

# TERMS OF REFERENCE

FOR THE PROCUREMENT AND IMPLEMENTATION OF THE  
DESIGN AND BUILD SCHEME INFRASTRUCTURE PROJECT FOR THE  
CONSTRUCTION OF **LABORATORY BUILDING I** OF  
PHILIPPINE SCIENCE HIGH SCHOOL - MIMAROPA REGION CAMPUS  
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## I. BACKGROUND

The PHILIPPINE SCIENCE HIGH SCHOOL-MIMAROPA Region Campus (PSHS-MRC) through the approved allocation for capital outlays under FY 2017 General Appropriations Act intends to apply the sum of **SEVENTY-EIGHT MILLION EIGHT HUNDRED THOUSAND PESOS (₱78,800,000.00)** being the approved budget for the procurement and implementation of the project **CONSTRUCTION OF LABORATORY BUILDING I** utilizing the **design and build scheme** with the project duration of **460 calendar days**.

## II. PROJECT DESCRIPTION AND LOCATION

The project will involve the Design and Build Scheme leading to the Construction of the **Laboratory Building I** 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 building will be located within the PSHS-MRC compound particularly at the middle part of the campus. The **Laboratory Building I** will be a 4-storey building which will sit on a flat area indicated in the campus masterplan (Please refer to the TOR drawings).

The project will have an Approved Budget for the Contract (ABC) of **SEVENTY-EIGHT MILLION EIGHT HUNDRED THOUSAND PESOS (₱78,800,000.00)** 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 construction of the **Laboratory Building I** in which a maximum of 3% shall be allocated for the Design and the balance for the Civil Works.

## III. CONCEPTUAL DESIGN

### The Construction Project - Design and Build Scheme

#### A. Construction Laboratory Building

The Building design shall conform to the provisions of the National Building Code of the Philippines (PD 1096), Accessibility Law (BP 344), National Structural Code of the Philippines, Electrical Engineering Law (RA 7920), Mechanical Engineering Law (RA 5336), Plumbing Code (RA 1378, 1993-1994 Revisions), Fire Code (RA 9514) and other laws and regulations covering environmental concerns and local ordinances and regulations.

The proposed **Laboratory Building I** shall be a 4-storey building. The dimensions and space/ areas are consistent with the PSHS Building Standards and Specifications,

enclosed herein. The building shall also house 42 separate rooms with the following specifications:

Rooms	Qty.	Occupants	Floor Area (m <sup>2</sup> )	TOTAL (m <sup>2</sup> )
<b>First Floor</b>				
Main Hall	1	470	520	520
Lobby	1	30	71	71
Entrance / Porch	1	40	95	95
Stage	1	50	95	95
Left Dressing Room	1	15	32	32
Right Dressing Room	1	15	32	32
Backstage Area	1	25	35	35
Men's CR (Backstage)	1	10	11	11
Women's CR (Backstage)	1	10	11	11
Men's CR (Main Hall)	1	10	33	33
Women's CR (Main Hall)	1		42	42
Store Room	1	5	8	8
EE Room	1	5	8	8
Main Stairs and Lobby	2	-	14	28
Emergency Stairs	2	-	7	14
Emergency Exit Lobby	2	-	17.5	35
Elevator	1	-	5	5
<b>Total</b>				<b>1, 075</b>

Rooms	Qty.	Occupants	Floor Area (m <sup>2</sup> )	TOTAL
<b>Second Floor</b>				
Biology Laboratory	1	60	120	120
Chemistry Laboratory	1	60	120	120
Physics Laboratory	1	60	120	120
Isolation Room	2	3	12	24
Central Dispensing w/ Biological Storage	1	20	109	109
Dumbwaiter	1		-	-
Stairs	1		-	-
Computer Science Laboratory	2	50	90	180
Network Room	1	15	30	30
Men's CR	1	10	18	18
Women's CR	1	10	18	18
Utility Room	1		8	8
EE Room	1		8	8
Corridor	1	80	<b>180</b>	<b>180</b>
Main Stairs and Lobby	2	-	10	20
Emergency Stairs	2	-	10	20
Elevator	1	-	5	5
Total				<b>980</b>

