

## TERMS OF REFERENCE

### FOR THE PROCUREMENT AND IMPLEMENTATION OF THE DESIGN AND BUILD SCHEME INFRASTRUCTURE PROJECT: CONSTRUCTION OF ELECTRICAL DISTRIBUTION SYSTEM (WITH GENSET AND 2 TRANSFORMERS) PHILIPPINE SCIENCE HIGH SCHOOL - MIMAROPA REGION CAMPUS BARANGAY RIZAL, ODIONGAN, ROMBLON

#### I. BACKGROUND

The PHILIPPINE SCIENCE HIGH SCHOOL-MIMAROPA Region Campus (PSHS-MRC) through the approved allocation for capital outlays under General Appropriations Act 2018 intends to apply the sum of **NINE MILLION EIGHT HUNDRED FIFTY THOUSAND PESOS (₱ 9,850,000.00)** being the approved budget for the procurement and implementation of the project **DESIGN AND BUILD SCHEME INFRASTRUCTURE PROJECT: CONSTRUCTION OF ELECTRICAL DISTRIBUTION SYSTEM (WITH GENSET AND 2 TRANSFORMERS)** utilizing the design and build scheme with the project duration of **ONE HUNDRED EIGHTY(180)** calendar days.

#### II. PROJECT DESCRIPTION AND LOCATION

The project will involve the **DESIGN AND BUILD SCHEME INFRASTRUCTURE PROJECT: CONSTRUCTION OF ELECTRICAL DISTRIBUTION SYSTEM (WITH GENSET AND 2 TRANSFORMERS)** of Philippine Science High School - MIMAROPA Region Campus, Rizal, Odiongan, Romblon pursuant to the technical specifications indicated in this Terms of Reference, and the PSHS System Building Standards and Specifications, enclosed herein.

The project will have an Approved Budget for the Contract (ABC) of **NINE MILLION EIGHT HUNDRED FIFTY THOUSAND PESOS (₱ 9,850,000.00)** including all taxes and applicable permits, licenses and clearances, for the project mentioned above.

The amount shall include all taxes and applicable permits, licenses and clearances, for the **DESIGN AND BUILD SCHEME INFRASTRUCTURE PROJECT: CONSTRUCTION OF ELECTRICAL DISTRIBUTION SYSTEM (WITH GENSET AND 2 TRANSFORMERS)** in which a maximum of **3%** shall be allocated for the Design and the remaining amount is for the Electrical and Civil Works of this project.

#### III. CONCEPTUAL DESIGN

##### The Construction Project

##### A. Detailed Engineering Design Reference for the **CONSTRUCTION OF ELECTRICAL DISTRIBUTION SYSTEM (WITH GENSET AND 2 TRANSFORMERS)**

- I. For the **DESIGN AND BUILD SCHEME INFRASTRUCTURE PROJECT: CONSTRUCTION OF ELECTRICAL DISTRIBUTION SYSTEM (WITH GENSET AND 2 TRANSFORMERS)** it shall be Design and Build under R.A 7920 Electrical Engineer

Law, Philippine Electrical Code (PEC), National Electrical code and the New Fire code of the Philippines. It shall be designed and approved by a Professional Electrical Engineer. The Purpose of the Underground service for this campus compared to overhead cables, underground cables are much safer because underground electrical cables are not exposed to many dangers and obstruction that overhead power cables are exposed to. Underground transmission of electricity is associated with reliability because instances of constant disruption in the supply of power as a result of storms or faults that are associated with overhead transmission lines are not common when power transmission lines are laid underground. This underground distribution design shall include all details about the electrical, mechanical, plumbing, structural, and architectural designs for this underground distribution, from the main feeder line to the main stub - outs per buildings and also the underground auxiliary details for the CATV, WAN/LAN, and INTERCOM provisions.

II. This scope of works shall be include in detailed engineering design;

### 1. Main Feeder Line or Main Transmission Line

The Main Feeder Line shall be installed by Electric supply provider (**TABLAS ISLAND ELECTRIC COOPERATIVE - TIELCO**), the contractor shall coordinate to the Electric supply provider for the supply and installation of the materials to be needed based on the design plan in constructing the main feeder line from the Main supply to the main concrete pedestal, the Cost of this installation shall be include in the contract. The main feeder line shall have a three (3) single phase Transformer that will be banking to provide a three phase output that will be sufficient to carry the **1MVA** total load Capacity of the PSHS - MRC. The Main Electrical control board and the Main Electric Meter will be included in this scope of works (see the design concept for the location of the stub - outs).

### 2. Main Distribution Panel

The Main Distribution panel also known as panelboard, breaker panel, or electric panel is a component of an electricity supply system that divides an electrical power feed into subsidiary circuits, while providing a protective fuse or circuit breaker for each circuit in a common enclosure. Main distribution panel will serve as the main electrical panel for the PSHS - MRC buildings and facilities. This will be placed in the designated EE room inside the Main powerhouse. The contractor shall provide the exact design for this electrical panel based on the total load Capacity of the PSHS - MRC.

### 3. Main Powerhouse

- The **Main powerhouse** will serve as the main Electrical control Facility for all the buildings at PSHS-MRC. All the Electrical Circuit Breakers per building, automatic transfer

switch, and Main Distribution Panel from the main supply will be placed in the designated EE room inside the powerhouse.

