

# TECHNICAL SPECIFICATIONS

## CONSTRUCTION OF DORMITORY BUILDING I 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 National Expenditure Program (NEP) of 2022 intends to apply the sum of **THIRTY-NINE MILLION TWO HUNDRED THOUSAND PESOS (₱39,200,000.00)** being the approved budget for the implementation of the project **Construction of Dormitory Building I** with the project duration of Three Hundred Sixty-Five (**365**) calendar days. [This project continues the prior project, Design and Build Scheme Infrastructure Project: Construction of Dormitory Building 1.](#)

### II. PROJECT DESCRIPTION AND LOCATION

The project will involve the **Construction of Dormitory Building I** of the Philippine Science High School - MIMAROPA Region Campus, Rizal, Odiongan, Romblon pursuant to the Technical Specifications, indicated herein.

This project will include the following scope:

- (a) Construction of Dormitory Building 1
  - (b) Ground Preparation
  - (c) Preparation of Driveway
- (Please refer to the annexes for the attached drawings).*

The project will have an Approved Budget for the Contract (ABC) of **THIRTY-NINE MILLION TWO HUNDRED THOUSAND PESOS ONLY (₱ 39,200,000.00)** including all taxes and applicable permits, licenses and clearances, for the projects mentioned above.

### III. CONSTRUCTION PHASE

#### A. SCOPE OF WORKS:

##### 1. Construction of Dormitory Building 1

The proposed Dormitory Building 1 is a 3-storey reinforced concrete building with a total floor area of 1,625.352 sq.m.

This item shall include:

##### a. Foundation

All foundations, footing tie beams, grade beams, columns from foundation to ground floor, and most of the area of ground floor slab (as indicated on

structural drawings) were already constructed by the previous contractor and shall be excluded on the scope of works.

#### **b. Ground Floor**

This floor will have a hallway connecting the lounge area and lobby, 3 dormer PWD rooms with toilet and bath, 2 Isolation rooms with toilet and bath, 1 dorm manager room with toilet and bath, 1 dorm attendant room with toilet and bath, gadget room, reflection room, dorm manager office, VIP area with 2 bedrooms and common pantry and own toilet, pantry, common toilet, mechanical room, and electrical room.

<i><b>Room/ Area</b></i>	<i><b>Quantity</b></i>	<i><b>Floor Area</b></i>
PWD room	3	19.55 sq.m
Dorm Manager's Room	1	16.07 sq.m
Dorm Attendant's Room	1	19.55 sq.m
Isolation Room	2	19.55 sq.m
Gadget Room	1	14.93 sq.m
Reflection Room	1	39.43 sq.m
VIP Room	1	58.90 sq.m
Mechanical Room	1	6.14 sq.m
Electrical Room	1	6.14 sq.m
Pantry Area	1	19.72 sq.m
Common Toilet	1	16.07 sq.m
Lobby and Lounge Area	1	85.80 sq.m

#### **c. Mezzanine Floor**

This floor will have a hallway, 4 dormer rooms, which have an area of 15.0 sq.m, 2 common toilets and baths, and 2 reading areas with balconies.

<i><b>Room/Area</b></i>	<i><b>Quantity</b></i>	<i><b>Floor Area</b></i>
Dormer's Room	4	15.0 sq m
Common Toilet and Bath	2	19.55 sq.m
Reading Area with Balcony	2	14.74 sq.m

#### d. Second Floor

This floor will feature a corridor, two storage areas, and 16 dormer rooms, each with a balcony, study area, toilet, and bath with an area of 19.55 sq.m. Each room will feature two double decks (not included in this Project), each with room for four students. This floor level may also accommodate 64 students.

<i>Room/Area</i>	<i>Quantity</i>	<i>Floor Area</i>
Storage Area	2	5.05 sq.m
Dormer's Room with Toilet and Bath and Balcony	16	19.55 sq.m
Corridor	1	72.61 sq.m

#### e. Third Floor

This floor level is typical of the second floor, which will also feature a corridor, two storage areas, and 16 dormer rooms, each with a balcony, study area, toilet, and bath with an area of 19.55 square meters. Each room will have two double decks, each room can accommodate four students, and can accommodate up to 64 students in total.

<i>Room/Area</i>	<i>Quantity</i>	<i>Floor Area</i>
Storage Area	2	5.05 sq.m
Dormer's Room with Toilet and Bath and Balcony	16	19.55 sq.m
Corridor	1	72.61 sq.m

#### f. Roof

The roofing is made of steel truss and rib-type pre-painted 0.5mm thk. roofing materials with concrete gutter and a parapet wall along the perimeter of the building. The roof level will also have a concrete deck with a water tank on both sides of the building.

#### g. Fire Exit Stair

Both sides of the building have a fire exit stair. It has access to all floors including the roof deck. Handrails are made of steel tubular railings at all levels.

It also has windows for ventilation and lighting. Fire exit doors are made of steel with Panic Hardware conforming to the fire code requirements.

#### **h. Facade**

The facade will include an aluminum composite panel canopy that covers the roofing and ceiling, as well as vertical slats at the balcony made of tubular steel painted finish. Above the canopy is a 200mm x 200mm slate tile with the PSHS marble logo.

### **2. Ground Preparation**

This item of the project shall serve the purpose of:

- a. Backfilling activities at rear and left side of the building.
- b. Ground improvement.

### **3. Preparation of Driveway**

This item of the project shall serve the purpose of preparing the 40m driveway connecting to the road network.

#### **NOTE:**

- a. During hauling of materials, the allowable weight or load for each truck will be 5 to 6 tons that passes through the road network.

## **B. GENERAL SPECIFICATIONS:**

### **STRUCTURAL**

#### **1.0 GENERAL**

##### **1.01 WORKING DRAWINGS**

- A. These Specifications for Structural Works shall form part of the Structural Working Drawings.
- B. In the interpretation of these drawings, indicated dimensions shall govern and distances or sizes shall not be scaled for construction purposes.
- C. In cases of conflict in details or dimensions between the Architectural and Structural Drawings, a joint decision shall be made by the Structural Engineer and the Architect.

#### **2.0 MATERIALS**

##### **2.01 CONCRETE**

Mix design shall conform to ACI 211.1 and ACI 301. The minimum 28-day cylinder compressive strength shall be:

- fc' = 20.7 MPa (3000psi) Foundations, Columns, Beams, Footing Tie Beams
- fc' = 20.7 MPa (3000psi) Suspended Slabs
- fc' = 20.7 MPa (3000psi) Slab on Fill

##### **2.02 CEMENT**

Cement for the concrete shall conform to the requirements of "Specifications for Portland Cement" (ASTM C150, latest edition).

## 2.03 CONCRETE AGGREGATE

### A. Fine Aggregate

1. Fine aggregates shall consist of natural Porac sand. Fine aggregates shall consist of hard, tough, durable, uncoated particles. The stipulated percentages of fines in the sand shall be obtained either by the processing of natural sand or by the production of a suitably graded manufactured sand. The shape of the particles shall be generally rounded or cubical and reasonably free from flat or elongated pieces. Rock, which breaks down into thin, flat elongated particles, regardless of the type of processing equipment used, will not be approved for use in the production of fine aggregate. A thin, flat elongated particle is defined as a particle having a maximum dimension in excess of five times the minimum dimensions.
2. The fine aggregate shall conform to the following grading limits:

Sieve Designation U.S. Std., Square Mesh	Cumulative Percentage by Weight	
	<u>Passing</u>	<u>Retained</u>
No. 3/8"	100	0
No. 4	95 - 100	0 - 5
No. 8	-	-
No. 16	45 - 80	20 - 55
No. 30	-	-
No. 50	10 - 30	70 - 90
No. 100	2 - 10	90 - 98

3. In addition to the grading limits shown above, the fine aggregate as delivered to the mixer, shall have a fineness modulus of not less than 2.3 or more than 3.0 and, during normal operations, the grading of the fine aggregate shall be controlled so that the fineness module of at least nine of ten test samples of the fine aggregate as delivered to the mixer shall not vary more than 0.20 from the average fineness modulus of all samples tested during the preceding 30-day period. The fineness modulus shall be determined by dividing by 100, the sum of the cumulative percentage retained on U.S. Standard Sieves Nos. 4, 8, 16, 30, 50 and 100. At the option of the Contractor, fine aggregate may be separated into two or more sizes or classifications, but the resulting combined sand shall be of uniform grading within the limits specified above. It may be generally assumed that a fine blending sand will be required to meet the above grading.

