

TECHNICAL SPECIFICATIONS

CONSTRUCTION OF ACADEMIC BUILDING I (TAKE OVER CONTRACT) 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 FY 2016 General Appropriations Act intends to apply the sum of **TWENTY-EIGHT MILLION SIX HUNDRED SIXTY-ONE THOUSAND FIVE HUNDRED FORTY-FIVE and 07/100 PESOS (₱ 28,661,545.07)** being the approved budget for the procurement and implementation of the project **Construction of Academic Building I (Take over Contract)** with the project duration of Two Hundred Twenty (220) calendar days.

II. PROJECT DESCRIPTION AND LOCATION

The project will involve the **CONSTRUCTION OF ACADEMIC BUILDING I (TAKE OVER CONTRACT)** of the Philippine Science High School - MIMAROPA Region Campus, Rizal, Odiongan, Romblon pursuant to the technical specifications.

The project will have an Approved Budget for the Contract (ABC) of **TWENTY-EIGHT MILLION SIX HUNDRED SIXTY-ONE THOUSAND FIVE HUNDRED FORTY-FIVE and 07/100 PESOS (₱ 28,661,545.07)** including all taxes and applicable permits, licenses and clearances, for the projects mentioned above.

The **Construction of Academic Building I (Take over Contract)** in which the Approved Budget Contract shall be allocated for the Architectural, Civil, Electrical, Mechanical, Electronics, and Plumbing works.

III. CONSTRUCTION PHASE

The Construction Project

Structural works

- A. Reinforcing bars for concrete exposed to weather shall be protected with at least 75mm clear distance and in no case less 40mm concrete. This condition may be waived when adequate waterproofing is provided.
- B. Reinforcing bars shall be deformed conforming to ASTM A615 billet steel as follows:
 - i. 16mm \emptyset bars and larger shall be high grade with minimum $F_y = 414\text{MPA}$ (6000PSI).
 - ii. 12mm \emptyset bars and smaller shall be intermediate grade with minimum $F_y = 276\text{MPA}$ (40000PSI).

if bending and welding are important, deformed bar shall conform to ASTM A706 low alloy grade 414 steel bar.

- C. All concrete works shall be done in accordance ACI-318-95 building code for reinforced concrete and all structural steel works shall be done in accordance with the AISC specifications as it does not conflict with the national structural code of the Philippines (NSCP - 1) requirements.
- D. Slab on fill must not be placed unless fill has been properly compacted clean coarse sand bed except driveways where it shall be 150mm. Backfill of all excavated areas and the preparation of sub-base shall be well compacted at least 95% of the standard proctor density before well compacted clean coarse sand are laid.
- E. The contractor shall coordinate with the AR, ME, SE, and EE plans as to the exact sizes and location of the holes thru floors slab and walls.

F. Concrete Mixes & Placing

- Unless otherwise indicated in plans or noted in the structural specification, the minimum 28 days compressive cylinder strength shall be as follows:
 1. Suspended slabs, beams, and girders - 21MPA (3000PSI)
 2. Columns and pedestal - 21MPA (3000PSI)
 3. Retaining walls - 21MPA (3000PSI)
 4. Footing Tie beams - 21MPA (3000PSI)
 5. Parapet walls and Gutter - 21MPA (3000PSI)
 6. Other Structural Elements - 21MPA (3000PSI)
 7. Slab on grade, Curtain walls - 17MPA (3000PSI)
 8. Bedded slab, Sidewalks - 17MPA (3000PSI)
 9. Non- Structural Elements - 17MPA (3000PSI)
- Concrete shall be deposited in its final position without segregation, re handling or flowing. Placing shall be done properly with buggies, bucket, or wheel - borrows, no chutes shall exceed six (6) meter aggregate length.
- No depositing of concrete shall be allowed without the use of vibrators unless authorized by the Architect/Engineer in charge of PSHS - MRC.