- i. **Electrical works** - Power house should be well illuminated and the design of the installation of the electrical panel board, pipes, fittings, boxes, wires, outlet and fixtures should be based on the Philippine Electrical Code.
- ii. **Architectural Works** - The flooring of the power house should be painted with the approved color of industrial epoxy paint. Ceiling works - the ceiling of the power house should be metal furring framing with hanger accessories and 12mm gypsum moisture resistant or fire retardant board. Provide also a Fire Rated Doors for the Main Door will be a Double Door and for the EE room will be a single door.
- iii. **Mechanical works** - The contractor shall provide a Fire Protection system and a drainage system for the safety of these facilities.
- iv. **Structural works** - Due to slope of the existing earth surface from the perimeter fence to the location of the concrete pedestal and the main powerhouse, the Main Powerhouse and concrete pedestal shall be elevated and the perimeter of the location shall have a Slope protection. Perimeter wall shall be constructed around the perimeter of the location of the main powerhouse and the concrete pedestal (**See the design concept for the location of the main powerhouse and concrete pedestal**).
- v. **EE room** shall be enclosed by a concrete wall with proper ventilation; approximately the dimension of this EE room would be 3m in length, 3m in width and 3m in height.
- vi. **Storage room** shall be enclosed by a concrete wall with proper ventilation; this room will serve as the storage area for the tools and equipment for the maintenance of this facility.
- vii. **Standby generators** shall be placed in this main power house.

#### 4. Concrete Service Entrance and Concrete pedestal

The concrete service entrance will be the main post which the electricity supply provider will tap then it will be connected to the main concrete pedestal. This main concrete pedestal where the Transformers, Main Electrical Control Board, and the Main Electric meter for the PSHS - MRC will be placed. It is also the main tapping point from the main electrical supply to Main Powerhouse. For the dimension of this concrete pedestal it shall accommodate at least six (6) single phase transformer for provision for future additional loads for this campus (**See the design concept for the location of the stub - outs**). The main concrete pedestal will be place near the Main Powerhouse, for the security and safety of the two structure provide a perimeter wall and a slope protection

because it was located in the lower part of the existing earth soil surface (See the design concept for the location of the main powerhouse and concrete pedestal).

## 5. Electrical Manholes

These Electrical manholes will be the service manholes for the maintenance of the underground Electrical distribution system connected from the main supply to concrete pedestal to main powerhouse and from the main powerhouse to the main stub out per building. This Electrical manholes has a two design concept the two way manhole and the three way manhole, for the three way manhole it will be the main stub - out of the buildings while the two way manhole will be the service manhole of the underground cabling raceway from the powerhouse to every stub - outs (See the location of the manholes and stub - outs in the design concept).

## 6. Auxiliary Hand holes

The Auxiliary Hand holes will be the service hand hole for the maintenance of the underground Auxiliary distribution system for Telephone, WAN, LAN, and Public Address system from the main server room to stub - outs per buildings (See the location of the manholes and stub - outs in the design concept).

## 7. Auxiliary Distribution

For the Main Auxiliary Distribution the contractor shall provide only a provision. For the provision use a conduit that will be suited for the Public Address system, WAN/LAN Network cable, CCTV system and Intercom cable Provision since the Main server room will be located at the admin building and the building has not been construct and design, The Contractor shall provide first a provision for this scope. From the location of Guard House to every building stub - out. This distribution should not be connected to the main electrical power house. (See the design concept for the location of the stub - outs).

## 8. Generators and ATS

The Generator set and Automatic Transfer Switch (ATS) shall be include in the design, this generator will serve as the back - up electricity supply of every facilities in PSHS - MRC and it shall be placed inside main powerhouse. The specification of the ATS and the wires that will be use should be based on the load capacity per building

## 9. Main distribution line for the PSHS - MRC facilities

- See the following lists of PSHS - MRC Facilities;
  - i. ACADEMIC BUILDING 1

- ii . ACADEMIC BUILDING 2
- iii. DORMITORY BUILDING 1
- iv. DORMITORY BUILDING 2
- v. SCHOOL CANTEEN
- vi. LABORATORY BUILDING
- vii. ADMINISTRATION/EMPLOYEE'S BUILDING
- viii. PERIMETER & STREETLIGHTS
- ix. OLYMPIC POOL
- x. GYMNASIUM
- xi. ELEVATED WATER TANK
- xii. GUARD HOUSE

- **LOAD CAPACITY PER BUILDINGS AND FACILITIES FOR REFERENCE;**

BUILDINGS	LOAD CAPACITY	UNIT	CONNECTION
ACADEMIC BUILDING 1	100	KILO VOLT - AMPERE	THREE PHASE
ACADEMIC BUILDING 2	100	KILO VOLT - AMPERE	THREE PHASE
LABORATORY BUILDING	150	KILO VOLT - AMPERE	THREE PHASE
ADMINISTRATION BUILDING	100	KILO VOLT - AMPERE	THREE PHASE

BUILDINGS	LOAD CAPACITY	UNIT	CONNECTION
SCHOOL CANTEEN	25	KILO VOLT - AMPERE	SINGLE PHASE
DORMITORY BUILDING 1	50	KILO VOLT - AMPERE	SINGLE PHASE
DORMITORY BUILDING 2	50	KILO VOLT - AMPERE	SINGLE PHASE
PERIMETER FENCE & STREETLIGHTS, GUARD HOUSE, ELEVATED WATER TANK	30	KILO VOLT - AMPERE	SINGLE PHASE
GYNASIUM, FOOTBALL FIELD, & OLYMPIC POOL	25	KILO VOLT - AMPERE	SINGLE PHASE

- The load capacity of the buildings and facilities is equal to Six hundred thirty (630) Kilovolt - Ampere in total.

**NOTE:** The Contractor shall provide a maximum Load Capacity of ONE (1) Megavolt - Ampere for the Total Load Capacity of PSHS - MRC buildings and for the possible additional Facilities and buildings in the future.