### B. Coarse Aggregate

1. Coarse aggregate shall consist of gravel, crushed gravel or rock, or a combination of gravel and crushed gravel or rock, approved by the Structural Engineer. The coarse aggregate, as delivered to the site, shall have uniform and stable moisture content. The approval of deposits shall

not be construed as constituting the approval of all materials taken from the deposits, and the Contractor will be held responsible for the specified quality of all such materials, used in the work. Coarse aggregate shall consist of hard, tough, durable, clean and uncoated particles. All foreign materials and dust shall be removed by adequate processing. The particle shape of the smallest size of crushed coarse aggregate shall be generally rounded or cubical, and the coarse aggregate shall be reasonably free from flat and elongated particles in all sizes. A thin, flat and elongated particle is defined as a particle having a maximum dimension greater than five times the minimum dimension.

The coarse aggregate shall be well graded from fine to coarse. It shall conform to the following grading limits:

Sieve Sizes U.S. Std., Square Mesh		Percent Passing by Weight Individual Sieves	
(mm)	(inches)	3/4" size	1-1/2" size
50	2"		100
37.50	1-1/2"		90 - 100
25	1"	100	20 - 55
19	3/4"	90 - 100	0 - 15
9.50	3/8"	20 - 55	0.5
4.75	No. 4	0 - 10	

2. The sizes of coarse aggregate to be used in the various parts of the work shall be in accordance with the following or as directed by the Structural Engineer:

	<u>General Use</u>	
	<u>Sizes</u> (inches)	<u>Sizes</u> (mm)
Footings	1" or 3/4"	25 or 19
R.C. Beams, Columns, Slabs, Walls, Wall Footing, Lintel Beams	3/4"	
19		

#### 2.04 WATER

Water used in mixing concrete shall be clean and free from injurious amounts of oils, acids, alkalis, salts, organic materials or other substances deleterious to concrete or steel.

#### 2.05 REINFORCING BAR

##### A. Main Bars

All main reinforcing bars shall be deformed conforming to ASTM A706.

##### B. Yield Strength

The minimum yield strength of reinforcement to be use corresponding to the structural member shall be enumerated below:

Footings/Footing Tie Beams	fy= 60,000 psi	414 MPa
Columns, Beams	fy =60,000 psi	414 MPa
Slabs	fy = 40,000 psi	276 Mpa

## 2.06 ADMIXTURE

Admixtures to be used in concrete shall be subject to prior approval of the Structural Engineer. Use DARACEM RM and/or PRIMEPLAST R1 super plasticizers for all concrete mix. Super plasticizers shall be added only after the mix has complied with the slump requirement of not more than 50 mm.

## 3.0 EXECUTION

### 3.01 MATERIAL STORAGE

#### A. Cement

Cement bags shall be stored in a suitable weatherproof structure, which shall be as airtight as practicable; floor shall be elevated above the ground, a distance sufficient to prevent the absorption of moisture. Bags shall be stocked against outside walls. The manner of storage shall permit easy access for inspection and identification of each shipment. Cement that has been in storage for a long time, that there is doubt about its quality, will be tested by standard mortar tests to determine its suitability for use and such cement shall not be used without approval.

#### B. Aggregates

Aggregates shall be stored in such a manner as to avoid the inclusion of foreign materials in the concrete. Aggregates of different sizes shall be stored in separate piles. Stockpiles of coarse aggregate shall be built in horizontal layers not exceeding 1.20 m. in depth to avoid segregation. Should the coarse aggregate become segregated, it shall be remixed to conform to the grading requirements given hereinafter. Sufficient live storage shall be maintained at all times to permit continuous placement of concrete at the rate specified.

#### C. Reinforcement

Reinforcement shall be stored in a manner that will avoid excessive rusting or coating with grease, oil, dirt, and other objectionable materials.

### 3.02 SAMPLING AND TESTING

#### A. Sampling

ASTM C172. Collect samples of fresh concrete to perform tests specified. ASTM C31 for making test specimens.

#### B. Testing

1. Slump Tests: ASTM C143. Take concrete samples before commencing concrete placement. One set of samples prior to and one set after the addition of plasticizer admixtures. The slump may be increased to the desired workable condition with the addition of an approved admixture provided that the water-cement ratio required to attain the specified strength is not exceeded. Perform tests at commencement of concrete placement, for each batch of concrete.

2. Compressive Strength Tests. ASTM C39. Make five (5) test cylinders for each set of tests in accordance with ASTM C31. Test two (2) cylinders at 7 days (one with and one without plasticizer admixture) and hold one (1) cylinder (without plasticizer admixture) in reserve. Provide concrete cylinders for compressive tests not less than once a day, nor less than once for each 50 cubic meters of concrete, nor less than once for each 500 square meter of surface area for slabs or walls. Double the cylinder collection frequency and number of batches sampled when pumping concrete. If the average strength of the 28-day test cylinders is less than  $f'_c$  and a maximum of one single cylinder is less than  $f'_c$  minus 300 psi, take three (3) ASTM C42 core samples and test. If the average strength of the 28-day test cylinders is less than  $f'_c$  and two (2) or more cylinders are less than  $f'_c$  minus 300 psi, take six (6) core samples and test. Concrete represented by core tests shall be considered structurally adequate if the average of three (3) cores is equal to at least 85 percent of  $f'_c$  and if no single core is less than 75 percent of  $f'_c$ . Locations represented by erratic core strengths shall be retested. Remove concrete not meeting strength criteria and provide new, acceptable concrete. Repair core holes with non-shrink grout. Match color and finish of adjacent concrete.
3. One (1) tension test and one (1) bend test shall be made from each lot of ten (10) tons of reinforcing steel bars purchased.

### 3.03 ACCEPTANCE OF CONCRETE

Concrete poured will be considered satisfactory if the averages of all sets of these consecutive strength test results equal or exceed the required  $f'_c$  and no individual strength test result falls below the required  $f'_c$  by more than 3.45 MPa.

### 3.04 CORE TEST AND LOAD TEST

If individual tests of laboratory cured cylinder samples produce strength more than 3.45 MPa below  $f'_c$ , core tests may be resorted subject to the approval by the Structural Engineer.

### 3.05 MIXING OF CONCRETE

- A. All concrete shall be mixed until there is a uniform distribution of the materials and shall be discharged completely before the mixer is recharged.
  1. All concrete shall be machine mixed. Mixing shall begin within 30 minutes after the cement has been added to the aggregates. The time of mixing, after all cement and aggregates are in the mixer drum, shall be not less than one minute for mixers having a capacity of one cubic yard or less; for mixers of larger capacities, the minimum time shall be increased 15 seconds for each additional cubic yard or fraction thereof of additional capacity. All mixing water shall be introduced in the drum before one-fourth of the mixing time has elapsed. The mixer drum shall rotate at a peripheral speed of about 61 meter per minute (200 ft./m.) throughout the mixing period. The entire contents of the mixer drum shall be discharged before recharging. The time elapsing between the introduction of the mixing water to the cement and aggregates or the cement to the aggregates and placing of the concrete in the final position in the forms shall not exceed 45 minutes.