G. Concrete Slabs

- All reinforcement shall be provided with 20mm clear concrete covert except for slab on grade where reinforcement should be placed at the center of the slab thickness.
- Unless otherwise detailed in continuous slabs having same reinforcement running in one direction, reinforcing bars shall be bent up or extended.
- For two-way slabs, bars along the shorter span shall be placed below the longer span bars at center and above of the longer span bars at the supports. The spacing of bars at the column strip shall be 1.5 times the spacing in the middle strip but in any case, greater than 2.5 the slab thickness or 450mm.

- Temperature bars of suspended slab shall be placed above the main reinforcement at midspan and shall be below the main

TABLE 1. SCHEDULE OF TEMPERATURE BARS	
THICKNESS	MINIMUM TEMP. BARS
100mm	10mm ϕ @ 400mm O.C
125mm	10mm ϕ @ 300mm O.C

reinforcement at the supports.

- Unless otherwise noted, all bends shall be reinforced with 100mm ϕ at 0.25 MOC EW at center of slab. Slab construction joints shall not be more than 3.0m.
- Whenever required, drop slab shall be additionally reinforced.
- Extra reinforcements shall be provided at corner slab.
- Unless noted in the plan, all openings shall be reinforced all around by 2-16mm ϕ bar at the top and bottom of the slab.

H. Concrete Beams and Girders

- Unless otherwise noted in the specification, camber all beams and girders at least 6mm for every 4.5mm of span except cantilevers for which cambers shall be noted in the plans or as ordered by the Architect/Engineers in charge of PSHS - MRC but in case less than 20mm for every 3m of span.
- Typical bar bending and cutting details for intermediate beams and girders are shown in approved drawings. Main reinforcing bars shall have a standard hook of 90-degree bend plus 12 times the diameter of the bar extension at its free end.
- If beam reinforcement end in a wall, the clear distance from the bar to the farthest face of the wall shall not be less than 50mm, minimum embedment length shall be shown in Table 2.
- If there are two or more layers of reinforcing bar, use separators of size equal to the bar diameter but not less than 25mm spaced at 900mm on centers. In no case shall be less than two separators between layers of bars.

150mm	10mm ϕ @ 200mm O.C
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- When Beam crosses a girder, rest beam bars on top of the girder bars. Reinforcing bars shall be symmetrical about the centerline whenever possible. Upper bars shall be placed directly above those bars in the bottom layers.
- No splices shall be permitted on beams where critical bending occurs. Length of lap splice where permitted shall be shown in the approved drawings, not more than 50% of the bars at any one section shall be allowed to splice therein. A typical welded splice detail is shown in the approved drawing.
- For all beams, always fit the reinforcement in one layer whenever possible. Whenever beams are supporting a planted column, bottom bar at midspan of the beam shall continue up to the supports.
- For girders, hoops shall be used within the distance twice of the girder depth. Beyond it, stirrups with seismic hooks may be used within the spliced length, 10mm ϕ hoops shall be provided at 0.10M O.C.
- Individuals bars within a bundle shall terminate at different points with at least 40 times the bar diameter stagger.

BAR Size ASTM A615	BAR IN TENSION												BAR IN COMPRESSION					
	FOR Fy = 275 MPA						FOR Fy = 414MPA						FOR Fy = 275 MPA			FOR Fy = 275 MPA		
	fc = 21 MPA		fc = 28 MPA		fc = 35 MPA		fc = 21 MPA		fc = 28 MPA		fc = 35 MPA		fc = 21	fc = 28	fc = 35	fc = 21	fc = 28	fc = 35
	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2	MPA	MPA	MPA	MPA	MPA	MPA
10mm ϕ	300	450	250	375	250	350	450	650	400	575	350	500	200	200	200	250	200	200
12mm ϕ	350	550	300	450	300	400	550	800	475	700	425	625	200	200	200	300	250	250
16mm ϕ	475	750	425	600	375	550	750	1050	650	925	575	825	250	250	250	350	350	300
20mm ϕ	600	900	525	750	475	700	900	1300	800	1150	700	1025	300	300	250	450	400	350
25mm ϕ	900	1375	800	1200	700	1050	1375	2050	1200	1800	1050	1600	400	350	300	550	500	450
28mm ϕ	1025	1650	900	1325	800	1200	1550	2300	1325	2000	1200	1800	450	400	350	650	550	500
32mm ϕ	1175	1750	1000	1525	900	1350	1750	2625	1525	2275	1350	2050	500	450	400	750	650	550

