



BID BULLETIN NO. 2

Date: December 06, 2023
Title: IB-2023-11-18 CONSTRUCTION OF THREE (3) STOREY EVSU BURAUEN ACADEMIC BUILDING
Reference No.: 10348371

This bulletin is being issued to revise/clarify certain portions of the bidding documents. This shall form an integral part of the bidding document for the above-mentioned procurement project.

REFERENCE	AMENDMENT/ADDITIONAL REFERENCE
Section VI. Specifications	Please see the Outline Specifications in Annex “A” as the basis for the specifications for the complete project, subject to change based on the approved design.
Section VIII. Bill of Quantities	Please see the Bill of Quantities in Annex “B” as the basis of information on the quantities of Works to be performed to enable Bids to be prepared efficiently and accurately. However, the complete project has an ABC of Php42,800,000.00 as such the bill of quantities for submission shall cover the ABC of the complete project less the bid amount.
Section IX. Checklist of Technical and Financial Documents	Amended Checklist of Technical and Financial Documents is reflected in Annex “C” .
Section X. Terms of Reference	This section is additional to the posted PBD and will be referred to as Section X. Terms of Reference. Please see the attached TOR in Annex “D” as the basis for the terms and parameters of this project.

All statements and formats referring to this clause should be amended/corrected accordingly.

For guidance and information of all concerned.

For further information, please refer to:

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Noted:

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Republic of the Philippines
EASTERN VISAYAS STATE UNIVERSITY
Physical Plant and Infrastructure Development Office

OUTLINE SPECIFICATIONS

NAME OF PROJECT: IB-2023-11-18 CONSTRUCTION OF THREE (3) STOREY EVSU BURAUEN ACADEMIC BUILDING
LOCATION: SAN DIEGO DISTRICT IX- BURAUEN, LEYTE - EVSU BURAUEN CAMPUS

GENERAL CONDITIONS

All parts of the construction shall be finished with first class workmanship, to the fullest talent and meaning of the plans and these Specifications, and to the entire satisfaction of the Architect/Engineer and the University.

The construction shall conform to all the requirements of the National Building Code, as well as the local rules and regulations of Tacloban City.

ITEM 803 (1) a, b, c STRUCTURE EXCAVATION

DESCRIPTION

This Item shall consist of the necessary excavation for foundation structures not otherwise provided for in the Specifications. the backfilling of completed structures and the disposal of all excavated surplus materials, shall be in accordance with these Specifications and in reasonably close conformity with the Plans or as established by the Engineer.

It shall also include the furnishing and placing of approved foundation fill material to replace unsuitable material encountered below the foundation elevation of structures.

No allowance will be made for classification of different types of material encountered.

Construction Requirements

Clearing and Grubbing

Prior to starting excavation operations in any area, all necessary clearing and grubbing in that area shall have been performed in accordance Clearing and Grubbing.

Excavation

- (1) General, all structures. The Contractor shall notify the Engineer sufficiently in advance of the beginning of any excavation so that cross-sectional elevations and measurements may be taken on the undisturbed ground. The natural ground adjacent to the structure shall not be disturbed without permission of the Engineer.

Trenches or foundation pits for structures or structure footings shall be excavated to the lines and grades or elevations shown on the Plans or as staked by the Engineer. They shall be of sufficient size to permit the placing of structures or structure footings of the full width and length shown. The elevations of the bottoms of footings, as shown on the Plans, shall be considered as approximate only and the Engineer may order, in writing, such changes in dimensions or elevations of footings as may be deemed necessary, to secure a satisfactory foundation.

Boulders, logs, and other objectionable materials encountered in excavation shall be removed.

After each excavation is completed, the Contractor shall notify the Engineer to that effect and

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no footing, bedding material or pipe culvert shall be placed until the Engineer has approved the depth of excavation and the character of the foundation material.

- (2) Structures other than pipe culverts. All rock or other hard foundation materials shall be cleaned all loose materials, and cut to a firm surface, either level, stepped, or serrated as directed by the Engineer. All seams or crevices shall be cleaned and grouted. All loose and disintegrated rocks and thin strata shall be removed. When the footing is to rest on material other than rock, excavation to final grade shall not be made until just before the footing is to be placed. When the foundation material is soft or mucky or otherwise unsuitable, as determined by the Engineer, the Contractor shall remove the unsuitable material and backfill with approved granular material. This foundation fill shall be placed and compacted in 150 mm (6 inches) layers up to the foundation elevation.

When foundation piles are used, the excavation of each pit shall be completed before the piles are driven and any placing of foundation fill shall be done after the piles are driven. After the driving is completed, all loose and displaced materials shall be removed, leaving a smooth, solid bed to receive the footing.

UTILIZATION OF EXCAVATED MATERIALS

All excavated materials, so far as suitable, shall be utilized as backfill or embankment. The surplus materials shall be disposed of in such manner as not to obstruct the stream or otherwise impair the efficiency or appearance of the structure. No excavated materials shall be deposited at any time so as to endanger the partly finished structure.

Preservation of Channel

If any excavation or dredging is made at the side of the structure before caissons, cribs, or cofferdams are sunk in place, the Contractor shall, after the foundation base is in place, backfill all such excavations to the original ground surface or stream bed with material satisfactory to the Engineer.

Backfill and Embankment for Structures

Excavated areas around structures shall be backfilled with free draining granular material approved by the Engineer and placed in horizontal layers not over 150 mm (6 inches) in thickness, to the level of the original ground surface. Each layer shall be moistened or dried as required and thoroughly compacted with mechanical tampers.

In placing backfills or embankment, the material shall be placed simultaneously in so far as possible to approximately the same elevation on both sides of an abutment, pier, or wall. If conditions require placing backfill or embankment appreciably higher on one side than on the opposite side, the additional material on the higher side shall not be placed until the masonry has been in place for 14 days, or until tests made by the laboratory under the supervision of the Engineer establishes that the masonry has attained sufficient strength to withstand any pressure created by the methods used and materials placed without damage or strain beyond a safe factor.

All embankments adjacent to structures shall be constructed in horizontal layers and compacted as prescribed in Subsection 104.3.3 except that mechanical tamper may be used for the required compaction. Special care shall be taken to prevent any wedging action against the structure and slopes bounding or within the areas to be filled shall be benched or serrated to prevent wedge action. The placing of embankment and the benching of slopes shall continue in such a manner that at all times there will be horizontal berm of thoroughly compacted material for a distance at least equal to the height of the abutment or wall to the backfilled against except insofar as undisturbed material obtrudes upon the area.

Broken rock or coarse sand and gravel shall be provided for a drainage filter at weep holes as shown on the Plans.

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3 Method of Measurement

3.1 Structure Excavation

The volume of excavation to be paid for will be the number of cubic meters measured in original position of material acceptably excavated in conformity with the Plans or as directed by the Engineer, but in no case, except as noted, will any of the following volumes be included in the measurement for payment:

- The volume outside of neat lines of under drains as shown on the Plans, and outside the limits of foundation fill as ordered by the Engineer.
- The volume included within the staked limits of the roadway excavation, contiguous channel changes, -ditches, etc., for which payment is otherwise provided in the Specification.
- Volume of water or other liquid resulting from construction operations and which can be pumped or drained away.
- The volume of any excavation performed prior to the taking of elevations and measurements of the undisturbed ground.
- The volume of any material except that where the Plans indicate or the Engineer directs the excavation after embankment has been placed and except that when installation of pipe culverts by the imperfect trench method specified in Item 500 is required, the volume of material re-excavated as directed will be included.
- The volume of excavation for footings ordered at a depth more than 1.5 m (60 inches) below the lowest elevation for such footings shown on the original Contract Plans, unless the Bill of Quantities contains a pay item for excavation ordered below the elevations shown on the Plans for individual footings.

ITEM NO. 900 (1)c1 – STRUCTURAL CONCRETE (Ready Mix Concrete, Class A, 28 Days)

SCOPE

This Item shall consist of furnishing, bending, placing and finishing concrete in all structures except pavements in accordance with this Specification and conforming to the lines, grades, and dimensions shown on the Plans. Concrete shall consist of a mixture of Portland Cement, fine aggregate, coarse aggregate, admixture when specified, and water mixed in the proportions specified or approved by the Architect/Engineer.

CLASSES AND USES OF CONCRETE

Five classes of concrete are provided for in this Item, namely: A, B, C, P and Seal. Each class shall be used in that part of the structure as called for on the Plans. The classes of concrete will generally be used as follows:

- Class A – All superstructures and heavily reinforced substructures. The important parts of the structure included are slabs, beams, girders, columns, arch ribs, box culverts, reinforced abutments, retaining walls, and reinforced footings.
- Class B – Footings, pedestals, massive pier shafts, pipe bedding, and gravity walls, unreinforced or with only a small amount of reinforcement.
- Class C – Thin reinforced sections, railings, precast R.C. piles and cribbing and for filler in steel grid floors.
- Class P – Pre-Stressed concrete structures and members.
- Seal – Concrete deposited in water.

Material Requirements

Portland Cement (APO Portland Cement or Approved equal)

It shall conform to all the requirements of Subsection 311.2.1.

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Fine Aggregate

It shall conform to all the requirements of Subsection 311.2.2.

Coarse Aggregate

It shall conform all the requirements of Subsection 311.2.3 except that gradation shall conform to Table 900.1.

Table 900.1 – Grading Requirements for Coarse Aggregate

Sieve Designation		Mass Percent Passing				
Standard Mm	Alternate US Standard	Class A	Class B	Class C	Class D	Class E
63	2-1/2"		100			
50	2"	100	95-100			
37.5	1-1/2"	95-100	-			100
25	1"	-	35-70		100	95-100
19.0	3/4"	35-70	-	100	95-100	-
12.5	1/2"	-	10-30	90-100	-	25-60
9.5	3/8"	10-30	-	40-70	20-55	-
4.75	No.4	0-5	0-5	0-15*	0-10*	0-10*

* The measured cement content shall be within plus (+) or minus (-) 2 mass percent of the design cement content.

Water

It shall conform to the requirements of Subsection 311.2.4

Admixtures

Admixtures shall conform to the requirements of Subsection 311.2.7

Curing Materials

Curing materials shall conform to the requirements of Subsection 311.2.8.

Expansion Joint Materials

Expansion joint materials shall be:

1. Preformed Sponge Rubber and Cork, conforming to AASHTO M 153.
2. Hot-Poured Elastic Type, conforming to AASHTO M 173.
3. Pre-formed Fillers, conforming to AASHTO M 213.]

Elastomeric Compression Joint Seals

These shall conform to AASHTO M 220.

Elastomeric Bearing Pads

These shall conform to AASHTO M 251 or Item 412 – Elastomeric Bearing Pads.

Storage of Cement and Aggregates

Storage of cement and aggregates shall conform to all the requirements of Subsection 311.2.10.

Sampling and Testing of Structural Concrete

As work progresses, at least one (1) sample consisting of three (3) concrete cylinder test specimens, 150 x 300mm (6 x 12 inches), shall be taken from each seventy-five (75) cubic meters of each class of concrete or fraction thereof placed each day.

Compliance with the requirements of this Section shall be determined in accordance with the following standard methods of AASHTO:

Sampling of fresh concrete	T 141
Weight per cubic metre and air content (gravi- Metric) of concrete	T 121
Sieve analysis of fine and coarse aggregates	T 27
Slump of Portland Cement Concrete	T 119
Specific gravity and absorption of fine aggregate	T 84

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Tests for strength shall be made in accordance with the following:

Making and curing concrete compressive and

flexural tests specimens in the field T 23

Compressive strength of molded concrete

Cylinders T 22

Production Requirements

Proportioning and Strength of Structural Concrete.

The concrete materials shall be proportioned in accordance with the requirements for each class of concrete as specified in Table 900.2, using the absolute volume method as outlined in the American Concrete Institute (ACI) Standard 211.1. “Recommended Practice for Selecting Proportions for Normal and Heavyweight Concrete”. Other methods of proportioning may be employed in the mix design with prior approval of the Architect/Engineer. The mix shall either be designed or approved by the Architect/Engineer. A change in the source of materials during the progress of work may necessitate a new mix design.

The strength requirements for each class of concrete shall be as specified in Table 900.2.

Table 900.2 - Composition and Strength of Concrete for Use in Structures

Class Of Concrete	Minimum Cement Content Per m3 Kg (bag**)	Maximum Water/ Cement Ratio kg/kg	Consistency Range in Slump mm (inch)	Designated Size of Coarse Aggregate Square Opening Std.mm	Minimum Compressive Strength of 150x300mm Concrete Cylinder Specimen at 28 days, MN/m2 (psi)
A	360 (9bags)	0.53	50 – 100 (2 – 4)	37.5 -4.75 (1-1/2” – No.4)	20.7 (3000)
B	320 (8 bags)	0.58	50 – 100 (2 – 4)	50 – 4.75 (2” – No.4)	16.5 (2400)
C	380 (9.5 bags)	0.55	50 – 100 (2 - 4)	12.5 – 4.75 (1/2” – No.4)	20.7 (3000)
P	440 (11 bags)	0.49	100 max. (4 max.)	19.0 – 4.75 (3/4” – No.4)	37.7 (5000)
Seal	380 (9.5 bags)	0.58	100 – 200 (4 – 8)	25 – 4.75 (1” – No.4)	20.7 (3000)

* The measured cement content shall be within plus or minus 2 mass percent of the design cement content.

** Based on 40 kg/bag

Consistency

Concrete shall have a consistency such that it will be workable in the required position. It shall be of such a consistency that it will flow around reinforcing steel but individual particles of the coarse aggregate when isolated shall show a coating of mortar containing its proportionate amount of sand. The consistency of concrete shall be gauged by the ability of the equipment to properly place it and not by the

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difficulty in mixing and transporting. The quantity of mixing water shall be determined by the Architect/Engineer and shall not be varied without his consent. Concrete as dry as it is practical to place with the equipment specified shall be used.

Batching

Measuring and batching of materials shall be done at a batching plant.

1. Portland Cement

Either sacked or bulk cement may be used. No fraction of a sack of cement shall be used in a batch of concrete unless the cement is weighed. All bulk cement shall be weighed on an approved weighing device. The bulk cement weighing hopper shall be properly sealed and vented to preclude dusting operation. The discharge chute shall not be suspended from the weighing hopper and shall be so arranged that cement will neither be lodged in it nor leak from it. Accuracy of batching shall be within plus (+) or minus (-) 1 mass percent.

2. Water

Water may be measured either by volume or by weight. The accuracy of measuring the water shall be within a range of error of not more than 1 percent.

3. Aggregates

Stockpiling of aggregates shall be in accordance with Subsection 311.2.10. All aggregates whether produced or handled by hydraulic methods or washed, shall be stockpiled or binned for draining for at least 12 hours prior to batching. Rail shipment requiring more than 12 hours will be accepted as adequate binning only if the car bodies permit free drainage. If the aggregates contain high or non-uniform moisture content, storage or stockpile period in excess of 12 hours may be required by the Architect/Engineer. Batching shall be conducted as to result in a 2- mass percent maximum tolerance for the required materials.

4. Bins and Scales

The batching plant shall include separate bins for bulk cement, fine aggregate and for each size of coarse aggregate, a weighing hopper, and scales capable of determining accurately the mass of each component of the batch. Scales shall be accurate to one-half (0.5) percent throughout the range used.

5. Batching

When batches are hauled to the mixer, bulk cement shall be transported either in waterproof compartments or between the fine and coarse aggregate. When cement is placed in contact with moist aggregates, batches will be rejected unless mixed within 1-1/2 hours of such contact. Sacked cement may be transported on top of the aggregates.

Batches shall be delivered to the mixer separate and intact. Each batch shall be dumped cleanly into the mixer without loss, and, when more than one batch is carried on the truck, without spilling of material from one batch compartment into another.

6. Admixtures

The Contractor shall follow an approved procedure for adding the specified amount of admixture to each batch and will be responsible for its uniform operation during the progress of the work. He shall provide separate scales for the admixtures which are to be proportioned by weight, and accurate measures for those to be proportioned by volume. Admixtures shall be measured into the mixer with an accuracy of plus or minus three (3) percent. The use of Calcium Chloride as an admixture will not be permitted.

7. Mixing and Delivery

Concrete may be mixed at the site of construction, at a central point or by a combination of central point and truck mixing or by a combination of central point mixing and truck agitating. Mixing and delivery of concrete shall be in accordance with the appropriate requirements of AASHTO M 157 except as modified in the following paragraphs of this section, for truck mixing or a combination of central point and truck mixing or truck agitating. Delivery of concrete shall be regulated so that placing is at a

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continuous rate unless delayed by the placing operations. The intervals between delivery of batches shall not be so great as to allow the concrete in place to harden partially, and in no case shall such an interval exceed 30 minutes.

In exceptional cases and when volumetric measurements are authorized, for small project requiring less than 75 cu.m. per day of pouring, the weight proportions shall be converted to equivalent volumetric proportions. In such cases, suitable allowance shall be made for variations in the moisture condition of the aggregates, including the bulking effect in the fine aggregate. Batching and mixing shall be in accordance with ASTM C 685, Section 6 through 9. Concrete mixing, by chute is allowed provided that a weighing scales for determining the batch weight will be used.

For batch mixing at the site of construction or at a central point, a batch mixer of an approved type shall be used. Mixer having a rated capacity of less than a one-bag batch shall not be used. The volume of concrete mixed per batch shall not exceed the mixer’s nominal capacity as shown on the manufacturer’s standard rating plate on the mixer except that an overload up to 10 percent above the mixer’s nominal capacity may be permitted, provided concrete test data for strength, segregation, and uniform consistency are satisfactory and provided no spillage of concrete takes place. The batch shall be so charge into the drum that a portion of the water shall enter in advance of the cement and aggregates. The flow of water shall be uniform and all water shall be in the drum by the end of the first 15 seconds of the mixing period. Mixing time shall be measured from the time all materials, except water, are in the drum. Mixing time shall not be less than 60 seconds for mixers having a capacity of 1.5m³ or less. For mixers having a capacity greater than 1.5m³, the mixing time shall not be less than 90 seconds. If timing starts, the instant the skip reaches its maximum raised position, 4 seconds shall be added to the specified mixing time. Mixing time ends when the discharge chute opens.

The mixer shall be operated at the drum speed as shown on the manufacturer’s name plate on the mixer. Any concrete mixed less than the specified time shall be discarded and disposed off by the Contractor at his own expenses.

The timing device on stationary mixers shall be equipped with a bell or other suitable warning device adjusted to give a clearly audible signal each time the lock is released. In case of failure of the timing device, the Contractor will be permitted to continue operations while it is being repaired, provided he furnishes an approved timepiece equipped with minute and second hands. If the timing device is not placed in good working order within 24 hours, further use of the mixer will be prohibited until repairs are made.

Re-tampering concrete will not be permitted. Admixtures for increasing the workability, for retarding the set, or for accelerating the set or improving the pumping characteristics of the concrete will be permitted only when specifically provided for in the Contract, or authorized in writing by the Architect/Engineer.

Mixing Concrete:

1. General

Concrete shall be thoroughly mixed in a mixer of an approved size and type that will insure a uniform distribution of the materials throughout the mass. All concrete shall be mixed in mechanically operated mixers. 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 Architect/Engineer.

Equipment having components made of aluminum or magnesium alloys, which would have contact with plastic concrete during mixing, transporting or pumping of Portland Cement concrete, shall not be used. Concrete mixers shall be equipped with adequate water storage and a device of accurately measuring and automatically controlling the amount of water used.

Materials shall be measured by weighing. The apparatus provided for weighing the aggregates and cement shall be suitably designed and constructed for this purpose. The accuracy of all weighing devices

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except that for water shall be such that successive quantities can be measured to within one percent of the desired amounts. The water measuring device shall be accurate to plus or minus 0.5 mass percent. All measuring devices shall be subject to the approval of the Architect/Engineer. Scales and measuring devices shall be tested at the expense of the Contractor as frequently as the Architect/Engineer may deem necessary to ensure their accuracy.

Weighing equipment shall be insulated against vibration or movement of other operating equipment in the plant. When the entire plant is running, the scale reading at cut-off shall not vary from the weight designated by the Architect/Engineer more than one mass percent for cement, 1-1/2 mass percent for any size of aggregate, or one (1) mass percent for the total aggregate in any batch.

2. Mixing Concrete at Site

Concrete mixers may be of the revolving drum or the revolving blade type and the mixing drum or blades shall be operated uniformly at the mixing speed recommended by the manufacturer. The pick-up and throw-over blades of mixers shall be restored or replaced when any part or section is worn 20mm or more below the original height of the manufacturer's design. Mixers and agitators which have an accumulation of hard concrete or mortar shall not be used.

When bulk cement is used and volume of the batch is 0.5m³ or more, the scale and weigh hopper for Portland Cement shall be separate and distinct from the aggregate hopper or hoppers. The discharge mechanism of the bulk cement weigh hopper shall be interlocked against opening before the full amount of cement is in the hopper. The discharging mechanism shall also be interlocked against opening when the amount of cement in the hopper is underweight by more than one (1) mass percent or overweight by more than 3 mass percent of the amount specified.

When the aggregate contains more water than the quantity necessary to produce a saturated surface dry condition, representative samples shall be taken and the moisture content determined for each kind of aggregate.

The batch shall be so charged into the mixer that some water will enter in advance of cement and aggregate. All water shall be in the drum by the end of the first quarter of the specified mixing time. Cement shall be batched and charged into the mixer so that it will not result in loss of cement due to the effect of wind, or in accumulation of cement on surface of conveyors or hoppers, or in other conditions which reduce or vary the required quantity of cement in the concrete mixture.

The entire content of a batch mixer shall be removed from the drum before materials for a succeeding batch are placed therein. The materials composing a batch except water shall be deposited simultaneously into the mixer.

All concrete shall be mixed for a period of not less than 1-1/2 minutes after all materials, including water, are in the mixer. During the period of mixing, the mixer shall operate at the speed for which it has been designed. Mixers shall be operated with an automatic timing device that can be locked by the Architect/Engineer. The time device and discharge mechanics shall be so interlocked that during normal operation no part of the batch will be charged until the specified mixing time has elapsed.

The first batch of concrete materials placed in the mixer shall contain a sufficient excess of cement, sand, and water to coat inside of the drum without reducing the required mortar content of the mix. When mixing is to cease for a period of one hour or more, the mixer shall be thoroughly cleaned.

3. Mixing Concrete at Central Plant

Mixing at central plant shall conform to the requirements for mixing at the site.