III. Preparation of the following Detailed Design Drawings (see PSHS-MRC Checklist of Drawings Requirements) based on the approved Design Development Drawings and Design Parameters including any revisions and refinements as approved and required by PSHS-MRC:

a. Detailed Architectural Plans (refer to Checklist of Drawings Requirements and Design Parameters). **Note: The Prospective bidder must present their Design based on our concept. The Design of the Procuring Entity is for reference purpose only.**

b. Detailed Structural Plans (refer to Checklist of Drawings Requirements and Design Parameters). **Note: The Prospective bidder must present their Design based on our concept. The Design of the Procuring Entity is for reference purpose only.**

c. Detailed Electrical Plans (refer to Checklist of Drawings Requirements and Design Parameters). **Note: The Prospective bidder must present their Design based on our concept. The Design of the Procuring Entity is for reference purpose only.**

d. Detailed Storm Drain, Sanitary and Plumbing Plans (refer to Checklist of Drawings Requirements and Design Parameters). **Note: The Prospective bidder must present their Design based on our concept. The Design of the Procuring Entity is for reference purpose only.**

e. Detailed Mechanical Plans (refer to Checklist of Drawings Requirements and Design Parameters). **Note: The Prospective bidder must present their Design based on our concept. The Design of the Procuring Entity is for reference purpose only.**

f. Structural Computations, including Soil Boring Test Results and Seismic Analysis and Electrical Design Computations.

g. General Notes and 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.

h. Detailed Bill of Quantities, Cost Estimates including a summary sheet indicating the unit prices of construction materials, labor rates and equipment rentals.

i. Summary of Works

#### IV. CHECKLIST OF DRAWINGS REQUIREMENTS AND DESIGN PARAMETERS

- ARCHITECTURAL DESIGN PARAMETERS

- I. Codes and Standards

- The Architectural Works shall be in accordance with the following Philippine laws, Codes and Standards.

- Laws and Codes:

1. National Building Code of the Philippines and its Latest and Amended IRR
  2. RA 9266 or Architectural Law and its Latest and Amended IRR
  3. BP 344 or Accessibility Law and its Latest and amended IRR
  4. AO 35, s. 1994 or, AO Pertaining to the Control of Radiation Hazards
  5. RA 9514 New Fire Code of the Philippines
  6. Existing Local Codes and Ordinances.
  7. And other Laws that applies to the projects
- Standards:
    1. Bureau of Product Standards (BPS)
    2. Underwriters Laboratory (UL)

## II. Proposal should include the following:

- Floor Plans (scale 1:100 minimum) including proposed furniture layout
  - Roof Plan/s showing downspouts (scale 1:100 minimum), including detail of gutter downspout, etc.
  - Reflected ceiling plan/s (scale 1:100 minimum), including details
  - Details of Stairs, fire escapes/exits, accessible ramps etc., in the forms of plans evaluation/section
  - 
  - Details of specialized design features (scale 1:50m) such as partitions
  - Details of rooms (1:50m) in the form from floor to roof (scale 1:50m)
  - Schedule of doors, gates emergency exits, etc., (scale 1:50m), including specifications for materials and hardware
  - Schedule of windows (scale 1:50m) including specifications for materials and hardware
  - Schedule of finishes for interior and exterior floors, walls ceilings
  - Architectural Interior Design Technical Specifications
  - Architectural Interior Design Scope of Works
  - Architectural Interior Design Bill of Quantities
  - Cost Analysis
- **STRUCTURAL/CIVIL WORKS DESIGN PARAMETERS**

### I. Codes and Standards

The Civil/Structural Design shall be in accordance with the following Philippine laws, Codes and Standards.

- Codes
  - a. National Structural Code the Philippines (NSCP) 2010
  - b. National Building Code of the Philippines and its revised IRR
  - c. Accessibility Law
  - d. Local Codes and Ordinances
- Standards
  1. Bureau of Product Standards (BPS)
  2. Philippine National Standards (PNS)
  3. DPWH Blue Book

4. American Concrete Institute (ACI)
5. American Society for Testing Materials (ASTM)
6. American Welding Society (AWS)

**II. Proposal should include the following:**

- General Notes and construction Standards
- Site Development Plan
- Foundation Plan/s (scale 1:100m minimum)
- Floor Framing Plan/s (scale 1:100m minimum)
- Roof Framing Plan/s (scale 1:100m minimum)
- Schedule and Detail of Footings and Columns
- Schedule and Detail of Beams and Floor Slabs
- Details of Flat form
- Details of Stairs, Ramps, Fire Exits
- Details of Elevated Water Tank
- Structural Analysis and Design (for main structure Pedestal)
- Seismic Analysis
- Geotechnical Analysis
- Structural and technical specifications
- Structural Scope of Works
- Structural Bill of Quantities
- Cost Analysis

• **SANITARY/PLUMBING DESIGN**

**I. Codes and Standards**

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

- Codes:
  - a. National Building Code of the Philippines and its New IRR
  - b. Fire Code of the Philippines
  - c. National Plumbing Code of the Philippines (NPCP)
  - d. Sanitation Code of the Philippines
  - e. 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. Proposal should include the following:**



- General Notes and Legends
- Location and Site Plan
- Storm Drainage Layout (scale 1:100m minimum) including actual length of tapping line to Main Drainage line
- Design Analysis
- Sanitary Technical Specifications
- Sanitary Scope of Works
- Sanitary Bill of Quantities
- Cost Analysis

- **MECHANICAL WORKS DESIGN**

- I. **Codes and Standards**

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

- Codes:
  - a. National Building Code of the Philippines and its New IRR
  - b. New Fire Code the Philippines
  - c. Mechanical Engineering Code of the Philippines (ME Code)
  - d. 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.