Rooms	Qty.	Occupants	Floor Area (m <sup>2</sup> )	TOTAL
<b>Third Floor</b>				
Research Lab 1	1	60	120	120
Research Lab 2	1	60	120	120
Research Lab 3	1	60	120	120
Isolation Room	2	3	12	24
Central Dispensing w/	1	20	109	109

Chemical Storage				
Dumbwaiter	1		-	-
Stairs	1		-	-
Outdoor Animal House	1	60	140	140
Animal Laboratory	1		29	29
Men's CR	1	10	18	18
Women's CR	1	10	18	18
Utility Room	1		8	8
EE Room	1		8	8
Corridor	1		180	180
Main Stairs and Lobby	2		10	20
Emergency Stairs	2		10	20
Elevator	1		5	5
<b>Total</b>				<b>939</b>

Rooms	Qty.	Occupants	Floor Area (m <sup>2</sup> )	TOTAL
<b>Fourth Floor</b>				
Green House	1		120	120
Roofdeck	1		580	580
Lecture Room	1		48	48
Preparation Room	1		35.5	35.5
EE Room	1		8	8
Corridor	2		38	76
Main Stairs and Lobby	2		10	20
Emergency Stairs	2		10	20
Elevator	1		5	5
<b>Total</b>				<b>864.5</b>

	Qty.	Occupants	Floor Area (m <sup>2</sup> )	TOTAL
First Floor	19			<b>1,075</b>
Second Floor	21			<b>980</b>
Third Floor	20			<b>939</b>

Fourth Floor	12			<b>864.5</b>
<b>TOTAL</b>	<b>72</b>			<b>3,858.50</b>

The primary objective in laboratory design is to provide a safe environment for PSHS - MRC student and faculties to conduct research and experiments. Therefore, all health and safety hazards must be identified and carefully evaluated so that protective measures can be incorporated into the design. The basic laboratory design features listed in this section illustrate some of the basic health and safety elements to include in all new laboratories of PSHS - MRC. The subsections of Section 2.1 provide specific guidance on additional critical features of a general laboratory (e.g., fume hoods, hazardous materials storage, and compressed gases.)

#### Other References

Soil Bearing Capacity for Laboratory Building I is 160 kpa.

### SPECIAL REQUIREMENTS FOR LABORATORIES

This section deals with the spaces used for research or teaching activities with a technical or scientific function, in which there is a potential risk or hazard to users are described as ‘Laboratories’.

**Non-hazardous** spaces often called “**Dry Laboratories**” which may include computer facilities and language laboratories.

**Laboratories** may be required in areas such as **Biosciences, Medical Research, Physics, or Chemistry** and may include teaching, research, quality control, testing or analysis. These activities may require the usage of chemicals, including dangerous goods, hazardous substances, electrical or radiation hazards, pathogens, quarantine materials or work processes which could also be hazardous.

**Special Hazard Laboratories** are areas within laboratories (or whole laboratories) in which particularly hazardous substances are used or specific hazardous processes are required which necessitate the requirement to conform to specific standards and legislation in the design and operation.

The standards relating to these special hazard laboratories will be over and above the regulatory requirements which are listed in the following section. These special hazard laboratories may include microbiological laboratories, vivarium’s, cytotoxic chemical preparation rooms, clean rooms and radiological laboratories to cite examples.

The designated laboratory area should include, or have access to, all support spaces required, such as; instrument and preparation labs, laboratory stores, sample stores, chemical stores, wash up, media prep, sterilization facilities, waste storage and waste treatment facilities.

Write up areas are permitted within the laboratory boundary however, these should be separated from areas where hazardous materials are stored or processes undertaken and should only be used on a temporary basis to support the scientific activities. These design requirements are for research and teaching laboratories within the PSHS - MRC environment. Specialist advice on regulatory requirements associated with such facilities should be sought.