4. Mixing Concrete in Truck

Truck mixers, unless otherwise authorized by the Architect/Engineer, shall be of the revolving drum type, water-tight, and so constructed that the concrete can be mixed to insure a uniform distribution of materials throughout the mass. All solid materials for the concrete shall be accurately measured and charged into the drum at the proportioning plant. Except as subsequently provided, the truck mixer shall be equipped with a device by which the quantity of water added can be readily verified. The mixing water

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may be added directly to the batch, in which case a tank is not required. Truck mixers may be required to be provided with a means of which the mixing time can be readily verified by the Architect/Engineer. The maximum size of batch in truck mixers shall not exceed the minimum rated capacity of the mixer as stated by the manufacturer and stamped in metal on the mixer. Truck mixing, shall, unless other-wise directed be continued for not less than 100 revolutions after all ingredients, including water, are in the drum. The mixing speed shall not be less than 4 rpm, nor more than 6 rpm.

Mixing shall begin within 30 minutes after the cement has been added either to the water or aggregate, but when cement is charged into a mixer drum containing water or surface wet aggregate and when the temperature is above 32^oC, this limit shall be reduced to 15 minutes. The limitation in time between the introduction of the cement to the aggregate and the beginning of the mixing may be waived when, in the judgement of the Architect/Engineer, the aggregate is sufficiently free from moisture, so that there will be no harmful effects on the cement.

When a truck mixer is used for transportation, the mixing time specified in Subsection 405.4.4 (3) at a stationary mixer may be reduced to 30 seconds and the mixing completed in a truck mixer. The mixing time in the truck mixer shall be as specified for truck mixing.

5. Transporting Mixed Concrete

Mixed concrete may only be transported to the delivery point in truck agitators or truck mixers operating at the speed designated by the manufacturers of the equipment as agitating speed, or in non-agitating hauling equipment, provided the consistency and workability of the mixed concrete upon discharge at the delivery point is suitable point for adequate placement and consolidation in place.

Truck agitators shall be loaded not to exceed the manufacturer’s guaranteed capacity. They shall maintain the mixed concrete in a thoroughly mixed and uniform mass during hauling.

No additional mixing water shall be incorporated into the concrete during hauling or after arrival at the delivery point.

The rate of discharge of mixed concrete from truck mixers or agitators shall be controlled by the speed of rotation of the drum in the discharge direction with the discharge gate fully open.

When a truck mixer or agitator is used for transporting concrete to the delivery point, discharge shall be completed within one hour, or before 250 revolutions of the drum or blades, whichever comes first, after the introduction of the cement to the aggregates. Under conditions contributing to quick stiffening of the concrete or when the temperature of the concrete is 3^oC, or above, a time less than one hour will be required.

6. Delivery of Mixed Concrete

The Contractor shall have sufficient plant capacity and transportation apparatus to ensure continuous delivery at the rate required. The rate of delivery of concrete during concreting operations shall be such as to provide for the proper handling, placing and finishing of the concrete. The rate shall be such that the interval between batches shall not exceed 20 minutes. The methods of delivering and handling the concrete shall be such as will facilitate placing of the minimum handling.

7. Method of Measurement

The quantity of structural concrete to be paid for will be the final quantity placed and accepted in the completed structure. No deduction will be made for the volume occupied by pipe less than 100mm (4 inches) in diameter or by reinforcing steel, anchors, conduits, weep holes or expansion joint materials.

ITEM NO. 902(1)a- REINFORCING STEEL(DEFORMED)

DESCRIPTION

This Item shall consist of furnishing, bending, fabricating and placing of steel reinforcement of the type, size, shape and grade required in accordance with this Specification and in conformity with the requirements

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shown on the Plans or as directed by the Architect/Engineer.

Reinforcing shall conform to the requirements of the following Specifications:

Deformed & Plain Billet Steel	(ASTM A 615)
Bars for Concrete Reinforcement	(AASHTO M 31)
Deformed rail -Steel and Plain	
Bars for Concrete Reinforcement	(ASTM A 616)
Deformed A & b – Steel and Plain	
Bars for Concrete Reinforcement	(ASTM A 617)

ORDER LISTS

Before materials are ordered, all order lists and bending diagrams shall be furnished by the Contractor, for approval of the Architect/Engineer. The approval of order lists and bending diagrams by the Architect/Engineer shall in no way relieve the Contractor of responsibility for the correctness of such lists and diagrams. Any expense incident to the revisions of materials furnished in accordance with such lists and diagrams to make them comply with the Plans shall be borne by the Contractor.

BENDING

All reinforcing bars requiring bending shall be cold-bent to the shapes shown on the Plans or required by the Architect/Engineer. Bars shall be bent around a circular pin having the following diameters (D) in relation to the diameter of the bar (d):

Nominal diameter, d, mm	Pin diameter (D)
10 to 20	6d
25 to 28	8d
32 and greater	10d

Bends and hooks in stirrups or ties may be bent to the diameter of the principal bar enclosed therein.

SPLICING

All reinforcement shall be furnished in the full lengths indicated on the Plans. Splicing of bars, except where shown on the Plans, will not be permitted without the written approval of the Architect/Engineer. Splices shall be staggered as far as possible and with a minimum separation of not less than 40 bar diameters. Not more than one-third of the bars may be spliced in the same cross-section, except where shown on the Plans

Unless otherwise shown on the Plans, bars shall be lapped a minimum distance of:

Splice Type	Grade 40 min. lap	Grade 60 min. lap	But not less than
Tension	24 bar dia	36 bar dia	300 mm
Compression	20 bar dia	24 bar dia	300 mm

In lapped splices, the bars shall be placed in contact and wired together. Lapped splices will not be permitted at locations where the concrete section is insufficient to provide minimum clear distance of one and one-third the maximum size of coarse aggregate between the splice and the nearest adjacent bar. Welding of reinforcing steel shall be done only if detailed on the Plans or if authorized by the Architect/Engineer in writing. Spiral reinforcement shall be spliced by lapping at least one and a half turns or by butt welding unless otherwise shown on the Plans.

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REINFORCING BARS

- Use Rebar with a grade 40 designations that offers minimum yield strength of 40,000 pounds per square inch and conforms to ASTM A-615 performance standards.
- If RSB 12mm thk and below, use grade 40.
- If RSB 16mm thk and above, use grade 40.

ITEM NO. 1003(1)a1 & (3)– CARPENTRY & JOINERY WORKS

CEILING SUSPENSION SYSTEM

SCOPE

This specification covers the furnishing of materials and labor including equipment necessary to complete the installation of fiber cement board panels/ceiling as shown on the drawings and as specified herein.

MATERIALS

(Hardiflex) Fiber Cement sheets shall be manufactured from asbestos-free materials.

- a. 4.5-mm thick for internal wall and eaves.
- b. Composition: Fiber cement board shall be asbestos free, fiber-reinforced cement sheets.
- c. Density: 1380 kg/m³ minimum

Steel framing for suspended and furred ceilings

- a. Furring Channels: ASTM C 645-gauge 25 standard channels
- b. Accessories: Hangers and inserts
- c. Installation Standard: ASTM C 754

FASTENERS

- Provide fasteners of type, material size, corrosion resistance, holding power and other properties required for fastening furring and framing members to substrates indicated.
- Trim Accessories: Provide metal trims accessories of profile and materials as shown on the drawings, or as otherwise required by the Architect/manufacturer.

METAL SUPPORT INSTALLATION

Ceiling and Soffit Support Systems

- a. Secure hangers or rods to structural support by connecting directly to structure where possible; otherwise connect to inserts, clips or other anchorage devices or fasteners indicated.
- b. Space main runners, hangers and furring according to requirements of ASTM C754, except as otherwise indicated.
- c. Where spacing of structural members, or width of ducts or other equipment, prevents regular spacing of hangers, provide supplemental hangers and suspension members and reinforce nearest affected hangers to span extra distance.
- d. Attach directly to structural elements only; do not attaché to metal deck. Loop hangers and wire-tie directly or provide anchors or inserts.
- e. Install compression posts, splay wires and other accessories as required to comply with seismic requirements.
- f. Extend runners to within 6 inches of walls.
- g. Wire-tie or clip furring members to main runners and to other structural supports indicated. In fire resistance rated assemblies, wire-tie furring members, do not clip.
- h. Do not permit furring or runners to contact masonry or concrete walls.

APPLICATION AND FINISHING OF FIBER CEMENT PANELS GENERAL

- a. Apply and finish fiber cement panels as per specifications by manufacturer for flush-jointed

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applications.

- b. Install fiber cement panels in manner which minimizes the number of end-butt joints or avoids them entirely where possible.
- c. Install exposed fiber cement panel with face side out. Do not install imperfect, damages or damp boards. Bat boards together for slight contact at edges and ends with not more than 1.5 mm open space between boards. Do not force into place.
- d. Locate either edge or end joints over supports, except in horizontal applications where intermediate support is provided behind end joints. Position boards so that like edges abut, tapered edges against tapered ends. Do no place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.
- e. Attach fiber cement panel for supplementary framing and blocking provided for additional support at openings and cutouts.
- f. Space fasteners in fiber cement boards in accordance with referenced application and finishing standard and manufacturer specifications.

ACCESSORY INSTALLATION

- a. Trim:
 1. Use same fasteners to anchor trim accessory flanges as required to fasten plaster board to supports, unless otherwise recommended by trim manufacturer.
 2. Install metal corner beads at external corners.
 3. Install metal casing bead trim whenever edge of plaster board would otherwise be exposed or semi-exposed.
- b. Control Joints:
 1. Install control joints at junction of plaster board partitions with walls or partitions of other finish material.
 2. Install control within long runs of partitions, ceilings or soffits at approximately 30'-0" on center or as indicated.
 3. Where plaster board is vertically continuous, as at stairwells, provide horizontal control joints at each floor level.
- c. Special Trim: Install as indicated on drawings and in accordance with manufacturer's instructions.
(See Approved Plans and Specifications)
 1. Formica Laminates must be attached to the ceiling with proper adhesion as recommended by the architect and the manufacturer.

Note:

(All materials to be used must be inspected and approved by the architect in charge of records prior to installation)

ITEM NO. 1004 – HARDWARE

DESCRIPTION

This item shall consist of various types of materials and metal fittings that are necessary for completion, fabrication, and installation. Each material used shall be in compliance with the approved drawings such as, types of metal or steel.

MATERIALS

- a. Stainless Bar Handle (2" x 48")
- b. Stainless Deadbolt Locks
- c. Stainless Push Plate (3" x 12")
- d. Stainless Pull Handle (2 ½" x 12")
- e. Stainless Pull Handle Bar (1 ¾" x 8")
- f. Stainless Indicator Door Lock

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- g. Door Hinges
- h. Stainless Steel Cubicle Door Hinge

ITEM NO. 1007(1) b– ALUMINUM FRAMED GLASS DOOR

GENERAL

This specification covers the furnishing of materials and labor including equipment necessary to complete the installation aluminum framed tempered glass doors. There are two types of aluminum framed tempered glass door; single-leaf and double-leaf doors, each with a specified lengths and widths as shown in the approved drawings.

INSTALLATION

Tempered Glass

- a. Glass pane shall be cleared with a thickness of 8 millimeters.
- b. All exposed edges shall be polished and rounded.
- c. All holes and notches to be drilled prior to the tempering process.

Aluminum Channels and Hardware

- a. Extruded aluminum components are #6463-T5 alloy 3/8-inch-deep profile suitable for 3/8 inch or 1/2-inch tempered glass.
- b. Buffed and bright dip anodized or powder coat painted.
- c. Screws or fasteners shall be stainless steel to prevent rust and corrosions.

Hinges

- a. Hinges on heavy duty glass are constructed of #320 stainless steel or solid brass.
- b. Hinges shall be self-centering within 15 degrees of closed portion.

ITEM NO. 1008(1) c – ALUMINUM FRAMED GLASS WINDOW

GENERAL

Work included furnish and install steel windows as shown in the approved drawings. Work shall include but not be limited to steel windows (fixed, project-in, project-out, side hung-out or side hung-in), closures, trim, anchors and factory applied finishes (if required).

Inspection

- a. Window openings shall conform to details and dimensions shown on the approved drawings.
- b. Conditions which may adversely affect the window installation must be corrected by the contractor prior to installation.
- c. Set Windows plumb, level and true to line, without warp or rack of frames or ventilators.
- d. Anchor units securely to surrounding construction with approved fasteners.
- e. The exterior joints between the windows, trim and mullions shall be properly sealed watertight with an approved sealant and nearly pointed.
- f. Attach ventilator hardware, as required, and adjust ventilators to operate smoothly free from twist and to be weather tight when closed and latched.
- g. Any Braded surface of the window finish shall be cleaned and touched up with air dry paint, as approved and furnished by the window manufacturer, in color to match factory applied finish.
- h. Use Aluminum frame with ¼ thick clear glass sliding window. (See approved drawings).

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ITEM NO. 1010 (1) – WOODEN FRAMES

DESCRIPTION

This item shall consist of the materials and installation of wooden door jamb shown on the plans and in accordance with the following specification.

MATERIALS

- a. 2” x 4” Good Lumber Door Jamb

REQUIREMENTS

Lumber jambs when required shall kiln dried with moisture content of not more than 14% and shall be of specie indicated on the plans and/or specified under item 1003 on carpentry and joinery works.

INSTALLATION

Frames shall be set plumb and square in concrete or masonry shall be painted with hot asphalt at its contact surface and provided with two rows of common wire nails 100mm long for anchorage. Frame set in concrete shall be installed in place prior to concrete work.

Frames set in masonry work may be installed after laying of hollow concrete blocks, brick adobes. Space between frames and masonry shall be fully filled with cement mortar proportioned 1:3.

ITEM NO. 1010 (2) a – WOODEN DOORS

DESCRIPTION

This item shall consist of furnishing all materials, hardware, plant tools, labor and services necessary for complete fabrication and installation of wooden doors of the type and size as shown on the plans and in accordance with the following specifications.

MATERIALS REQUIREMENTS

Lumber

Lumber of doors, windows and jambs, and panel when required shall kiln dried with moisture content of not more than 14% and shall be of specie indicated on the plans and/or specified under item 1003 on carpentry and joinery works.

Plywood

Plywood for veneer of solid core and hollow core flush doors shall be 3-ply, rotary cut, 6mm thick ordinary plywood, Class B grade. Analok framed with stucco flush type door with accessories at toilet cubicles and bathrooms or at places where these are exposed to moisture.

Adhesive

Adhesive shall be water resistant resins and shall be non-staining. Hardware shall be specified under item 1004 on the Building Hardware.

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CONSTRUCTION REQUIREMENTS

Fabrication

Wooden doors, including frames, shall be fabricated in accordance with the designs and sizes shown on the plans. The fabricated products shall be finished square, smoothly sanded and free from damage warpage.

- a. Flush type solid core doors
Flush type solid core doors shall be fabricated in the same manner as the hollow core door type except that the space between stiles and rails shall be filled and fitted with wood blocks of the same species and of uniform thickness thinner by about the thickness of the plywood veneers. The Filler blocks shall be secured to either stiles or rails by nails. Stiles and rails of flush type doors shall be joined by means of blind mortise and tenon joint, tightly fitted, glued and locked with bamboo pin 5mm round
- b. Lock installation
Locks of doors shall be fitted at the same height, centered 1000mm above the finished floor level. Locks shall be installed in conformity with the templates and instruction supplies with locksets. Holes for mounting locks shall be properly formed to provide to snug fit and rigid attachment of the locks to the doors. Strike plates shall be fitted on the door frame in true alignment with the lock latch.

INSTALLATION

- a. Frames shall be set plumb and square in concrete or masonry shall be painted with hot asphalt at its contact surface and provided with two rows of common wire nails 100mm long for anchorage. Frame set in concrete shall be installed in place prior to concrete work.

Frames set in masonry work may be installed after laying of hollow concrete blocks, brick adobes. Space between frames and masonry shall be fully filled with cement mortar proportioned 1:3.

- b. Hinged Doors
Hinged doors, whether panel or flush type with standard height of 2100mm and width of not more than 900mm shall be hung with four loose-pin hinges, 100 mm x 100mm. Swing out exterior doors shall be hung with four fast-pin butt hinges. Two hinges shall be fitted 150mm third points between top and bottom edge of the door. The other two hinges shall be fitted at third points between top and bottom hinges. Care should be taken to ensure that the hinges are fitted such that third pins are aligned to ease of in insertion and smoothness of operation. For added smoothness pins should lightly greased. Hammering of hinges to attain proper alignment shall not be allowed. For wider and heavier doors such as narra panel doors, an additional hinge shall be fitted 100mm below the top hinge to counteract the door fitting action.

ITEM NO. 1012(2) & (7) – GLASS AND GLAZING

DESCRIPTION

This specification covers the furnishing of materials and labor including equipment necessary to complete the installation of Glass and Mirrors as shown on the drawings.

MATERIALS AND INSTALLATION

- a. 5mm thick polished round edge glass mirror.
 - Mirror shall be installed on comfort rooms. (if required in approved drawings)
- b. 10mm thick clear glass.
 - Shall be installed exclusively on doors with fixed glass that are shown on the drawings.

Note:

(All materials to be used must be inspected and approved by the architect in charge of records prior to installation)

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ITEM 1018 (1&2) CERAMIC TILES

DESCRIPTION

This item shall consist of furnishing all ceramic tiles and cementitious material, tools and equipment including labor required in undertaking the proper installation of walls and floor tiles as shown on the Plans and in accordance with this Specification.

MATERIAL REQUIREMENTS

Ceramic tiles and trims shall be made of clay, or a mixture of clay and other materials which is called the body of the tile. Tile bodies are classified by ASTM C242 as to their degree of water absorption. Ceramic tiles and trims are manufactured either by dust-pressed process in which the clays are ground to dust mixed with a minimum of water shaped in steel dies and then fired or by plastic process in which the clays are made plastic by mixing with water, shapes by extrusion or in molds and then fired.

Glazed Tiles and Trims

Glazed tiles and trims shall have an impervious face of ceramic materials fused onto the body of the tiles and trims. The glazed surface may be clear white or colored depending on the color scheme approved by the Architect/Engineer Standard glazes may be bright (glossy) semi matte (less glossy) matte (dull) or crystalline (mottled and textured; good resistance to abrasion). Glazed tiles are used principally for walls; crystalline glazed tiles may be used for floor provided however that these are used as light duty floors.

Unglazed Tiles

Unglazed tiles shall be hard dense tile of homogeneous composition. Its color and characteristics are determined by the materials used in the body, the method of manufacture and the thermal treatment. It is used primarily for floors and walks.

Trim

Trims are manufactured to match wall tile color, texture and to coordinate with it in dimension. These are shaped in various ceramic trim, units such as caps, bases, coves, bullnoses, corner, angles, etc. that are necessary for edging or making a transition between intersecting planes.

Accessories

Accessories like some soap holders and shall be made wall mounted type with colors to reconcile with the color of the adjacent wall tiles.

Cement

Cement shall be Portland conforming to the specification requirements defined in item 700, Hydraulic Cement.

Sand

Sand shall be well graded fine aggregate clean river sand, free from soluble salts and organic impurities.

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Lime

Lime shall be hydrated lime with free un-hydrated oxide and magnesium oxide content not to exceed 8 percent by weight.

CONSTRUCTION REQUIREMENTS

Tile work shall not be started until roughing-ins for plumbing, electrical and other trades have been completed and tested. The work of all other trades shall be protected from damage.

Surface Preparation

- Mortar mix from scratch coat and setting bed shall consist of one part Portland cement $\frac{1}{4}$ part lime and 3 parts sand by volume. Surface to receive tile must be level, true to elevation, dry, free from dirt, oil and other ointments. Allow at least seven days curing of scratch coat and setting bed. Installation work shall not be allowed to proceed until unsatisfactory conditions are corrected.
- Bond coat shall be Portland cement paste.
- Thoroughly dampen surfaces of masonry or concrete walls before scratch coat is applied.
- On masonry or concrete surface first apply a thin coat with pressure, then to bring it out sufficient to compensate for the major irregularities of the surface to a thickness not less than 10mm. at any point.
- Evenly rate scratch coat to provide good mechanical key before the mortar mix has fully hardened.

INSTALLATION PROCEDURE

Ceramic tiles shall be soaked in clean water prior to installation for a minimum of one hour.

CLEANING

Clean ceramic tile surfaces thoroughly as possible upon completion of grouting. Remove all grout haze, observing tile manufacturers recommendations as to use of acid or chemical cleaners.

Protection from Construction Dirt

- Apply a protective coat of neutral cleanser solution diluted with water in the proportion of 1:4 or 1-liter cleanser concentrate to 1-gallon water.
- In addition, cover tile flooring with heavy-duty no staining construction paper, taped in place, just before final acceptance of the work removes paper and rinse protective coat of neutral cleaner from tile surface. Do not let protective paper get torn or removed.

METHOD OF MEASUREMENT

All works performed under this item shall be measured in square meters for areas actually laid with ceramic tiles and accepted to the satisfaction of the Architect/Engineer.

- *Setting Wall Tiles:* seal wall tile thoroughly in clean water before setting. Set wall tile by trowelling neat portland cement skim coat on float coat or apply skim coat to back of each tile unit. Immediately float tile in place. Make joints straight, level and perpendicular. Maintain vertical joints plumb.
- *Grouting:* Grout joints in wall tile with neat white cement immediately after suitable area of tile has been set. Tool joints slightly concave, cut off excess mortar and wipe from face tile. Roughen interstices of depressions. In mortar joints after grout has been cleaned from surface. Fill to line of cushion tile bases or covers with mortar. Make joints between wall tile, plumbing and other built-in fixtures with light colored caulking. Immediately after grout has had its initial set, give tile wall surfaces protective coat of non-corrosive soap.
- All tiles for floor and walls shall be free from laminations, serrated edges, chipped-off corners and other

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defects, which would adversely affect their appearance and strength. All joints between tiles and mouldings shall be filled with tile grout and then carefully wiped.

- Floor tiles in the ground and second floor must be .60mx.60m and .30mx.60m. For the toilet, .30mx.60m floor tiles shall be used and .60mx.60m tiles for the walls.
- **All materials to be used by this item of work must first be inspected and approved by the architect in-charge of records before installation.**

ITEM NO. 1027 (3)– DECORATIVE STONE

DESCRIPTION

This item shall consist of furnishing all decorative stone wall cladding, tools and equipment including labor required in undertaking the proper installation of stone cladding as shown on the Plans and in accordance with this Specification.

The specified material to be used as finish for the facade of the project:

- 600mm x 150mm Stone Wall Cladding (approved color and design)

INSTALLATION

- Prepare The Surface. Regardless of your substrate construction, the surface must be clean and free of any contaminating materials. Remove any oils, waxes, paint, curing compounds or loose debris. This is essential for the stone cladding to adhere optimally to the surface.
- Direct adhesion method is the most common wet met method employed. A wet method, by default, is considered a direct adhesion method. It makes use of a liquid latex combined with a cement-based filler powder to form cement mortar.
- The mortar is applied to the surface in thin layers. The method does not demand onsite drilling. It is the cheapest installation method.