- II. **Proposal should include the following:**

- General Notes and Legends, Site Development Plan, Location Plans
- Floor Plans/Isometric Drawings (scale 1:100m minimum) of Fire Suppression Systems, fire sprinkler system, wet stand pipe, dry stand pipe and other installation
- Details of Firewater Supply System (scale 1:50m)
- Technical Specification
- Mechanical Scope of Works
- Mechanical Bill of Quantities
- Cost Analysis

- **ELECTRICAL DESIGN PARAMETERS**

- I. **Codes and Standards**

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

- Codes:
  - a. Philippine Electrical Code`
  - b. National Electrical Code
  - c. New Fire Code of the Philippines
  - d. National Building Code of the Philippines and Its new IRR
  - e. 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)

- II. **Proposal should include the following:**

- General Notes and Legends
- Location and Site Plan
- Lighting Layout (scale 1:100m minimum) including details
- Power Layout (scale 1:100m minimum) including details
- Auxiliary System Layout (scale 1:100m minimum) including details (Telephone System with Intercom, WAN and LAN System.
- Schedule and Details of Loads
- Riser Diagram
- Other Detail
- Electrical Computation
- Voltage Drop Calculation
- Design Analysis
- Short Circuit Analysis
- Electrical Technical Specifications
- Electrical Scope of Works
- Electrical Bill of Quantities
- Cost Analysis

- B. **CONSTRUCTION PHASE 1 OF ELECTRICAL DISTRIBUTION SYSTEM (WITH GENSET AND 2 TRANSFORMERS)**

- a) **CONSTRUCTION OF MAIN DISTRIBUTION LINE PER BUILDINGS - PHASE 1**

- For the **ACADEMIC BUILDNG 1** it has a total load capacity of 100 Kilo Volt - Ampere, Three **(3)** - Phase connection. The Electrical supply of the building was a 3 phase Electrical connection with Four **(4)** wires,

the main supply of this building will be tap in the Main Distribution panel from the powerhouse then it will distribute the main supply through a raceway.

- For the **SCHOOL CANTEEN, DORMITORY BUILDING 1 & 2** the electrical connection for these buildings was a single phase Electrical connection with Three (3) wires, for the School Canteen the total load capacity of this building based on the load schedule was Twenty Five (25) Kilowatt, Dormitory BLDG. 1 is Fifty (50) Kilowatt & For Dormitory BLDG. 2 is Fifty (50) Kilowatt with single phase connection. The main supply will be tap to a main distribution panel from the powerhouse then it will distribute the main supply through an electrical raceway.
- For the **LABORATORY BUILDING 1** it has a total load capacity of 150 Kilo volt-ampere, Three (3) - Phase connection. The Electrical supply of the building was a 3 phase Electrical connection with four (4) wires, the main supply of this building will be tap in the Main Distribution panel from the powerhouse then it will distribute the main supply through a raceway.
- For the **WATER TANK PEDESTAL, GUARD HOUSE, and PERIMETER LIGHTS & STREETLIGHTS** these Facilities it has a total load capacity of 30KW - Single phase connection. (See the design concept for the location of the stub - outs).
- The **Electrical raceway** from the powerhouse to the water tank pedestal shall be embedded with the minimum of 900mm length below the Ground level and the conduit that will across the road will be place in the electrical provision in the road sidewalk (see the design concept for the location of the raceway).

- b) CONSTRUCTION OF MAIN FEERDER LINE
- c) CONSTRUCTION OF MAIN POWERHOUSE
- d) CONSTRUCTION OF MAIN CONCRETE PEDESTAL
- e) CONSTRUCTION OF ELECTRICAL MANHOLES
- f) CONSTRUCTION AUXILIARY HANDHOLES
- g) CONSTRUCTION OF AUXILIARY DISTRIBUTION PROVISION
- h) SUPPLY AND INSTALLATION OF GENSET AND ATS
  - For the Construction Phase 1, supply and installation of the GENSET and ATS shall be on Academic Bldg. 1 only.
- i) SUPPLY AND INSTALLATION OF MAIN DISTRIBUTION PANEL
- j) TRANSFERRING AND INSTALLATION OF THE EXISTING 50KVA GENERATOR FROM THE CONVENTION CENTER TO THE MAIN POWERHOUSE.

#### IV. SELECTION OF CONTRACTOR

The procurement and implementation of the project shall be in accordance with the provisions of RA 9184. Bidding process shall be conducted by the Bids and Awards Committee (BAC) to be assisted by the TWG. The campus director of PSHS-MRC shall create the Design and Build Committee (DBC) to be composed of highly technical

personnel in the field of architecture and engineering/construction. The DBC and TWG shall prepare the design brief and performance specifications and parameters, review the detailed engineering design, and assist the BAC in the evaluation of technical and financial proposals in accordance with the criteria set.

## **A. Eligibility Requirements**

The eligibility requirements for infrastructure projects shall comply with the applicable provisions of Section 23-24 of the IRR of RA 9184.

### **a. Eligibility Documents**

#### **Class "A" Documents**

- i. PhilGEPS Registration
- ii. Registration from the Securities and Exchange Commission ( SEC), Department of trade and Industry (DTI) for sole proprietorship, or Cooperative Development Authority (CDA) for cooperatives;
- iii. Mayor's permit issued by the city or municipality where the principal of business of the prospective bidders is located;
- iv. Statement of all its on-going and completed government and private contracts within ten (10) years from the submission of bids
  - a. CPES rating or
  - b. Certificate of Completion
- iv. PCAB licenses and registration for the type and cost of the contract for this project (Small B - License Category C and D) and contractor's registration certificate from DPWH;
- v. Audited financial statement, stamped " received" by the BIR for the preceding calendar year;
- vi. NFCC computation or CLC.
- vii. Tax clearance

#### **Class " B " Documents**

##### **a. Joint Venture agreement, if applicable.**

##### **b. Technical Documents**

- i. Bid Security (in any form)
- ii. Project Requirements
  - ii1. Design and Construction Method
  - ii2. Value engineering analysis of construction method. Prospective bidders shall prepare a value engineering analysis report of their proposed construction method to be applied for the PROJECT. Importance shall be made on the following criteria:
    - Cost-saving, measured on a per square meter average figure
    - Time-saving in construction duration, measured using the HOPE approved PERT/CPM of the project.
  - ii3. Organizational Chart
  - ii4. List of Contractor's Personnel with complete qualification and experience data
  - ii5. List of Contractor's Equipment units, which are owned, leased, and/or under purchase agreements, supported by certification of availability of

equipment from the equipment lessor/vendor for the duration of the project.