NOTES: 1. For reinforcing bars in tension with stand hook at its end. Development length may be divided by 2.50
2. Case 1 is for bars with the clear spacing not less than the bar diameter or either less than 25mm otherwise Case 2 shall be used

I. Concrete Column

- Beam-column joints shall be provided by a hoop at 0.1 M O.C, the number of sets for such hoops shall be the same in the confined region as scheduled.
- Where column changes in sized, vertical reinforcement shall be offset at a slope of not more than 1.6 and extra 10mm ϕ hoops at 0.10M O.C. shall be provided throughout than offset region.

- Splice shall be allowed only within the center half of the clear column height. Splice length shall be provided with a hoop spaced at 0.10M O.C, Splice length shall be considered as tension splice as presented in approved drawings.
- Column ties and spiral shall be provided with minimum clear concrete cover of 40mm. Vertical bars shall have a clear distance of 1.5 times bar diameter or 40mm whichever is larger.
- Confined region shall be equal to the larger of the following:
 - **0.450MM**
 - **Bigger Column Dimension**
 - **(Clear Column Height)/16**

J. Structural Steel

- All materials and workmanship shall conform to the latest edition of American Institute of steel construction manual unless otherwise shown or noted.
- All structural steel including that of gusset plates shall be ASTM A36 Steel with yield strength of $F_y = 248\text{MPA}$.
- All bolts and threaded fasteners shall be ASTM A325.
- All welds shall be E70XX electrode and shall develop at least 100% of the strength of the connected members.
- The contractors shall submit to the structural engineer the shop/fabrication drawings for approval before any works shall commence.
- All double angle structural members must be provided with filler plates at 0.30M O.C. maximum spacing.
- All exposed structural steel members shall have at least two coats of red lead o zinc chromate primer paint.
- All trusses, beams, and Girders, must be provided with a camber at the rate of 3mm for every 3.0m of clear span in a parabolic layout.

K. Foundations

- All footing where designed based on the allowable soil bearing capacity of 150KPA. The contractor shall report in writing to the designer the actual condition at the level of footing and confirm the actual soil bearing capacity before depositing concrete.
- No footing shall rest on uncompact fill nor loose soil. All footings should rest at least 1.0 below the ground. The minimum concrete protection for reinforcement shall be 75mm clear.
- All column reinforcement shall rest above the bottom reinforcements of the footing with 90-degree bend plus 12 times bar diameter extension at the free end but not less than 300mm. Hoops in the column shall continue below the top of the footing at 0.10M O.C.

L. CHB Walls

- All CHB Walls have a minimum compressive strength of 450PSI and shall be reinforced as presented in Table 3.
- Minimum lap length of splice shall be 250mm.
- Provide right angled reinforcement at corners, 900mm long.
- Provide beams blocks at every 10th layer of CHB and a post at every 3.0m.
- Where CHB walls adjoin columns, RC beams, and RC walls. Dowel with the same size as the vertical or horizontal reinforcements shall be provided.

TABLE 3. SCHEDULE OF CHB REQUIREMENTS		
BLOCK THICKNESS	HORIZONTAL REINFORCEMENTS	VERTICAL REINFORCEMENTS
100mm	10mm ϕ @ 600mm O.C	10mm ϕ @ 600mm O.C
125mm	10mm ϕ @ 600mm O.C	10mm ϕ @ 600mm O.C
150mm	10mm ϕ @ 400mm O.C	10mm ϕ @ 400mm O.C
200mm	10mm ϕ @ 400mm O.C	10mm ϕ @ 400mm O.C

Electrical Works

- 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.
- Power service to the building shall be 230 volts, 3-phase 60HZ, AC power source, 3-wire + 1-ground.
- All electrical wiring installation such as lighting, power, fire alarm & CCTV system to be used shall be polyvinyl chloride (PVC) pipe. "Schedule 40"
- Unless otherwise specified, the minimum size of wire shall be 3.5mm TW/THHN² and conduit shall be 20mm ϕ electrical trade size.
- 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 approval equal.
- All outlet boxes shall be galvanized gauge no. 16, deep type with factory knockouts. Cover all junction boxes (no exposed wire)
- Panelboards 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 panelboard shall be "G.E or square-D)".