#### Physics Laboratory

**The Physics Laboratory** shall be a 120 sq. m Facility in the laboratory Buildings. This facility shall have an Architectural Finishes which is based on the Architectural, Mechanical, Electrical, Plumbing/Sanitary, and Fire protection standard for a Physical laboratory. It shall have this following provision:

- Provision of area for the Installation of Laboratory Tables which could be mounted with iron stand. Tables shall be provided by PSHS-MRC.
- The contractor shall provide plumbing pipelines including water supply and floor mounted outlet for laboratory tables.
- Supply and Installation of Overhead Cabinets on the side mounted to the wall.
- Provision for Storage Room for the Laboratory Equipment and Tools. Laboratory Equipment and tools shall be provided by PSHS-MRC.
- Provision of LED Screen Television outlet at the Key areas.
- Supply and Installation of a Dark room (Lightings shall be Dimmable).
- Supply and Installation of safety shower and eyewash.

### **Biology Laboratory**

**The Biology Laboratory** shall be a 120 sq. m Facility in the laboratory Buildings. This facility shall have an Architectural Finishes which is based on the Architectural, Mechanical, Electrical, Plumbing/Sanitary, and Fire protection standard for a Biology laboratory. It shall have these following requirements;

- With general ventilation system with air intakes and exhausts that are capable of providing source of air for breathing
- With well lightings
- Provisions for 9 modular laboratory tables with sink which shall be provided by PSHS-MRC. The Contractor shall provide plumbing pipeline and water supply for Laboratory Tables.
- Supply and installation of safety shower and sink.
- Supply and Installation of eye-wash station
- Supply and Installation of Microbiological hood for use of hazardous chemicals
- Supply and Installation of fire extinguisher mounted to the wall or in a fire extinguisher cabinet
- Supply and Installation of floor-mounted electrical 3-prong outlets with 3-gangs per table
- Supply and Installation of Electrical outlets sufficient in number and location to minimize the use of extension cord
- Provision of LED Screen Television outlet at the Key areas.
- Separated preparation/isolation room which has the contractor shall provide:
  - Self-closing, lockable doors.
  - Dimmable lightings
  - Provisions for two (2) working tables and cabinets which can be mounted on the wall. The contractor shall provide plumbing pipelines and water line for preparation tables.
  - Floor-mounted electrical 3-prong outlets with 3-gangs per table
  - Provision for functioning biosafety cabinet for BL1. Biosafety cabinet shall be provided by PSHS-MRC.
  - Provision for safety shower and sink

### **Chemistry Laboratory**

The **Chemistry Laboratory** It shall be a 120 sq. m Facility in the laboratory Buildings. This facility shall have an Architectural Finishes which is based on the Architectural, Mechanical, Electrical, Plumbing/Sanitary, and Fire protection standard for a Chemistry **Laboratory**. It shall have these following requirements;

- Supply and Installation for Ventilation purge fan around the laboratory vented out doors and not between rooms.
- Supply and Installation for electrical outlet with ground fault interruption along key areas
- Supply and Installation of gas line, floor mounted outlets electricity, water supply and plumbing pipelines for Demonstration Table. Demonstration Table shall be provided by PSHS-MRC.
- Supply and Installation of Water - Resistant and chemically - resistant work surfaces;
- Supply and Installation of Master-Utility Cut Off for electricity and Gas Pipelines.
- Supply and Installation of Safety shower accessible to key areas
- Supply and Installation of Eye-wash Station
- Supply and Installation Fire extinguisher mounted to the wall or in a fire extinguisher cabinet
- Supply and Installation of a Functioning Fume Hood for use of hazardous chemicals.
- Supply and Installation for Functioning biosafety for BL2.
- Supply and Installation of enclosure for Storage of Lab Gowns and Personal Protective Equipment. Lab Gowns and Personal Protective Equipment shall be provided by PSHS-MRC.
- Well ventilated and lighted room
- Supply and Installation of Smoke detectors around key areas especially in the chemical storage area.