- ii6. Manpower Schedule
- ii7. Equipment Utilization Schedule
- ii8. Bar Chart and S-curve
- ii9. Construction Safety and Health Program
- ii10. PERT-CPM
- ii11. Omnibus Sworn Statement

### **c. Financial Component**

Financial Bid Form

- i. Bill of Quantities
- ii. Detailed Cost Estimates
- iii. Summary Sheet indicating the unit prices of materials, labor rates and equipment rental
- iv. Payment schedule

### **B. Eligibility Criteria**

- a) The eligibility of contractors shall be based on the legal, technical and financial requirements above-mentioned. In the technical requirements, the contractor (as solo or in joint venture/consortia) should be able to comply with the experience requirements under the IRR of RA 9184, where one of the parties (in a joint venture/consortia) should have at least one similar project in construction, with at least 50% of the cost of the Approved Budget for the Contract (ABC).
- b) If the bidder has no experience in construction projects on its own, it may enter into subcontracting, partnerships or joint venture with engineering firms for the portion of the contract.

### **v. FOR DESIGN PERSONNEL**

The key professionals and the respective qualifications of the DESIGN PERSONNEL shall be as follows:

#### **A. Design Architect**

The Design Architect must be duly-licensed with at least ten (10) years of experience in the design of residential, academic or institutional facilities, and shall preferably be knowledgeable in the application of Green Design Technology in school construction.

#### **B. Structural Engineer**

The Structural Engineer must be a duly-licensed Civil Engineer with at least ten (10) years of experience in structural design and shall preferably be knowledgeable in the application of Green Design Technology in school construction.

**C. Electrical Engineer**

The Electrical Engineer must be a registered Professional Electrical Engineer with at least ten (10) years of experience in the design of lighting, power distribution and preferably knowledgeable in developments in emergent efficient lighting technologies and energy management.

**D. Electronics Engineer**

The Electronics Engineer must be a registered Professional Electronics Engineer with at least ten (10) years of experience in the related field knowledgeable in communication systems (specifically structured and local area network cabling, PABX), building management systems.

**E. Mechanical Engineer**

The Mechanical Engineer must be a Professional Mechanical Engineer with at least ten (10) years of experience in HVAC and fire protection systems and preferably knowledgeable in emergent, alternative energy-efficient HVAC technologies.

**F. Sanitary Engineer**

The Sanitary Engineer must be duly-licensed with at least ten (10) years of experience in the design of building water supply and distribution, plumbing, and preferably knowledgeable in waste water management/treatment, and emergent, alternative effluent collection and treatment systems, and DENR AO 36 s. 2004 (DAO 92-29 "Hazardous Waste Management).

The key professionals listed are required. The **DESIGN & BUILD CONTRACTOR** may, as needed and at its own expense, add additional professionals and/or support personnel for the optimal performance of all Architectural and Engineering Design Services, as stipulated in these Terms of Reference for the PROJECT. Prospective bidders shall attach each individual's resume and PRC license of the (professional) staff.

**VI. CONSTRUCTION PERSONNEL**

The key professionals and the respective qualifications of the **CONSTRUCTION PERSONNEL** shall be as follows:

**A. Project Manager**

The Project Manager shall be a licensed architect or engineer with at least Ten (10) years relevant experience on similar and comparable projects in different locations. The Project Manager should have a proven record of managerial capability through the directing/managing of major civil engineering works, including projects of a similar magnitude.

**B. Project Engineer/ Architect**

The Project Engineer/Architect shall be a licensed architect or engineer with at least Ten (10) years of experience in similar and comparable projects and shall preferably be knowledgeable in the application of rapid construction technologies.

**C. Materials Engineer**

The Materials Engineer must be duly accredited with at least Ten (10) years of experience in similar and comparable projects and shall preferably be knowledgeable in the application of rapid construction technologies.

**D. Electrical Engineer**

The Electrical Engineer must be a registered Professional Electrical Engineer with at least Ten (10) years of experience in the design of lighting, power distribution and preferably knowledgeable in developments in emergent efficient lighting technologies and energy management.

**E. Electronics Engineer**

The Electronics Engineer must be a registered Professional Electronics Engineer with at least Ten (10) years of experience in the related field knowledgeable in communication systems (specifically structured and local area network cabling, PABX), building management systems.

**F. Mechanical Engineer**

The Mechanical Engineer must be duly-licensed with at least Ten (10) years of experience in similar and comparable projects in the installation of HVAC and fire protection.

**G. Sanitary Engineer**

The Sanitary Engineer must be duly-licensed with at least Ten (10) years of experience in similar and comparable projects in the installation of building water supply and distribution, plumbing.

**H. Foreman**

The Foreman must have at least Ten (10) years of experience in similar and comparable projects and shall preferably be knowledgeable in the application of Green Building technologies.

**I. Safety Officer**

The safety officer must be an accredited safety practitioner by the Department of Labor and Employment (DOLE) and has undergone the prescribed 40 hour Construction Safety and Health Training (COSH).

