TERMS OF REFERENCE (TOR)

Government of the Republic of the Philippines

Project: : **ONE LOT MODIFICATION /ENHANCEMENT OF SEWAGE TREATMENT PLANT** (Design and Build-Improvement of Waste Water Treatment Plant)

Location : **WEST VISAYAS STATE UNIVERSITY MEDICAL CENTER**
E. Lopez St, Jaro, Iloilo City

Procuring Entity : **WEST VISAYAS STATE UNIVERSITY MEDICAL CENTER**

Section VI. Specifications

Revised TOR as indicated in the Bid Bulletin

TERMS OF REFERENCE

ONE LOT MODIFICATION /ENHANCEMENT OF SEWAGE TREATMENT PLANT (Design and Build-Improvement of Waste Water Treatment Plant)

A. Background and Rationale

If wastewater is not properly treated, then the environment and human health can be negatively impacted. These impacts can include harm to fish and wildlife populations, oxygen depletion, beach closures and other restrictions on recreational water use, restrictions on fish and shellfish harvesting and contamination of drinking water. (**https://www.usgs.gov/special-topic/water-science-school/science**)

On February 4, 2019 DENR Region 6 have findings in our existing Sewage Treatment Plant- we have the exceedance in

a. Phosphate – 23.5 mg/l
b. Ammonia – 128.1 mg/L

These are the violation of Section 7.2 of DAO 2016-08.

WVSUMC is a Class C institution. DENR Effluent Standard for Class C are

a. Phosphate – 1.0 mg/l
b. Ammonia – 0.05 mg/L

We are mandated by law RA 9275 – Philippine Clean Water Act of 2004.

With that we need to improve our Sewage Treatment Plant.

B. Objective

Improvement and enhancement of the Sewage Treatment Plant to make its effluent passable the standard set forth by the law.

Sewage treatment is the process of removing contaminants from municipal wastewater, containing mainly household sewage plus some industrial wastewater. Physical, chemical, and biological processes are used to remove contaminants and produce treated wastewater (or treated effluent) that is safe enough for release into the environment.

The purpose of a sewage treatment plant is to treat the wastewater as thoroughly as practically possible and to pass the effluent standard. Complying the standard is the criteria of the DENR for the issuance of the Discharge Permit

C. Project Requirements

Modification /Enhancement of Sewage Treatment Plant to include all its required mechanical, electrical, and plumbing in compliance to the required DENR standards for effluent discharge parameters

D. Conceptual Design/Project Components

1) Color, 2) Temperature, 3) pH, 4) BOD, 5) Total Suspended Solids, 6) Fecal Coliform, 7) Ammonia, 8) Nitrate as NO_3N, 9) Phosphate, 10) Oil and Grease, 11) Surfactants (MBAS) and 12) Other effluent standards as may be prescribed by the latest DAO that is applicable to hospitals.

The design of Wastewater Treatment Plant is preferably an underground system to maximize the limited space of the hospital and will serve major buildings of such as the Five (5) story Annex Building, Two (2) story Linen and Laundry Building, Two (2) Story A-UP Building, Three (3) story Physicians Quarters, Three (3) story Mother and Child Building, Two (2) Story San Lorenzo Ruiz and Perinatal Complex Building. (see attached WVSUMC Site Development Plan)

The septic tanks of the abovementioned buildings will serve as major effluent outlets of the proposed wastewater treatment plant. (see plan of septic tank locations).

Electrical devices, panels and wires are completely installed and compatible with the existing main power supply of 230 to 240V,60 hertz, three phase.

Electrical devices, panels and wires of the wastewater treatment plant will be tapped to the existing back up power supply or generator of the Medical Center in case of power interruption and can also be tapped to an alternative renewable energy such as solar power.

E. Scope or Deliverables for Wastewater Treatment Plant

a. Pre-Construction Phase

1. Complete detailed design of the wastewater treatment system based on the approved plans, schematic diagrams and design parameters including any revisions and refinements as required.

2. Treatment process and its attached documents prescribed by the DENR that will show efficiency of the process and must be signed and sealed by designing Engineer.

3. Volume of wastewater computation signed and sealed by designing Engineer.

4. Detailed Cost Estimates or Unit Price Analysis of all applicable unit prices using current cost indices, rental rates, labor rates and other related thereto.

