inspection enables the Engineer/Consultant to confirm the correctness of the existing structure and to assess the structural condition of the building. Any evidenced structural modification, deterioration of materials, weakness in structural members or connection, settlement or foundation problems or unusual structural features shall be noted.

2. Rebound hammer Test shall be done at least ten (10) locations to determine the in-place compressive strength of concrete. Rebound Hammer consist of a spring loaded steel hammer which when released strikes a steel plunger in contact with concrete surface. The spring loaded hammer must travel with a fixed and reproductive velocity. The rebound distance of the steel hammer from the steel plunger is measured in a linear scale attached to the frame of the instrument.

Destructive Testing

- Destructive testing would include concrete core extraction to determine concrete compressive strength tests and steel bars tensile strength tests. This method will consist of actual chipping of concrete to expose the steel bars. This tests will have to take specimen from the existing structures through the use of specialized equipment.

1. Concrete coring for beams and columns shall be done ten (10) locations known to be critical area of structural stability. Specimen to be drilled shall be 2" dia.to 4" dia. At a length twice its diameter by using Dymodrills. The core specimen shall not be disturbed during transportation. It must be placed in a container with sand.

2. Cover meter survey - Existing concrete structures will need to examined and tested to ensure that the concrete remains of adequate strength and durability. The cover meter survey will give a detailed view of the reinforcement closest to the surface within a concrete structure. Information such as, re: reinforcement spacing, diameter, depth from surface and location can be determined. The test involves scanning the surface with an electromagnetic meter in six (6) locations, which, detects the ferrous elements within the concrete.

STRUCTURAL EVALUATION

- After all necessary test are made and documented, the structural assessment for the following items shall be put in the process:

1. Verification of the actual capacity of the existing structure based on the test results.
2. Computation of loading capacity of structural elements
3. Verification of actual condition for a proposed additional one floor of the existing structure based on the test result.
4. Provision for structural plans, working drawings showing rectification and recommend specification measures if necessary
5. Certify structural soundness of the building; and
6. Other related design analysis and evaluation

SECTION 03830 Concrete Rehabilitation

- Upon completion of all the test on the concrete structure of the building, the Contractor/Consultant shall rehabilitate all the destructed concrete areas and restore in place all areas affected by their works. This includes the restoration of the physical aesthetic and painting of the structure.

- Restoration works shall be properly checked by OETS Project Engineer and End-users. Rectification works made on those areas shall be to the satisfaction of the End-user.

COMPLETION PERIOD

The Contractor is given **(see attached TOR)** to execute of the works as specified. The **DESIGN CONSULTANT** shall coordinate to the OETS Inspector and End-users for the schedule of testing's and other related job

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