The above key personnel listed are required. The **CONTRACTOR** may, as needed and at its own expense, add additional professionals and/or support personnel for the optimal performance of all Construction Services, as stipulated in these Terms of Reference, for the PROJECT. Prospective bidders shall attach each individual's resume and PRC license of the (professional) staff, proof of qualifications, and related documents as necessary.

**VII. PRELIMINARY DESIGN AND CONSTRUCTION STUDIES**

No bidding and award of design and build contracts shall be made unless the required preliminary design and construction studies have been sufficiently carried out and duly approved by the Head of the Procuring Entity that shall include, among others, the following:

- i. Project Description

- ii. Conceptual Design
- iii. Performance Specifications and Parameters
- iv. Preliminary Survey and Mapping
- v. Preliminary Investigations
- vi. Utility Locations
- vii. Approved Budget for the Contract
- viii. Proposed Design and Construction Schedule
- ix. Minimum requirements for a Construction Safety and Health Program for the project being considered
- x. Tender/Bidding Documents, including Instructions to Bidders and Conditions of Contract

The above data are for reference only. The procuring entity does not guarantee that these data are fully correct, up to date, and applicable to the project at hand. The contractor is responsible for the accuracy and applicability of all data, including the above, that it will use in its design and build proposal and services.

The acquisition of right-of-way and the conduct of eminent domain proceedings shall still be the responsibility of the procuring entity, which shall include a preliminary budget for this purpose.

#### **VIII. DETAILED ENGINEERING REQUIREMENT**

1. Upon award of the contract within a period of 30 Calendar Days, the winning bidder shall be responsible for the preparation and submission of all necessary detailed engineering investigations and surveys in accordance with the provisions of Annex "A" of this IRR (with the exception of the Bidding Documents and the ABC).
2. The procuring entity shall ensure that all the necessary schedules with regard to the submission, confirmation and approval of the detailed engineering and the details of the construction methods and procedures shall be included in the contract documents.
3. The procuring entity shall review, order rectification, and approve or disapprove - for implementation only - the submitted plans within these schedules. All instructions for rectification shall be in writing stating the reasons for such rectification. The contractor shall be solely responsible for the integrity of the detailed engineering and the performance of the structure irrespective of the approval/confirmation by the procuring entity.

#### **IX. SCOPE OF WORKS AND PROJECT IMPLEMENTATION**

##### **A. Design Phase**

The Philippine Science High School - MIMAROPA Region Campus, through the PSHS System Design and Build Committee for Design and Build Scheme, shall provide the design brief description of the project in accordance to RA9184 Annex G Sec. 11.



In compliance with the design and build Terms of Reference, 10 days after issuance of Notice to Proceed, the DESIGN AND BUILD CONTRACTOR shall submit an Initial Design Proposal and the Final Design Phase for approval after 20 days.

The DESIGN AND BUILD CONTRACTOR shall also submit a detailed program of work within thirty (30) calendar days after the issuance of the Notice to proceed for approval by the procuring entity that shall include, among others:

- a. The order in which it intends to carry out the work including anticipated timing for each stage of design/detailed engineering and construction;
- b. Periods for review of specific outputs and any other submissions and approvals;
- c. Sequence of timing for inspections and tests as specified in the contract documents;
- 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 major stage of the work;
- g. Description of the quality control system to be utilized for the project
- h. Utilize the existing geotechnical/soil investigation report as basis for the computation of structural analysis of the building.
- i. From the approved schematic design documents, prepare the complete construction drawings and detailed technical specifications, cost estimates and the bill of quantities, setting forth in detail the work required for the architectural, structural, civil, landscape architecture, electrical, plumbing/sanitary, mechanical and other service-connected equipment, utilities, site planning aspects and related works, electronic and communications and the site development plan of the PROJECT's immediate environs.
- j. Prepare layouts, specifications and estimates of all furniture and equipment required for the fit-out of the buildings, specifically items that are owner-furnished materials.
- k. Prepare the scope of work for construction based on the prepared bill of quantities and cost estimates while fitting within the approved budget.
- l. Provide value engineering analysis on all prepared construction documents.
- m. Coordinate with all offices and agencies concerned, within and outside the Campus regarding utility connections, permits and other requirements needed.
- n. Periodically coordinates and presents the status of the design phase to the Head of Procuring Entity and the PSHS Design & Build Committee.

All drawings included in the contract documents should be drawn using **CAD software** and plotted on 20"x 30" sheets and A3 size (7 Copies). All other textual submittals shall be printed and ring-bound on A4-sized sheets.

Where required, design components shall be designed in coordination with the agencies concerned (e.g., coordinate with electric company for power lines and concerned company/agency for water and sewage lines).

Partial and earlier submission of the construction drawings, such as those affecting the preliminary stages of construction (site works, foundation works, etc.) shall be allowed. The DESIGN & BUILD CONTRACTOR may only proceed with the CONSTRUCTION

PHASE after the approval of the PSHS-MRC Design and Build (D&B) Committee including drawings, designs, and bill of estimates as recommended by the Technical Working Group (TWG) and upon accomplishing all necessary PRE-CONSTRUCTION tasks.