Note:

(All materials to be used must be inspected and approved by the architect in charge of records prior to installation)

ITEM NO. 1046 (2) a1 – MASONRY WORKS

DESCRIPTION

This item shall consist of furnishing of all necessary materials, tools, equipment and labor necessary to compete the execution of the masonry works using Concrete Hollow Blocks as shown on the plans and herein specified.

MATERIAL REQUIREMENTS

- Cement shall be standard Portland cement, ASTM C- 150 -58 type I
- Aggregates shall conform to the applicable requirements of Item 405, Structural concrete.
- Water shall conform to the applicable requirements of Item 714, Water.
- Reinforcing Steel shall conform to the applicable requirements of Item 710, Reinforcing Steel and Wire Rope.
- Mortar shall consist of sand, cement and water conforming to the requirements of Item 405, Structural Concrete, mixed in the proportion of one (1) part cement to three parts sand by volume and sufficient water obtain the required consistency.
- Concrete Hollow Blocks shall have a minimum face and 3 holes and shall have a thickness of 1” (.025). Normal size shall be 6”x8”x16” and 4”x8”x16”, minimum compressive strength equal or exceed those

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mentioned in the specification.

INSTALLATION

- All masonry work shall be laid true to line, level, plumb and neat in accordance with the plans.
- Units shall be cut accurately to fit all plumbing ducts, opening for electrical works, and all holes shall be neatly patched.
- No construction support shall be attached to the wall except where specifically permitted.
- Masonry unit shall be sound, dry, clean and free from cracks when placed in the structure.
- Proper masonry units shall be used to provide for all window, doors, bond beams, lintels, plaster etc., with minimum of unit cutting.
- Where masonry units cutting are necessary, all cuts shall be neat and true to line.
- Units shall be placed while the mortar is soft and plastic. Any unit disturbed to the extent that the initial bond is broken after initial positioning shall be removed and re-laid in fresh mortar.
- Mortar should not be spread too far ahead of units, as it will stiffen and loose plasticity, especially in hot weather. Mortar that has stiffened should not be used. ASTM c 270 requires that mortar be used within 2 ½ hours of initial mixing.

FINISH AND APPEARANCE

- All units shall be sound and free of cracks or other defects that interfere with the proper placement of the unit or significantly impair the strength or permanence of the construction. Minor cracks, incidental to the usual method of manufacture or minor chipping resulting from customary methods of handling in shipment and delivery, are not grounds for rejection.
- Where units are to be used in exposed wall construction, the face or faces that are to be exposed shall not show chips or cracks, not otherwise permitted, or other imperfections when viewed from a distance or not less than 6.1 m under diffused lighting.
- Five percent of a shipment containing chips, not larger than 25.4 mm in any dimension. Or cracks not wider than 0.5 mm and not longer than 25% of the nominal height of the unit, is permitted.
- The color and texture units shall be specified by the purchaser. The finished surfaces that will be exposed in place shall conform to an approved sample, consisting of not less than four (4) units, representing the range of texture or color permitted.
- A shipment shall not contain more than 5% of units, including broken unit that do not meet the requirements of the above provisions.

CEMENT MORTAR

Cement mortar shall be used as base for cement plaster finish masonry and concrete walls and for grouting of masonry walls. The mixture of cement mortar to be used shall conform to the following schedule:

- Class “A” mortar shall consist of one (1) part cement four parts (4) sand and sufficient water to form a workable mixture.
- Class “B” mortar shall consist of one (1) part cement to five parts (5) sand and sufficient water to form a workable mixture.

MASONRY WALLS

CONCRETE HOLLOW BLOCKS

- Concrete hollow blocks to be used for walls and partitions as shown and indicated in the drawings shall have an average strength of not less than 1900 lbs. per square meter. Concrete hollow blocks shall be wetted with water before installation.
- Blocks shall be laid straight and uniform with regular running bond and with the vertical faces truly vertical and set true to line. All CHB shall be laid with cement mortar joints (1:3 or 1:4) mix, and all joints and cells shall be solidly filled from the face of the blocks to the depth of the face completely and compactly.

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- Blocks shall be reinforced with 10mm vertical bars at 0.60m on centers and one horizontal bar for every third course of “4” CHB walls.
- Whenever necessary, all horizontal and vertical bars shall be anchored 20D into the concrete footings, columns and beams.
- All horizontal reinforcements shall be tied to the vertical reinforcements at every intersection with No. 16 G.I wire.

CONCRETE AND MASONRY FINISHES

CEMENT PLASTER

Whenever shown or indicated in the drawings, all masonry and concrete surface shall be finished with cement plaster, applied as follows:

The surface shall be wetted and thoroughly wood floated with a scratch coat of cement plaster, 3/8” thick.

Cement plaster shall consist of 1:2 cement mortar.

SPECIAL ITEM – WOOD PLASTIC COMPOSITE PANEL

DESCRIPTION

This item shall consist of furnishing all wood plastic composite wall panels, tools and equipment including labor required in undertaking the proper installation of interior wood plastic composite wall panels as shown on the Plans and in accordance with this Specification.

The specified material to be used as finish for the interior walls of the project:

- 159mm x 23mm indoor WPC Wall Cladding (approved color and design).

INSTALLATION

From the professional consideration of installation, WPC wall cladding is suggested to be installed by professional construction personnel. Please clean the wall before installation and make the wall dry, smooth and clean. If there are construction industry regulations or local regulations, please install them according to the regulations.

1. Fixation of keel. Steel keel is also usually used. The space between keels should be less than 400 mm. The steel keel should be fixed on the wall with expansion screw. Antirust paint should be applied to the steel keel. Install the plastic wood keel evenly and fix it on the flat wall with expansion screws. It is recommended that the distance between each keel be less than 400mm. It need keep 3-5mm at the joint of the keel to keel to prevent expansion. When install the WPC keel. In the position of the expansion tube, drill the hole on the keel first. Then put the plastic expansion tube into the hole. Screw the screws into the expansion tube and fix the keel to the wall. The nail head should be all screwed into the keel, not exposed outside the keel, otherwise it may lead to uneven board surface.
2. Fixation of **Wood-Plastic Wallboards:**

When installing the WPC wall panel, the stainless-steel starting fastener should be used first to fix the first piece board.

- First use a smaller diameter drill, lead a hole on the Part where the SS Screws into the wall board, then screw the first row of the wall board into the keel.
- Push the cut WPC wall board to the appropriate position, then screw the wall board, and so on, install

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in turn. It is recommended that the length of each WPC wallboard should not exceed 2.9 meters.

- After installation to the Wall, each row of the last piece of WPC wall panel uses stainless steel tapping screws directly fixed on the keel.
- Install “L” shape Side cover. It can be fixed with stainless steel screws.

For plastic wood materials, the water absorption is about 0.2% and the expansion rate is about 0.5%, so when installing this wall cladding, please leave the corresponding gap between each board (3-5 mm).

Electric drill is a tool that must be used in the installation process; because the plastic wood material has a certain brittleness, when fixing the keel with the WPC material, the lead hole is first drilled, then Fix screws, but don't directly nailed. Otherwise, the material may crack and break. Nail gun can be used to fix the wall cladding too. Labor gloves are best used during construction. It is recommended to use stainless steel screws to fix the screws during installation.

Note:

(All materials to be used must be inspected and approved by the architect in charge of records prior to installation)

B.5- PROJECT BILLBOARD

DESCRIPTION

This item shall consist of materials and installation of project billboard in accordance with this specification

MATERIAL

- 4'x8' Tarpaulin
 - ½" x 4' x 8' Marine Plywood
 - Assorted Cocolumber
-
- The billboard shall be depicted on standard billboard measuring of 1220mm x 2400mm (4'x8') using ½" marine plywood or tarpaulin of the same size.
 - The billboard shall be installed in front of the project site

ITEM NO. 1002 – PLUMBING WORKS

GENERAL

- The Contractor shall furnish all labor, materials and equipment necessary to complete all the works for the sanitary, drainage and water supply system. The owner shall provide necessary drilling of water well and shall yield substantial quantity/volume of water needed to have a functional water supply system to project site either in rainy or dry seasons. The Owner shall likewise arrange/secure consent/approval of tapping to existing water line if necessary or requested by authorities concerned.
- All works shall comply with the provisions of the Philippine National Plumbing Code, MWSS regulations, DPWH guidelines and all other codes and ordinance other local authorities having jurisdiction over the project.
- “Roughing-in” for all pipes and fixtures shall be carried along with the building construction. Correct location for the pipes shall be kept in the walls and floor as specified on the plans.

MATERIALS

- All materials must bear the trademarks as reference of the manufacturers. The Contractor shall furnish the Engineer with the original and copies of the certificate of origin of materials to be used.

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- Soil, waste, Vent Pipes and Fittings shall be made of Unplasticized Polyvinyl Chloride (uPVC) -Series 1000 or whatever is indicated in the drawing and shall be manufactured by “Neltex” or its approved equivalent on property certificated by Bureau of Product Standard.
- Water pipes shall be made of G.I Pipes and fittings shall be made of G.I or whatever indicated in the drawings and shall be approved equal in property certificated by Bureau of Product Standard.
- Cleanouts shall be the same as pipe \varnothing , installed in connection with UPVC hubs and spigot pipes consist of a long sweep quarter extended as indicated in the drawings. An extra heavy cast brass ferrule with countersunk trap screw cover caulked into hub of the fittings shall be flushed with the floors.
- Floor drains shall be stainless steel plated or approved equal, and locally manufactured.
- Gate valves shall be G.I or bronze solid wedge type with screwed ends, or its equivalent as approved by the Engineer.
- Plumbing fixtures and equipment shall be properly identified to illustrate the quality and design of fixture that will be required. All fixtures shall have supply line with cut-off valves having chromium finish and shall be as manufactured by Philippine Standards as follows:
- Water closet shall be of floor mounted tank type complete with all fittings. Color shall be approved by the Architect/Engineer.
- *Stainless Steel Sink* shall be used in all counters with sink as indicated in the drawings. Lavatory shall be complete with necessary fittings.
- Provide traps at every plumbing fixture and other equipment requiring connection to the drainage system.
- Adapters shall be used to join pipes, fittings of different types and sizes and different combination approved by the Engineer.

Materials Use:

- Water Closet, w/ Bidet Hose, complete w/ fittings and accessories (HCG Brand)
- Wall Hung Lavatory with fittings and accessories (Cool Brand)
- Urinal, complete w/ fittings and accessories (Cool Brand)
- Stainless Kitchen Sink (Single/ Double)
- Shower, complete w/ fittings and accessories
- Faucet (Cool Brand)
- 360° Rotation Flexible Gooseneck Kitchen Faucet
- Stainless Steel Grease Trap
- 4” Stainless Floor drain
- PPRC. Pipe 25mm \varnothing X 4m, PN16
- PPRC. Pipe 20mm \varnothing X 4m, PN16
- PPRC Gate Valve, 25mm \varnothing
- PPRC Gate Valve, 20mm \varnothing
- 1Hp Motor Pump w/ fittings and accessories
- Stainless Steel Water Tank (Grade 304)
- Sub-meter w/ fittings and accessories
- Corporate valve

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METHODS OF CONSTRUCTION

All work shall be done by skilled worker only under the supervision of a master plumber. Contractor shall perform the work in accordance with good workmanlike practice to the satisfaction and approval of the Engineer.

On completion of the sanitary, drainage and water supply system and plumbing work and upon delivery of the building, the Contractor shall submit the “as-built” drawings of the entire plumbing system layout as actually installed in the building for future reference.

INSTALLATION

- Install plumbing fixtures free and open to afford easy access for cleaning. Install fixtures as indicated on drawings, furnishings all brackets, cleats, plates and anchors required to support fixtures rigidly in place.
- Install fixture and accessories in locations directed in accordance with manufacturer’s instructions, minimizing pipe fittings.
- Protect items with approval means to maintain perfect conditions. Remove work damaged or defective and replace with perfect work without extra cost to the University.
- All G.I. solid and drainage pipes shall have a minimum slope of 1%.
- Vertical pipes shall be secured strongly by hooks to building framing. Provide suitable bracket or chairs at the floors from which they start.
- Where an end or circuit vent pipe from any fixtures or line of fixtures is connected to a vent line serving other fixtures, connection shall be at least four (4) feet 1.20 M above floor on which fixtures are allocated, to prevent use of any vent line as a waste.
- Horizontal pipes shall be supported by well secured strap hangers.
- Connection of water closets to soil pipes shall be made by means of flanged Plates and asbestos packing without use of rubber putty or cement.
- Make all joints air and water-tight; for jointing pipes, caulk with oakum or jute and soft pig lead.
- For bell and spigot jointed cast iron and waste pipes, caulk with oakum or jute and soft pig lead.
- Lead to cast iron pipes use brass ferrule wiped on lead side and caulked into ball of cast iron soil pipe.
- Concrete pipes: bell or spigot or tongue and groove use yarning material and cement mortar.
- G.I. Pipes – Use Teflon Tape or white lead when tightening threaded joints.

ROUGH-IN

- Provide correctly located opening of proper sizes where required in walls and floors for passage of pipes.

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- All items to be embedded in concrete shall be thoroughly clean and free from all rust, scale and paint.
- All changes in pipe sizes on soil, wash and drain lines shall be provided with reducing fittings or recesses reducers. For changes in pipe sizes provide reducing fittings.
- High corrosive nature ground within site shall be taken into account by a plumber. Protective features shall be installed to prevent corrosion of all water pipes installed underground.
- Extend piping to all fixtures, outlets and equipment from gate valves installed in the branch near the riser.
- All pipes shall be cut accurately to measurements, and worked into place without springing or forcing.
- Care shall be taken as not to weaken structural portion of the building.

TESTING

Materials shall be subjected to such standard tests as may be required to ascertain their fitness, and the complete plumbing system shall be tested with the presence of the Engineer of the following methods.

The water test shall be applied to the plumbing system in its entirety or in sections. If applied to the entire system, all openings in the piping system shall be tightly closed except the highest opening and the entire system filled with water to the pint of overflow. All dead ends shall be relieved of air during the process whether the test is by section or it's entirely. If the system is tested by sections, each opening of section shall be filled with water.

DISINFECTION

The entire water distribution system shall be thoroughly, flushed and disinfected with a solution containing not less than fifty (50) part per million (50 ppm) of available chloride. The chlorinating materials shall be either liquid chloride or calcium hypo chloride or chloride lime. The disinfecting solution shall be allowed to remain in the system for a period of sixteen (16) hours, during which all valves and faucets shall be opened and closed several times. After disinfection, the solution shall be flushed from the system with clean water until the residual chorine content is not greater than 0.2 parts per million.

CLEANING AND PAINTING

All exposed metal surfaces shall be rid of grease dirt or other foreign materials. Chrome or nickel-plated piping, fittings and trimmings shall be polished upon completion. All equipment, pipes, valves and fittings shall be cleaned of greased and sludge.

- a. Any damages to the building finish or furnishing due to the Contractor's failure to properly clean the piping system shall be repaired by the Contractor at his expense.
- b. All exterior surfaces of piping to be installed in or through concrete, tile floors and underground shall be given one coat of acid-resisting paint with a bituminous base.
- c. After completion of all work the fixtures, fittings, accessories and other materials shall be thoroughly cleaned and delivered in a good condition satisfactory to the Engineer.

MAINTENANCE

The Contractor shall maintain and keep the works in good condition in accordance with Specification. During the period of maintenance, the Contractor shall make good all defects which may appear in the pipelines trench, and in the lots in which the pipes are lined.

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DESCRIPTION

This item shall consist of furnishing all materials, tools, equipment and fixtures required as shown on the Plans for the satisfactory performance of the entire plumbing system including installation in accordance with the latest edition of the National Plumbing Code, and this Specification.

MATERIAL REQUIREMENTS

All piping materials, fixtures and appliances fitting accessories whether specifically mentioned or not but necessary to complete this item shall be furnished and installed.

SEPTIC TANK

The septic tank shall be provided as shown on the Plans including all pipe vents and fittings. The various construction materials such as concrete masonry work shall conform to the corresponding items of this specification. Inlet and outlet pipes shall conform to the latest edition of the National Plumbing Code.

APPROVED ALTERNATE PIPES AND FITTINGS

Pipes and fittings for sanitary and potable water lines as approved alternate shall be Unplasticized Polyvinyl Chloride Pipes and Fittings (UPVC). Pipes and fittings shall be made of virgin materials conforming to specification requirements defined in ASTM D-2241 and PNS 65:1986. Fittings shall be molded type and designed for solvent cement joint connection for water lines and rubber O-ring seal joint for sanitary lines.

PLUMBING FIXTURES AND FITTINGS

All fittings and trimmings for the fixtures shall be chromium plated and polished brass unless otherwise approved. Exposed traps and supply pipes for the fixtures shall be connected to the roughing in, piping system at the wall unless otherwise indicated on the Plans. Built in fixtures shall be watertight with provision of water supply and drainage outlet, fittings and trap seal. Unless otherwise specified, all plumbing fixtures shall be made of vitreous china complete with fittings.

Water closet shall be vitreous china, free standing toilet combination, round front bottom outlet siphonic washdown bowl with extended rear self and closed coupled tank with cover complete with fittings and mounting accessories. Model make and color shall be submitted for approval prior to delivery at jobsite by the Architect/Engineer.

Lavatory shall be vitreous china, wall hung with rear overflow and cast in soap dishes, pocket hanger with integral china brackets, complete with twin faucets, supply pipes, P-trap and mounting accessories. Model make and color shall be approved by the Architect/Engineer.

Bathroom and Toilet Accessories

Shower head and fitting shall be movable, cone type with escutcheon arm complete with stainless steel shower valve and control lever, all exposed surface to be chromium finish. Grab bars shall be made of tubular stainless-steel pipe provided with safety grip and mounting flange. Floor drains shall be made of stainless-steel beehive type, measuring 100mmx 100mm and provided with detachable stainless strainer, expanded metal lath type. Toilet paper holder shall be vitreous china wall mounted. Color shall reconcile with the adjacent fixture and facing tiles. Soap holder shall be vitreous china wall mounted. Color shall reconcile with the adjacent tile works. Faucet(s) shall be made of stainless steel for interior use. Hose-bib(s) shall be made of bronze cast finish.1

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CONSTRUCTION REQUIREMENTS

The Contractor before any installation work is started shall carefully examine the Plans and shall investigate actual structural and finishing work condition affecting all his work. Where actual condition necessitates a rearrangement of the approved pipe layout, the contractor shall prepare Plan(s) of the proposed pipe layout for approval by the Architect /Engineer.

Installation of Soil, Waste, Drain and Vent Pipes

- All pvc pipe shall be pitch 6mm per 300mm but in no case flatter than 3mm per 300mm.
- Horizontal lines shall be supported by well secured length heavy strap hangers. Vertical lines shall be secured strongly by hooks to the building frame and a suitable brackets or chairs shall be provided at the floor from which they start.
- All main vertical soil and waste stacks shall be extended full size to and above the roof line to act as vents, except otherwise indicated in the Plans.
- Vent pipes in roof spaces shall be run as close as possible tpo under side of roof with vertical piping pitched down to stacks without forming traps. Vertical vent pipes may be connected into one main vent riser above the highest vented fixtures. Where an end or circuit vent pipe from any fixtures is connected to a vent line serving other fixtures, the connections shall be at least 1.20m above the floor on which the fixtures are located.
- Horizontal waste line receiving the discharge from two or more fixtures shall be provided with end vents unless separate venting of fixture is noted on the Plans
- All changes in pipe sizes on soil and waste lines shall be made with reducing fittings or recessed reducers. All changes in directions shall be made by appropriate use of 45 degrees' wyes, half wyes, long sweep quarter bends or elbows may be used in soil and waste lines where the change of direction of flow is from the horizontal to the vertical and on the discharge from waste closets. Where it becomes necessary to use short radius fittings in other locations the approval of the Architect/Engineer shall be obtained prior to installation of the same.
- All joints of cast iron pipes in bell and spigot shall be firmly packed with oakum or hemp and caulked with pig lead at least 25mm deep.
- Each fixture and place of equipment requiring connection to the drainage system except fixtures with continuous waste shall be equipped with a trap. Each trap shall be placed as near to the fixture as possible.

Water Pipe, Fittings and Connections

- All water pipings inside the building and underground, 100mm. diameter and smaller shall be galvanized iron threaded pipe with malleable iron fittings.
- The water piping shall be extended to all fixtures, outlets and equipment from the gate valves installed in the branch near the riser.
- The cold water system shall be installed with a fall towards a main plugged and left ready for future connections.

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Main branches

- All pipes shall be cut accurately to measurements and shall be worked into place without springing or forcing. Care shall be taken so as not to weaken the structural portions of the building.
- All piping above the ground shall be run parallel with the lines of the building unless otherwise indicated in the plans.
- All service pipes, valves and fittings shall be kept at sufficient distance from other work to permit finished covering not less than 12.5mm from such work or from finished covering on the different service.
- No water piping shall be buried in floors, unless specifically indicated on the plans and approved by the Architect/Engineer.
- Changes in pipes shall be made with reducing fittings.

Valves and Hose Bibs

- Valves shall be provided on all supplied fixtures as herein specified.
- The cold water connections to the domestic hot water heater shall be provided with gate valves and the return circulation connection shall have gate and a check valve.
- All connection to domestic hot water heaters shall be equipped with unions between valves and tanks.
- Valve shall not be installed with its stem below the horizontal. All valves shall be gate valves unless otherwise indicated on the plans.
- Valves up to and including 50mm diameter shall be threaded ends, rough bodies and finished trimmings, except those on chromium plated brass pipe.
- Valves 63mm in diameter and larger shall have iron bodies, brass mounted and shall have either screws or flange ends.
- Hose bibs shall be made of brass with 12.5 mm inlet threads, hexagon shoulders and 199mm male.

Fixtures, Equipment and Fastening

- All fixtures and equipment shall be supported and fastened in a safe and satisfactory workmanship as practiced.
- All fixtures, where required to be wall mounted on concrete or concrete hollow block wall, fasten with brass expansion bolts.
- Expansion bolts shall be 6mm diameter with 20mm threads to 25 mm into solid concrete, fitted with loose tubing or sleeves of proper length to acquire extreme rigidity.
- Inserts shall be secured anchored and properly flushed into the walls. Inserts shall be concealed and rigid. Bolts and nuts shall be horizontal and exposed. It shall be provided with washers and chromium plate finish.

Pipe Hangers, Inserts and Supports

- Pipe hangers shall be wrought iron or malleable iron pipe spaced not more than 3m part for

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horizontal runs or pipe, except hub and spigot soil pipe which shall have hanger spaced not over 1.50 m apart located near the hub.