- All wiring devices shall be “National” or approved equal.
- All materials to be used shall be brand new and must be approved type for the particular location and purpose intended.
- Provide grounding system to all lighting and power circuit as per Philippine Electrical Code requirement.
- 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
- 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.
- Provide flexible metal conduit and sufficient mica tube from junction boxes to lighting fixtures.
- 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

Mechanical Works

- All equipment shall be installed in approximate location as shown on the drawings.
- All equipment shall set on level reinforced concrete foundation at least 150mm. Higher than the floor line, if applicable.
- All equipment shall be mounted on or supported with vibration isolation units or assemblies as specified and or shown on the drawings.
- 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.
- All materials to be used shall be brand new and clean.
- Deviations and revisions from plans shall be referred to the architect for review and approval.
- All necessary government permit shall be secured and paid for by the contractor.
- All dimension is in millimeter unless otherwise specified.
- All mechanical works shall be in accordance with the latest Mechanical Engineers code ASVE and ASHRAE standard.
- Mechanical contractor shall observe always safety and orderliness.

- Mechanical contractor shall verify site prior to actual installation.

Metal works

- All handrails using stainless steel materials to prevent rust and corrosion.
- All steel decks shall be welded to the beams reinforcement bars before concrete pouring.
- All fire exits will be welded following the standard procedure and specifications using angle bars and flat bars.

Architectural works

- All interior ceiling using gypsum board and all exterior ceiling using hardiflex or smart board finished with paints. Ceiling joist and framings using metal furring metal furring and metals stud.
- Windows and window frame shall conform sized, design and kinds of materials shown in the details of windows, schedule of windows or as per the bill of materials.
- The materials for the floor finishes shall be plain plastered cement finish for the provision of floor tiles finishes for phase 2 or improvement of Academic building 1.
- The toilet and bathroom shall be finished unglazed. The walls of the toilet and bathrooms shall be with 300mm x 300mm ceramic tiles and for the floor tiles is 300mm x 300mm ceramic tiles.
- All painting works for this project, except as hereinafter specified, shall be done with the use of BOYSEN PAINTS. Skim coat application for all the masonry finishes before the final coat applications.

Plumbing Works

- 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.
- Coordinate the drawing with other related drawings and specification the engineer shall be notified immediately of any discrepancy found therein.
- All pipes shall be installed as indicated on plans, any relocations required for proper execution of other trade shall be with prior approval of the architect or engineer.

- Proposed sanitary utilities shall conform to the actual location, depth and invert elevation of all existing pipes and structure as verified by the contractor.
- Refer to architectural plans for area drain, catch basin, floor drains and clean out location.
- All slopes for horizontal drainage shall maintain 2% unless otherwise specified.
- Size of water supply pipes to fixtures shall be in accordance with the manufacturer’s instructions.
- The contractor shall verify all existing utilities at site, coordinate the works with the line service connecting point unless otherwise specified.
- All pipe sizes and dimensions are in millimeters unless otherwise specified.
- All hangers shall not be anchored at purlins, unless otherwise approved by the structural engineer.