The retempering of concrete, i.e. mixing with or without additional cement, aggregates, or water, will not be permitted. Adequate mixing plant and equipment for transporting and placing concrete shall be arranged with an ample auxiliary installation to provide a minimum supply of concrete in case of breakdown of machinery or in case the normal supply of concrete is disrupted. The auxiliary supply of concrete shall be sufficient to complete the casting of a section up to a construction joint that will meet the approval of the Structural Engineer. In cases where hand mixing of concrete may arise, it shall be done on a watertight platform and in such a manner as to ensure a uniform distribution of the materials throughout the mass. Mixing shall be continued until a homogenous mixture of the required consistency has been obtained. The concrete shall be mixed only in such quantities as are required for immediate use and any concrete that has developed the initial set shall not be used. Concrete that has partially set shall not be retempered or remixed.

B. Trial Mix

Concrete proportions shall be selected based on the results of trial batches prepared in a laboratory or in field batches. A series of trial mix designs shall be performed to allow selection of the most advantageous proportion to be adopted for each class of concrete.

### 3.06 FORM

A. General

Forms shall be used wherever necessary to confine the concrete and shape it to the required lines, or to insure the concrete from contamination of materials caving or sloughing from adjacent, excavated surfaces. Forms shall have sufficient strength to withstand the pressure resulting from placement and vibration of the concrete, and shall be maintained rigidly in the correct position. Forms shall be sufficiently tight to prevent loss of mortar from the concrete. Forms for exposed surfaces against which the backfill is not to be placed shall be marine grade plywood armored with phenolic (epoxy) film and edges sealed watertight. Bolts and rods used for internal ties shall be so arranged that when the forms are removed all metal will not be less than two (2) centimeters from the formed surface.

B. Formed Surfaces (As-Cast Smooth Form)

All concrete surfaces except the mat foundation and the underside of suspended slabs with drop ceiling, shall be formed with form facing material such as steel plate, ARMORPLY plywood or other durable and smooth material that will produce 'as-cast smooth form' finish. Following the form removal, remove the abrupt irregularities by rubbing the joints with an abrasive tool to produce uniform texture. No chiseling and/or patching by cement are allowed to correct imperfections on the service. To ensure compliance to this specification requirement, the Contractor is required to submit shop drawings for formworks to include design calculations indicating arrangement of forms, sizes and grades of supports, panels and related components.

C. Cleaning and Oiling of Forms

Before placing the concrete, the contact surfaces of the form shall be cleaned of encrustations of mortar, grout, or other foreign material, and shall be coated

with commercial form oil that will effectively prevent sticking and will not stain the concrete surfaces.

D. Removal of Forms

1. Forms shall be removed in a manner, which will prevent damage to the concrete. Forms shall not be removed without approval. Any repairs of surface imperfections shall be performed at once and curing shall be started as soon as the surface is sufficiently hard to permit curing without further damage.
2. Prevent concrete damage during form removal. After placing concrete, forms shall remain in place for the following minimum time periods.

<u>Element</u>	<u>Time Period (Days Minimum)</u>
Walls, columns, sides of beams and girders and slabs on grade	1
Joist, beam, or girder soffits:	
Clear span between structural supports	
Under 3.00 m.	7
3.00 m. to 6.00 m.	14
Over 6.00 m.	21
One-way floor slabs:	
Clear span between structural supports	
Under 3.00 m.	4
3.00 m. to 6.00 m.	7
Over 6.00 m.	10

3. Special Requirements for Reduced Time Period Prior to Form Removal: Forms may be removed earlier than specified if ASTM C39 test results of field-cured samples from a representative portion of the structure indicate that the concrete has reached 85 percent (minimum) of the design strength.
4. Reshoring: Reshore concrete elements where forms are removed prior to the specified time period. Do not permit elements to deflect or accept loads during form stripping or reshoring. Where columns, walls, or other advancements of other framing and forms are needed for future use, forms may be stripped after 2 days if loads are not applied to load-bearing members. After forms are removed, slabs and beams over 10 feet in span and cantilevers over the specified time period in paragraph entitled "Removal of Forms". Perform reshoring members to overloads, eccentric loading, or reverse bending. Reshoring elements shall have the same load-carrying capabilities as original shoring and shall be spaced similar to original shoring. Firmly secure and brace reshoring elements to provide solid bearing and support.

3.07 PLACING REINFORCEMENT

A. General

Steel reinforcement shall be provided as indicated, together with all necessary wire ties, chairs, spacers, supports and other devices necessary to install and secure the reinforcement properly. All reinforcement, when placed, shall be free from loose, flaky rust and scale oil, grease, clay, and other coating and foreign substances that would reduce or destroy its bond with concrete. Reinforcement shall be placed accurately and secured in place by use of metal or concrete supports, spacers and ties. Such supports shall be of sufficient strength to maintain the reinforcement in place throughout the concreting operation. The supports shall be used in such manner that they will not be exposed or contribute in any way to the discoloration or deterioration of the concrete.

B. Splicing

Splices shall be by lapping or welding to develop the full strength of the bars. Unless otherwise indicated the minimum splice length shall be 24 times the bar diameter or 30 centimeters whichever is greater.

### 3.08 CONVEYING OF CONCRETE

A. Concrete shall be conveyed from the mixer to the place of final deposit by methods, which will prevent the separation or loss of materials.

1. Concrete shall be conveyed from mixer to forms as rapidly as practicable, by methods, which will prevent segregation, or loss of ingredients. There shall be no vertical drop greater than 1.5 meters except where suitable equipment is provided to prevent segregation and where specifically authorized. Use of belt conveyors, chutes or other similar equipment in which the concrete is delivered to the structure in a thin, continuously exposed flow will not be permitted except for very limited or isolated sections of the work. Such equipment shall be arranged to prevent objectionable segregation.
2. Approval of the Structural Engineer shall be obtained before starting any concrete pour. Concrete shall be worked readily into the corners and angles of the forms and around all reinforcement and embedded items without permitting the material to segregate. Concrete shall be deposited as close as possible to its final position in the forms so that flow within the mass does not exceed two (2) meters and consequent segregation is reduced to a minimum. Near forms or embedded items, or elsewhere as directed, the discharge shall be so controlled that the concrete may be effectively compacted into horizontal layers not exceeding 30 cm. in depth within the minimum lateral movement specified. Free water shall be collected in depressions away from the forms and removed by bailing prior to placement of additional concrete. All concrete placing equipment and methods shall be subject to approval.
3. Concrete shall be placed before the initial set has occurred and before it has contained its water content for more than 45 minutes.
4. Concrete shall be consolidated with the aid of mechanical vibrating equipment and supplemented by handspading and tamping. In no case shall vibrators be used to transport concrete inside the forms. The vibrating equipment shall be of the internal type and shall at all times be adequate in number or units and power of each unit to properly consolidate all concrete.

Form or surface vibrators shall be used unless specifically approved. The duration of vibration shall be limited to that necessary to produce satisfactory consolidation without causing objectionable segregation. Vibrators shall not be inserted into lower courses that have commenced initial set, and reinforcement embedded in concrete beginning to set or already set shall not be disturbed by vibrators. Consolidation around major embedded parts shall be by hand spading and tamping and vibrators shall not be used.

5. In placing concrete through reinforcement, care shall be taken that no segregation of the coarse aggregate occurs. On the bottom of beams and slab, where the congestion of steel near the forms makes placing difficult, a layer or mortar of the same cement-sand ratios as used in concrete shall be first deposited to cover the surfaces.

### 3.09 CURING

#### A. General

1. All concrete shall be moist cured for a period not less than seven (7) consecutive days by an approved method or combination applicable to local conditions. The Contractor shall have on hand all equipment needed for adequate curing and protection of the concrete and shall be ready to start the curing process immediately following the removal of forms.
2. The surface of the concrete shall be kept continuously wet by covering with water, by continuous spraying, or by covering with burlap plastic or other approved materials thoroughly saturated with water and keeping the covering wet by spraying or intermittent housing. Water for curing shall be generally clean and free from any elements, which might cause objectionable staining, or discoloration of the concrete.