- Chains, straps perforated turn-buckles or other approved means of adjustment except the turn-buckles may be omitted for hangers on soil or waste lines or individual toilet rooms to maintain stacks when spaced does not permit.
- Trapeze hangers may be used in lieu of separate hangers on pipe running parallel to and close to each other.
- Inserts shall be cast steel and shall be of type to receive a machine bolt or nut after installation. Insert may be permitted adjustment of the bolts in one horizontal direction and shall be installed before pouring of concrete.
- Wrought iron clamps or collars to support vertical runs of pipe shall be spaced not more than 6m apart for as indicated on the plans.

Plates and Flashing

- Plates to cover exposed pipes passing through floor finished walls or ceiling shall be fitted with pvc pipe.
- Plates shall be large enough to cover and close the hole around the area where pipes pass. It shall be properly installed to insure permanence.
- Roof areas penetrated by vent pipes shall be rendered watertight by lead sheet flashing and counter flashing. It shall extend at least 150mm above the pipe and 300 mm along the roof.

Protection and Cleaning

- During installation of fixtures and accessories and until final acceptance, protect items with strippable plastic or other approved means to maintain fixtures in perfect conditions.
- All exposed metal surfaces shall be polished clean and rigid of grease, dirt or other foreign materials upon completion.
- Upon completion, thoroughly clean fixtures and accessories to leave the work in polished condition.

Inspection, Warranty Test and Disinfection

All pipes, fittings, traps, fixtures, appurtenance and equipment of the plumbing and drainage system shall be inspected and approved by the Architect/Engineer to ensure compliance with all requirement of all codes and regulations referred to in these specifications.

DRAINAGE SYSTEM TEST

The entire drainage and venting system shall have all necessary openings which can be plugged to permit the entire system to be filled with water to the level of the highest stack vent above the roof.

The system shall hold this water for a full 30 minutes during which time there shall no drop greater than 102 mm.

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Where only a portion of the system is to be tested, the test shall be conducted in the same manner as described for the entire system except the vertical stack 3.00 m highest horizontal line to be tested may be installed and filled with water to maintain sufficient pressure or water pump may be used to supply the required pressure.

If and when the Architect/Engineer decides that an additional test is needed, such as an air to smoke test on the drainage system, the Contractor shall perform such test without any additional cost.

WATER TEST SYSTEM

Upon completion of the roughing-in and before connecting fixtures the entire cold water piping system shall be tested shall be tested at a hydrostatic pressure 1 ½ times the expected working pressure in the system during operation and remained tight and leak-proofed.

Where piping system is to be concealed the piping system shall be separately in manner similar to that described for the entire system and in the presence of the Architect/Engineer or his duly designated representative.

DEFECTIVE WORK

- All defective materials replaced and tested will be repeated until satisfactory performance is attained.
- Any material replaced for the satisfactory performance of the system made shall be at the expense of the Contractor.
- Caulking of screwed joints or holes will not be permitted.

AS-BUILT DRAWINGS

Upon completion of work, the Contractor shall submit two sets of prints with all as-built changes shown on the drawings in a neat workmanship manner. Such prints shall show changes or actual installation and conditions of the plumbing system in comparison with the original drawings.

ITEM NO. B.7 - OCCUPATIONAL SAFETY AND HEALTH

GENERAL

Personal Protective Equipment

The Contractor shall, at his own expense, furnish his workers with protective equipment for eyes, face, hands and feet, lifeline, safety belt/harness, protective shields and barriers whenever necessary by reason of the hazardous work process or environment, chemical or radiological or other mechanical irritants or hazards capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical agent.

Provision of personal protective equipment (PPE) shall be in accordance with Rule 1080 of the OSHS. The equivalent cost for the provision of PPE (life span, depreciation, replacement, etc.) shall be an integral part of the project cost.

- The employer shall provide adequate and approved type of protective equipment. Workers within the construction project site shall be required to wear the necessary PPE at all times.
- Construction workers who are working from unguarded surfaces six (6) meters or more above water or ground, temporary or permanent floor platform, scaffold or where they are exposed to the possibility of falls hazardous to life or limb, must be provided with safety harnesses and life lines.
- Specialty construction workers must be provided with special protective equipment, such as specialized goggles or respirators for welders and painters or paint applicators.

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- All other persons who are either authorized or allowed to be at a construction site shall wear appropriate PPE.

Construction Safety Signages

Construction Safety Signages must be provided to warn the workers and the public of hazards existing in the workplace. Signages shall be posted in prominent positions at strategic location as assigned by the architect and, as far as practicable, be in the language understandable to most of the workers employed.

The signages include but are not limited to:

- Mandatory requirement on the usage of personal protective equipment prior to entry to the project site.
- Areas where there are potential risks of falling objects.
- Areas where there are potential risks of falling.
- Areas where explosives and flammable substances are used or stored.
- Areas where there are tripping or slipping hazards.
- Approaches to working areas where danger from toxic or irritant airborne contaminants/substances may exist which should indicate the name of the contaminant/substance involved and the type of respiratory equipment to be worn.
- All places where contact with or proximity to electrical/facility equipment can cause danger.
- All places where workers may come in contact with dangerous moving parts of machineries or equipment.
- Location of fire alarms and firefighting equipment.
- Instructions on the usage of specific construction equipment.
- Periodic updating of man-hours lost.

Signages should be regularly inspected and maintained in good condition. Signages that are damaged or illegible or that no longer apply should be removed and replaced by the safety officer, as needed.

Note: The contractor shall also provide at his own expense, furnish the assessment and inspectorate team of the procuring entity with protective equipment for eyes, face, hands and feet, lifeline, safety belt/harness, protective shields and barriers whenever necessary by reason of the hazardous work process or environment, chemical or radiological or other mechanical irritants or hazards capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical agent.

ITEM NO. 1202(1) – AUTOMATIC FIRE SPRINKLER SYSTEM

General

Work Included Furnish and install steel windows as shown in the approved drawings. Work shall include but not be limited to (fixed, project-in, project-out, side hung-out or side hung-in) frames, closures, trim, anchors and factory applied accessories (if required).

Furnish all materials and labor for the detailed design and installation for complete fire sprinkler. All work shall be performed in accordance with the approved drawings and specifications.

ITEM 1208- FIRE ALARM SYSTEM

FIRE CONTROL PANEL

The Networked Intelligent Addressable Fire Alarm Control Panel (FACP) shall consist of 3 nos. of addressable Loop driver cards, Communication card for repeater panel located at around 500-meter distance, TCP/IP Network card, 240V AC power supply input and in-built battery backup. The capacity of battery (AH) shall be selected so as to operate the Fire alarm system control panel, repeater panel, detectors and other components for 24 hours in standby mode plus 30 mins. in alarm mode.

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1. The Fire Alarm Control Panel shall have an operator interface control and annunciation panel with a backlit liquid crystal display, individual colour coded system status LED's, and an alphanumeric keypad for the field programming and control of the fire alarm system. The FACP shall control and communicate with the addressable detectors, addressable modules, repeater panel, annunciators and other system-controlled devices like Audio Alarm hooter, Fire Contact output and Alarm output.
2. It shall be possible to:
 - Enable, disable or adjust sensitivity of any addressable device through the system keypad or operator terminal and store events in a non-volatile memory and generate system status reports.
 - Provide Zoning facility (at least 10 nos of independent zones and their respective LED indications), Alarm threshold adjustment (for pre-signal alarm signal), Environmental Effect Compensation, Alarm verification, disabling of detectors, detection of field wiring faults, detector mismatch, Power failure auto restart etc.
 - Test the functioning of all modules, detectors, and healthiness of loop wiring, etc. and reporting of all the troubles online.
 - Remote Program, configuration and monitoring of FACP via TCP/IP network card (Relevant software to be provided by bidder).
3. Input Signal Processing at FACP
 - The control panel and loop cards shall have facility for connection via a fully supervised two-wire loop circuit (class A wiring).
 - Each loop driver card shall be able to handle 00 - 99 detector inputs.
 - Reverse polarity or fault in the field wiring shall not damage the detector.
 - Reporting of fire alarms shall have priority over faults. However, provision shall be made to see all the fire and fault alarms.
4. Malfunction Monitoring in FAC

All the detection line circuits shall be monitored against open circuit, short circuit and ground faults. If malfunction occurs in any detection line, the control panel shall indicate a trouble condition for that detection line. In addition, the following criteria shall also be met:

 - Fault in one detection line shall not affect the functioning of other detection lines. A single open circuit shall not inhibit the detection capability of a detection circuit; the remaining circuit should still remain functional.
 - A short circuit shall not inhibit the detection capability of a detection circuit.
 - A single Ground fault shall not inhibit the detection capability of a detection line

ENCLOSURE

The cabinets of FAS control panel shall be suitable for wall mounting.

The cabinets shall be primed and powder coated with a corrosion resistant paint with manufacturer's standard finish.

The panel shall have front door with standard industrial key-lock facility.

The cabinet shall have gasket sealing with ingress protection class IP31 or higher.

MULTI SENSOR DETECTOR

Plug in type Addressable Multiple criteria / multi-Sensor detectors combined (Photo + Thermal) with detector mounting base & required accessories:

The detectors shall incorporate, at least, two separate sensing elements, Infrared photo diode, a photoelectric smoke sensing chamber using the optical scatter principle and thermal detection using a thermistor/temperature detector. It shall also be possible to configure the detector to work in a degraded mode such as only photoelectric type or only thermal type in case of failure of other sensing element. It shall have built-in automatic compensation for changes in ambient conditions.

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REPEAT RESPONSE INDICATOR

Remote/ Repeat Response Indicator & required accessories:

Repeat response indicators shall provide LED indication for the detectors to which it is connected. These are for detectors, whose visual indicators cannot be seen due to physical obstruction. The repeat response indicator shall be capable of working with simple 2- wire connection from the detector.

FAULT ISOLATOR MODULE

Addressable Fault / Loop isolator module with Surface mounting base & required accessories:

In case of a wire-to-wire short, the Fault Isolator Module shall automatically open-circuit (disconnect) the loop. When the short circuit condition is corrected, the Fault Isolator Module shall automatically reconnect the isolated section. It shall not be necessary to replace or reset the Fault Isolator Module after its normal operation. It shall provide LED flashing indication to indicate that the Isolator is operational and shall illuminate steadily to indicate that a short circuit condition has been detected and isolated.

MANUAL CALL POINT

Manual Call Points (MCP) shall be addressable and comprises of a push button placed in a suitable metallic enclosure with a break glass or fibre front cover, suitable for use in outdoor environment with a "Break glass" message on the glass.

ELECTRONIC SOUNDER

Addressable wall mounted electronic Sounder/Hooter with base and required accessories:

The electronic Sounders shall have DB level of 90 dBs at 1 meter away. It shall be field programmable without the use of special tools and a multi tone facility.

CABLES

2C x 1.5 Sq.mm Multistrand Copper, PVC insulated, Overall shielded, FRLS sheathed cable for Fire alarm system for field wiring between fire detectors and FAS Panel inside the existing 25 mm MS conduit or GI flexible conduits at end portions. The cable shall be conforming to IS- 15908: 2011 and the PVC insulated copper conductor cables shall be conforming to IS- 694.

SCOPE OF INSTALLATION AND COMMISSIONING

1. Installation as per drawings provided, testing & commissioning of Fire Alarm Control Panel with loop driver cards and Repeater Panel, all supplied items addressable Detectors, Isolators, MCPs, Sounders with base plate and hardware accessories on turnkey basis.
2. Laying and termination of 2C x 1.5 Sq.mm FRLS cable (internal cabling between FAS panel and other components) with all necessary accessories like cable compression glands, lugs, ferruling, end termination, cable tags, through existing 25 dia MS conduits or supplied flexible conduits at end portions for all types of detectors and peripherals for connectivity with the FAS panel.
3. Installation of MS conduits in trench / wall including clamping / fixing of conduits (required MS conduit accessories to be provided by the vendor), Laying in MS conduits and termination of the supplied Cable between Repeater panel and Fire alarm Panel.
4. From the nearest available 240 V AC power supply source, the vendor has to extend power supply to the FAS Panel and Repeater panel. The required cabling, casing/capping locally is included in the scope of the vendor.
5. The control panel & repeater panel shall be anchored on wall. All non-conducting metallic parts shall be connected to a Grounding bus at the bottom of panels. The grounding bus shall be connected to the grounding system of the building.

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ITEM NO. 1100- ELECTRICAL WORKS

CONDUITS, BOXES & FITTINGS

Description

This item shall consist of the furnishing and installation of the complete conduit work consisting of electrical conduits; conduit boxes such as junction boxes, pull boxes, utility boxes, octagonal and square boxes; conduit fittings such as couplings, locknuts and bushings and other electrical materials needed to complete the conduit roughing-in work of this project.

MATERIAL REQUIREMENTS

All materials shall be brand new and shall be of the approved type meeting all the requirements of the Philippine Electrical Code and bearing the Philippine Standard Agency (PSA) mark.

CONDUITS

Standard PVC, EMT and RMC conduit pipe system is required for this project.

Conduit runs shall be concealed in drop ceiling and or embedded in concrete structure where concealment is not possible.

No conduit of less than 15mm normal diameter shall be installed for this project (two or more conduits shall not be installed in lieu of a large size).

Conduit run shall be continuous from outlet and no running thread shall be in any conduit run. Conduit shall be cut square and properly reamed.

All joints shall be screwed enter knockouts of conduit boxes, pull boxes, panels and cabinet squarely. Lock-nuts shall be screwed tight to ensure continuity of raceway grounding.

Bonds and offset shall be avoided where possible, but where necessary it shall be made with approved conduit bending apparatus.

Conduit which has been deformed or crushed in any manner should not be installed.

The Contractor shall plug with lead or closed with approved pipe caps the ends of all conduits which are to be left empty within the cabinets and conduit boxes so as to prevent the entrance of white ants and dirt within the conduit system.

This lead or cap shall be placed that can be easily removed when so desired and at the same serve the purpose intended.

Pill wire shall be inserted in the empty ducts before they are closed with lead or caps and shall be left therein for the future use.

When not shown on the plans, conduit sizes shall correspond to the conduit sizes on tables of the Philippine Electrical Code latest edition.

Conduit Boxes

All conduit boxes shall be code gauge steel and galvanized. Outlet boxes shall be galvanized pressed steel of standard make. In general, outlet boxes shall be at least 100 mm square or octagonal, 53 mm deep and 16 mm minimum gauge.

Conduit Fittings

All conduit fittings such as locknuts and bushing shall be galvanized of standard make.

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General Specifications

The work to be done under this division of specifications consists of the fabrication, furnishing, delivery and installation; complete in all detailed of the electrical work, at the subject premises and all work materials incidental to the proper completion of the installation, except those portions of the work which are expressly stated to be done by other fields. All works shall be done in accordance with the rules and regulations and with the specifications

Specifications on:

- Lighting fixtures and lamp
- All lighting fixtures and lamp are as specified and listed on lighting fixture schedule.
- For fluorescent lamp, it shall be 40-watt rapid start cool-white. All fluorescent ballast shall be 230 volts, high power factor, of good quality materials and approved by the Bureau of Product Standard (BPS).
- Material Requirements
- All materials to be used shall conform to the BPS specification.

Construction Requirements

- All grounding system installation shall be executed in accordance with the approved plans.
- Grounding system shall include building perimeter ground wires, ground rods, clamps, connectors, ground walls and ground wire taps as shown in the approved design.

Auxiliary System

- All auxiliary system such as telephone and intercom system, time clock system, fire alarm system and public address/nurse’s call/paging system installation shall be done in accordance with the approved design.
- All materials to be used shall conform to the Bureau of Philippine Standard (BPS) specifications.
- Important requirement regarding supervision of the work and submission of certificate of completion.
- All wiring installation herein shall be done under the direct supervision of a licensed Electrical Engineer at the expense of the Contractor. The contractor shall submit the certificate of completion duly approved by the University/PMO’s representative.
- Test and guarantee
- Upon completion of the electrical construction work, the contractor shall provide all test equipment and personnel and to submit written copies of all test results.
- The contractor shall guarantee the electrical installation are done and in accordance with the approved plans but not mentioned in these specifications. The contractor shall guarantee that the electrical systems are free from all grounds and from all defective workmanship and materials and will remain so for a period of one year.

SCOPE OF WORK

The work under this Electrical, consist of furnishing all materials, equipment, tools, labor and all other services necessary to complete and make ready for operation the Electrical Power and Lighting System described below and or indicated in the Electrical Plans in accordance with the latest edition of the Philippine Electrical Code and this Specifications and General Conditions of the Contract.

CONSTRUCTION REQUIREMENTS

- Furnishing and installation of service entrance, conduits and conductors, and all items required by local utility power company’s policy, rules and regulations.
- Furnishing and installation of panel boards at location indicated on the plan and electrical riser layout, including all accessories required.
- Furnishing and installation of feeder and branch circuit conductors with the necessary conduits,

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- approved type of fittings and devices as indicated in the electrical plans.
- Furnishing and installation of all types of utilization devices, outlets and wall switches with properly installed cover plate.
 - Furnishing of all lighting fixtures, conduits, including service entrance duct, terminal cabinet and utility boxes.

CODES, REGULATIONS AND STANDARDS

The installation and equipment shall conform to good ENGINEERING practices and in particular comply with the requirements laid down in the following documents or its equivalent which are mandatory and modified only by specific agreement.

Philippine Electrical Code, Latest Edition ----- PEC

Underwriter’s Laboratory, Inc. ----- UL

National Electrical Manufacturer’s Association ----- NEMA

Local Utility Power Company (LEYECO II) ----- LUPC

In addition to the requirements of these Codes and the Utility Power Company’s requirements. Bureau of Fire Protection (BFP), Tacloban City engineering office (CEO). Local government regulation and suppliers Specification if any, shall be followed.

DRAWING AND SPECIFICATION

The Drawings and Specifications are meant to be complementary to each other, and what is called for by one shall be binding as if called for both. Any apparent conflict between the drawings and specifications, and any controversial or unclear points in either shall be preferred to the supervising Architect/Engineer for final interpretation and decisions. On one copy of the plans, have a record showing all deviations that happened during the construction.

Upon completion of work as described herein, the Contractor at his own expense shall furnish the University/PMO 6 copies of the “As Built” plan for future references and maintenance purposes.

CORRELATION OF WORK

The Electrical Contractor shall confer with the General Contractor and Engineer to determine how and where his work fits with that of other crafts, after familiarizing himself with the plans and specifications.

This shall be done at the beginning of construction. Should there be any existing doubts at any point, ruling shall be secured from the supervising Architect/Engineer, who shall be given time to inspect the work covering this point and to prepare a detail in the form of drawings and written instructions as required.

PERMITS AND INSPECTION

The Contractor shall obtain at his own expense, all the necessary permits and certificates of Electrical Inspection from the proper government authorities required for both the performance of his work involved and the proper operation of the system upon completion of the work.

The Contractor shall at his expense, reproduce the electrical plans for his work to the necessary scale and complete them with the information and requirements as required by the government authorities concerned in issuing and Certificate of Electrical Inspection.

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EXAMINATIONS OF PREMISES

Prospective bidder is required to examine the architectural, structural, and electrical plans of the project, to visit the site and carefully take note of all the conditions thereat to have personal informed under which the electrical work is to be done.

No allowance will subsequently be made in his behalf of any error on his part. He will be deemed to have done this before submitting his proposal and no subsequent claims on the ground of inadequate or inaccurate information will be entertained.

LAYOUT OF WORK

- Electrical system layout indicated on the drawings is generally diagrammatic and the location of location of outlets, devices, apparatus and equipment are only approximate.
- The exact routing of conduits, location of outlets, devices, apparatus and equipment shall be governed by structural and architectural conditions and limitations.
- For the exact location, consult the supervising Architect/Engineer. This does not mean to permit redesigning of the systems. All outlets are to be interconnected as indicated in the drawings.
- The University/PMO reserves the right to make any reasonable change in location of outlet and equipment prior to rough-in, without involving additional expense.
- The Contractor shall be responsible and pay charges for cutting and patching for piping lines where sleeves or slots were not installed or where incorrectly located.

MATERIALS AND WORKMANSHIP

All materials to be installed shall be unused, brand new and shall conform to the standards of the Underwriters Laboratories, Inc. in everywhere such as standard has been established for the particular type of materials to be used.

Only skilled workmen using proper tools and equipment shall be employed during the entire course of installation work.

All workmanship shall be of the best practices of the trade involved. The same job site during the entire course of the job.

SERVICE ENTRANCE

The Electrical Contractor shall furnish and install 220 volts rating, (3) Phase line underground service entrance connection.

The service entrance conductors shall be thermoplastic type **THWN/THHN** standard copper conductors, stranded, whose number and size are indicated on the plans and electrical riser diagram.

SERVICE METERING FACILITIES

It shall be the duty of the Contractor to request the local power company to install a proper type and size of service metering instruments and all other necessary accessories, materials, equipment, devices and fittings.

PANELBOARDS

- The contractor shall furnish and install the necessary panel board multi-breaker type including the breakers as indicated in the drawings.
- Circuit breakers shall be tropical of the magnetic thermal type with ratings and number of poles as indicated in the drawings.
- All panel boards to be used shall be flush mounted when located in areas that are visible to the general public and may be surface mounted when located in machine room or areas where they are not visible to the public.

ANNEX “A”

- All panel boards shall be set plumb and symmetrical with the surrounding objects. Panel boards shall be installed in a perfectly fit cabinet of appropriate size provided with a stop indoor trim and good quality cylinder lock.

WIRING METHODS

- Wiring for all systems shall be type **THHN** conductors using plastic conduit pipes. Other types of conductors shall be as indicated in the drawings.
- Conduit shall be embedded in columns, walls and toppings of floors slabs to allow flush connections and lighting system which may be exposed between joints in case a drop ceiling is installed.
- Proper fittings shall be provided at ends of conduits. Wiring installations through wooden double partitions shall be in standard PVC conduits, and all cases, the wiring installation shall be concealed from view.
- All conduit and conduit fittings shall be PVC and shall conform to the U.S. Underwriters Laboratories Inc. Standard and Codes.
- The minimum size of conduit to be used shall be 13mm diameter. Sizes larger than 13mm diameter shall be indicated in the drawings.
- Smallest size of conductor to be used shall be 2.0mm², type THW. THW wire shall be indicated in the drawings.
- ***Circuit homeruns for lighting shall be 3.5mm² and 5.5mm² for the power or otherwise indicated on the plans.***
- All splice, tape and junctions for all systems using conductors up to 14mm² shall be accomplished by using electrical friction or rubber types.
- Proper type of connections shall be employed to accommodate all splices and solder less type terminals to be used for connection to Bus bar.
- Taps and splices shall be properly protected with both plastic and friction electrical tapes to proper insulation and protection for 600 volts.
- Wiring from ceiling outlets to lighting fixtures recessed in dropped ceilings shall be done using type THW conductors in RS or PVC conduits.
- Proper size of boxes shall be used for switch and outlet receptacles.
- Necessary fittings such as bushing, locknuts and anti-short fiber bushing shall be used at proper places so required.
- When not shown on the Plans, conduit sizes shall correspond to the conduit sizes as prescribed in the Philippines Electrical Code table for “Size of Conduit Pipes”.