## **B. Pre-Construction**

- a) Secures all necessary building permits prior to construction. All incidental fees shall be included in the cost estimate of the building.
- b) Prepares the PERT-CPM of the construction phase.
- c) Provides all other necessary documents that shall be required by B&D Committee

## **C. Construction Phase**

- a) Implements all works indicated in the approved construction drawings and documents. All revisions and deviation from the approved plans, especially if it shall impact the overall cost of the project, shall be subject for approval.
- b) Provides soil filling, grading and other soil protection measures of the building and other elements of the site, in response to the results of soil and materials testing.
- c) Constructs the buildings and other necessary structures, complete with utilities and finishes, resulting in operable and usable structures.
- d) Provides protection or relocation of existing trees indigenous to the area, and proper removal and replacement of all introduced trees and vegetation affected by the construction.
- e) Layouts piping, conduits, manholes, boxes and other lines for utilities including tapping to existing utility lines. Facilitate the connection of all utilities (power, water, sewer, structured cabling and telephone) with their corresponding utility companies. All application fees shall be included in the project cost.
- f) Installs fire protection systems and fixtures, fire extinguishers, emergency lights and lighted fire exit signs.
- g) Prepares shop-drawings for approval.
- h) Coordinates with the B&D Committee regarding scheduling of delivery and installation of all owner-furnished materials and equipment during construction.
- i) Conducts all necessary tests (to be required by B&D Committee) and issue reports of results.
- j) Rectifies punch-listing works to be inspected and issued by the B&D Committee and/or the End-user.
- k) Complies with the DOLE-OSH requirements and submit periodic reports concerning occupational safety and health.
- l) Provides all other necessary documents that shall be required by the B&D Committee.

## **D. Post Construction Phase**

- a) Prepares of as-built plans
- b) Turn-overs of all manuals, certificates and warranties of installed items.
- c) Secures building certificate of occupancy and fire safety inspection certificate

### **C. Variation Orders**

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 any design or document, reviewed and approved, the contractor shall notify the procuring entity within a reasonable period of time and shall shoulder the cost of such changes.

- a. 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:
  - i. 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.
  - ii. Provided that the contractor suffers delay and/or incurs costs due to changes or errors in the procuring entity's performance specifications and parameters, he shall be entitled to either one of the following:
    - a. an extension of time for any such delays under Section 10 of Annex "E"; or
    - b. 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 contract

### **F. DEFECTS AND LIABILITY**

- a. All design and build projects 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, however, to the liabilities imposed upon the engineer/architect who drew up the plans and specification for a building sanctioned under Section 1723 of the New Civil Code of the Philippines.
- b. The contractor shall be held liable for design and structural defects and/or failure of the completed project within the warranty periods specified in Section 62.2.3.217 of the IRR.

### **x. OVERALL PROJECT TIME SCHEDULE**

The DESIGN & BUILD CONTRACTOR shall propose the most reasonable time schedule for the completion of the project. It is expected that this period will not exceed One Hundred Eighty (180) calendar days from the date of the issuance of the Notice to Proceed (NTP): thirty (30) calendar days for the Design Phase and One Hundred Fifty (150) calendar days for the Construction Phase.

## **XI. THE IMPLEMENTING AGENCY'S GENERAL RESPONSIBILITY**

The implementing agency for the project is the Campus Director of PSHS-MRC with final approval for all decisions and actions from the PSHS System Office of the Executive Director through the Build and Design Committee. The B&D Committee shall:

- a) Prepare the design brief for the project in accordance with PSHS Systems' policies, existing codes, traditions, standards, and the conditions and design criteria enumerated in the Terms of Reference.
- b) Coordinate with CONTRACTOR and the Campus Director of PSHS-MRC with regards to implementation of the project.
- c) Assist in the coordination of the CONTRACTOR with various utility agencies during implementation phases of the project.
- d) Conduct regular coordination meetings between the CONTRACTOR and PSHS-MRC to facilitate the implementation of the project.

## **XII. THE DESIGN & BUILD CONTRACTOR'S GENERAL RESPONSIBILITY**

- a) The DESIGN & BUILD CONTRACTOR shall include the 30 calendar days for the design phase in the total Project duration of 180 calendar days.
- b) The DESIGN & BUILD CONTRACTOR shall certify that he has, at his own expense, inspected and examined the proposed project site, its surroundings and existing infrastructure and facilities related to the execution of the work and has obtained all the pieces of information that are considered necessary for the proper execution of the work covered under these Terms of Reference.
- c) The DESIGN & BUILD CONTRACTOR shall ensure that all works at the stages of design, construction, restoration of affected areas, and testing and commissioning shall be carried out efficiently and effectively.
- d) The DESIGN & BUILD CONTRACTOR shall provide PSHS-MRC with complete reports such as technical analysis, maps and details regarding the existing conditions and proposed improvements within the site.
- e) The DESIGN & BUILD CONTRACTOR shall consider the academic calendar and critical dates and occasions within PSHS-MRC, in order to align his work schedule with the academic calendar of the school to avoid unnecessary disruption of school activities due to construction activities such as closure of water and power supply and non-usage of the existing roads.
- f) The DESIGN & BUILD CONTRACTOR shall inform PSHS-MRC of critical events during construction, especially when such events can potentially disrupt school activities.
- g) The DESIGN & BUILD CONTRACTOR shall be PCAB accredited and shall have a Construction Safety and Health Program approved by DOLE and designed specifically for the CONSTRUCTION OF DORMITORY BUILDING I.

- h) The DESIGN & BUILD CONTRACTOR will be held accountable for accidents that might occur during the execution of the project. The DESIGN & BUILD CONTRACTOR is required to install warning signs and barriers for the safety of the general public and the avoidance of any accidents and provide appropriate and approved type personal protective equipment for their construction personnel.
- i) The DESIGN & BUILD CONTRACTOR shall be professionally liable for the design and shall submit a signed and sealed copy of the approved construction documents to form part of the Contract Documents.
- j) Only the plans approved by the Head of Procuring Entity (HOPE) shall be signed and sealed by the DESIGN & BUILD CONTRACTOR, and thereafter shall be the plans used for construction should there be deviation from the original design the contractor shall seek approval of the Head of the Procuring Entity (HOPE).
- k) All works designed and constructed should be guaranteed to seamlessly fit into the overall system general design standards of the PSHS System.