### 3.10 FINISHING

#### A. Concrete Surfaces

Concrete surfaces shall not be plastered except the underside of suspended slabs, which are covered by, drop ceiling. Exposed concrete surfaces shall be formed with ARMORPLY plywood, and after removal of forms, the surfaces shall be smooth, true to line and shall present a finished appearance except for minor defects of joists which can be ground to a smooth surface to remove all joint marks of the formwork.

### 3.11 CONCRETE SLAB ON FILL

- A. The concrete slabs on fill shall be laid on a prepared foundation consisting of a sub-grade and granular fill with thickness equal to the thickness of the overlying slab except as indicated otherwise.
  1. Sub-grade shall be rolled, rammed, tamped to a thoroughly compacted foundation.

### 3.12 FOUNDATION

- A. Allowable bearing capacity shall be 100 kPa.
- B. Excavation for footings shall be carried to a depth as specified in the plans.

- C. Existing underground pipes, tunnels, etc. shall be brought to the attention of the Structural Engineer for evaluation.

### 3.13 REINFORCED CONCRETE BEAM

- A. Unless otherwise noted in the plans or Specifications, camber all R.C. beams at least 6 mm. for every 4.5 m. of span except cantilevers which shall be 18 mm. for every 3.0 m. of span.
- B. If there are two (2) or more layers of reinforcing bars, use 25 mm. diameter separators spaced at 900 mm. o.c.
- C. If beam reinforcing bars end in a wall, the clear distance from the bar to the farther face of the wall shall be not less than 5 diameters. The reinforcing bars shall terminate on a standard 90-degree hook.
- D. Beam reinforcing bars supporting slab reinforcement to be 25 mm. from the bottom of the finish.
- E. When a beam crosses a girder, rest beam bars on top of girder bars. At column intersection girder bars shall be on top of beam bars.
- F. Top bars splices shall be located at midspan and both bar splices at column supports.
- G. Provide at least 6 - 10 mm. diameter stirrups spaced at 150 mm. o.c at beam supports, the first stirrup located 50 mm. from the face of the column unless closer spacing is specified in the Structural Plans.

### 3.14 REINFORCED CONCRETE SLAB

- A. Unless otherwise noted in plans or Specifications, camber all R.C. slabs at least 3 mm. per 3.0 m. of shorter span.
- B. If slabs are reinforced both ways, the short span bottom bars shall be placed below the long span bottom bars and top bars, vice-versa.
- C. Lengths of bar cut-offs shall be as specified on the next page.
- D. Concrete covering shall be 18 mm. for top and bottom bars.
- E. Unless otherwise specified by the Structural Engineers, bar chairs shall be provided at least 0.60 m. each way to support top and bottom slab separately.

### 3.15 REINFORCED CONCRETE COLUMN

- A. Unless otherwise indicated, the column pedestal embedded in the ground shall be 50 mm. larger than the column as per plan at the ground floor level.
- B. Construction joints in columns shall be located at the top of the pedestal (ground floor line) or at least a distance above the floor equal to the maximum dimension of the column or 1/6 storey height.
- C. All ties shall be fastened to column vertical reinforcement by means of #16 G.I. wires at all intersection points of ties and column rebars.
- D. Not more than one-third (1/3) of the total number of bars shall be spliced at the same level. The lap splice shall be "1d" is the development length as tabulated in Sub-Section 3.13F or 40 bar diameter whichever is greater. Splices shall be staggered a distance of at least 40 bar diameters.
- E. Lap welded splice may be used in lieu of the above. The capacity of the weld provided shall be 125% larger than the tensile capacity of the bigger bar being spliced. No butt-welded splices are allowed unless otherwise permitted by the Structural Engineer.

### 3.16 REINFORCED CONCRETE WALL

- A. Unless otherwise indicated in the plans, the R.C. wall horizontal bars shall enclose the vertical bars.
- B. Reinforcing bars shall have at least 50 mm. concrete clearance.
- C. Carry vertical bars 0.60 m. above floor level to provide for splices when necessary. Elsewhere stop at 50 mm. below the top of the slab. The bar shall terminate on a standard 90-degree hook.
- D. Horizontal and vertical bars conforming to ASTM A615 shall have minimum splice lapping and wired with #16 G.I. wire. Not more than one-half (1/2) of the top number of bars shall be spliced at the same line. Splices shall be staggered a distance of at least 40 bar diameters.

### 3.17 CHB WALL

#### A. Vertical and Horizontal Reinforcement

Unless otherwise specified, the vertical and horizontal reinforcements for CHB shall be 10 mm. diameter at 400 for all wall thickness. Lap splices shall be 300 mm. long (minimum).

#### B. Lintel Beams

1. Lintel beams to be used shall be 0.15 by 0.20 m. reinforced by 4 - 10 mm. diameter with 10 mm. diameter at 300 ties.
2. Lintel beams shall be provided at top of CHB wall openings. It shall extend at least 0.20 m. beyond the openings.
3. Provide lintel beams for walls exceeding 3.00 m. in height.
4. For long walls, lintel beams acting as columns shall be provided at 6 m. o.c.

#### C. Dowels

Where CHB walls adjoin R.C. columns and beams, provide dowels on R.C. column and beams prior to pouring to match CHB wall reinforcement. The dowels shall be 12 mm. bars at 400 o.c. (L = 600 m.) unless otherwise shown on the Drawings.

#### D. Gap

1. Where the top of a CHB wall adjoins a beam provides a 50 mm. gap to be filled with a soft material like styropor. Rebars, as required in Sub-Section 3.17C, shall be retained for stability.
2. Where the sides of a CHB wall adjoin a column provide a 50 mm. gap to be filled with a soft material like styropor. Rebars, as required in Sub-Section 3.17C, shall be retained for stability.

#### E. Anchors

Where columns and beams have been poured without the CHB wall dowels, provide 16 mm. diameter expansion bolts at 400 m. o.c. These anchors shall be drilled and hammered in place. No chipping-off of concrete columns and beams is allowed unless otherwise permitted by the Structural Engineer.

### 3.18 STRUCTURAL TOLERANCES

#### A. Cast-In-Place Concrete

Unless otherwise specified by the Structural Engineer, the following are the acceptable structural tolerances for cast-in-place concrete construction. All

dimensions, which are not within the required tolerances, shall be corrected prior to pouring of concrete.

- (a) Cross sectional dimensions and location to reinforcements.
  - Dimensions less than 200 mm. . . . . □ 6 mm.
  - 200 mm. to 600 mm. . . . . □ 9 mm.
  - Over 600 mm. . . . . □ 12 mm.
- (b) Member length or height . . . . . 6 mm. per 3.0 m.  
(Maximum limitation = 12 mm.)
- (c) Deviation from straight line . . . . . 6 mm. per 3.0 m.  
(Sweep and/or plumbness)
- (d) Location of bar cut-offs or bends . . . . . □ 50 mm.

### 3.19 CONCRETE PROTECTION FOR REINFORCEMENT

#### A. Concrete Cover

The following minimum concrete cover shall be provided for reinforcing bars. For bar bundles, the minimum cover shall equal the equivalent diameter of the bundle but need not be more than 2 inches on the tabulated minimum whichever is greater.

Cast-In-Place Concrete (Reinforced Concrete Construction):

	<u>Minimum Cover</u>
Cast against and permanently exposed to earth	75 mm.
Exposed to earth, weather or corrosive substance	
20 mm. diameter and larger	50 mm.
16 mm. diameter and smaller	38 mm.
Not exposed to weather or in contact with ground, slabs, walls and joints	
25 mm. diameter and smaller	19 mm.
Beams, girders and columns principal reinforcement, ties stirrups or spirals	38 mm.