OUTLETS AND SWITCHES

- All boxes for outlets and switches shall be PVC approved products of reputable manufacturers.
- All ceiling outlet boxes intended for lighting outlets shall be of the 10cm octagonal box. Larger boxes when required shall be 5.3cm deep.
- Convenience and wall switch outlet boxes shall be of the 10cm. by 5.3cm. rectangular deep flush type or 100 square cm junction box with gang raised cover as required to accommodate the wires therein.
- All junction boxes, pull boxes and blank boxes shall be fitted with standard flat metal or plastic box cover.
- All boxes including junction and pull boxes shall be of sufficient size to provide free space for all conductors enclosed in the box, in addition to the fittings such as switch mechanism and receptacles that may be placed therein.

WALL SWITCHES AND RECEPTACLES

- Suitable single pole, two-gang and three-way switches of the flush tumbler type and receptacles with proper Bakelite cover plates shall be furnished and installed as indicated in the drawings.
- Wall switches intended to control lights on the 230 volts system shall be rated 15 amp.250 volts.
- Convenience outlets shall be flushed duplex type rated 20 amperes 230 volts 60Hz., AC.
- Acceptable Brands: ***National or Panasonic.***

ANNEX “A”

GROUNDING INSTALLATION

- The contractor shall furnish and install **all ground cables**, connection **ground rods** and all other materials required to provide a permanent effective grounding system.
- Grounding, in general, shall conform to the provisions of the Philippine Electrical Code and as recommended by the equipment manufacturer.
- All enclosure for electrical equipment regardless of voltage shall be grounded, including metal frames of switchboard, motors, generators and steel poles. Each shall be grounded in separate grounding system.
- **Grounding cables shall be bare TW (color green)**, cooper of suitable size and of the approved type. Ground rods shall be copper clad steel with diameter of 16mm and length of 2.0m.
- Ground clamps shall be of high copper alloy bronze with minimum thickness of 4.7mm hardware made from silicon bronze.
- The clamps shall be of a shape and size to fit the points of application and type of connection to be made from cable rod, pipe and curved or flat surfaces. Connections shall be suitable for direct burial without danger or corrosion.

LIGHTING OUTLETS

All ceiling outlets shall be 10cm. x 5cm. octagonal boxes. Connection from fixtures to boxes shall be accomplished by using type TW on a flexible conduit.

LIGHTING FIXTURES

All lighting fixtures shall be furnished and installation by the contractor. They shall be as shown on the drawings or specified on the schedule of lighting fixtures. For other details as to the type and model, **consult the Architect/Engineer.**

TEST AND GUARANTEE

- The Contractor shall furnish all apparatus to be in making various electrical tests of all wiring system (for shorts and grounds) after the electrical work are completed.
- The Contractor guarantees all work installed under the Contractor to be free from all defects for a period of one-year acceptance of the works.
- The Contractor also agrees to repair and make good at his own expense any and all defects which may develop in his work during the time if said defects arise due to poor workmanship.

POWER LOAD CENTER

This item shall consist of furnishing and installation of the light/ power panel board and distribution panel boards at the location shown on the plans complete with circuit breakers, cabinets and all accessories, completely wired and ready for service.

- a. Material Requirements
All items shall be brand new and shall be of the approved type. It shall conform to the requirements of the Philippine Electrical Code and shall bare the Philippine Standard Agency (PSA) mark.
- b. Circuit Breaker (Molded Case) – MCCB
The low voltage switchboard shall be standard modular unitized units, metal built, dead front, safety type construction and shall consist of the following.
 1. Main Circuit Breaker – the main circuit breaker shall be draw-out type, manually or electrically operated as required with ratings and capacity as shown on the plans.
 2. Feeder Circuit Breakers – there shall be as many feeder breakers as are shown on the single line diagram or schematic riser diagram and schedule of loads and computations on the plans.

ANNEX “A”

- The circuit shall be draw out or molded case required. The circuit breakers shall each have sufficient interrupting capacity and shall be manually operated complete with trip devices and all necessary accessories to ensure safe and sufficient operation.
- The number, ratings, capacities of the feeder branch circuit breakers shall be as shown on the approved plan.
- Circuit breakers shall each be of the indicating type, providing “ON” and “OFF” and “TRIP” position of the operating handles and shall each be provided with nameplate for branch circuit designation.
- Circuit breaker shall be so designed that an overload or short on one pole automatically causes all poles to open.

3. **Grounding System** – all non-current carrying metallic parts like conduits, cabinets and equipment frames shall be properly grounded in accordance with the Philippine Electrical Code, latest edition.

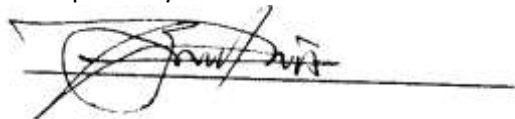
The size of the ground rods and ground wires shall be as shown on the approved plan. ***The ground resistance shall not be more than 5 Ohms.***

4. **Panel Board and Cabinets** – shall conform to the schedule of panel boards as shown on the approved plan with respect to supply characteristics, rating of main lugs or main circuit breaker, number and ratings and capacities of branch circuit breakers.

- Panel board shall consist of a factory completed dead front assembly amounted in an enclosing flush type cabinet consisting of code gauge galvanized sheet steel box with trim and door.
- Each door shall be provided with catch lock and two (2) keys.
- Panel board shall be provided with directories and shall be printed to indicate load served by each circuit.
- Panel board cabinets and trim shall be suitable for the type of mounting shown on the approved plan. The inside and outside of panel board cabinets and trims shall be factory painted with one rust proofing primer coat and two finish coats of pearl gray enamel paint.
- The main and branch circuit breakers for panel boards shall have the rating, capacity and number of poles as shown on the approved plan.
- Breaker shall be thermal magnetic type. Multiple breakers shall be of the common trip type having a single operating handle.
- For 50- ampere breaker or less, it may consist of single pole breaker permanently assembled at the factory into a multi-pole unit.

(See Approved Electrical Drawing)

Prepared by:



AR. BERNIE G. TUDIO, UAP

Head, PPIDO

ANNEX “B”

BILL OF QUANTITIES

CONSTRUCTION OF THREE (3) STOREY EVSU BURAUEN ACADEMIC BUILDING

EVSU Burauen Campus, Burauen, Leyte

Contract Duration: 120 Calendar Days

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	ESTIMATED DIRECT COST	MARK-UPS IN PERCENT		TOTAL MARK-UP		VAT	TOTAL INDIRECT COST	TOTAL COST	UNIT COST
					OCM	PROFIT	%	VALUE				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) (5)X(8)	(10) 5%[(5)+(9)]	(11) (9)+(10)	(12) (5)+(11)	(13) (12)/(3)
B.3	Permits and Clearances	1.00	l.s.									
B.5	Project Billboard	1.00	each									
B.7	Occupational Safety and Health	16.00	mo									
B.9	Mobilization/ Demobilization	1.00	l.s									
B.25	Detailed Architectural and Engineering Design	1.00	l.s.									
803 (1)a	Structure Excavation	182.89	cu.m.									
804 (1)a	Embankment from Structure Excavation	435.80	cu.m.									
804 (4)	Gravel Fill	20.10	cu.m.									
900 (1) c1	Structural Concrete (Ready Mix, Class A, 28 days)	269.88	cu.m.									
902 (1) a1	Reinforcing Steel, Grade 40	13,054.54	kgs									
903 (2)	Formworks and Falseworks	193.83	sq.m.									
1000 (1)	Soil Poisoning	79.57	L									
	TOTAL											

NOTE:

This Bill of Materials are for the conceptual plans made by the procuring entity and are subject to change based on the approved plans and specifications to be submitted by the contractor and per submitted financial bid. No owner supplied materials is permitted unless stated on the contract. Contract/Amount may not change and no change order is permitted based on Annex "G" of RA 9184.

ANNEX “C”

Checklist of Technical and Financial Documents

I. TECHNICAL COMPONENT ENVELOPE

Class “A” Documents

Legal Documents

- (a) Valid PhilGEPS Registration Certificate (Platinum Membership) (all pages) in accordance with Section 8.5.2 of the IRR; **or**
- (b) Updated and valid 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; **and**
- (c) Valid and Current 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; **and**
- (d) Updated and valid Tax clearance per E.O. No. 398, s. 2005, as finally reviewed and approved by the Bureau of Internal Revenue (BIR).

Technical Documents

- (e) 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; **and**
- (f) Statement of the bidder’s Single Largest Completed Contract (SLCC) similar to the contract to be bid, except under conditions provided under the rules; **and**
- (g) Philippine Contractors Accreditation Board (PCAB) License (at least Category D) **or** Special PCAB License in case of Joint Ventures **and** registration for the type and cost of the contract to be bid; **and**
- (h) Original copy of Bid Security. If in the form of a Surety Bond, submit also a certification issued by the Insurance Commission **or** original copy of Notarized Bid Securing Declaration; **and**
- (i) Project Requirements, which shall include the following:
 - a. Organizational chart for the contract to be bid;

ANNEX “C”

- b. List of contractor’s key personnel (*e.g.*, 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, as the case may be; **and**

- (j) Preliminary Conceptual Design Plans in accordance with the degree of details specified by the procuring entity;
- (k) Design and construction methods;
- (l) List of design and construction personnel, to be assigned to the contract to be bid, with their complete qualification and experience data; and,

- (m) Value engineering analysis of design and construction method;
- (n) Original duly signed Omnibus Sworn Statement (OSS) **and** 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.

Financial Documents

- (o) The Bidder’s audited financial statements, showing, among others, the Supplier’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; **and**
- (p) The prospective bidder’s computation of Net Financial Contracting Capacity (NFCC).

Class “B” Documents

- (q) 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 **or** 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.

ANNEX “C”

Document required to be attached in the bid documents:

- (r) Certificate of Site Inspection

II. FINANCIAL COMPONENT ENVELOPE

- (s) Original of duly signed and accomplished Financial Bid Form; **and**

Other documentary requirements under RA No. 9184

- (t) Original of duly signed Bid Prices in the Bill of Quantities; **and**
- (u) Duly accomplished Detailed Estimates Form, including a summary sheet indicating the unit prices of construction materials, labor rates, and equipment rentals used in coming up with the Bid; **and**
- (v) Detailed Plans and Drawings;
- (w) Signed Terms of Reference/Technical Specifications of the project;
- (x) Cash Flow by Quarter.
- (y) PERT/CPM;
- (z) Construction Schedule/S-Curve.

ANNEX “D”

TERMS OF REFERENCE (TOR)

**CONSTRUCTION OF THREE (3) STOREY EVSU
BURAUEN ACADEMIC BUILDING**

I. PROJECT DESCRIPTION

1. Project Title:

Design and Build of the Three (3) Storey EVSU Burauen Academic Building at EVSU Burauen.

2. General Description:

The project shall cover the design and construction of the Three (3) Storey Academic Building at EVSU Burauen, San Diego Street, Poblacion District IX, Burauen, Leyte. The general objective is to provide additional classrooms addressing SDG 4 and SDG 9 by creating a conducive learning environment for students. This will also cater for administrators and faculty members by providing adequate space for lectures and laboratories including offices for its clientele. Specifically, the project seeks to provide a structurally safe and secure environment and to upgrade the university’s carrying capacity through its facilities.

The project has a total floor area approximately 2,051.79 sq. m. based on its building footprint with sufficient parking area that includes PWD services. The Approved Budget for the Contract (ABC) shall be in the amount of Php4,855,000.00. The budget for the building’s completion will be proposed after the completion and approval of the design.

3. Project Components:

The building components are as follows:

3.1 *FIRST FLOOR:*

- 1.) 3 Lecture Rooms
- 2.) 1 Laboratory Room
- 3.) 2 Comfort Rooms (Male and Female)
- 4.) 1 PWD/All Gender Comfort Rooms
- 5.) 2 Stockrooms
- 6.) 2 Stairs
- 7.) Corridor

3.2 *SECOND FLOOR:*

- 1.) 3 Lecture Rooms
- 2.) 1 Laboratory Room
- 3.) 2 Comfort Rooms (Male and Female)
- 4.) 1 PWD/All Gender Comfort Rooms

ANNEX “D”

- 5.) 2 Stockrooms
- 6.) 2 Stairs
- 7.) Corridor

3.3 THIRD FLOOR:

- 1.) 2 Laboratory Rooms
- 2.) 2 Lecture Rooms
- 3.) 1 Faculty Room
- 4.) 2 Comfort Rooms (Male and Female)
- 5.) 1 PWD/All Gender Comfort Room
- 6.) 2 Stockrooms
- 7.) 2 Stairs
- 8.) Corridor

3.4 ROOF DECK:

- 1.) Roof Deck Area
- 2.) 1 Comfort Rooms (Male and Female)
- 3.) 1 PWD/All Gender Comfort Rooms
- 4.) 1 Stockroom
- 5.) 1 Maintenance Room

The site shall be developed to accommodate the standard requirements of a modern state university that complies with the standards prescribed by the National Building Code of the Philippines, the relevant Accessibility Law, the inclusivity of the Gender and Development (GAD) Program, Post-COVID-19 design standards, and other referral codes for design standard of buildings.

The procuring entity awards all parts of the project to a single contract to a single firm, partnership, corporation, joint venture (JV), or consortium. The Conceptual Design should become the basis by the Contractor/Consultant of the Detailed Design.

II. PROCUREMENT MODE AND OBJECTIVES

The Design and Build Scheme of procurement is recommended, pursuant to the guidelines for the Procurement and Implementation of Contracts for Design and Build Infrastructure Projects of RIRR of RA 9184. The procurement aims to:

- 1.) To prepare complete Architecture and Engineering Plans and related studies/investigations that consider the following:
 - a) Optimal benefits for all stakeholders, which includes the procuring entity, direct users and the general public.
 - b) Construction of a building that conforms to all relevant laws, and design standards and legal procedures.
- 2.) To build a Three (3) Storey EVSU Burauen Academic Building consistent with the following principles:

ANNEX “D”

- a) Minimize adverse impacts on the natural environment ensuring that all DRR-CCA design principles are adhered to.
 - b) Produce a Comprehensive Architectural and Engineering Plans which include concepts in:
 - i. Energy savings through day lighting and monitoring of power consumption;
 - ii. Natural Ventilation and thermal comfort concepts;
 - iii. Addressing occupational hazards and environmental health concepts;
 - c) Site Development and Building Design that will be resilient, flexible and can accommodate technological change.
- 3.) To implement a turnover procedure in accordance with standard Project Acceptance and Turnover.

III. GENERAL SCOPE OF WORK

The contract shall consist of two (2) stages:

STAGE I:

ARCHITECTURAL AND ENGINEERING (A&E) DESIGN OF THREE (3) STOREY EVSU-BURAUEN ACADEMIC BUILDING

- A. Pre-Design Phase** where the specific parameter, size and scope of the works to the building shall be established. Preliminary schematic maps/ drawings shall be presented by the Winning Bidder for approval by the procuring entity before Final Detailed Architectural and Engineering Design (DAED) Plans are completed. It includes, but not limited to:
- a) Conduct of reconnaissance, engineering surveys on utilities locations, on-site investigations of connection/tapping points; and
 - b) Preparation of preliminary architectural and engineering designs, layouts, outline specifications, preliminary cost estimates, value engineering/value analysis study and specific recommendations prior to final design. (*see ANNEXes for Design References*).
- B. Basic Design Phase** includes preparation of final detailed plans and designs, working drawings, specifications, detailed cost estimates for the construction of the Three (3) Storey Academic Building Project. Complete Detailed Architectural and Engineering Design (DAED) Plans, Technical Specifications and Design Calculations for the construction of the building. Such plans, designs and specifications shall be subject to review and approval by EVSU. The Design Development (DD) and the Contract Documents (CD) phases of the design shall continue after the bid is awarded. It shall likewise be subject to review and approval by the EVSU.

Aside from the A&E professional design fees, other incidental expenses that are also to the account of the winning bidder shall include the geodetic survey of the project lot and other design and construction requirements.

- C. Contract Documentation Phase** will cover preparation of necessary

ANNEX “D”

documents for audit purposes until the projects completion and acceptance.

STAGE II:

CONSTRUCTION OF THE THREE (3) STOREY EVSU-BURAUEN ACADEMIC BUILDING

Stage II shall be the Construction of Three (3) Storey Academic Building which can be covered by the budget:

- A. Winning bidder shall prepare supplementary drawings required to suit actual field conditions.
- B. The winning bidder shall demolish/haul the existing obstructions in the assigned lot area based on the site development map and complete the construction of the structural component of the building from the foundation up to the roof deck. From the ground floor up to the 3rd floor; all the building’s systems (electrical, mechanical/fire protection, plumbing/sanitary, and information and communication) shall be rendered fully functional; and with complete architectural finishes. From 1st floor to the roof deck, a complete roughing-in works and exterior walls are painted plain cement finish. Waterproofing shall be provided at the roof deck.
- C. Winning Bidder shall adhere to the strict compliance of all applicable permits/licensing and documentary requirements.
- D. All other related tasks until completion and acceptance of the project.

IV. METHODOLOGY

This Project is a “Design and Build” Scheme contract and is a fixed lump sum cost and changes or variation orders will only be allowed if the changes in the design and construction requirements were not anticipated in the preparation of contract documents prior to contract signing and approval. The following guidelines shall govern the approval for changes or variation orders for work items under the DBS (Ref. Annex “G” of the revised 2016 IRR of R.A. 9184).

This Design and Build Contract includes submission of site investigation reports, preparation of project execution plan, preparation of detailed construction drawings/plans and submission of As-Built Plans.

A. Contract Implementation for the Design and Build Scheme

As a rule, contract implementation guidelines for the procurement of infrastructure projects shall comply with Annex “E” of the IRR of RA 9184, as amended. The following provisions shall supplement the procedures specified in Annex “E”.

- 1.) No works shall commence unless the contractor has submitted the required documentary requirements and the procuring entity has given written approval. Work execution shall be in accordance with reviewed] and approved documents.

ANNEX “D”

- 2.) The contractor shall be responsible for obtaining all necessary information as to risks, contingencies which may affect the works and shall prepare and submit all necessary documents specified by the procuring entity to meet all regulatory approvals as specified in the contract documents.
- 3.) The contractor shall submit a detailed program of work within seven (7) calendar days after issuance of the Notice to Proceed (NTP) for approval by the procuring entity that shall include, among others:
 - a.) The order in which it intends to carry out the work including anticipated timing for each stage of design/ detailed engineering and construction,
 - b.) Periods for review of specific outputs and any other submissions and approvals,
 - c.) Sequence of timing for inspections and tests as specified in the contract documents,
 - d.) General description of the design and construction methods to be adopted,
 - e.) Number and names of personnel to be assigned for each stage of the work,
 - f.) List of equipment required on site for each major stage of the work, and,
 - g.) Description of the quality control system to be utilized for the project.
- 4.) 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 documents which have been previously submitted, reviewed and approved, the contractor shall notify the procuring entity within a reasonable period of time and shall shoulder the cost of such changes.
- 5.) As a rule, changes in design and construction requirements shall be limited only to those that have not been anticipated in the contract documents prior to contract signing and approval. The following guidelines shall govern approval for change or variation orders:
 - a.) Change Orders resulting from design errors, omissions or non-conformance with the parameters and the contract documents by the contractor shall be implemented by the contractor at no additional cost to the procuring entity.
 - b.) Provided that contractor suffers delay and/or incur 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 “D”

Annex “E”; or

- ✓ payment for such costs as specified in the contract documents, provided, the cumulative amount of the variation order does not exceed ten percent (10%) of the original contract price.

- 6.) The contract documents shall include the manner and schedule of payment specifying the estimated contract amount and installments in which the contract price will be paid.
- 7.) The contractor shall be entitled to advance payment subject to the provisions of Section 4 of Annex “E”.
- 8.) The procuring entity shall define the quality control procedures for the design and construction in accordance with agency guidelines and shall issue the proper certificates of acceptance for sections of the works or the whole of the works as provided for in the contract documents.
- 9.) The contractor shall provide all necessary equipment, personnel, instruments, documents, and others to carry out specified tests.
- 10.) All design and builds 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.
- 11.) 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 62.2.3.2 of the IRR.
 - 1.) Implement the project taking into consideration the communities and their landscape, and achieve enhanced environmental performance and comprehensive environmental compliance.
 - 2.) Stimulate the local economy by maximizing local business participation in implementing the project.
 - 3.) Maximize use of minority or local business enterprises.
 - 4.) Gender perspective.
 - 5.) Engage communities and stakeholders to proactively participate in the project from planning stage up to implementation/ construction stage.
 - 6.) Develop and implement an effective Quality Program.
 - 7.) Achieve swift commencement and timely completion of the project.
 - 8.) Provide cost-effective solutions and cost-containment methodologies.
 - 9.) Increase Work Zone safety with engineering improvements and enhanced awareness through public information.
 - 10.) Minimize life-cycle cost of the project.
 - 11.) Any additional project goals will be included in the Special Provisions.

ANNEX “D”

Obligations of the Winning Bidder/Contractor

The Contractor shall be responsible for furnishing all labor, material, plant, equipment, services, and support facilities for the following:

- a.) Design and Construction of structures in the Project components including utility relocations, if any,
- b.) All Project reference provided by the client shall be field check and verified by the Winning Bidder/Contractor,
- c.) Project construction management including Health and Safety Measures as stated in Department of Public Works (DPWH) Order No.39, Series of 2020 “Revised Construction Guidelines for the Implementation of Infrastructure Projects During the COVID-19 Public Health Crisis”,
- d.) Project-related Public Information activities,
- e.) Coordination with Project stakeholders, other contractors, and utility Client EVSUs, if any,
- f.) Design Quality of temporary structures,
- g.) Construction Quality and Workmanship,
- h.) Maintenance and protection of traffic and access to properties (both temporary and permanent access),
- i.) Project safety and security, as per DOLE RA 9514,
- j.) Preliminary Engineering (PE), such as surveys, bore hole testing, etc.
- k.) Harmful and hazardous materials remediation (design and construction),
- l.) Drainage and erosion control
- m.) Construction waste disposal and handling,
- n.) Ancillary Work, such as access roads, driveways, temporary fencing, relocation of drainage, work sites, and temporary works,
- o.) Transportation permits for construction materials,
- p.) Coordination and relocation of utilities and municipal drainage facilities (when required),
- q.) Soil poisoning and earthworks to comply with finished ground elevation,
- r.) Administration of the project during the contract period, and,

ANNEX “D”

- s.) Implementation and administration of the required to plan, implement, and maintain a Quality Plan for the Work. The quality plan will detail how the Contractor will establish and operate its quality program management structure, independent from design and construction production, and document its procedures pertaining to all aspects of the work listed below. The quality plan will be established and maintained by the Contractor such that it provides an agency- auditable system that assures the Contractor complies with all contract requirements pertaining to the general areas of the construction work. If new material/technology is to be introduced, the Winning Bidder or Contractor will refund 50% of the cost of the pay item to be replaced regardless if the cost of the new material/technology is lower or higher compared to the original work item.