5. Technical Specifications describing type and quality of materials and equipment to be used, manner of construction and the general conditions under which the project is to be constructed.

6. Permits and clearances as prescribed by regulatory agencies.

7. Project Construction Schedule in real time with corresponding S Curve and Manpower Schedule.

8. Construction safety and Occupational Health Program duly approved by DOLE.

9. Technical documents as required of the IRR of RA 9184 Procurement Act of the Philippines

b. Construction/Installation Phase

As a rule, contract implementation guidelines for procurement of infrastructure projects shall comply with Annex "E" and guidelines for the implementation of contracts for DESIGN AND BUILD infrastructure projects shall comply with Annex "G" of IRR, RA 9184. The following provisions shall supplement these procedures:

1. The contractor shall commence work upon issuance of the necessary permits for the project. The work execution shall be in accordance with reviewed and approved documents.

2. The contractor shall be responsible for obtaining all necessary information as to risks, contingencies and other circumstances which may affect the works and shall prepare and submit all necessary documents specified by the Building Official to meet all regulatory approvals as specified in the contract documents.

3. The contractor shall submit a detailed program of works within fourteen (14) calendar days after the issuance of the Notice to Proceed for approval by the procuring entity that shall include, but will not be limited to:

    a. The order in which it intends to carry out the work including anticipated timing for each stage of detailed planning and construction with Construction Schedule and S-Curve;
    b. Periods for review of specific outputs and any other submissions and approvals;
    c. Sequence of timing for inspection and tests;
    d. General description of the design and construction methods to be adopted;
    e. Number and names of personnel to be assigned for each stage of the work;
    f. List of equipment required on site for each stage of the work, and
    g. Description of the quality control system to be utilized for the project.

4. Any errors, omissions, inconsistencies, inadequacies or failure submitted by the contractor that do not comply with the requirements shall be rectified, resubmitted and reviewed at the contractor's cost. If the contractor wishes to modify and design or document which has been previously submitted, reviewed and approved, the contractor shall notify the Procuring Entity within a reasonable period of time and shall shoulder the cost of such changes.

5. As a rule, changes in design and construction requirements shall be limited only to those that have not been anticipated in the contract documents prior to contract signing and approval. The following guidelines shall govern approval for change or variation orders:

   a. Change Orders resulting from design errors, omissions or non-conformance with the performance specifications and parameters and the contract documents by the contractor shall be implemented by the contractor at no additional cost to the Procuring Entity

   b. Provided that the contractor suffers delay and/or incurs costs due to changes or errors in the Procuring Entity's performance specifications and parameters, the contractor shall be entitled to either one of the following:

      1. An extension of time for any such delays under Section 10 of Annex "E" of IRR (RA 9184); or

      2. Payment for such costs as specified in the contract documents, provided, that the cumulative amount of the variation order does not exceed ten percent (10%) of the original project cost.

   c. The contract documents shall include the manner and schedule of payment specifying the estimated contract amount and installments in which the contract will be paid.

   d. The contractor shall be entitled to advance payment subject to the provisions of Section 4 of Annex "E", IRR (RA 9184) and stipulated in BDS

   e. The Procuring Entity shall define the quality control procedures for the design and construction in accordance with the DENR guidelines and shall issue the proper certificates of acceptance for sections of the works or whole of the works as provided for in the contract documents.

   f. The contractor shall provide all necessary equipment, personnel, instruments, documents and others to carry out specified tests.

   g. This Design and Build project shall have a minimum Defects Liability Period of one (1) year after contract completion or as provided for in the contract documents. This is without prejudice to the liabilities imposed upon the engineer/architect who drew up the plans and specification for the building as sanctioned under Section 1723 of the New Civil Code of the Philippines.

h. The contractor shall be held liable for design and structural defects and/or failure of the completed project within the warranty period of 15 years for permanent structures/buildings as specified in Section 62.2.3.2 of the IRR (RA 9184)

i. The Program of Works and Detailed Estimates shall be based on the actual and approved Plans and Specification.

5. All safety standards and guidelines prescribed by Department of Labor and Employment must be observed during project implementation.

6. Progress billings will be processed in accordance with the existing documentary requirements prescribed by the implementing unit.

c. Post Construction Phase

1. In house personnel of the Medical Center shall be trained after the completion and during commissioning of the project with issued certificate of training.