### 3.20 REINFORCING BARS

#### A. Main Bars

All main reinforcing bars shall be deformed conforming to ASTM A615.

#### B. Yield Strength

The minimum yield strength of the main reinforcing bars and ties, stirrups, and dowels shall be:

$$f_y = 276 \text{ MPa (40,000 psi)}$$

#### C. Development Length

Development length requirements ( $l_d$ ) shall be as per Sub-Section 3.13F.

#### D. Splice and Anchorage Lengths

Splice and anchorage lengths shall follow those set for development lengths ( $l_d$ ) unless otherwise indicated in the plans or approved by the Structural Engineer.

E. Equivalent metric size bars, when used, shall be as per tabulation below:

No. 3	.	.	.	.	.	10 mm. diameter
No. 4	.	.	.	.	.	12 mm. diameter
No. 5	.	.	.	.	.	16 mm. diameter
No. 6	.	.	.	.	.	20 mm. diameter
No. 8	.	.	.	.	.	25 mm. diameter
No. 9	.	.	.	.	.	28 mm. diameter
No. 10	.	.	.	.	.	32 mm. diameter
No. 11	.	.	.	.	.	36 mm. diameter

### 3.21 STANDARD HOOK

#### A. Rebars

A standard hook for rebars, if required, shall be either of the following:

- (a) A semi-circular turn plus an extension of at least 4 diameters but not less than 62 mm. at the free end of the bar.
- (b) A 90 degree turn plus an extension of at least 12 bars diameter at the free end of the bar.

#### B. Bend Diameter

Minimum diameters of bend measured on the inside of the bar shall be as follows:

- 10 mm. diameter to 25 mm. diameter . . . 6 bar diameters
- 28 mm diameter to 32 mm diameter. . . 8 bar diameters

### 3.22 WELDED SPLICE

#### A. Lap Welded Splice

Lap welded splices, when used, shall develop a resistance equal to at least 125 percent of the tensile capacity of the bar being spliced.

#### B. Butt-Welded Splice

Butt-welded splice, when used, shall be considered 75% efficient. The remaining 50% capacity to develop 125 percent of the tensile capacity of the bar shall be provided for by an additional welded lap splice connection on the same joint.

#### C. Details / Requirements

1. Details of all welded splices shall be submitted by the Contractor for approval by the Structural Engineer.
2. Only certified welders shall be allowed to perform welding operations. These welders shall be subject to the approval of the Project Manager.

#### D. Testing of Welds

1. Welds shall be considered satisfactory if 9 out of 10 random samples passed the requirements, otherwise, welding procedures shall be corrected to attain better quality welds. Unsatisfactory welds shall be remedied subject to the approval by the Structural Engineer.
2. Testing of welds shall be by X-Ray Method (non-destructive tests) unless otherwise directed by the Structural Engineer.

#### E. Connection

Connection of crossing bars by tack welding is not permitted.

### 3.23 CONSTRUCTION JOINT



#### A. Location

1. Construction joints shall be located within the middle third span of slabs, beams or girders.
2. At beam-girder intersection, the construction joint on the girder shall be located a distance equal to twice the depth of the beam. Diagonal bars shall be provided to resist 100% shear at the construction joint.
3. The total length of the diagonal bar shall be at least twice the development length required for the bar. The ends of the bar shall be hooked.
4. Construction joints in columns shall be located a distance above the floor equal to at least the maximum dimension or 1/6 of storey height.
5. Construction joints shall be provided where indicated or as otherwise directed.
  - (a) Joints not indicated on Drawings shall be so made and located as not to impair the strength of the structure. When a construction joint is to be made, the surface of the hardened concrete shall be thoroughly cleaned and all laitance removed. In addition, the joint shall be thoroughly wetted and slushed with a coat of neat cement grout immediately before placing new concrete.
6. Where a joint is to be made, the surface of the concrete shall be thoroughly cleaned and all laitance and standing water removed. Vertical joints also shall be thoroughly wetted and coated with neat cement grout immediately before placing new concrete.

#### 3.24 EXPANSION AND CONTRACTION JOINT

Expansion and contraction joints shall be provided where indicated and shall be in accordance with details.

#### 3.25 PREFORMED STRIP

Prefomed strips shall be placed before the next concrete of a joint is poured. The joint sealer shall be applied after concrete on both sides of the joint have been poured and after the joint lines have been tried.

#### 3.26 INSPECTION

Concrete shall be proportioned, mixed, and placed only in the presence of the Engineer or his representative; ample notice shall be given before mixing is commenced.

### **ARCHITECTURAL WORKS**

#### 1. Ceiling

- a. Areas with ceiling works are common hallways in all floors and toilets. Common hallways shall be in plain 10mm thk. Gypsum board and all toilet ceilings shall be 6mm thk. ficem board. All other rooms not mentioned above shall be in slab soffit painted finish.
- b. Ceiling joint connection shall provide mesh tape with putty for proper jointing.
- c. Ceiling joist and framings shall be in metal frames such as furring, wall angle, carrying channels and others to complete the works.

#### 2. Floor Finishes

- a. Toilet and bathroom shall be finished unglazed. Toilet floor tiles shall be 300mm x 300mm vitrified ceramic tiles. Sizes may vary upon advice by the end user.
  - b. All walls of toilets and bathrooms shall be 1/2 height of 300mm x 300mm vitrified ceramic tiles and subject for approval of the end user.
  - c. Use tile adhesive and not Portland cement as an alternative.
  - d. Provide at least 50mm drop finish from room FFL. to toilet FFL.
  - e. Submit tile sample for approval prior to installation.
  - f. Common hallways and stair finishes shall be smooth plain cement in chlorinated rubber paint finish.
3. Painting
- a. All painting works except as hereinafter specified, shall be BOYSEN PAINTS or approved equal.
  - b. For Exterior walls - use Elastomeric paint, 1 primer coat, spot putty and sanding, 2-finishing coat including surface preparation (skim coating).
  - c. For Interior walls – 2 to 3 skim coat application, 1 to 2 coats of flat latex primer, 2 finishing coats of semigloss latex paint including surface preparation.
  - d. For ceiling paints, apply 2 coats of white flat latex paint including surface preparation (use skim coat for slab soffit).
  - e. Verify color scheme / swatches for final approval.
4. Windows
- a. Window frames shall be 768 High-end aluminum profile in powder coated finish or approved equal.
  - b. Windows shall be ¼” thk. annealed glass
  - c. Provide all necessary hardware as per approved by PSHS including rubber gaskets and sealants. Prior to installation, make sure to have at least primer paint the perimeter of window opening.
5. Doors
- a. Door panels shall conform to the standard specs as specified in the drawings.
  - b. Provide Hafele brand stainless-steel doorknob and hinges or approved equal for lockset and accessories in all door panels.
  - c. Glass doors shall be ¼” thk. annealed glass in powder coated aluminum frame finish.
  - d. Fire exit doors and accessories shall conform to the latest Fire Code requirements.
6. Grills
- a. Provide steel grills at the 2nd and 3rd floor open area for security purposes.
  - b. Finish should be in an epoxy primer and quick drying enamel for topcoat.
  - c. Provide sample details for approval.
7. Stairs
- a. Stair railings shall be in tubular steel as specified in the drawings. Finish shall be in an epoxy primer and quick drying enamel for topcoat.
  - b. All steps of the main stair for all floors, except the fire exit stair, should have aluminum stair nosing.
  - c. Floor finish shall be in epoxy paint finish.
8. Facade/ Canopy
- a. Canopy shall be clad with Aluminum Composite Panel (ACP) in aluminum frame finish. Color shall be approved by the end user.
  - b. Provide 200mm x 200mm Slate tiles for the facade with PSHS marble logo as indicated in the drawings.