MATERIAL SPECIFICATIONS

- Water lines- riser, down feed, main distribution and tapping water lines shall be galvanized iron pipe (G.I.) schedule 40, similar to “supreme” pipe.
- 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.
- Sewer pipes- shall be polyvinyl chloride (PVC) pipe, series 1000, “NELTEX” brand or approved equal.
- Waste pipes- shall be polyvinyl chloride (PVC) pipe, series 1000, “NELTEX” brand or approved equal.
- ACU/AHU/FCU Waste pipe- shall be polyvinyl chloride (PVC) pipes, series 1000, “NELTEX” brand or approved equal and shall be provided with thick close cell elastomeric thermal insulation “AEROFLEX” brand or approved equal and installed as per manufacturers recommendation.
- Vent pipes- shall be polyvinyl chloride (PVC) pipes, series 1000, “NELTEX” brand or approved equal.
- Downspouts- shall be polyvinyl chloride (PVC) pipe, series 1000, “NELTEX” brand or approved equal.
- 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.
- Underdrains/ perimeter drain pipes- shall be polyvinyl chloride (PVC) pipes, series 1000, “NELTEX” brand or approved equal.
- 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

POTABLE WATER LINES		SANITARY DRAINAGE AND VENT LINES	
EQUIVALENT PIPE DIAMETER		EQUIVALENT PIPE DIAMETER	
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	
MAXIMUM SPACING OF PIPE SUPPORT		MAXIMUM SPACING OF PIPE SUPPORT	
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
STORM DRAINAGE LINES			
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	
MAXIMUM SPACING OF PIPE SUPPORT			
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

Electronics and Communication works

- Public address system has been strategically design that all student and staff will able to take attention by the connections of speakers on all designated areas in Academic Building 1.
- WAN/LAN will be installed on the selected areas in the Academic Building 1.
- CCTV provision for the improvement of Academic Building 1.

Roof system

- All roof framings materials using a welded C - Purlins and Angle bars specified on the detailed drawings for girt and trusses.
- Roofing using the long span, rib type with stainless bended materials like main gutter and ridge roll.

IV. SELECTION OF CONTRACTOR

The procurement and implementation of the project shall be in accordance with the provisions of RA 9184. Bidding process shall be conducted by the Bids and Awards Committee (BAC) to be assisted by the TWG. The campus director of PSHS-MRC shall create the Design and Build Committee (DBC) to be composed of highly technical personnel in the field of architecture and engineering/construction. The DBC and TWG shall prepare the design brief and performance specifications and parameters, review the detailed engineering design, and assist the BAC in the evaluation of technical and financial proposals in accordance with the criteria set.

Eligibility Requirements

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

a. Eligibility Documents

Class "A"
Documents

- i. PhilGEPS Registration

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

Class “ B “ Documents

a. Joint Venture agreement, if applicable.

b. Technical Documents

- i. Bid Security (in any form)
- ii. Project Requirements
 - ii1. Construction Method
 - ii2. Value engineering analysis of construction method. Prospective bidders shall prepare a value engineering analysis report of their proposed construction method to be applied for the PROJECT. Importance shall be made on the following criteria:
 - Cost-saving, measured on a per square meter average figure
 - Time-saving in construction duration, measured using the HOPE approved PERT/CPM of the project.
 - ii3. Organizational Chart
 - ii4. List of Contractor’s Personnel with complete qualification and experience data
 - ii5. List of Contractor’s Equipment units, which are owned, leased, and/or under purchase agreements, supported by certification of availability of equipment from the equipment lessor/vendor for the duration of the project.
 - ii6. Manpower Schedule
 - ii7. Equipment Utilization Schedule
 - ii8. Bar Chart and S-curve
 - ii9. Construction Safety and Health Program
 - ii10. PERT-CPM
- iii. Omnibus Sworn Statement

c. Financial Component

Financial Bid Form

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

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 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.

B. Eligibility Criteria

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

v. 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/ Architect

The Project Engineer/Architect shall be a licensed architect or 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. Materials Engineer

The Materials Engineer must be duly accredited 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.

D. 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.

E. Electronics Engineer

The Electronics Engineer must be a registered Professional Electronics Engineer with at least five (5) 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 five (5) 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 five (5) 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 five (5) years of experience in similar and comparable projects and shall preferably be knowledgeable in the application of Green Building technologies.