2. Discharge Permit and laboratory results of the wastewater effluent indicating pass or satisfactory shall be the basis for the process of Final Billing.

3. Approved "As Built" Plans signed and sealed by a certifying Mechanical/Sanitary/Chemical Engineer whichever is applicable of the design rights shall be submitted.

4. Operations Manual original and duplicate copy shall be submitted.

5. Engineer's Report and its attached documents prescribed by the DENR during application of Discharge Permit shall be submitted.

6. Testing and Commissioning Report signed and sealed by the Engineer shall be submitted.

7. One (1) year monitoring of Wastewater Discharge sampled on a quarterly basis.

8. All equipment must have redundancy with magnetic flow meter for monitoring of influent and effluent volumetric flow rate.

9. One (1) year warranty for equipment and workmanship shall be imposed.

10. One (1) year quarterly maintenance check-up

F. Implementation Arrangement

Reporting Protocol

Detailed Design and Plans (whether preliminary or final), will be submitted to the WVSUMC Procuring Entity Implementing Unit for review and approval, Submittals will be in three (3) sets.

a. Technical queries will be submitted to the WVSUMC Procuring Entity Implementing Unit for appropriate action.

b. Billing Statements with supporting documents during design and construction/installation will be submitted to the WVSUMC Procuring Entity Implementing Unit for action..

G. Eligibility Requirements (Refer to Bid Tender Documents)

H. Manpower Requirements (Refer to Bid Tender Documents)

I. Approved Budget Cost

The total approved budget cost for the Project is Three Million Pesos Six Hundred Thousand Pesos Only (Php 3,600,000.00)

J. Time Frame

The Contractor is required to complete the Project within the time period as shown below, to start upon the Contractor's receipt and signing of Notice to Proceed.

ACTIVITY	Days					
	20	40	60	70	80	90
Pre-Detailed Design and Detailed Design including approval	→	→				
Construction including Application and Issuance of Permits, Acceptance and Turnover			→	→	→	→

Section VI. Specifications

Revised TOR as indicated in the Bid Bulletin

SUBJECT : SANITARY/PLUMBING DESIGN PARAMETERS (Subject to consultants improvement and modification based on the Approach and Methodology narrated under his Technical Proposal)

I. Codes and Standards

The Sanitary/Plumbing Design shall be in accordance with the following Codes and Standards.

- **Codes:**
  1. National Building Code of the Philippines and Its New IRR
  2. Fire Code of the Philippines
  3. National Plumbing Code of the Philippines (NPCP)
  4. Sanitation Code of the Philippines
  5. Existing Local Codes and Ordinances.

- **Standards:**
  1. Bureau of Product Standards (BPS)
  2. Philippine National Standards for Drinking-Water
  3. Underwriters Laboratory (UL)
  4. DOH National \ Laboratory (NRL)
  5. DOH Health Care Waste Management Manual
  6. National Water Resources Board (NWRB)
  7. National Plumbers Association of the Philippines (NAMPAP)
  8. Philippine Society of Sanitary Engineers, Inc. (PSSE)

II. Site Works

- Based on the Master Site Development of the WVSU MEDICAL CENTER, the Site Works shall provide complete layout of the following:
  1. Sewerage Pipe Network, indicating Sewage Manholes, Sewage pipes and the location of the Septic Tanks
  2. Water Supply Network, indicating the location of Water Service entrance, Cisterns, and proposed Pump House and main water lines.

- The Sewerage Pipe Network design shall accommodate all sewage coming from all the facilities, conveyed by gravitational flow leading to the proposed Sewage Treatment Plant;

  Per capita wastewater demand: 150-250 gal/capita/day per bed

- Provide complete cold water supply pipes from the main water source to cistern,

III. Summary of Materials

- Sewer and Vent pipes; Unplasticized Polyvinyl Chloride (uPVC) extra series 1000 (Conforming to ISO 4435 ASTM D2729 including Trims and Fittings)
- Sewage Manholes; Traffic Type Reinforced Concrete with Standard Cast Iron Cover
- Wastewater pipeline; was area/dietary (same as sewer and neat pipes)

- Cold Waterline pipes; for buildings, Polypropylene Pn16/Pn20 Fusion Weld Pipes including Trims and Fittings (BPS Certified)

SUBJECT: **MECHANICAL WORKS DESIGN PARAMETERS** (Subject to consultant's improvement and modification based on the Approach and Methodology narrated under his Technical Proposal)

I. Codes and Standards

The Mechanical Design shall be in accordance with the following Codes and Standards.