### **Animal Laboratory**

The **Animal Lab** is specialized in feed, forage and feed ingredient analysis and shall be equipped with facilities to support animal handling and research. The Laboratory is equipped with modern analytical instruments to support student teaching and research. It shall have the following provisions:

- Supply and Installation of Mechanical ventilation system to maintain desired temperature and humidity for laboratory animals.
- Direct connection to the school's emergency electrical generation system.
- Provision for laboratory tables and laboratory sinks which shall be provided by PSHS-MRC. Plumbing pipelines and water supply shall be provided by the contractor.
- Supply and Installation of emergency eyewash
- Provision for a space (for cage) which serves as temporary shelter of amphibians and reptiles that are subject for studies.
- Provision for a space (for cage) which serves as temporary shelter of bats that are subject for studies.
- Provision for a space (for cage) which serves as temporary shelter of birds that are subject for studies.

### **Computer Laboratory**

The purpose of a computing facility will greatly impact most design aspects including room layout, computer hardware, printing systems, projection/presentation systems, etc. Consider what the primary use of this facility will be:

- Open computer use - students come and go but need permission to use the computers for assignments or projects.
- Instructional computing facility - facility is used for instruction lead by a single person.
- Collaborative work - facility is used by students in a group project setting.
- Laboratory work - computers are used for data collection or in a laboratory setting.

The contractor shall Supply and Install the following:

- Fire extinguisher and smoke detector.
- Split type Air-conditioning unit
- Wall mounted outlets two Smart TVs
- Mounted five in-ceiling speakers (corner)
- Audio/video outlet (connected to in-ceiling speakers and Smart TVs)
- 10 wall power sockets (3-gang)
- 3 in-ceiling power sockets (For WAPs)
- 3 in-ceiling Ethernet ports (For WAPs)
- 10 floor power sockets (Large center area)
- 15 ceiling sockets

**Furniture** - with workstation table's arrangement along the walls, perimeter lab layout allows teacher to easily maneuver around the classroom and manage student work. Teachers can easily keep an eye on what a large number of students are working on, and students can quickly turn around when the teacher needs to make a presentation.

Perimeter layout functions well for subjects that have students working fairly autonomously without a lot of lecture-based learning. The large center area also facilitates creation of a central collaborative work area from either movable tables or stationary stations - making conducive to subjects requiring both individual and small-group projects.

**Accessibility** - At least one workstation in the facility should be placed on an adjustable height table for accessibility by people using wheelchairs. The instructor's workstation should also be placed on an adjustable height table.

In addition to placing accessible tables in the lab, one should also consider the accessibility of the computer applications (using special input/output hardware or software), other systems (printing, A/V equipment, etc.), and the accessibility of the room layout.

## **Research Laboratory**

A flexible and adaptable generic laboratory floor plate provides the basis for exceptional scientific research and teaching environments within the PSHS - MRC, allowing for growth and sustaining dynamic change, fostering interaction and team-based research and facilitating linkages with other institutions, providing flexibility for periodic co-location.

### **Research Lab 1 (BMS Research Laboratory)**



This BMS Research Lab shall be a 120 sq. m facility in the Laboratory Buildings. This facility shall have an Architectural Finishes which is based on the architectural, mechanical, electrical, plumbing/sanitary, and fire protection for a Biology laboratory. The contractor shall provide these following:

- Supply and Installation of Water System, Faucets, Water Drainage, and Floor Sink.
- Supply and Installation of Fire Extinguisher and Water Sprinkler.
- Provision for ceiling-mounted Electric Fans.
- Supply and Installation of three gang's three-prong outlets per side of the laboratory.
- Provision for area for Installation of Laboratory Stools and Tables with faucets in both ends which shall be provided by PSHS-MRC.
- Supply and Installation of Six (6) cabinets on the sides mounted on the wall.
- Supply and Installation of Cabinet for Storage Room for safe keeping of the materials and equipment.
- Supply and Installation for Easy-to-Open Windows at one side of the Laboratory.
- Provision for Smart Television outlets mounted on the wall.