I. Safety Officer

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

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

VI. SCOPE OF WORKS AND PROJECT IMPLEMENTATION

A. 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 of the PERT-CPM of the construction phase.
- c) Provides all other necessary documents that shall be required by B&D Committee

B. 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) Constructs the buildings and other necessary structures, complete with utilities and finishes, resulting in operable and usable structures.
- c) 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.
- d) 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.
- e) Installs fire protection systems and fixtures, fire extinguishers, emergency lights and lighted fire exit signs as required by applicable laws.
- f) Coordinates with the D&B Committee regarding scheduling of delivery and installation of all owner-furnished materials and equipment during construction.
- g) Conducts all necessary tests (to be required by D&B Committee) and issue reports of results.
- h) Rectifies punch-listing works to be inspected and issued by the D&B Committee and/or the End-user.
- i) Complies with the DOLE-OSH requirements and submit periodic reports concerning occupational safety and health.
- j) Provides all other necessary documents that shall be required by the D&B Committee.

C. 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

D. 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

E. 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.

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 **Two Hundred Twenty (220) calendar days** for the Construction Phase.

VIII. 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 D&B Committee shall:

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

IX. THE CONTRACTOR'S GENERAL RESPONSIBILITY

- a) 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 Terms of Reference.
- b) CONTRACTOR shall ensure that all works at the stages of construction, restoration of affected areas, and testing and commissioning shall be carried out efficiently and effectively.

- c) 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.
- d) 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.
- e) The CONTRACTOR shall inform PSHS-MRC of critical events during construction, especially when such events can potentially disrupt school activities.
- f) The CONTRACTOR shall be PCAB accredited and shall have a Construction Safety and Health Program approved by DOLE.
- g) The CONTRACTOR will be held accountable for accidents that might occur during the execution of the project. 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.
- h) The CONTRACTOR shall be professionally liable for the as-built plan and shall submit a signed and sealed copy of the approved 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 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.

x. 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 CONSTRUCTION PHASE (7 copies each)**
 - a) Shop drawings (hard copy and soft copy)
 - b) PERT-CPM
 - c) Concrete Test results
 - d) Guarantees, warranties and other certificates
 - e) Fire and Life Safety Assessment Report 2 and 3 (FALAR 2 and 3)
- B. FOR THE POST-CONSTRUCTION PHASE (7 copies each)**
 - a) As-built plans (hard copy and soft copy)
 - b) Certificate of Occupancy
 - c) Fire Safety Inspection Certificate (if applicable)

- d) All other necessary documents to be required by B&D Committee

xiv. CODES AND STANDARDS

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

xv. INSTALLATION AND WORKMANSHIP

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

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

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

Any errors, omissions, inconsistencies, inadequacies or failure submitted by the CONTRACTOR that do not comply with the requirements shall be rectified, resubmitted and reviewed at the CONTRACTOR'S cost. If the CONTRACTOR wishes to modify any design or document, reviewed and approved, the CONTRACTOR shall notify the procuring entity within a reasonable period of time and shall shoulder the cost of such changes.

xvi. MATERIALS

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

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

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

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

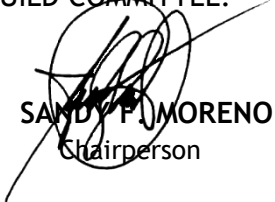
xvii. MODE OF PAYMENT

- a) The PSHS-MRC shall pay the winning 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 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 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 CONTRACTOR can be made:
 - i. Progress Billing
 - ii. Detailed Statement of Work Accomplished (SWA)
 - iii. Request for payment by the CONTRACTOR
 - iv. Pictures/photographs during, before and after construction (for all Billings payed)
 - v. Pictures/photographs of work accomplished
 - vi. Payment of utilities (power and water consumption)
 - vii. CONTRACTOR's affidavit (if accomplishment is more than 60%)

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

Prepared by:

DESIGN AND BUILD COMMITTEE:

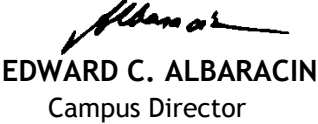

SANDY P. MORENO
Chairperson


ARCH. JOLITO G. TAN
Member


ENGR. BRYAN E. MANZANO
Member


ENGR. JOSEPH G. BANTANG
Member

Concurred by:


EDWARD C. ALBARACIN
Campus Director