- **Codes:**
  1. National Building Code of the Philippines and Its New IRR
  2. New Fire Code of the Philippines
  3. Mechanical Engineering Code of the Philippines (ME Code)
  4. Existing Local Government Codes and Ordinances.

- **Standards:**
  1. Bureau of Product Standards (BPS)
  2. Philippine National Standards (PNS)
  3. Underwriters Laboratory (UL) and Factory Mutual (FM)
  4. International Electro technical Commission (IEC) 1988
  5. National Fire Protection Association (NFPA)
  6. National Fire Protection Association (NFPA) 99 Standard for Health Care Facilities.
  7. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE).
  8. Center for Disease Control and Prevention (CDC) Manual.

SUBJECT: **ELECTRICAL SYSTEM DESIGN PARAMETERS** (Subject to consultant's improvement and modification based on the Approach and Methodology narrated under his Technical Proposal)

I. Codes and Standards

The Electrical System Design Parameters shall be in accordance with the following Codes and Standards.

- **Codes:**
  1. Philippine Electrical Code
  2. National Electrical Code
  3. New Fire Code of the Philippines
  4. National Building Code of the Philippines and Its New IRR
  5. Existing Local Codes and Ordinances

- **Standards:**
  1. Bureau of Product Standards (BPS)
  2. Underwriters Laboratory (UL)
  3. National Fire Protection Association
  4. International Electro technical Commission (IEC)
  5. Illumination Engineering Society (IES)
  6. National Electrical Manufacturer's Association (NEMA)
  7. DOH Manual on Technical Guidelines for Hospital and Health Facilities Planning and Design

II. Site Works

Based on the Master Site Development of the WVSUMC, the Site Works shall provide complete Electrical layout of the following:

Electrical System

1. Power System
   - Provide and install adequate normal branch circuits for the Power System.

2. Lightning Protection System

   - The lightning protection system shall include grounding conductors, ground rods, and auxiliary equipment as required for a complete and operational lightning protection system.

Provide Details of the following:

1. Panel Board and Circuit Breakers
2. Switchgear and other Metering Devices
3. Grounding System Layout
4. Others as may be required.

III. Summary of Materials

1. Wiring Devices: Wiring devices shall be non-automatic control devices, the contact is guaranteed by the pressure of the special spiral springs.

   - Switches shall be of 15A, 250V or 300V except as otherwise noted and approved. Terminals shall be screw-type or quick-connected type.
   - General use receptacle shall be 15A, 240V grounding type unless otherwise indicated on the drawings.
   - Special purpose receptacles shall be as called for on the drawings. Matching plugs shall be supplied.

2. Panel boards and Circuit Breakers: The Panel board and Circuit Breakers shall be equipped with molded-case circuit breakers and shall be the type as indicated in the panel board schedule and details.

- Provide molded-case circuit breakers of frame, trip rating and interrupting capacity as shown on the drawings. The circuit breakers shall be quick-make, quick break, thermal-magnetic, trip-indicating and shall have common trip on all multiple breakers with internal trip mechanism.
- All current-carrying parts of the panel boards shall be plated. Provide solid neutral (S/N) assembly when required. The assembly shall be isolated from the enclosure.

3. Electrical Conduits, Boxes and Fittings: All conduits, boxes and fittings shall be standard rigid steel, zinc coated or galvanized.

   - Rigid Steel Conduits (RSC)
   - Rigid Metal Conduits (RMC)
   - Intermediate Metal Conduits (IMC)
   - Electrical Metallic Tubing (EMT)
   - Plasticized Polyvinyl Chloride (uPVC) if required shall be schedule 40.

4. Conductors: Wires and cables shall be of the approved type and unless specified or indicated otherwise, all power and lighting conductors shall be insulated for 600 volts.

   - The conductors used in the wiring system shall be of soft-annealed copper having a conductivity of not less than 98% of that of pure copper and insulated for 60 °C Temperatures.
   - All conduits of convenience outlets and wire ways for lighting branch circuit homeruns shall be wired with a minimum of 3.5 mm square in size.

   - Final details of the system shall follow specific requirements, quantity and type of service.