V. DELIVERABLES AND TIMELINE:

Deliverables	Timeline
STAGE I: ARCHITECTURAL AND ENGINEERING (A&E) DESIGN OF THE CONSTRUCTION OF THREE (3) STOREY EVSU-BURAUEN ACADEMIC BUILDING	
1. Detailed program of work, approach, work plan and schedule for the implementation of the contract works. <ul style="list-style-type: none"> i. The order in which it intends to carry out the work including anticipated timing for each stage of design/detailed engineering design; ii. Periods for review of specific outputs and any other submissions and approvals; iii. General description of the design methods to be adopted; iv. Number and names of personnel to be assigned for each phase of the work; 	Within Seven (7) Calendar Days after issuance of NTP
2. Reconnaissance, Engineering Surveys and On-Site Investigations.	Within One Hundred and Twenty (120) Calendar Days after issuance of NTP
3. Preparation of Preliminary Plans, Elevations, Specification Outlines, Preliminary Cost Estimates, Value Engineering/ Value Analysis Study and other specific recommendations by the Consultant for the Design for Architectural/ Civil , Structural, Sanitary/ Plumbing (Plumbing System of	
	Within Fourteen (14) Calendar Days after issuance of NTP

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<p>additional toilets and integration to main system), Electro-Mechanical (AC System location and design), Lighting and Power System, Lighting Fixtures including Parking Area, Auxiliary Works/ Network/ Cabling/ Data System (BMS in close coordination with EVSU-IT), Fire Protection System, Fire Detection and Alarm System (Smoke Detector and Sprinkler Location Plan), CATV System, PA/BGM System , Telephone System, Security/ CCTV System integrated to be BMS ready, Proposed Furnishings (Furniture Design, Cabinetries, Counters), Landscaping Works (Proposed), and Specialty Works (where required) for Approval before Final Design.</p>		
<p>4. Submission of Final Plans of Approved Preliminary Plans for the Design for Structural, Sanitary/ Plumbing (Plumbing System of additional toilets and integration to main system), Electro-Mechanical (AC System location and design), Lighting and Power System, Lighting Fixtures including Parking Area, Auxiliary Works/ Network/ Cabling/ Data System (BMS in close coordination with EVSU- IT), Fire Protection System, Fire Detection and Alarm System (Smoke Detector and Sprinkler Location Plan), CATV System, PA/BGM System , Telephone System, Security/ CCTV System integrated to be BMS ready, Proposed Furnishings (Furniture Design, Cabinetries, Counters), Landscaping Works (Proposed), and Specialty Works (where required) including Working Drawings, Technical Specifications, Detailed Cost Estimates for permit purposes, wherever required.</p>	<p>Within Twenty (20) Calendar Days after issuance of NTP</p>	
<p>5. Approval of Final Plans duly signed and sealed by respective professionals for Design for Architectural/ Civil , Structural, Sanitary/ Plumbing (Plumbing System of additional toilets and integration to main system), Electro-Mechanical (AC System location and design), Lighting and Power System, Lighting Fixtures including Parking Area,</p>	<p>Within Thirty (30) Calendar Days after issuance of NTP</p>	

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<p>Auxiliary Works/ Network/ Cabling/ Data System (BMS in close coordination with EVSU- IT), Fire Protection System, Fire Detection and Alarm System (Smoke Detector and Sprinkler Location Plan), CATV System, PA/BGM System , Telephone System, Security/ CCTV System integrated to be BMS ready, Proposed Furnishings (Furniture Design, Cabinetries, Counters), Landscaping Works (Proposed), and Specialty Works (where required) including Working Drawings, Technical Specifications, Detailed Cost Estimates for permit purposes, wherever required, and Bid Documents.</p>		
<p>STAGE II: CONSTRUCTION OF THE THREE (3) STOREY EVSU-BURAUEN ACADEMIC BUILDING (WHICH CAN BE COVERED BY THE BUDGET)</p>		
<p>MOBILIZATION AND SITE PREPARATION</p>	<p>Within Seven (7) Calendar Days after receipt of NTP</p>	
<p>FOUNDATION WORKS</p>	<p>Within One Hundred and Twenty (120) Calendar Days after issuance of NTP</p>	
<p>STRUCTURAL WORKS</p>		
<p>ARCHITECTURAL/ CIVIL WORKS</p>		
<p>ELECTRICAL/ ELECTRONICS WORKS</p>		
<p>PLUMBING/ SANITARY WORKS</p>		
<p>FIRE PROTECTION WORKS</p>		
<p>TESTING AND COMMISSIONING, PUNCHLIST AND RECTIFICATION</p>		
<p>PROJECT ACCEPTANCE AND TURN-OVER</p>		

VI. STANDARD OF SERVICES:

The designer/Contractor shall undertake the design-build services by utilizing its technical knowledge and best-accepted professional standards. The Designer/Contractor shall carry out the services based on sound architectural and engineering theories and practices to ensure that the final works will provide the most economical, “smart” and feasible building. Further, the contractor shall

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provide an adequate number of personnel of known qualifications and experience.

VII. DURATION OF THE CONTRACT:

The Design and Build Scheme will cover ONE HUNDRED TWENTY (120) CALENDAR DAYS or Four (4) Months or Sixteen (16) Weeks.

The **Stage I - Architectural and Engineering (A&E) Design of the Three (3) Storey EVSU-Burauen Academic Building** shall be completed within THIRTY (30) CALENDAR DAYS starting from the receipt of the Notice to Proceed (NTP).

The **Stage II - Construction of the Three (3) Storey EVSU-Burauen Academic Building (which can be covered by the budget)** shall be completed within ONE HUNDRED AND TWENTY (120) CALENDAR DAYS starting from receipt of Notice to Proceed (NTP).

VIII. DESIGN AND BUILD SCHEME QUALIFICATIONS:

A local Design and Build firm with experience in Architectural and Engineering (A&E) Design and Construction of Academic Buildings with the following qualifications:

1. Must be operational and engaged as a consultancy and construction firm at least five (5) years;
2. Must have satisfactorily completed a contract for a similar project with magnitude and complexity at least equivalent to the proposed project; and
3. The contractor must likewise pass the eligibility requirements under Section 24 of Republic Act 9184, otherwise known as the Government Procurement Reform Act and its Revised Implementing Rules and Regulations (RIRR).

IX. PERSONNEL QUALIFICATION REQUIREMENTS:

As a minimum requirement, the Designer/ Contractor shall provide licensed and professional personnel with adequate technical experience in the design, implementation and supervision of contract works:

MINIMUM CONTRACTOR’S TEAM COMPOSITION/MANPOWER NETWORK

DESIGN TEAM	Number	General Experience	License/ Certification	Relevant Experience
Principal Architect/Engineer	1	10	PRC and UAP/PICE	5
Project Manager/ Coordinator	1	10	PRC and UAP/PICE	3
Project Designer Engineer, Structural/Civil	1	10	PRC and UAP/ PICE/ASEP	3

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Project Design Engineer, Mechanical	1	7	PRC and PSME	3
Project Design Engineer, Electrical	1	7	PRC and IIEE	3
Project Design Engineer, Electronics	1	7	PRC and IECEP	3
Project Design Engineer, Plumbing/Sanitary	1	7	PRC and PSSE	3
Network Engineer	1	5	PRC and IECEP /CCNA/CCNP or JNCDA/JNCDS	2
Engineering Assistant/Draftsman	1	5	Proficient in CAD and Sketchup of the latest version for support and production of design plans/ drawings and other needed documents	2

Note: All work experience for the proposed positions are verifiable by EVSU.

CONSTRUCTION TEAM	Number	General Experience	License/ Certification	Relevant Experience
Project Manager	1	10	PRC and UAP/PICE	5
Architect and Engineers (Civil, Electrical, Mechanical, Sanitary and Electronics)	4	7	PRC and UAP/PICE/IIEE/PSME/PSSE/IECEP	3-5
QA/QC Civil, Electrical, Electronics, Mechanical	3	5	Relevant Certification	3-5
Materials Engineer	1	5	Relevant Certification	3
Environment, Health and Safety Officer	1	5	Relevant Certification	3
Construction Foreman	1	7	Relevant Certification	5

Note: All work experience for the proposed positions are verifiable by EVSU.

In the execution of the design and build scheme, multi-tasking by or nomination of key personnel to more than one of the above-stated fields or professions is prohibited.

The Designer/ Contractor shall provide additional personnel as may be required and pertinent to the accomplishment of the project in its entirety at no additional cost to EVSU.

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The Designer/Contractor shall likewise provide copies of the Professional Regulation Commission (PRC) Licenses and Latest Professional Tax Receipt of their personnel and list of on-going and completed projects (both private and government) within the years of relevant experience required.

Except as otherwise agreed upon by the EVSU, the personnel for the project shall consist of those indicated in the Work Plan and List of Key Personnel submitted and no changes shall be made in the key staff. In the event any employee resigns, is discharged or withdrawn, the Designer/Consultant shall provide suitable personnel of equivalent or of better qualifications acceptable to EVSU.

X. ESTIMATED BUDGET FOR THE CONTRACT AND TERMS OF PAYMENT:

A. FEE

For and in consideration of the faithful, satisfactory and full performance of all the works and requirements under this contract, EVSU agrees to pay the Designer/Contractor an amount not exceeding the Approved Budget for the Contract of **FOUR MILLION EIGHT HUNDRED FIFTY-FIVE THOUSAND PESOS (Php4,855,000.00)** after observance of the required procedures in compliance with the Government Procurement Reform Act (Republic Act No. 9184) and Government Accounting and Auditing Manual.

Breakdown:

Stage 1	Architectural and Engineering (A&E) Design of Three (3) Storey EVSU-Burauen Academic Building		
Stage 2	Construction of Three (3) Storey EVSU-Burauen Academic Building (which can be covered by the budget)		
	ABC for Phase I	=	4,855,000.00

B. ADVANCE PAYMENT

An advance payment not to exceed fifteen percent (15%) of the Contract Price in Philippine Peso shall be made upon the submission of a written request per stage of work by the Designer/Contractor to cover the cost of Mobilization. The advance payment shall be deducted by the EVSU in equal installments against the statements for the progress billings of the Services until the Advance Payment has been fully deducted.

Advance Payment shall be made only upon the submission to and acceptance by EVSU of an Irrevocable Standby Letter of Credit or equivalent value from a commercial bank, a bank guarantee or a surety bond callable on demand. issued by a duly licensed surety or insurance company and confirmed by EVSU.

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C. TERMS OF PAYMENT

The payment scheme below shall be observed in the processing of payment in favor of the Design and Build Scheme.

Mode of Payment		Percentage (%)
1	Downpayment/ Mobilization Fee	15%
2	Submission of Pre-Design Plans, Specifications, and other relevant documents required.	10%
3	Submission of duly signed and sealed Final Approved Plans, Cost Estimates, Specifications, and other documents required.	5%
4	Fifty percent (50%) Completion of Works	20%
5	Seventy Five percent (75%) Completion of Works	20%
6	Substantially Completed Works of Ninety-Five percent (95%)	20%
7	Retention Fee	10%
TOTAL		100%

The following documents must be submitted to EVSU before processing of payments to the Contractor:

- a) Progress Billing
- b) Detailed Statement of Work Accomplished (SWA)
- c) Request for Payment by the Contractor
- d) Photographs of Works Accomplished

In consideration of the payment, the Designer/Contractor agrees and undertakes to execute and complete the Design and Build Services and remedy any defects therein in conformity with the provisions of the Contract.

The Designer/Contractor shall also undertake to pay taxes in full and on time and that failure to do so will entitle the government to suspend payment for any services delivered.

XI. RESPONSIBILITIES OF THE DESIGNER/CONTRACTOR:

STAGE I:

ARCHITECTURAL AND ENGINEERING (A&E) DESIGN OF THREE (3) STOREY EVSU-BURAUEN ACADEMIC BUILDING

- 1) The Designer/Contractor shall undertake all works necessary for the A&E Design of the Three (3) Storey EVSU-Burauen Academic Building project;
- 2) Conduct preliminary engineering studies and activities required for the A&E

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Design of the proposed building project, in compliance with the provisions of relevant laws, ordinances, codes, rules and regulations;

- 3) Consult and verify with EVSU to ascertain the requirements of the proposed project;
- 4) The Designer/Contractor shall provide TEN (10) COMPLETE SETS in A1 Standard Size (including one original in tracing paper) of the approved plans/drawings, specifications and other documents of the project. However, when extra sets of plans/drawings are required, the cost of production shall be at the expense of EVSU. The Designer/Contractor shall also provide a soft copy of plans/drawings, cost estimates and other documents related to the A&E Design of the project to EVSU.

STAGE II:

CONSTRUCTION OF THE THREE (3) STOREY EVSU-BURAUEN ACADEMIC BUILDING WHICH CAN BE COVERED BY THE BUDGET.

- 1) The Designer/Contractor shall undertake all necessary Construction Works of the Three (3) Storey EVSU-Burauen Academic Building project which can be covered by the budget;
- 2) Acquire all clearances and permits (*se ANNEX G*) necessary for the Project by providing all documentary requirements without incurring require payments of fees to the Government or Agency of the Government;
- 3) The Designer/Contractor shall verify existing drawings/plans that were the basis of the project and shall make sure that all works conform to regulatory requirements.

The Designer/Contractor shall also assist EVSU in the Post-Construction Services such as but no limited to:

- a) Preparation of checklist/punchlists of the defects/deficiencies and monitor rectification works thereof;
- b) Providing As-Built plans duly signed and sealed by the concerned engineers/designer with his/her valid PRC license number, validity of license. and current PTR number affixed/stamped on every page/sheet of the document of the following:
 1. Architectural
 2. Structural/Civil
 3. Electrical
 4. Electronics
 5. Mechanical
 6. Fire Protection/Fire Prevention
 7. Other Specialty Works
- c) All As-Built Plans and Documents shall be delivered in sets as follows:

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1. One (1) set Original Copies, with the working drawings in the smallest scale of 1:100 meters prepared in CAD format, printed/plotted in Mylar paper original copies;
 2. Five (5) sets of Blueprint copies for each plan
 3. Two (2) sets of soft copies of AutoCAD plans/drawings and PDF format of Cost Estimates, Specifications, PERT-CPM, Schedule of Timeline, and other related documents in CD-ROM/Flash Drive Storage device;
 4. Other documents processed and issued in favor of EVSY during the construction period (i.e., Inspection Reports, Record Book, Building/ Mechanical/ Electrical Permits, Fire Safety Reports, Clearances, Certificates and related documents)
- d) Consolidated Project Records, Operating and Maintenance Manuals and Guides for easy reference.
- e) Assist in the preparation and issuance of Certificate of Completion of Works and Turn-Over Ceremonies.

A. Special Instruction/Information to Bidders

All the figures given in the TOR except those that are detailed by Client EVSU as a primary requirement parameter will be used only as reference or guide in preparing preliminary conceptual design and financial proposal. All references of the Project shall be field checked and verified by the Winning Bidder/Contractor.

B. Submission of Bids/Proposals Bidders/Contractors/Developers shall be required to submit their Proposals under a two-envelope system such as the following:

B.1 1st Envelope: Technical Proposal

- 1.) Complete set of Plans based from the Client Concept and requirements, statutory requirements from DOLE RA 9514 & National Building Code of the Philippines PD 1096, and other relevant standards, A2 size of convenient size and scale, in two (2) white/blue print copies, duly signed and sealed by a licensed Architect/Civil Engineer.
- 2.) Vicinity Map drawn on A1 size of convenient size and scale, in two (2) white/blue print copies, duly signed and sealed by a licensed Civil Engineer.
- 3.) Project Execution Plan to include but not limited to-
 - a. containing the list of relevant Management and Design Team, its Staff, Construction Phase Engineer’s, Material Engineer, QA/QC Engineer, Safety Engineer and Officers, Construction Foremen, Number of Skilled and Non-Skilled Workers based on Project Timeline PERT and GANTT Chart;
 - b. Hazard Identification Plan (HAZIP);
 - c. Inspection & Test Plan (ITP) for all verifiable activities that needs to be signed-off by Client EVSU;
 - d. Manpower Loading;
 - e. Material Delivery Schedule.

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- 4.) Ground Profile Levelling based on Client EVSU minimum requirement in A1 size of convenient size and scale, in two (2) white/blueprint copies, duly signed and sealed by a license Civil Engineer
- 5.) Design Schematic Diagram with narrative duly signed and sealed by respective design professionals in two copies.
- 6.) List of Tools and Equipment to be used for the execution of the contract (refer to list of minimum equipment)
- 7.) Contractor/Bidder are enjoined to provide additional information if deemed necessary to clearly illustrate their respective specifications.
- 8.) All plans, technical specifications, and cost estimates submitted by the Bidders should be correlated with one another. Should there be any difference or variation among these documents, the technical specification shall prevail which shall become the basis of bid evaluation.

B.2 2nd Envelope: Commercial Proposal

The Financial Proposal shall comprise all the required documents enumerated in the ITB including the following additional documents:

- 1.) Prescribed Financial Proposal Submission Form
- 2.) Schedule of Rates for Managerial, Technical, Supervisory, Skilled and Non-Skilled
- 3.) Schedule of Rates for Tools & Equipment;
- 4.) Schedule of Rates in the prescribed form for the Scope of Works.
- 5.) Detailed estimates/computation in coming up with the unit cost
- 6.) Summary sheet indicating the unit prices of construction materials, labor rates and equipment rentals used in coming up with the bid; and
- 7.) Cash flow by quarter and payment schedule

C. Eligibility Requirements

Requirements shall conform to the applicable provisions of Section Nos. 23-24 and Annex "G" of the revised IRR of RA 9184, as amended.

Procedures in the evaluation of the interested Contractors/Developers shall be in accordance with Section Nos. 9-12 and Annex "G" of the Revised IRR of RA 9184, as amended.

To be eligible to participate in the public bidding, prospective Contractor/Developer must pass the following criteria:

- 1.) The Contractor/Developer must have signified its intention to participate in the public bidding pursuant to the provisions of the IRR of RA 9184, as amended, as per published invitation to Submit Bids/Proposals.
- 2.) Basic Qualification: The prospective Contractor/Developer must be registered with the Securities and Exchange Commission (SEC), the Department of Trade and Industry (DTI) or the Cooperative Development Authority (CDA) with authority to conduct business whichever is applicable.

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- 3.) Financial Capability: The prospective Contractor/ Developer must meet the Financial Contracting Capacity to undertake the project, as determined through the following formula:

Net Financial Contracting Capacity (NFCC). This will establish the value or cost of the project which the Contractor can undertake. The NFCC is computed as follows.

NFCC = (Current assets minus current liabilities) (15) minus the value of all outstanding or uncompleted portions of the projects under ongoing contracts, including awarded contracts yet to be started

- 4.) Experience and Track Record Requirements:
- The prospective Contractor/Developer must have completed a single contract that is similar to the contract to be bid, and whose value, adjusted to current prices using the National Statistics Office (MSO) consumer price indices, must be at least fifty percent (50%) of the Approved Budget of the Contract (ABC) of the specified project. ***The Contract Similarity shall be defined as similar to the Major Category of Works as indicated in the Scope of Works including its specific item of works herein provided.***
- 5.) PCAB License: The prospective Contractor/Developer must possess a valid PCAB License Category License Category B, Size Range Medium A, and be Registered *with classification General Building GB1- (Building or Industrial Plant)*.
- 6.) For Contractor/Developer who does not possess the required valid PCAB License/Registration and Size Range corresponding to the contract for bidding may enter into a Joint Venture Agreement (JVA) or *consortium* with a PCAB Licensed Contractor/Developer to secure a Special License prior to the bidding of the project for the purpose of compliance with this requirement.
- 7.) List of Design and Construction Personnel and Equipment as provided under Section 10.1, iii of Annex ‘G’ of the IRR of RA 9184, as amended. The prospective Designer/Contractor’s Key Personnel must have sufficient experience in the relevant aspect of schemes similar or related to the project(s) under bidding and must own, or with lease contract and/or under purchase agreements, sufficient major construction equipment necessary to undertake the Project.
- 8.) Background and Performance Check: The BAC must ensure that a thorough background investigation have been conducted on the prospective Contractor/Developer to gain as much information possible pertinent to the identity of the prospective Contractor/ Developer, its completed and ongoing projects, financial capability, track record for the past five years, as well as its reputation.

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- 9.) Contractors/Developers who meet all of the above-cited criteria shall be considered as eligible Bidders to participate in the procurement of specific project(s) pursuant to the provisions of the IRR of RA 9184, as amended.

D. Documents to be provided to the Bidders

The CLIENT EVSU shall provide the following documents to facilitate the Bidders/ Contractors/ Developer in the preparation of their bid proposals:

- 1.) All technical data and documents related to the project.
- 2.) In order to keep the unity and integrity of the project and facilitate the review of bid proposals, the following plans as provided by the CLIENT EVSU, subject to revisions if found necessary, shall be complied with:
 - ✓ General Lay-out Plan such as but not limited to the road plans, facility arrangement plans and lighting plans.
 - ✓ Structural building plans and details
 - ✓ Electrical building plans and details
 - ✓ Mechanical Infrastructure units and details, including HVAC & fire-fighting lay-out plans & details
 - ✓ Plumbing building plans and details
 - ✓ Architectural plans such as but not limited to the elevation and sections, doors and windows schedules, toilet and kitchen details, stair details and reflected ceiling plans of the building.
- 3.) Bidders are also encouraged to use new construction materials and/or methods/ technology.
- 4.) The checklist of documents to be provided by the Client EVSU to bidders is hereto attached as Annex “A”.
 - a.) Lot Plan/ Vicinity Map/ Site Development Plan for compliance.
 - b.) Architectural Building Plans for Compliance
 - c.) Structural Building Plans for Compliance
 - d.) Electrical/ Electronic / Mechanical Plans for Compliance
 - e.) Sanitary/ Plumbing Plans for Compliance
 - f.) Minimum Technical Specifications in Comparative Form/ Presentation vis-à-vis the Bidders Proposal
 - g.) Construction Schedule (S-Curve and Bar Chart)

E. Evaluation of Bids

For detailed evaluation of the Design and Build proposals, a two-step procedure shall be adopted by the BAC. The Design and Build Committee (DBC) shall serve as the Technical Working Group (TWG) to assist the BAC in the evaluation of Bid proposals.