### **XIII. PROJECTED SUBMITTALS DURING THE PROJECT**

The following submittals and accomplished documents shall be duly completed and Turned-over by the DESIGN & BUILD CONTRACTOR for the project:

#### **A. FOR THE DESIGN PHASE**

- a) Construction plans (signed and sealed) that include Architectural, Civil, Structural, Electrical, Structured Cabling, Mechanical, Fire Protection and Plumbing plans (7 sets hard copy and soft copy)
- b) Technical specifications (7 sets hard copy and soft copy)
- c) Detailed cost estimate (7 sets hard copy and soft copy)
- d) Bill of quantities (7 sets hard copy and soft copy)
- e) Site survey, topographic survey, survey of existing trees and all other pertinent data related to the conditions of the project site
- f) Documents required for securing the Building Permit

#### **B. Drawings and reports that the B&D Committee may require for the periodic update concerning the status of the design phase **FOR THE CONSTRUCTION PHASE (7 copies each)****

- a) Shop drawings (hard copy and soft copy)
- b) PERT-CPM
- c) Concrete Test results
- d) Guarantees, warranties and other certificates
- e) Fire and Life Safety Assessment Report 2 and 3 (FALAR 2 and 3)

#### **C. FOR THE POST-CONSTRUCTION PHASE (7 copies each)**

- a) As-built plans (hard copy and soft copy)
- b) Certificate of Occupancy
- c) Fire Safety Inspection Certificate (if applicable)
- d) All other necessary documents to be required by B&D Committee

#### **xiv. CODES AND STANDARDS**

The project shall be designed, engineered, installed, tested, commissioned and handed over in conformity with the Building and Design Standards of the PSHS System and with the latest editions of the National Building Code of the Philippines, the National Structural Code of the Philippines, the Philippine Electrical Code, Philippine Mechanical Code, the National Plumbing Code of the Philippines, National Fire Code of the Philippines and other relevant codes and standards.

#### **xv. INSTALLATION AND WORKMANSHIP**

Personnel of the CONTRACTOR should be specialists highly skilled in their respective trades, performing all labor according to first-class standards. A full time Project Engineer/Architect and Construction Safety Engineer shall be assigned by the CONTRACTOR at the job site during the construction of the project.

All work to be subcontracted shall be declared by the CONTRACTOR and shall be approved by the Campus Director of PSHS-MRC and its respective technical offices. However, subcontracting of any portion shall not relieve the contractor from any liability or obligation that may arise from the contract for this project.

Tapping for utilities such as power supply, water supply and sewage drainage shall be coordinated with their respective utilities/ service provider/ companies, and all works involved, including access to utilities tapping point, excavation, removal of obstructions, concrete breaking, backfilling and restoration of affected areas, shall be coordinated and included in the scope of work and cost of the project.

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 any design or document, reviewed and approved, the CONTRACTOR shall notify the procuring entity within a reasonable period of time and shall shoulder the cost of such changes.

#### **xvi. MATERIALS**

All materials and equipment shall be standard products of manufacturers engaged in the production of such materials and equipment and shall be the manufacturer's latest standard design.

The materials and workmanship supplied shall be of the best grade and constructed and/ or installed in a practical and first class manner. It will be completed in operation, nothing being omitted in the way of labor and materials required and it will be delivered and turned over in good condition, complete and perfect in every respect.

Materials and systems for structured cabling shall be in accordance with standards set by the PSHS System.

All materials shall be in conformance with the latest standards and with inspection and approval from B&D Committee.

## xvii. MODE OF PAYMENT

- a) The PSHS-MRC shall pay the winning DESIGN & BUILD CONTRACTOR progress payments based on billings for actual works accomplished, as certified by B&D Committee of the PSHS System. In no case shall progress billing be made more than once every thirty (30) calendar days. Materials or equipment delivered on the site but not completely put in place or used in the project shall be included for payment.
- b) All progress payment shall be subject to retention of ten percent (10%) based on the amount due to the winning DESIGN & BUILD CONTRACTOR prior to any deduction. The total retention money shall be released only upon Final Acceptance of the Project. The winning DESIGN & BUILD CONTRACTOR may, however, request for its release prior to Final Acceptance subject to the guidelines set forth in R.A. 9184 and its Implementing Rules and Regulations.
- c) The DESIGN & BUILD CONTRACTOR may request in writing which must be submitted to form part of the Contract Documents, for an advanced payment equivalent to fifteen percent (15%) of the total Contract Price. The advance payment shall be made once the DESIGN & BUILD CONTRACTOR issues its irrevocable standby letter of credit from a reputable bank acceptable to the PSHS System, or GSIS Surety Bond of equivalent value, within fifteen (15) days from the signing of the Contract Agreement to cover said advanced payment.
- d) First Payment/Billing shall have an accomplishment of at least 20% of the construction phase.
- e) The following documents must be submitted to the B&D Committee before processing of payments to the DESIGN & BUILD CONTRACTOR can be made:
  - i. Progress Billing
  - ii. Detailed Statement of Work Accomplished (SWA)
  - iii. Request for payment by the DESIGN & BUILD CONTRACTOR
  - iv. Pictures/photographs of original site conditions (for First Billing only)
  - v. Pictures/photographs of work accomplished
  - vi. Payment of utilities (power and water consumption)
  - vii. DESIGN & BUILD CONTRACTOR's affidavit (if accomplishment is more than 60%)

*Note: The DESIGN & BUILD CONTRACTOR can bill the PSHS-MRC of up to a maximum of 90% accomplishment.*

Prepared by:

DESIGN AND BUILD COMMITTEE:




SANDY F. MORENO  
Chairperson

Engr. BRYAN F. MANZANO  
Member

  
Arch. JOLITO G. TAN  
Member

  
Engr. JOSEPH G. BANTANG  
Member

Concurred by:

  
EDWARD C. ALBARACIN  
Campus Director