## **Research Lab 2**

**The Research Lab 2** is a 120 sq m. facility and shall be a general purpose research laboratory where students can conduct their research. It shall have architectural finishes which is based on the Architectural, Mechanical, Electrical, Plumbing/Sanitary, and Fire protection standard for a research laboratory. It shall have the following provisions:

- Provision for ten general purpose lab stations with laboratory table, laboratory sink, convenience outlets and storage racks under the table. The Contractor shall provide floor mounted outlets, water lines and plumbing pipelines.
- Provision of common central lab station with laboratory sink, convenience outlets and storage rack under the table. The Contractor shall provide floor mounted outlets, water lines and plumbing pipelines.
- Supply and Installation emergency eyewash and emergency shower.
- Supply and Installation fire extinguisher and sprinkler for fire protection.
- Direct connection to the school's emergency electrical generation system.

## **Research Lab 3 (*Sustainable Urban Development Lab*)**

**The Research Lab** shall be a 120 sq. m Facility in the laboratory Buildings. This facility shall have an Architectural Finishes which is based on the Architectural, Mechanical, Electrical, Plumbing/Sanitary, and Fire protection standard for a Physical laboratory. It shall have this following provision:

- Provision for circular conference table with 6 floor mounted electrical three-prong outlets with three gangs.
- Provision for Laboratory Tables
- Supply and installation of hanging Cabinets on the side mounted to the wall.
- Supply and Installation of Laboratory Cabinets for Storage Room for the Laboratory Equipment and Tools. Laboratory Equipment's and tools shall be provided by PSHS-MRC.
- Provision for Installation a ceiling mounted Air conditioning unit outlet only.
- Provision for Smart Television at the Key areas.
- Supply and Installation of Fire Extinguisher and sprinkler for fire protection.
- Supply and installation 4 in-ceiling speakers
- Supply and installation of three gang's three-prong outlets per side of the laboratory.

- Provision for sketch and planning tables.
- Well ventilated room.
- Direct connection to the school's emergency electrical generation system.

## **Auditorium**

Auditorium spaces are designed to accommodate large audiences. As such, they tend to have wide spans and are multiple-stories high in order to accommodate seating, sightlines, and acoustical requirements. Raised stage/dais floors and special lighting equipment are often required as well. Typical features of Auditorium space types include the list of applicable design objectives elements as outlined below. For a complete list and definitions of the design objectives within the context of whole building design.

## **Other Laboratory Building Requirements**

### **Fire Exit**

For the Ground Floor it shall have an Eight (8) Fire exits for Emergency purposes. The Main Entrance of the Auditorium will also be the exit point of the people who's near the main entrance and Two Fire exits located at the middle part of auditorium and another two Fire exits near the dressing room. At the back stage the two Fire exit located at the back of the building near the Male/Female Comfort room will be also the entrance door for performer and also for delivery of the materials that will be used for an event.

The contractor shall also supply and install a ladder type fire exits for Research Lab 1, 2, & 3 and for Chemistry Laboratory, Biology Laboratory, and Physics Laboratory (*see conceptual drawing plan for the Ground Floor of the Building*).

### **Ramp**

Ramp shall be located at the Male/Female Dressing room near the Fire exit and another ramp to connect the dressing rooms to the Main Stage. (*see conceptual drawing plan for the Ground Floor of the Building*).

### **Wall and Ceiling sound insulation**

The wall and ceiling sound insulation shall be located at the auditorium area, the contractor shall supply and install a wall and ceiling sound insulation to lessen the reverberation in the area and to make the area become sound proof. (*see conceptual drawing plan for the Ground Floor of the Building*).

### **Ducting works**

For the duct works, the contractor shall supply and install a ducting for the facilities in the laboratory which has an exhaust fume hood.