E.1 First-Step Procedure

The First Step Evaluation shall involve the review of the Technical Proposal and track record submitted by the Bidder/Contractor/Developer as indicated in this TOR and the Bidding Documents using the non-discretionary “pass/fail”

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criteria that involve compliance with the following requirements:

- 1.) Compliance to the documentary requirements for submission by the Bidders as enumerated in the Annexes “B” and “B1” (Technical Proposal).
- 2.) Adherence of preliminary design/plans to the required performance specifications and parameters of CLIENT EVSU to be shown in the comparative matrix; duly signed and sealed by the respective Registered License Professionals and the President/CEO of the company, for plans prepared, signed, and sealed by the bidder.
- 3.) Quality of personnel to be assigned to the project which covers suitability of key staff to perform the duties of the particular assignments and general qualifications and competence including education and training of the key staff.

E.2 Second-Step Procedure

Only those Bids that passed the above criteria shall be subjected to the Second Step Evaluation

The BAC shall open the Financial Proposal of each Contractor who passed the First-Step Procedure and shall evaluate it using non-discretionary pass or fail criteria including arithmetical corrections for computational errors — as stated in the Bidding Documents and thus determine the correct total Calculated Bid Prices. The BAC shall automatically disqualify any total Calculated Bid Price which exceeds the Approved Budget for the Contract (ABC). The total Calculated Bid Price (not exceeding the ABC) shall be ranked in ascending order, from lowest to highest. The bid with the lowest total Calculated Bid Price shall be identified as the Lowest Calculated Bid (LCB).

The LCB shall be subject to post-qualification in accordance with Section 34, Rule X of the IRR of RA 9184, as amended, to determine its responsiveness to the eligibility and bid requirements. If after post-qualification the LCB is determined to be post-qualified it shall be considered the Lowest Calculated and Responsive Bid (LCRB) and the contract shall be awarded to the bidder. In case of post-disqualification of the LCB, the procedure under Section 34 shall also be followed.

XII. DETAILED DESCRIPTION OF SCOPE OF WORKS

“Design and Build” Scheme (DBS) instruction for work items

The Contractor shall be responsible for furnishing all services and support facilities, provision of labor requirement, supply of materials, and deployment of appropriate equipment and machineries for the project. Below are some of the work and action items enumerated:

- 1.) General Work and Support Facilities Items includes but is not limited to-
 - a.) Mobilization (& Demobilization) of Staff, Personnel, and Equipment,
 - b.) Site Clearing and Provision of Field Office for Staff/Personnel,
 - c.) Posting of Project Information Billboard,

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- d.) Occupational Safety and Health Identification, Hazard Prevention, Mitigation, and Protocols, and,
 - e.) Coordination with Client EVSU who will assist the Contractor the necessary permits and clearances for project commencement.
- 2.) Design and construct the building complete with structural design analysis/computation, excavation, anchor works, backfill, compaction, all piping system, site development, if required, and all other works as specified in the TOR/specifications and approved drawings.

Site development may include some measure of erosion prevention, provision for diversion ditch for surface runoff, temporary access road, protection against livestock and/or wildlife contamination and instances that could lead to reduced surface run-off yield,

The anticipated Contractor work items for the building construction includes but is not limited to-

- a.) Temporary Site Access
- b.) Construction Safety: Barricade & Early Warning Set-up,
- c.) Excavation,
- d.) Backfill & Compaction,
- e.) Cutting & Breaking of Rock Formation,
- f.) Removal of obstruction,
- g.) Embankment works on structure excavation,
- h.) Embankment works on Cut & Fill Earthworks,
- i.) Gravel Fill,
- j.) Forms & Scaffolding Works,
- k.) Plain & Reinforced Concrete Works.

This project will focus on the foundation work of the Three (3) Storey Academic Building of EVSU Burauen Campus.

XIII. CONCEPTUAL DESIGN BASIS, & PARAMETERS

Division I – Civil Works/Earthworks/General Works

The following schemes are proposed as the conceptual design and basis by the contractor/consultant of the Detailed Design.

- 1.) DETAILED SURVEY WORKS
 - a.) All survey works shall be field checked and verified by the contractor.
- 2.) MATERIALS
 - a.) Standard materials shall follow the Blue Book prescriptions, among other things, the material requirements and construction requirements for different items of work, including the tests to be conducted during construction by any DPWH-accredited testing laboratory. The Blue Book incorporates pertinent provisions of the American Society for Testing and Materials (ASTM) and American Concrete Institute (ACI), among

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- other standards, pertaining to construction.
- b.) For other materials, these shall be subjected to standard testing procedures and approved by Client EVSU.
- 3.) ALL OTHER REQUIREMENTS SHALL BE DEFINED AND SPECIFIED IN THE PROJECT DESCRIPTION.
 - 4.) FOR ALL STRUCTURAL DESIGN AND ANALYSIS, THE FOLLOWING CRITERIA AND PARAMETERS MUST BE UTILIZED:

Standard Design Codes and References

The following standard codes and references shall be used where applicable.

- a.) American Concrete Institute (ACI) Standards
 - ✓ ACI 318 - Building code requirements for reinforced concrete structures
 - ✓ ACI 315 - Manual of standard practice for details and detailing of concrete reinforcement
 - ✓ ACI 350 - Environmental Engineering Concrete Structures
- b.) Structural Design Manual Specifications
- c.) National Structural Code of the Philippines (NSCP) 2015
- d.) National Building Code of the Philippines and its revised IRR
- e.) Philippine National Standards (PNS)
- f.) American Society of Testing and Materials (ASTM)
- g.) DPWH Blue Book
- h.) Uniform Building Code (UBC)
- i.) Steel Construction Manual (AISC)
- j.) Portland Cement Association (PCA) Concrete Information
- k.) Accessibility Law
- l.) Local Codes and Ordinances

Division II – Electro-Mechanical Works

1.) GENERAL

- a.) The Contractor shall design, furnish, deliver, install and test at site all mechanical equipment as shown on the Drawings and/or specified herein. He shall provide the necessary supervision, tools, materials, supplies and appurtenances for the proper installation, testing and operation of the completely assembled equipment. The contractor shall accomplish the work in a complete and finished manner in keeping with good supervisory practice in accordance with the drawings, manufacturer's recommendations and to the satisfaction of the Engineer.
- b.) All equipment furnished and installed shall be brand new and non-obsolete model (at most three years ex-stock), unused and guaranteed from defects in material, design and/or workmanship. No equipment nor material shall be delivered for installation on site prior to:
 - A. The return of acceptable shop drawings submitted by the Contractor in accordance with Division 7. Shop drawings of imported items which are ex-stock, shall be accompanied with importation papers to prove conformity with the three-year ex-

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stock requirement;

B. The equipment successfully passed the laboratory test to be conducted at the manufacturer's plant in the presence of authorized Client EVSU representatives. For imported equipment, certified copies of the performance test shall be furnished to the Engineer in accordance with Clause 7.02 prior to shipment. In no case shall the Contractor be allowed to deliver and install any equipment until satisfactory laboratory tests have been conducted.

C. Submission of a certificate of availability of parts and service locally for five (5) years, for all equipment supplied herewith to ensure operational viability of the installation within the said period.

All costs incidental to the above pre-delivery requirement shall be borne entirely by the Contractor.

- c.) Upon completion of the contract work, the Contractor shall arrange that a field testing be conducted on the installed equipment;
- d.) In the presence of authorized Client EVSU Engineers, the test shall be made to show that the installed equipment satisfies its specifications and operational requirements.
- e.) In the event of failure of the equipment to meet the guaranteed performance or to operate to the Engineer's satisfaction, the Contractor shall make such modifications, repairs and/or replacements and shall receive no additional compensation thereof. Failure of the equipment to meet the contract requirements in three (3) official field tests shall be a ground for rejection of the unit. Expenses to be incurred, including the travel expenses of Client EVSU, during the second, third and any subsequent official field test of the same equipment shall be charged to the Contractor/Supplier. The contract work will not be accepted, and final payment will not be recommended until a satisfactory test has been made. The test run shall be made within thirty (30) days upon receipt of the Contractor's request for such testing. Provided, however, that if the Engineer/s fail to appear and witness the test within the said period the field test shall not further delay the acceptance of the work.
- f.) Above field test shall be made only after the Contractor has furnished the Engineer, a copy of satisfactory results of his initial or preliminary tests on the equipment as part of his work and without cost to the Client EVSU. Only after all the equipment has been properly installed, tested and adjusted shall the new facilities be put into operation.
- g.) During the testing of the equipment, the Contractor shall arrange to have available, as necessary, representatives of the manufacturers of all the various pieces of equipment or other qualified persons who shall instruct the plant personnel in the operation and care thereof. These

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representatives shall have spent at least 72 working hours for the instruction and training of authorized Client EVSU representatives. A certificate of completion of this requirement shall be issued by the Client EVSU and shall form part of the Certificate of Project Completion of the contract works.

- h.) The equipment and installation shall be guaranteed for a period of at least one (1) year of trouble-free operation. A warranty certificate shall be issued by the Contractor to this effect. Effectivity date of the warranty shall start on the same day the units have been accepted. A duplicate copy of the same shall be furnished to the Engineer. The Contractor shall furnish and replace, without cost to the Client EVSU, any equipment or part that is defective or shows undue wear within the one (1) year warranty period.
 - i.) All equipment furnished under these Specifications shall comply with all applicable mandatory safety codes.
 - j.) Where materials of construction are not specified, the Contractor shall use first class commercial grades best suited for the particular use for which they are employed.
 - k.) The Contractor shall employ licensed Mechanical and/or Electrical Engineer/s to supervise the mechanical and/or electrical works as required by Commonwealth Act No. 294, known as the Mechanical Engineering Law and Republic Act No. 184, known as the Electrical Engineering Law.
- 2.) GENERAL CLIENT REQUIREMENTS
- a.) The project execution requirements shall comply, as a minimum, with the latest DOLE OCCUPATIONAL SAFETY AND HEALTH STANDARDS of 1990, and the latest version of the NATIONAL BUILDING CODE OF THE PHILIPPINES (PD 1096);
 - b.) In case of conflicting requirements between Client (EVSU), the statutory requirements and the industry standards, the requirements of Client EVSU shall prevail over the statutory requirements and industry standards, while the statutory standards shall prevail over the industry standards. Conflicting requirements shall be made known in writing to the Client EVSU within 24 hours of its discovery and shall be immediately replied within the same period of time to the Contractor on the corresponding advice and action to be taken. No change order shall be entertained;
 - c.) All Mechanical, Heating, Ventilating, and Air Conditioning Works shall be based on relevant standards, unless specified in this TOR;
 - d.) No work shall commence without an approved HAZIP and ITP for the activities sought to be accomplish;

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- e.) All works sought to be commenced shall have the necessary and mandatory managerial, supervisory, technical, skilled and non-skilled personnel as declared by the Contractor on its Project Execution Plan. Client EVSU with its representative shall check the physical site presence of these personnel, and report to EVSU the same. In cases that Contractor does not have the corresponding personnel on site, Client EVSU shall have the right to deduct corresponding amount as reflected on the values of those reported absent based from the Project Execution Plan;

3.) DETAILED CLIENT REQUIREMENTS

Welding Works:

- a.) All or any welding works shall be executed as per AWS D1.1 Standards, unless specified in this TOR;
- b.) All or any welding works of the Contractor shall comply with this enumeration, and those not enumerated shall be taken from AWS D1.1 Standards in suppletory character:
 - 1. Contractor shall prepare and submit a consolidated Inspection & Test Plan for all Mechanical, Welding, Heating, Ventilating, and Air Conditioning works for approval by EVSU QA/QC Mechanical/Welding Representative “PRIOR” to commence any work. All Contractor activities shall be monitored, recorded, supervised, and updated to the Client. EVSU QA/QC Mechanical/Welding Representative participation for each ITP listed activities shall either be monitoring, inspection
 - 2. All ITP based activities shall include among others the relevant specification requirements, the sub-section, the frequency of inspection, the Contractor Representative participation, the 3rd Party Representative participation, and the Client Representative participation.
 - 3. All request for inspection shall be in writing based on the Client-Approved Form, submitted by the Contractor along with the ITP for Review & Approval;
 - 4. Preparation of a WPS that shall be submitted to EVSU QA/QC Mechanical/Welding Representative for REVIEW, and/or APPROVAL; All welds for both WPQR & WPQT shall be subject to third- party independent NDT and Destructive Testing;
 - 5. Any change in welding parameters, weld position, and type of materials not covered by TYPE of Material Range under AWS or ASME shall be subject to another WPS;
 - 6. 20% of the Production welds selected randomly by EVSU QA/QC Mechanical/Welding Representative shall be tested using MPI, and carried-out by an approved 3rd Party Agency Representative, duly qualified and approved by EVSU QA/QC Mechanical/Welding Representative;
 - 7. All Contractor-designated/nominated welders shall undergo WPQT for the approved WPS, unless the Welder itself in the Welder who carried-out the successful welding on the WPQR;
 - 8. All accepted welds shall be duly signed and acknowledged by the 3rd Party Agency Representative/Technician and shall be reflected on the Issued-For-Construction (IFC) Drawing;

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Heating, Ventilating, and Air Conditioning (HVAC):

- a.) All laboratory rooms shall be designed as Positive Pressure Room of at least 8 Kpa “verifiable” difference.
- b.) All Air Intake units shall likewise be provided HEPA (High Efficiency Particulate Air) Filter, and with replacement filter that can be sourced either locally or domestically. The replacement filter source shall guarantee at least 15 years of post-sales replacement part availability. Such guarantee shall be in the form of an original certificate from the Supplier, duly signed and acknowledged by both the Supplier and the Contractor.
- c.) All air ventilation design calculations shall be based on at least 12 times the volume of the rooms that shall be completely replenished per hour with a range between 50% to 80% exhaust air evacuation volume that can comply with the mandatory 8 Kpa difference;
- d.) All non-laboratory rooms shall be provided with at least 6 times the room volume per hour filtered by the Air Intake Unit. No exhaust unit is required;
- e.) All rooms shall be provided with Split-Type Air Conditioning unit operating and compatible with 60 Hertz Frequency, and with the same type, size, brand, rating, and capacity for the REDUNDANT UNIT;
- f.) Each Air Conditioning Unit provided in the room is the actual requirement, and the second unit shall represent the redundant unit with the same capacity as the main unit.

Fire Fighting System

- a.) Unless specified, all Fire-fighting and fire suppression systems shall be based from Republic Act 9514 which will act in suppletory character if the Client Specification on some of the items are over and above the RA 9514 requirements. All specifications duly specified by Client over and above statutory requirements shall prevail and shall not be subject to an additional claim by Contractor. Any alternative proposal in writing by Contractor in lieu of the specified requirement by Client, even when the corresponding statutory requirements allows it to, shall only be entertained by the Client if Contractor has fully justified the reason for change, and is willing to waive at least 50% of the item cost proposed to be changed by Contractor. Such stipulation is designed to discourage introduction of changes that directly affects the quality of items preferred by Client to be used on this Project;
- b.) Fire suppression system shall be at least composed of three (3) types of pumps in a skid-mounted arrangement; namely, (1) Diesel-powered suppression pump, (2) Electric-powered suppression pump, and (3) Electric - powered 4-stage vertical pump as the jockey pump;
- c.) Minimum residual pressure shall be at least 100 psig on the remote fire sprinkler outlet;
- d.) Maximum sprinkler spacing shall be 15 ft;
- e.) Fire suppression volume shall be kept at a minimum verifiable discharge volume of 500 gpm;
- f.) Minimum Fire-Fighting Riser Pipe Diameter shall not be less than 4”Ø;
- g.) Minimum Level Distribution Pipe Diameter shall not be less than 2”Ø;

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- h.) Minimum Pipe Diameter on Sprinkler shall not be less than 1”Ø;
 - i.) Minimum sustained fire-fighting supply capability shall not be less than 30 minutes;
 - j.) Fire-fighting tank capacity shall be equal or greater than the Fire suppression volume multiplied by the sustained fire-fighting supply capability divided by 80% (20% remains unused);
 - k.) Fire-fighting tank shall be constructed as a leak-proof and monolithic reinforced concrete tank from base to side wall, and shall be verified as such by Client Representative;
 - l.) Jockey pump switch-on setting shall be at least 10 psig higher than the cut-off pressure setting of the fire- suppression pumps;
 - m.) All levels shall have at least two (2) complete set of Fire Fighting Cabinet composed of but not limited to – Fire Hose (100 ft), Fire Hose Reel, Fire Hose Nozzle, Fire Extinguisher, Fireman’s Axe, WOG Brass Gate Valve, and the clear/breakable glass cabinet which houses the items enumerated;
 - n.) All fire-fighting system components, piping, and accessories shall all be in red color;
 - o.) Minimum of two (2) – two-way commercial type fire hydrant shall be installed within 100 meters from building, but shall be pinpointed and determined on a later stage;
 - p.) All rooms and offices shall be provided with upright sprinkler head while all entrance, exits and hallways shall be provided with both upright and sidewall sprinkler head, where applicable;
 - q.) Hydrostatic Test Pressure sans the sprinkler system heads shall be carried-out at 224 psig for 2 hours hold time, and an acceptance criterion of 96% and without visible leak;
 - r.) All escape routes doors shall have a 2-hours fire rating. QA document shall be provided by the Contractor to Client EVSU from their Supplier, stating therewith its rating and compliance with the Client requirement;
 - s.) All other fire escape requirements shall be taken from RA 9514;
- 4.) SCOPE/LIMIT OF CONTRACT WORK
- The Contractor/Supplier shall be solely responsible for the supply and proper installation of all electro-mechanical equipment including all necessary requirements to fulfill the works specified herein. The contract works shall consist of but not necessarily be limited to the Design. Supply, deliver, install, testing and commissioning of following work.
- a.) Brand new units of pumping equipment which include submersible pump and motors, submersible cables, column pipes, discharge piping assembly, hypo-chlorinator unit, pump house lighting system, grounding/earthing system complete with all accessories and appurtenances in accordance with the specifications and as shown on the Drawings. Also included under pumping facilities is the pump house and the perimeter/security fencing.
 - b.) Supply, delivery and installation of Fire-Fighting Skid complete with all accessories in accordance with the Specifications and as shown on the Drawings.

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- c.) Supply, delivery and installation of distribution transformers and its protective devices, metering equipment and necessary materials and equipment to extend the single (1Ø or 3Ø) phase primary line from Electric Cooperative/local power provider nearest available up to proposed sites of various pumping stations.

5.) **EQUIPMENT PARTS AND AFTER SALES SERVICE**

The Contractor shall guarantee the availability of replacement parts and after sales service for a period of five (5) years, within the Luzon, Visayas or Mindanao areas for each piece of equipment supplied herewith. For contractors whose supplier/s has no service and parts outlet in that particular area, a Certificate of commitment from a reputable local based company to provide such parts and services shall be submitted and shall form part of the requirement prior to the provisional acceptance of the works.

- a.) The Contractor shall design, furnish, deliver, install, test and commission in accordance with these Specifications and drawings, one (1) set electro-mechanical hypo-chlorinator and one (1) set electro-magnetic flowmeter, and all other appurtenances as required in the proper installation and as specified herein and shown on the drawings.
- b.) The services of a factory representative to check the units during and after the installation shall be furnished at no cost to the Client EVSU. However, if the Contractor fails to provide the services of this representative, the Client EVSU has the right to pay the expenses incurred in the rendering of these services chargeable to the project cost.
- c.) The Contractor shall be responsible for all components, and for satisfactory installation and operation of the completely assembled unit.
- d.) Except as otherwise provided in these Specifications, any pump and motor assembly and accessories shall conform to AWWA Standard E 101-77.
- e.) The minimum pump efficiencies specified herein are the minimum laboratory efficiencies for a completely staged unit. The head capacity curve of the pump shall rise continuously to the left and the design point shall be located to the right of the point of maximum efficiency. There shall be no point within the operating range on the pump curves wherein the required horsepower exceeds the rated motor horsepower. The laboratory and field tests to be conducted on the pump assemblies shall be in accordance with AWWA Standards.
- f.) Anchor bolts for any pumps shall be furnished by the Supplier/manufacturer and set by the Contractor.
- g.) Determination of plumbness/correct alignment shall be part of pump installation.

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Division III – Electrical Works

1.) GENERAL

- a.) The Electrical Work shall consist of the furnishing, all labor, materials, tools and necessary services incidental to the proper and operation of the electrical system as specified herein and as shown on the Drawings. The Drawings and Specifications are intended to provide only a broad outline of the required equipment and system of operation and may not include all details of design and construction. Any item of work or material though not expressly shown on the Drawings or specified herein but is obviously required to obtain a usable installation shall be deemed included in the required works.
- b.) All system components shall be compatible with each other and suitable for 24-hour continuous operation.

2.) CODES AND REGULATIONS

- a.) The work under this Contract shall be done in accordance with the requirements of the latest edition of the Philippine Electrical Code (PEC Parts I and II), the regulations and requirements of power and telecommunications utilities as far as their permanent services are concerned, and the government ordinances enforced in the locality. In case of conflict with these specifications or the drawings, the preceding clause shall govern.
- b.) The Contractor shall be responsible for securing all necessary permits from the pertinent government authorities, at his expense, both for the construction and for the operation of the system upon completion of the work. The Contractor shall furnish the Client EVSU with the approved Certificate of Final Electrical Inspection.

3.) MATERIAL STANDARD

- a.) All materials, components, and equipment to be supplied and/or installed shall be of recent manufacture, brand new (at most, three (3) years ex-stock), unused and suitable for intended operation. They shall conform with U.S. Underwriter’s Laboratory (U/L) Standard for Safety, ASA, NEMA, IEC, IPCEA and ASTM in every case where such standards have been established, or with any other International Standards acceptable to the Engineer.
- b.) All materials and components shall be as specified unless specifically exempted, in which case, they shall be the best of their respective kind.
- c.) Samples of materials to be supplied shall be submitted for approval when required by the Engineer.
- d.) All electrical equipment and materials shall bear the manufacturer’s inspection label, unless exception to this requirement is inherent to a particular item.

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4.) SHOP DRAWINGS AND CATALOG DATA

- a.) The Contractor shall submit to the Engineer for approval seven (7) copies of the shop drawings of equipment and control components he intends to supply, as indicated in the drawings and specifications.
- b.) Shop drawings shall provide sufficient information to evaluate the suitability and compliance of the proposed equipment and control components with the plans and specifications.
- c.) Catalog data shall also be submitted to supplement the shop drawings. Catalog cuts, bulletins, brochures or the like, or photocopies of applicable pages thereof shall be submitted where drawings for certain items are not required to be submitted.
- d.) Should an error in the shop drawings be encountered during installation, the correction, including any field changes found necessary, shall be incorporated on the drawings and the revised drawing shall be submitted to the Engineer for review and approval.