- c. The Marble logo shall be cut into shape of PSHS logo within a size of 1.0m x 1.0m x 25mm thick. The color shall be included in the finish.
9. Waterproofing Works
    - a. Provide a minimum of 2 coats of flexible type cementitious waterproofing in all toilets, concrete tanks and roof decks. Brand shall be Bostik powermix or approved equal.
  10. Toilet Partition
    - a. All toilet partitions shall be in MDF phenolic board materials with complete accessories.
  11. Metal Works
    - a. Provide 50 x 75mm x 1.2mm thk. Steel tubular vertical slats at front and rear balcony. It should be painted in epoxy primer and quick drying enamel for the top coat.
    - b. Other steel works shall be painted with epoxy primer paint, topcoat shall be quick drying enamel.

## **ELECTRICAL WORKS**

1. All electrical works herein shall be done in accordance with these plans and specifications, the applicable provisions of the latest edition of the Philippine Electrical Code, the rules and regulations of the local enforcing authority and the requirements of the local power and telephone companies. The electrical works shall be under immediate supervision of a duly licensed Electrical Engineer.
2. Power service to the building shall be 230 volts, Single Phase 60HZ, AC power source, 2-wire + 1-ground.
3. All electrical wiring installation such as lighting, power, fire alarm & CCTV system to be used shall be polyvinyl chloride (PVC) pipe. "Schedule 40"
4. Unless otherwise specified, the minimum size of wire shall be 3.5mm THW/THHN2 and conduit shall be 20mm $\phi$  electrical trade size.
5. All wire shall be copper and thermoplastic insulated type "THHN/THWN" unless otherwise indicated in the plans and shall be manufactured by Phelps dodge or approved equal.
6. All outlet boxes shall be galvanized gauge no. 16, deep type with factory knockouts. Cover all junction boxes (no exposed wire)
7. Panel boards shall be of dead-front type construction with adequate wire space, surface mounted, finished in industrial grey enamel over a coat or rust inhibitor. Minimum thickness shall be 1.4mm (GA 16). Circuit breakers shall be quick-make, quick break, trip-free on overload and short-circuit edition, bolt-on type. All circuit breakers and panel boards shall be "G.E or Square-D)".
8. All wiring devices shall be "National" or approved equal.
9. All materials to be used shall be brand new and must be approved for the particular location and purpose intended.
10. Provide grounding systems to all lighting and power circuits as per Philippine Electrical Code requirement.
11. Mounting heights are: (Subject to Architect's approval)
  - a. Light Switches --- 1.20M above floor finish
  - b. Convenience Outlets --- 0.30M above floor finish
  - c. Telephone Outlets --- 0.30M above floor finish
  - d. Panelboard --- 1.40M above floor finish
  - e. Emergency Light --- 0.30M below ceiling line

- f. Data Outlet --- 0.30M below ceiling line
- 12. Pull boxes shall be used when applicable for easy pulling of wires and shall be according to code requirement. All fluorescent ballast shall be high power factor, rapid start, spring loaded lamp holder and enclosed in metallic box.
- 13. Provide flexible metal conduit and sufficient mica tube from junction boxes to lighting fixtures.
- 14. Upon completion of Electrical construction work, the following test shall be performed by the contractor inclusive of the installation to be reported in details and in forms approved by the owner's representative:
  - a. Insulation Resistance Test
  - b. Ground Resistance Test
  - c. Operational Test

### **FIRE PROTECTION**

1. All fire protection works herein shall be done in accordance with the latest edition of the Fire Code of the Philippines and The Philippine National Building Code plans and specifications.
2. The plans and specifications shall be signed and sealed by a Professional Mechanical Engineer (PME).

### **MECHANICAL WORKS**

1. All equipment shall be installed in an approximate location as shown on the drawings.
2. All equipment shall be set on level reinforced concrete foundation at least 150mm. Higher than the floor line, if applicable.
3. All equipment shall be mounted on or supported with vibration isolation units or assemblies as specified and or shown on the drawings.
4. Installation of all works shall be done in a neat and workmanlike manner, improperly set work or finish as determined by the architect shall be removed and replaced at extra cost.
5. All materials to be used shall be brand new and clean.
6. Deviations and revisions from plans shall be referred to the architect for review and approval.
7. All necessary government permits shall be secured and paid for by the contractor.
8. All dimensions are in millimeters unless otherwise specified.
9. All mechanical works shall be in accordance with the latest Mechanical Engineers code ASVE and ASHRAE standard.
10. Mechanical contractors shall always observe safety and orderliness.
11. Mechanical contractors shall verify the site prior to actual installation.

### **PLUMBING AND SANITARY WORKS**

1. All plumbing works included herein shall be executed according to the provision of the Philippine Plumbing code, the national building code & the rules & regulations of the city or municipality where the project will be built.
2. Coordinate the plumbing drawing with other related drawings and specification, the engineer shall be notified immediately of any discrepancy found therein.
3. All pipes shall be installed as indicated on plans, any relocations required for proper execution of other trades shall be with prior approval of the architect or engineer.

4. Proposed sanitary utilities shall conform to the actual location, depth and invert elevation of all existing pipes and structure as verified by the contractor.
5. Refer to architectural plans for area drain, catch basin, floor drains and clean out location.
6. All slopes for horizontal drainage shall maintain 2% unless otherwise specified.
7. Size of water supply pipes to fixtures shall be in accordance with the manufacturer's instructions.
8. The contractor shall verify all existing utilities at site, coordinate the works with the line service connecting point unless otherwise specified.
9. All pipe sizes and dimensions are in millimeters unless otherwise specified.
10. All hangers shall not be anchored at purlins, unless otherwise approved by the structural engineer.
11. Material specifications
  - a. Water lines- riser, down feed, main distribution and tapping water lines shall be galvanized iron pipe (G.I.) schedule 40, similar to "supreme" pipe.

<b>PIPING STANDARD REQUIREMENTS</b>			
<b>POTABLE WATER LINES</b>		<b>SANITARY DRAINAGE AND VENT LINES</b>	
<b>EQUIVALENT PIPE DIAMETER</b>		<b>EQUIVALENT PIPE DIAMETER</b>	
Nominal Pipe Diameter (mm)	Polypropylene Random (PPR) Pipe PN20 (mm)	Nominal Pipe Diameter (mm)	Soil and Vent Piping Polyvinyl Chloride (PVC) Pipe -Series 1000 (mm)
15	25	50	63
20	32	75	90
25	40	100	110
32	50	150	160
40	63	200	200
50	75	250	250

65	90	300	
75	110	375	
<b>MAXIMUM SPACING OF PIPE SUPPORT</b>		<b>MAXIMUM SPACING OF PIPE SUPPORT</b>	
Pipe Diameter (mm)	Polypropylene Random (PPR) Pipe (mm)	Pipe Diameter (mm)	Polyvinyl Chloride (PVC) Pipe (m)
25	.75	63	.75
32	.75	90	1
40	.75	110	1
50	1	160	1.25
63	1	200	1.25
75	1	250	1.5
90	1.25	300	1.5
110	1.25	375	1.75
<b>STORM DRAINAGE LINES</b>			
Nominal Pipe Diameter (mm)	Polyvinyl Chloride (PVC) Pipe-Series 1000 (mm)	High Density Polyethylene (HDPE) Pipe-PE 80/PN 6 (mm)	
50	63		

75	90	
100	110	
150	160	
200	200	
250	250	
300	315	
350		400
400		450
450		500
<b>MAXIMUM SPACING OF PIPE SUPPORT</b>		
Pipe Diameter (mm)	Polyvinyl Chloride (PVC) Pipe (m)	High Density Polyethylene (HDPE) (mm)
63	.75	
90	1	
110	1	
150	1.25	
200	1.25	
250	1.5	
315	1.5	
400		1.75
450		1.75
500		1.75

- b. Roughing-ins of water lines shall be polypropylene random copolymer (PPRC) pipe, PN-20, standard conforming to DIN-8077-8078, "BUGATTI" brand or approved equal fittings shall be fusion type.