### **Control Booth**

The Control Booth shall be located at the auditorium, it shall be elevated and must be parallel with the location of the main stage. (*see conceptual drawing plan for the Ground Floor of the Building*).

### **Water line supply and Drainage system**

The Contractor shall provide a Provision for the water line and floor drains for every laboratories.

### Laboratories Floor finish

The Floor for the laboratories must be epoxy paint finished and must be a chemical resistant.

### High Electric Load Equipment's

Every Laboratories has a High electric load capacity equipment's, the contractor shall provide at least Four (4) power outlet that can carry the load of a High electric load equipment's. See the examples of the equipment's;

Laboratory Equipment's	Specification
1. Centrifuge	<b>Max. speed</b> = 15000rpm (500-1500rpm), increment:100rpm. <b>Max. RCF</b> = 15100xg, increment:100rpm. <b>Speed Accuracy</b> = 20 rpm. <b>Rotor Capacity</b> = 0.2 mL/0.5mL/2mLx12. <b>Runtime</b> = 30 sec, 99 min/Continuous. <b>Driving Motor</b> = Brushless DC motor.
2. 50 L, Fully Automatic Autoclave with Drying	<b>Capacity</b> = 50 L. <b>Rated Power Supply</b> = 220V 50Hz/60Hz. <b>Rated Power (W)</b> = 2300 - 4600.
3. Analytical Digital Balance (220g/0.1 mg)	<b>Pan size</b> = 91mm. <b>Manual Calibration, With windbreaker</b>
4. Vortex Mixer	<b>Voltage</b> = 110 - 120V/220-230V, 50Hz/60Hz. <b>Power</b> = 60w
5. Bio Safety Cabinet	<b>Consumption</b> = 900 watts
6. Circulating Water Bath, 20L	<b>Power</b> = 1200 watts. <b>Power Supply</b> = 220V 50Hz/60Hz
7. Laboratory refrigerator	<b>Consumption</b> = 350 watts. <b>Power Supply</b> = AC220V 10%, 50Hz/60Hz
8. Lab Hot Air Oven	<i>(please search for the load specification for this equipment)</i>
9. pH sensor	<i>(please search for the load specification for this equipment)</i>
10. Water Quality Sensor	<i>(please search for the load specification for this equipment)</i>
11. Weather Sensor	<i>(please search for the load specification for this equipment)</i>

12. Wireless Carbon Dioxide Sensor	<i>(please search for the load specification for this equipment)</i>
13. Oxygen Gas Sensor	<i>(please search for the load specification for this equipment)</i>
14. Charge Sensor	<i>(please search for the load specification for this equipment)</i>
15. Thermocline Sensor	<i>(please search for the load specification for this equipment)</i>
16. Water Quality Colorimeter	<i>(please search for the load specification for this equipment)</i>
17. Turbidity Sensor	<i>(please search for the load specification for this equipment)</i>
18. Temperature Sensor	<i>(please search for the load specification for this equipment)</i>

B. Detailed Design - This will be submitted by the winning bidder.

1. 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 Audio/system 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 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.**

f. 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.**

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

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

## **CHECKLIST OF DRAWINGS REQUIREMENTS AND DESIGN PARAMETERS**

### **A. 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:**

- Perspective, Site Development Plan, Vicinity Map/Location Plan
- 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 Toilets (1:50m) including accessible toilets in the form of plans, evaluation/section
- Details of specialized design features (scale 1:50m) such as partitions cabinets, etc. and accessible design features (if applicable)

- Detail of typical bay section from ground to roof (scale 1:50m)
- 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

## **B. 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
  1. National Structural Code the Philippines (NSCP) 2010
  2. National Building Code of the Philippines and its revised IRR
  3. Accessibility Law
  4. 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 Trusses
- Details of Stairs, Ramps, Fire Exits
- Other Spot Details
- Structural Analysis and Design (for 2 story building and higher)