- c. Sewer pipes- shall be polyvinyl chloride (PVC) pipe, series 1000, "NELTEX" brand or approved equal.
- d. Waste pipes- shall be polyvinyl chloride (PVC) pipe, series 1000, "NELTEX" brand or approved equal.
- e. ACU/AHU/FCU Waste pipe- shall be polyvinyl chloride (PVC) pipes, series 1000, "NELTEX" brand or approved equal and shall be provided with thick closed cell elastomeric thermal insulation "AEROFLEX" brand or approved equal and installed as per manufacturers recommendation.
- f. Vent pipes- shall be polyvinyl chloride (PVC) pipes, series 1000, "NELTEX" brand or approved equal.
- g. Downspouts- shall be polyvinyl chloride (PVC) pipe, series 1000, "NELTEX" brand or approved equal.
- h. Storm drainage lines- for inside building, shall be polyvinyl chloride (PVC) pipes, series 1000, "NELTEX" brand or approved equal and reinforced concrete drain pipe for outside building.
- i. Underdrains/ perimeter drain pipes - shall be polyvinyl chloride (PVC) pipes, series 1000," NELTEX" brand or approved equal.
- j. Gate valves- 50 mmΦ and smaller, rising stem, all bronze, female threaded, minimum of 125 PSIG working pressure, similar to "BERMAD" brand or approved equal 65 mmΦ and larger, shall be rising outside screw and yoke

**IV. Selection of Contractor**

The procurement and implementation of the project shall be in accordance with the provisions of RA 9184 specifically its Annex "A". 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 or 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

<b>I. TECHNICAL COMPONENT ENVELOPE</b>	
<i>Class "A" Documents</i>	
<u>Legal Documents</u>	
<input type="checkbox"/>	(a) Valid PhilGEPS Registration Certificate (Platinum Membership) (all pages); <b>OR</b>



<input type="checkbox"/>	(b) Registration certificate from Securities and Exchange Commission (SEC), Department of Trade and Industry (DTI) for sole proprietorship, or Cooperative Development Authority (CDA) for cooperatives or its equivalent document. <b>and</b>
<input type="checkbox"/>	(c) Mayor's or Business permit issued by the city or municipality where the principal place of business of the prospective bidder is located, or the equivalent document for Exclusive Economic Zones or Areas. Proof of payment or the official receipt will be accepted as an alternative documentary requirement however, actual mayor's or business permit should be presented during post-qualification." and
<input type="checkbox"/>	(e) Tax clearance per E.O. No. 398, s. 2005, as finally reviewed and approved by the Bureau of Internal Revenue (BIR).
<u>Technical Documents</u>	
<input type="checkbox"/>	(f) Statement of the prospective bidder of all its ongoing government and private contracts, including contracts awarded but not yet started, if any, whether similar or not similar in nature and complexity to the contract to be bid. <b>and</b>
<input type="checkbox"/>	(g) Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid, except under conditions provided under the rules; <b>and</b>
<input type="checkbox"/>	(h) Philippine Contractors Accreditation Board (PCAB) License; <b>or</b> Special PCAB License in case of Joint Ventures; <b>and</b> registration for the type and cost of the contract to be bid; <b>and</b>
<input type="checkbox"/>	(i) Original copy of Bid Security. If in the form of a Surety Bond, submit also a certification issued by the Insurance Commission; <b>or</b> Original copy of Notarized Bid Securing Declaration; <b>and</b>
	(j) Project Requirements, which shall include the following:
<input type="checkbox"/>	a. Organizational chart for the contract to be bid;
	b. List of contractor's key personnel ( <i>e.g.</i> , Project Manager, Project Engineers, Materials Engineers, and Foremen), to be assigned to the contract to be bid, with their complete qualification and experience data;
	c. List of contractor's major equipment units, which are owned, leased, and/or under purchase agreements, supported by proof of ownership or certification of availability of equipment from the equipment lessor/vendor for the duration of the project.
	d. Construction Safety and Health Program.
<input type="checkbox"/>	(k) Original duly signed Omnibus Sworn Statement (OSS); <b>and</b> if applicable, Original Notarized Secretary's Certificate in case of a corporation, partnership, or cooperative; or Original Special Power of Attorney of all members of the joint venture giving full power and authority to its officer to sign the OSS and do acts to represent the Bidder

<i>Financial Documents</i>	
<input type="checkbox"/>	(l) The prospective bidder's audited financial statements, showing, among others, the prospective bidder's total and current assets and liabilities, stamped "received" by the BIR or its duly accredited and authorized institutions, for the preceding calendar year which should not be earlier than two (2) years from the date of bid submission; <b>and</b>
<input type="checkbox"/>	(m) The prospective bidder's computation of Net Financial Contracting Capacity (NFCC).
<b>Class "B" Documents</b>	
<input type="checkbox"/>	(n) If applicable, duly signed joint venture agreement (JVA) in accordance with RA No. 4566 and its IRR in case the joint venture is already in existence; <b>or</b> duly notarized statements from all the potential joint venture partners stating that they will enter into and abide by the provisions of the JVA in the instance that the bid is successful.
<b>II. FINANCIAL COMPONENT ENVELOPE</b>	
<input type="checkbox"/>	(o) Original of duly signed and accomplished Financial Bid Form; <b>and</b>
<i>Other documentary requirements under RA No. 9184</i>	
<input type="checkbox"/>	(p) Original of duly signed Bid Prices in the Bill of Quantities; <b>and</b>
<input type="checkbox"/>	(q) Duly accomplished Detailed Cost Estimates (r) Summary Sheet indicating the unit prices of construction materials, labor rates and equipment rentals used in coming up with the Bid; (r.1) Sample Summary Sheet <b>and</b>
<input type="checkbox"/>	(s) Cash Flow by Quarter or Payment Schedule.

**Additional Requirements**

Authorized Representative must present;

1. Authorization letter / Special Power of Attorney
2. Letter of Intent

**Notes:**

1. The authorized representative must show proof of employment under the company which he/she represents at least 5 years in the company (e. q. contract of employment etc).
2. Non – compliance of the additional requirements shall not be subjected for the failure or disqualification of the Prospective bidder. These requirements are for the compliance of the statutory and regulatory documents.

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 ventures with engineering firms for the portion of the contract.

## **V. 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 Five (5) 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**

The Project Engineer shall be a licensed civil engineer with at least Five (5) years of experience in similar and comparable projects and shall preferably be knowledgeable in the application of rapid construction technologies.

### **C. Electrical Engineer**

The Electrical Engineer must be a registered Professional Electrical Engineer with at least Five (5) years of experience in the design of lighting, power distribution and preferably knowledgeable in developments in emergent efficient lighting technologies and energy management.

### **D. Mechanical Engineer**

The Mechanical Engineer must be duly-licensed with at least five (5) years of experience in similar and comparable projects in the installation of Mechanical Equipment, HVAC, and Fire protection.

### **E. Registered Master Plumber**

The Registered Master Plumber must be a duly licensed Registered Master Plumber and must have at least five (5) years of experience in similar and comparable projects and shall preferably be knowledgeable in the application of Green Building technologies.