- Seismic Analysis
- Geotechnical Analysis
- Structural and technical specifications
- Structural Scope of Works
- Structural Bill of Quantities
- Cost Analysis

## **C. SANITARY/PLUMBING DESIGN**

### **I. Codes and Standards**

The Sanitary/Plumbing Design shall be in accordance with the following Philippine laws, 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. 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
- Water line Layout (scale 1:100m minimum) including actual length of tapping line from main water source when applicable
- Sewer line Layout (scale 1:100m minimum) including actual length of tapping line to septic tank or existing sewer line
- Isometric Layout, showing waterline, sewer line and drainage line
- Details of connections catch basins, downspouts, etc.
- Details of Septic Tank/Sewer Treatment Plant
- Design Analysis

- Sanitary Technical Specifications
- Sanitary Scope of Works
- Sanitary Bill of Quantities
- Cost Analysis

## **D. MECHANICAL WORKS DESIGN**

### **I. Codes and Standards**

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

- Codes:
  1. National Building Code of the Philippines and its New IRR
  2. New Fire Code 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.

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

- General Notes and Legends, Site Development Plan, Location Plans
- Floor Plans/Isometric Drawings (scale 1:100n minimum) showing Ventilation and Air Conditioning Systems and other installations
- Floor Plan/s Isometric Drawings (scale 1:100m minimum) of Air Conditioning Systems and details
- 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 Water Tank and Flow Diagram (scale 1:50m)
- Details of Firewater Supply System (scale 1:50m)
- Technical Specification
- Mechanical Scope of Works
- Mechanical Bill of Quantities
- Cost Analysis



## **E. 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:
  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)

### **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, Fire Alarm System, Audio, Video and others)
- Schedule and Details of Loads
- Riser Diagram
- Other Detail
- Electrical Computation
- Design Analysis
- Electrical Technical Specifications
- Electrical Scope of Works
- Electrical Bill of Quantities
- Cost Analysis

## **F. AUDIO DESIGN (SOUND SYSTEM)**

### **Codes and Standards**

Audio/Sound system Design shall be in accordance with the Philippine laws, Codes and Standards.

## **G. SECURITY DESIGN**

Laboratories, storage rooms, utility rooms, EE rooms, isolation rooms and the elevator should be accessible only with electronic key cards. The building should be fully covered inside with CCTV system. The main control of these systems will be in the Network Room in the second floor

## H. WASTE WATER TREATMENT DESIGN

In order to reduce our combined environmental impact and the risk of discharging harmful substances from the different Laboratories, it is very important that everyone contributes to reducing emissions of chemicals to the sewer network as far as possible. This treatment shall be built to treat the pollutants that normally occur in wastewater from the Building. Environmentally hazardous and harmful substances such as heavy metals and certain organic substances which are degradable with difficulty, toxic, bio accumulative or inhibit nitrification/denitrification (interfere with nitrogen separation) must on no account be discharged into the main sewer network of the Philippine Science High School - MIMAROPA Region Campus.

## IV. SELECTION OF DESIGN AND BUILD CONTRACTOR

The procurement and implementation of the project using the “Design and Build” scheme shall be in accordance with the provisions of RA 9184, specifically, its Annex G. 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 in the Design and Build for infrastructure projects shall comply with the applicable provisions of Section 23-24 of the IRR of RA 9184.

#### a. Eligibility Documents

<u>Class</u>	<u>“A”</u>
<u>Documents</u>	

- 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
- v. Single Largest Completed Contract (SLCC)
- vi. PCAB licenses and registration for the type and cost of the contract for this project (Medium B - License Category B) and contractor's registration certificate from DPWH;
- vii. Audited financial statement, stamped "received" by the BIR for the preceding calendar year;
- viii. Tax Clearance
- ix. NFCC computation.

### **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 design and construction method. Prospective bidders shall prepare a value engineering analysis report of their proposed design and 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 design and construction duration, measured using the HOPE approved PERTCPM of the project.
    - Operational efficiency to take advantage of natural lighting and ventilation in some areas and use of efficient toilet.
  - 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
- iii. Omnibus Sworn Statement
- iv. Drawing will be placed in an A3 paper included in the eligibility and technical documents

#### **c. Financial Component**

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

#### **d. Additional Requirements**

Authorized Representative must present;

- i. Authorization letter/Special Power of Attorney
- ii. Letter of Intent

**Note:** Non - compliance of the additional requirements (1 & 2) shall not be subjected for the failure or disqualification of the Prospective bidder. These requirements are for the compliance for the statutory and regulatory documents.

- iii. Presentation of Architectural Design and Estimate

## **B. Eligibility Criteria**

- a) The eligibility of design and build contractors shall be based on the legal, technical and financial requirements above-mentioned. In the technical requirements, the design and build 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, both in design and construction, with at least 50% of the cost of the Approved Budget for the Contract (ABC).
- b) If the bidder has no experience in design and build projects on its own, it may enter into subcontracting, partnerships or joint venture with design or engineering firms for the design portion of the contract.
- c) The relevant provisions under Section 23.5.2 of the IRR of RA 9184 on eligibility requirements shall be observed.

## **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).

**G. Chemical Engineer or Chemist**

The Chemical Engineer or Chemist must be duly-licensed with at least ten (10) years of experience in the design of laboratory building and analysis of chemical processes, and preferably knowledgeable in chemical principles.

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 **DESIGN & BUILD 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 design and build 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, surveys and designs 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 design 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 design and build contractor shall be solely responsible for the integrity of the detailed engineering design and the performance of the structure irrespective of the approval/confirmation by the procuring entity.

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

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

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, the DESIGN AND BUILD CONTRACTOR shall 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

### **E. 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 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.

- 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 460 calendar days from the date of the issuance of the Notice to Proceed (NTP): thirty (30) calendar days for the Design Phase and four hundred thirty (430) 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 DESIGN & BUILD CONTRACTOR, and the Campus Director of PSHS-MRC with regards to the design and implementation of the project.

- c) Assist in the coordination of the DESIGN & BUILD CONTRACTOR with various utility agencies during the detailed design and implementation phases of the project.
- d) Conduct regular coordination meetings between the DESIGN & BUILD 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 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.
- b) 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.
- c) 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.
- d) 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.
- e) The DESIGN & BUILD CONTRACTOR shall inform PSHS-MRC of critical events during construction, especially when such events can potentially disrupt school activities.
- f) 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 LABORATORY BUILDING.
- g) 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.
- h) 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.
- i) 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.
- j) 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
- g) Drawings and reports that the B&D Committee may require for the periodic update concerning the status of the design phase.

#### **B. FOR THE CONSTRUCTION PHASE (7 copies each)**

- a) As-built plans (hard copy and soft copy)
- b) All necessary permits (Fees shall be included in the contract)
- c) Shop drawings (hard copy and soft copy)
- d) PERT-CPM
- e) Test results
- f) Guarantees, warranties and other certificates
- g) Fire and Life Safety Assessment Report 2 and 3 (FALAR 2 and 3)

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

- a) Certificate of Occupancy
- b) Fire Safety Inspection Certificate
- c) 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 DESIGN & BUILD 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 DESIGN & BUILD CONTRACTOR at the job site during the construction of the project.

All work to be subcontracted shall be declared by the DESIGN & BUILD 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 design and build 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 DESIGN & BUILD CONTRACTOR that do not comply with the requirements shall be rectified, resubmitted and reviewed at the DESIGN & BUILD CONTRACTOR'S cost. If the DESIGN & BUILD CONTRACTOR wishes to modify any design or document which has been previously submitted, reviewed and approved, the DESIGN & BUILD 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 not 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

  
**ENGR. JOSEPH G. BANTANG**  
 Member

  
**ARCH. JOLITO G. TAN**  
 Member

Concurred:

  
**EDWARD C. ALBARACIN**  
 Campus Director