**F. 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).

Minimum Classification and number of Safety Officer as per Department Order No. 198 Chapter IV Covered Workplaces Section 14 for all covered workplaces shall be as follows:

<b>Number of Workers</b>	<b>Low Risk</b>	<b>Medium Risk</b>	<b>High Risk</b>
1 to 9	One (1) S01	One (1) S01	One (1) S02
10 to 50	One (1) S01	One (1) S02	One (1) S03
51 to 99	One (1) S02		One (1) S02 and One (1) S03
100 to 199		One (1) S02 and One (1) S03	
200 to 250	Two (2) S02 or One (1) S03	One (1) S02 and One (1) S03	Two (2) S03
251 to 500	Two (2) S02 and One (1) S03	Two (2) S03	One (1) S02 and Two (2) S03
501 to 750	Two (2) S02 and One (1) S03	Two (2) S03	One (1) S02 and Two (2) S03
751 to 1000	Two (2) S03		
Every additional 250 or fraction thereof	-	-	Additional One (1) S03 or S04
Every additional 500 or fraction thereof	Additional One (1) S03	Additional One (1) S03 or S04	-

Construction is considered as a High-Risk workplace, therefore, the requirement for the number of Safety Officers will depend on the High-Risk column.

### **G. First Aider**

The First Aider must be trained and duly certified or qualified to administer first-aid by the Philippine National Red Cross or by any organization accredited by the same.

### **H. Foreman**

The Foreman must have at least five (5) years of experience in similar and comparable projects and shall preferably be knowledgeable in the application of Green Building technologies.

The above list of key personnel is required and shall be available on-site during construction. 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 Technical Specifications, for the PROJECT. Prospective bidders shall attach everyone's resume and PRC license of the (professional) staff, proof of qualifications, and related documents, as necessary.

## **Section VI. SCOPE OF WORKS AND PROJECT IMPLEMENTATION**

### **A. Pre-Construction**

1. Secures all necessary building permits prior to construction. All incidental fees shall be included in the cost estimate of the building.
2. Prepares the PERT-CPM of the construction phase.
3. Provides all other necessary documents that shall be required by the Design and Build Committee.

### **B. Construction Phase**

1. Implements all works indicated in the approved construction drawings and documents. All revisions and deviations from the approved plans, especially if it shall impact the overall cost of the project, shall be subject for approval.
2. 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.
3. Constructs the buildings and other necessary structures, complete with utilities and finishes, resulting in operable and usable structures.
4. 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.
5. 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.

6. Installs fire protection systems and fixtures, fire extinguishers, emergency lights and lighted fire exit signs.
7. Prepares shop-drawings for approval.
8. Coordinates with the Design and Build Committee regarding scheduling of delivery and installation of all owner-furnished materials and equipment during construction.
9. Conducts all necessary tests (to be required by Design and Build Committee) and issues reports of results.
10. Rectifies punch-listing works to be inspected and issued by the Design and Build Committee and/or the End-user.
11. Complies with the DOLE-OSH requirements and submit periodic reports concerning occupational safety and health.
12. Provides all other necessary documents that shall be required by the Design and Build Committee.

C. Post Construction Phase

1. Prepares of as-built plans
2. Turn-overs of all manuals, certificates, and warranties of installed items.
3. Secures building certificate of occupancy and fire safety inspection certificate

D. Variation Orders

Any errors, omissions, inconsistencies, inadequacies, or failures 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.

1. 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:

- an extension of time for any such delays under Section 10 of Annex "E"; or
- 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

#### E. Defects and Liability

1. All 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.
2. The contractor shall be held liable for structural defects and/or failure of the completed project within the warranty periods specified in Section 62.2.3.217 of the IRR.

### **Section VII. OVERALL PROJECT TIME SCHEDULE**

The CONTRACTOR shall propose the most reasonable time schedule for the completion of the project. It is expected that this period will not exceed Three Hundred Sixty-Five (365) calendar days seven (7) days from the date of receipt of the Notice to Proceed (NTP).

### **Section VIII. RESPONSIBILITIES OF THE IMPLEMENTING AGENCY AND THE CONTRACTOR**

#### A. The Implementing Agencies General Responsibility

The implementing agency for the project is PSHS-MRC. The Design and Build Committee shall:

1. 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 Technical Specifications.
2. Coordinate with CONTRACTOR and the Campus Director of PSHS-MRC with regards to the design and implementation of the project.
3. Assist in the coordination of the CONTRACTOR with various utility agencies during the detailed design and implementation phases of the project.
4. Conduct regular coordination meetings between the CONTRACTOR and PSHS-MRC to facilitate the implementation of the project.

#### B. The Contractor's General Responsibility

1. The 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 Technical Specifications.

2. The 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.
3. The 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.
4. The 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.
5. The CONTRACTOR shall inform PSHS-MRC of critical events during construction, especially when such events can potentially disrupt school activities.
6. The CONTRACTOR shall be PCAB accredited and shall have a Construction Safety and Health Program approved by DOLE and designed specifically for the CONSTRUCTION OF SPORTS FACILITIES.
7. The CONTRACTOR will be held accountable for accidents that might occur during the execution of the project. As a precaution, the 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.
8. All works designed and constructed should be guaranteed to seamlessly fit into the overall system general design standards of the PSHS System.

## **Section IX. PROJECTED SUBMITTALS DURING THE PROJECT**

The following submittals and accomplished documents shall be duly completed and turned over by the CONTRACTOR for the project.

### **A. For the Pre-Construction Phase (7 copies each)**

1. All necessary permits (Fees shall be included in the contract)
2. PERT-CPM / PDM
3. Bar Chart/S-Curve
4. Manpower Schedule/Utilization



5. Equipment Utilization Schedule
6. Construction Methods
7. Derivation of Contract Time
8. Cashflow
9. Occupational Safety and Health Program approved by DOLE

B. For the Construction Phase (7 copies each)

1. As-built plans (hard copy and soft copy)
2. All necessary permits (Fees shall be included in the contract)
3. Shop drawings (hard copy and soft copy)
4. PERT-CPM
5. Test results
6. Guarantees, warranties and other certificates
7. Fire and Life Safety Assessment Report 2 and 3 (FALAR 2 and 3)

C. For the Post-Construction Phase (7 copies each)

1. Certificate of Occupancy (if applicable)
2. Fire Safety Inspection Certificate
3. All other necessary documents to be required by D & B Committee

## **Section X. CODES AND STANDARDS**

The project shall be designed, engineered, installed, tested, commissioned, and handed over in conformity 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.

## **Section XI. 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 Manager, Project Engineer/Architect, Construction Safety Engineer or Safety Officer, First Aider and Foreman 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 build contractor from any liability or obligation that may arise from the contract for this project.

The following scope/specialty works shall be allowed for subcontracting: painting work, ceiling works, and installation of special items i.e. cladding, fire protection system, cctv, electrical items, provided that subcontractor passed the eligibility requirements of the portion to be subcontracted.

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 which has been previously submitted, reviewed, and approved, the CONTRACTOR shall notify the procuring entity within a reasonable period and shall shoulder the cost of such changes.

## **Section XII. 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.

All materials shall be in conformance with the latest standards and with inspection and approval from the Design and Build Committee.

## **Section XIII. MODE OF PAYMENT**

- A. The PSHS-MRC shall pay the winning CONTRACTOR progress payments based on billings for actual works accomplished, as certified by the Design and Build 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 CONTRACTOR prior to any deduction. The total retention money shall be released only upon Final Acceptance of the Project. The winning 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 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 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 Design and Build Committee before processing of payments to the CONTRACTOR can be made:

1. Progress Billing
2. Detailed Statement of Work Accomplished (SWA)
3. Request for payment by the BUILD CONTRACTOR
4. Pictures/photographs of original site conditions (for Billing)
5. Before, During and After pictures/photographs of work accomplished with a date attached during the actual.
6. Payment of utilities (power and water consumption)
7. CONTRACTOR's affidavit

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

Prepared by:

DESIGN AND BUILD COMMITTEE:



**WOODRITZ F. RABINO**

Chairperson



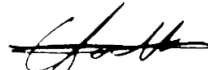
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Campus Director