5.) PRE-DELIVERY EQUIPMENT APPROVAL

The electrical equipment to be supplied shall be completed, assembled, wired and tested at the factory and shall be inspected and tested by the Engineer for approval prior to delivery to the project site.

6.) COORDINATION

The Contractor shall coordinate and work with all other parties with whose apparatus he shall connect part/s of the work required herein. The Contractor shall prepare drawings of details of the equipment he supplied, location of sleeves, conduits and support that may be required by other trades and shall furnish the Client EVSU with at least five (5) copies of these drawings, for the information of all parties concerned. The approval of such drawings shall not relieve the Contractor in any way from the responsibility of properly locating and/or coordinating his work with those of other parties involved.

7.) WORKMANSHIP

- a.) The work throughout shall be executed in the best and most thorough manner in accordance with the best practice of the trade involved and to the satisfaction of the Engineer.
- b.) Skilled workmen using proper tools and equipment under continuous competent supervision as required by the trade shall accomplish the works.
- c.) The Contractor shall maintain on file at the job site a set of as- built drawings incorporating all actual installation and deviations from the Drawings. The as- built drawings shall be submitted to the Client EVSU prior to provisional acceptance of the electrical works.

8.) FIELD TEST REQUIREMENT

The Supplier shall furnish labor and equipment to perform the following test:

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- a.) System Test – Each panel-board shall be tested with the power equipment connected, circuit breakers closed, and all loads and fixtures permanently connected for their intended operation for a minimum of 24 hours continuous operation in the presence of the Engineer, at the expense of the Contractor. The entire installation shall be free from any ground fault and from any short circuit. In no case shall the insulation resistance be less than that allowed by PEC regulations for Electrical Equipment of Buildings and/or manufacturer’s recommendations. Failures shall be corrected in a manner satisfactory to the Engineer.
 - b.) Performance Test and Equipment Setting – It shall be the responsibility of the Contractor to test the entire electrical system for the proper equipment operation. Setting of all protective relays, pilot devices, and auxiliary systems shall conform to operating requirements. The Contractor shall turnover the entire electrical installation to the Client EVSU in a satisfactory working condition.
- 9.) GUARANTEES
- a.) The Contractor guarantees that the supplied electrical equipment and components shall be free from any defect in workmanship or materials for a period of one (1) year from the date of Provisional Acceptance or 14 months from completion of installation, whichever comes first.
 - b.) The Contractor shall indemnify and render harmless the Client EVSU and/or the Engineer from and against all liabilities due to injuries or disabilities to persons; from damages to property; or from any and all legal and other expenses which may be incurred by the Client EVSU and/or the Engineer in defense of any claim, legal action or suit arising out of the Contractor’s performance of the Contract.
- 10.) INTERMEDIATE METAL CONDUIT (ALTERNATE RIGID STEEL CONDUIT)
- a.) General: NEMA Standard trade sizes, UL approved or equivalent material.
 - b.) Mild steel, hot dipped galvanized with inside enamel or epoxy coating.
 - c.) Size. 15 mmØ (½”Ø) minimum.
 - d.) Couplings, unions and fittings: standard, threaded
 - e.) Use limitation: As specified in the latest edition of PEC and/or NEC.
 - f.) Expansion fittings. Use for runs spanning expansion joints.
 - g.) Paint field cuts and repair damaged protective coating with red or zinc lead chromate. Conduit threads shall not be painted.

Division IV- Auxiliary Works

1.) GENERAL

- a.) Information and Communication Technology (ICT) Component
 - Installation of structured cabling system for Data and Voice Connectivity and wireless network (LAN)

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- Cabling for CCTV security system
- Packaged technical implementation and training services
- LAN main distribution should be fiber optic technology
- Structured Cabling System
- Data Connectivity
- Shall be 1RU and provide 24 modular jack ports, with universal wiring that maybe terminated to T568A or T568B
- Shall terminate the building cabling on 100-style insulation displacement connectors
- Other Requirement/s

Division V- Sanitary and Plumbing Works

1.) GENERAL

- a.) The Sanitary and Plumbing Work shall consist of the furnishing, all labor, materials, tools and necessary services incidental to the proper and operation of the electrical system as specified herein and as shown on the Drawings. The Drawings and Specifications are intended to provide only a broad outline of the required equipment and system of operation and may not include all details of design and construction. Any item of work or material though not expressly shown on the Drawings or specified herein but is obviously required to obtain a usable installation shall be deemed included in the required works.
- b.) The Contractor shall furnish all labor, materials and equipment necessary to complete all the works for the sanitary, drainage and water supply system. The owner shall provide necessary drilling of water well and shall yield substantial quantity/volume of water needed to have a functional water supply system to the project site either in rainy or dry seasons. The Owner shall likewise arrange/secure consent/approval of tapping to existing water lines if necessary or requested by authorities concerned.
- c.) All works shall comply with the provisions of the Philippine National Plumbing Code, MWSS regulations, DPWH guidelines and all other codes and ordinance other local authorities having jurisdiction over the project.
- d.) “Roughing-in” for all pipes and fixtures shall be carried along with the building construction. Correct location for the pipes shall be kept in the walls and floor as specified on the plans.
- e.) All system components shall be compatible with each other and suitable for 24-hour continuous operation.

2.) CODES AND REGULATIONS

- a.) The work under this Contract shall be done in accordance with the requirements of the latest edition of the National Plumbing Code of the

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Philippines (RA 1378), the regulations and requirements of sanitary and plumbing utilities as far as their permanent services are concerned, and the government ordinances enforced in the locality. In case of conflict with these specifications or the drawings, the preceding clause shall govern.

- b.) The Contractor shall be responsible for securing all necessary permits from the pertinent government authorities, at his expense, both for the construction and for the operation of the system upon completion of the work. The Contractor shall furnish the Client EVSU with the approved Certificate of Final Plumbing Inspection done by a registered Master Plumber.

3.) MATERIAL STANDARD

- a.) All materials, components, and equipment to be supplied and/or installed shall be of recent manufacture, brand new (at most, three (3) years ex-stock), unused and suitable for intended operation. They shall conform with U.S. Underwriter’s Laboratory (U/L) Standard for Safety, ASA, NEMA, IPC, NSPC, and ASTM in every case where such standards have been established, or with any other International Standards acceptable to the Engineer.
- b.) All materials and components shall be as specified unless specifically exempted, in which case, they shall be the best of their respective kind.
- c.) All materials must bear the trademarks as reference of the manufacturers. The Contractor shall furnish the Engineer with the original and copies of the certificate of origin of materials to be used.
- d.) All sanitary and plumbing equipment and materials shall bear the manufacturer’s inspection label unless exception to this requirement is inherent to a particular item.
- e.) Soil, waste, Vent Pipes and Fittings shall be made of Unplasticised Polyvinyl Chloride (uPVC) - Series 1000 or whatever is indicated in the drawing and as manufactured or its approved equivalent on property certificated by Bureau of Product Standard.
- f.) Water pipes shall be made of G.I Pipes and fittings shall be made of G.I or whatever indicated in the drawings and shall be approved equal in property certificated by Bureau of Product Standard.
- g.) Cleanouts shall be the same as pipe Ø, installed in connection with UPVC hubs and spigot pipes consisting of a long sweep quarter extended as indicated in the drawings. An extra heavy cast brass ferrule with countersunk trap screw cover caulked into the hub of the fittings shall be flushed with the floors.
- h.) Floor drains shall be stainless steel plated or approved equal, and

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locally manufactured.

- i.) Gate valves shall be G.I or bronze solid wedge type with screwed ends, or its equivalent as approved by the Engineer.
- j.) Plumbing fixtures and equipment shall be properly identified to illustrate the quality and design of fixtures that will be required. All fixtures shall have supply line with cut-off valves having chromium finish and shall be as manufactured by Philippine Standards as follows:
 - 1.) Water closet shall be of floor mounted tank type complete with all fittings. Color shall be approved by the Architect/Engineer.
 - 2.) Stainless Steel Sink shall be used in all counters with sink as indicated in the drawings. Lavatory shall be complete with necessary fittings.
 - 3.) Provide traps at every plumbing fixture and other equipment requiring connection to the drainage system.
 - 4.) Adapters shall be used to join pipes, fittings of different types and sizes and different combinations approved by the Engineer.

4.) SHOP DRAWINGS AND CATALOG DATA

- a.) The Contractor shall submit to the Engineer for approval seven (7) copies of the shop drawings of equipment and control components he intends to supply, as indicated in the drawings and specifications.
- b.) Shop drawings shall provide sufficient information to evaluate the suitability and compliance of the proposed equipment and control components with the plans and specifications.
- c.) Catalog data shall also be submitted to supplement the shop drawings. Catalog cuts, bulletins, brochures or the like, or photocopies of applicable pages thereof shall be submitted where drawings for certain items are not required to be submitted.
- d.) Should an error in the shop drawings be encountered during installation, the correction, including any field changes found necessary, shall be incorporated on the drawings and the revised drawing shall be submitted to the Engineer for review and approval.

5.) METHODS OF CONSTRUCTION

- a.) Each building shall be provided with sanitary facilities in accordance with the best practice for mobility of disabled persons as provided in the National Building Code of the Philippines, Accessibility Law, and by other government departments having jurisdiction.

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- b.) All work shall be done by a skilled worker only under the supervision of a master plumber. Contractor shall perform the work in accordance with good workmanlike practice to the satisfaction and approval of the Engineer.
- c.) On completion of the sanitary, drainage and water supply system and plumbing work and upon delivery of the building, the Contractor shall submit the “as-built” drawings of the entire plumbing system layout as actually installed in the building for future reference.

Sewer Line and Vent System

- a.) Sewer line and Vent System. Provide complete Sewer line and Vent System from all (Domestic) plumbing fixtures and floor drains; laid by gravity flow or pumping from lift or transfer station leading to the Sewage Treatment Plant (STP).
- b.) For Drainage Fixture Units, refer to Chapter 7, Table 7-2, NPCP.

Wastewater line and Vent System

- a.) For Estimated Demand Weight of Fixtures in Fixture Units; refer to Chapter 7, Table 7-2, NPCP.

Potable Water Supply System

- a.) Provide complete cold-water supply pipes to all plumbing fixtures. From the main water source to the cistern, the water shall be pumped to the Elevated Water Tank (EWT) and conveyed to the fixtures by gravity system and or distributed to fixtures by transfer pumped with constant pressure through a Pneumatic Storage Tank to plumbing fixture, whichever is feasible.
- b.) All potable water supply system piping shall be made of PPR PN20, and S2.5 for all PPR Fittings. Non-PPR Fittings and Fixtures must be able to handle line pressure of at least 120 psig, and a water-hammer of at least 224 psig;
- c.) All level distribution pipes shall at least have an isolation valve, pressure regulator, check valve, and blow-off valve;
- d.) An elevated stainless-steel tank with a volume capacity of no less than 8 cubic meters in two 4 cubic meters volume (4 + 4) shall be provided by Contractor, and shall be complete with pump automation switching components and accessories;
- e.) A PPR Header shall be provided for the discharge line to suite size of the PPR Riser Pipe, with corresponding check valves & drain valves for each of the tank;
- f.) A Reinforced Potable Water Cistern Tank shall be provided and constructed monolithically from the base to its side wall requiring NO waterstops and shall be subject to Client EVSU verification. The size shall be no less than a quarter of the elevated tank volume divided by 80% (20% unused volume), and shall be complete with pump automation switching components and accessories;
- g.) Sufficient electric powered pump on a minimum of 2.0 Hp shall be supplied, installed, and commissioned by the Contractor for the Potable Water Supply System, complete with pump automation switching

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components and accessories, for each of the elevated water tank, in separate piping line;

Storm Drainage System

a.) Complete Storm Drainage System shall be provided for all roofs, canopies, concrete ledges and balconies including condensate drains laid for gravity flow connected to a leader/pipeline leading to the natural ground level storm drainage network.

6.) DISINFECTION

a.) The entire water distribution system shall be thoroughly flushed and disinfected with a solution containing not less than fifty (50) parts per million (50 ppm) of available chloride. The chlorinating materials shall be either liquid chloride or calcium hypochlorite or chloride lime. The disinfecting solution shall be allowed to remain in the system for a period of sixteen (16) hours, during which all valves and faucets shall be opened and closed several times. After disinfection, the solution shall be flushed from the system with clean water until the residual chlorine content is not greater than 0.2 parts per million.

7.) MAINTENANCE

a.) The Contractor shall maintain and keep the works in good condition in accordance with Specification. During the period of maintenance, the Contractor shall make good all defects which may appear in the pipelines trench, and in the lots in which the pipes are lined.

8.) INSPECTIONS

a.) All plumbing systems for which permits are required by National Plumbing Code shall be inspected by the Client EVSU. No portion of any plumbing system shall be concealed until inspected and approved. The Client EVSU or his representative shall not be liable for expenses incurred in the removal and replacement of materials required to warrant proper inspection.

b.) When the installation of a plumbing system is complete, an additional and final inspection shall be made. Plumbing systems regulated by the codes shall not be connected to the water and energy fuel supplies nor to the sewer system until authorized by the Client EVSU and other agencies concerned.

c.) All Administrative Plumbing Personnel, Plumbing Inspector shall be a Registered and Licensed Master Plumber in accordance with the provision of Republic Act 1378.

d.) All plumbing systems shall be tested and approved as required by the codes or the Client EVSU.

e.) It shall be the duty of the contractor to notify the Client EVSU or its representative that such work is ready for inspection. The Client EVSU or its representative requires that every request for inspection be filed at least three (3) working days before such an inspection is intended.

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Such a request shall be in writing and jointly signed by the Contractor and the Contractor’s Registered and Licensed Master Plumber.

- f.) It is the duty of the Contractor requesting for inspection to provide access to and means for proper inspection of such work as well as provide all the equipment, tools, power, and water required for the test.
- g.) Additional inspections not required by the National Plumbing Code, the Client EVSU or its representative may require other inspections of the plumbing works to comply with the other provisions of other codes, other pertinent laws, and ordinances enforced by the Client EVSU or its representative.

XIV. SPECIAL CONSIDERATIONS ON THE CONCEPTUAL DESIGN:

1.) GENDER AND DEVELOPMENT ACTION PLAN

- a.) The Gender Action Plan (GAP) shall also form part of the contract. The contractor shall comply with the measures set forth in the GAP. Further highlighting the project’s benefits in terms of community development, livelihood and income opportunities, gender and participation.
- b.) The contractor shall adhere to RA 6685, apply core labor laws and regulations and incorporate applicable workplace occupational safety norms; strongly encourage to hire at least 20% women in skilled and unskilled positions in civil works; comply with GAD-related legal mandates, including prevention and response to gender-based violence.
- c.) Establish and implement a mechanism that will prevent and address incidents of sexual harassment and other forms of gender-based violence occurring in the context of civil works at work and affected or surrounding communities/areas.

XV. TERMS AND CONDITIONS OF THE CONTRACT:

A. Roles and Responsibilities

1.) Responsibilities of Designer/Contractor

- a.) Prepare and submit the Architectural, Structural, Electrical, AFSS/ Mechanical, Plumbing/ Sanitary and cost estimates including the corresponding cash flow and implementation/ delivery schedule for the review and approval of the Client EVSU within the 30-calendar day period reckoned from the issuance of the Notice to Award (NOA).
- b.) Secure all necessary permits and licenses from Client EVSU for the plans and designs on Architectural, Structural, Electrical, AFSS/ Mechanical, ABR, and Plumbing/ Sanitary. Submit copies of the permits upon approval by the concerned agencies.
- c.) Provide warranty for the complete, satisfactory and faithful performance of all works in accordance with the approved design and specifications. To guarantee the faithful performance by the winning bidder of its obligations under the contract in accordance with the Bidding Documents, it shall post a performance security prior to the signing of the contract as provided for in the Bid Data Sheet.

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- d.) Secure, for the account of the project, a Contractors All Risk and Fire Insurance equal to 100% of the project cost and maintain such insurance policy until the project has been completed and accepted by the Client EVSU.
 - e.) Coordinate and consult all matters with Client EVSU pertaining to the actual implementation of the Project through monthly submission of reports, requests and recommendations.
 - f.) Handle, coordinate, and secure all necessary permits, licenses and clearances for the Project from concerned government agencies outside Client EVSU.
 - g.) Assume any and all claims for the damages and/ or liabilities arising out of defects or imperfections in the construction or in the quality of works performed in the project.
 - h.) Shoulder all expenses related to the processing and final approval of the land development with the appropriate government agencies, which includes but not limited to payment of all fees, permits, ECC and licenses that may be required in the implementation of the Project, as well as ROW permits with DENR/ CENRO, and Cutting/ Breaking/ & Restoration Permits with DPWH.
 - i.) Facilitate the provision of water and power connection, including the payment of necessary fees.
- 2.) Responsibilities of Client EVSU
- a.) Review and approve all plans, designs, technical specifications, cost estimates, cash flow and delivery schedule.
 - b.) Secure and shoulder the cost and expenses in acquiring the land for the expansion facilities, as well any privately- owned property where ROW is required.
 - c.) Ensure compliance with requirements such as warranty for the complete, satisfactory and faithful performance of all works in accordance with the approved design and specifications.
- 3.) Advance Payment
- The winning bidder shall be provided the 15% advance payment based on the total contract cost as indicated in the Special Conditions of the Contract. However, the Advance payment may only be released after the approval of Client EVSU of the final designs of the project, submission of which by the winning bidder should be within the prescribed 30 calendar-day period stated in the Notice of Award.
- 4.) Progress Payment
- a.) The Contractor may submit a Statement of Work Accomplished (SWA) or progress billing and corresponding request for progress payment for work accomplished certified/signed by authorized

ANNEX "D"

signatories. The SWA should show the amounts that the Contractor considers itself to be entitled to up to the end of the month.

- b.) The materials and equipment delivered on the site but not completely put in place shall be excluded from payment.
- c.) The Client EVSU shall deduct the following from the certified gross amounts to be paid to the Contractor as progress payment:
 - 1. Cumulative value of the work previously certified and paid for.
 - 2. Portion of the advance payment to be recouped for the month.
 - 3. Retention money in accordance with the condition of contract.
 - 4. Amount to cover third party liabilities.
 - 5. Amount to cover uncorrected discovered defects in the works.
- 5.) Retention Money
 - a.) Progress payments are subject to retention of ten percent (10%) referred to as the "Retention Money". Such retention shall be based on the total amount due to the Contractor prior to any deduction and shall be retained from every progress payment until fifty percent (50%) of the value of works, as determined by the Client EVSU, are completed.
 - b.) If, after fifty percent of the works have been completed and the work is satisfactorily done on schedule, no additional retention shall be made; otherwise, the ten percent (10%) retention shall be imposed. A certificate shall be issued by the Implementing Unit attesting to the satisfactory completion and on schedule of the works.
 - c.) The total Retention Money shall be due for release upon final acceptance of the Works.
 - d.) The contractor may, however, request the substitution of the retention money for each progress billing with irrevocable standby letters of credit of from a commercial bank, bank guarantees or surety bonds callable on demand, of amount equivalent to the retention money substituted for and acceptable to Client EVSU, provided that the project is on schedule and is satisfactorily undertaken. Otherwise, the ten percent (10%) retention shall be made.
 - e.) The irrevocable standby letters of credit, bank guarantee and/or surety bonds, to be posted in favor of the Client EVSU shall be valid until Final Acceptance of the Project and will answer for the purpose for which the ten percent (10%) retention is intended, i.e., to cover uncorrected discovered defects and third party liabilities.
- 6.) Contract Completion
 - a.) Once the project reaches an accomplishment of ninety-five percent

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(95%) of the total contract amount, the Client EVSU shall create an Inspectorate Team to make preliminary inspection and submit a punch-list to the Contractor in preparation for the final turnover of the project. Said punch-list will contain, among others, the remaining works, work deficiencies for necessary corrections, and the specific duration/ time to fully complete the project considering the approved remaining contract time. This, however, shall not preclude the Client EVSU's claim for liquidated damages.

7.) Liquidated Damages

- a.) Where the Designer/Contractor refuses or fails to satisfactorily complete the work within the specified contract time, plus any time extension duly granted and is hereby in default under the contract, the Designer/Contractor shall pay the Client EVSU for liquidated damages, and not by way of penalty, an amount, as provided in the conditions of contract, equal to at least one tenth (1/10) of one percent (1%) of the cost of the unperformed portion of the works for every month of delay.
- b.) Such amount shall be deducted from any money due or which may become due to Designer/Contractor under the contract and/or collect such liquidated damages from the retention money or other securities posted by the Designer/Contractor, whichever is convenient to the Client EVSU.
- c.) In case that the delay in the completion of the work exceeds a time duration equivalent to thirty percent (30%) of the specified contract time plus any time extension duly granted to the Designer/Contractor, the Client EVSU may rescind the contract, forfeit the Designer's/ Contractor's performance security and takeover the prosecution of the project or award the same to a qualified Designer/Contractor through negotiated contract.
- d.) The total sum of liquidated damages shall not exceed one percent (1%) of the total contract price, in which event the contract shall automatically be taken over by the Client EVSU or award the same to a qualified Designer/Contractor through negotiation and the erring Designer's/ Contractor's performance security shall be forfeited. The amount of the forfeited performance security shall be aside from the amount of the liquidated damages that the Designer/Contractor shall pay the Client EVSU and impose other appropriate sanctions.

8.) Suspension of Work

- a.) The Client EVSU shall have the authority to suspend the work wholly or partly by written order for such period as may be deemed necessary, due to force majeure or any fortuitous events or for failure on the part of the Designer/Contractor to correct bad conditions which are unsafe for workers or for the general public, to carry out valid orders given by the Client EVSU or to perform any provisions of the contract, or due to adjustment of plans to suit existing field conditions as found necessary during construction. The Designer/Contractor shall immediately comply

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- with such order to suspend the work wholly or partly.
- b.) The Designer/Contractor or its duly authorized representative shall have the right to suspend work operation on any or all activities along the critical path of activities after fifteen (15) calendar days from date of receipt of written notice from the Designer/Contractor to the Concerned Operating Unit or equivalent official, as the case may be, due to the following:
 - c.) Peace and order conditions make it extremely dangerous, if not possible, to work. However, this condition must be certified in writing by the Philippine National Police station which has responsibility over the affected area and confirmed by the Department of Interior and Local Government (DILG) Regional Director.
 - d.) Delay in the payment of Designer's/ Contractor's claim for progress billing beyond forty-five (45) calendar days from the time the Contractor's/ Developers claim has been certified to by the Client EVSU's concerned operation unit that the documents are complete unless there are justifiable reasons thereof which shall be communicated in writing to the Designer/Contractor.
- 9.) Extension of Contract Time
The conditions of extension of contract time as stipulated in Annex “E” of the IRR of RA 9184, as amended, shall apply to this contract.
- 10.) Termination of Contract
The conditions of termination of contract as stipulated in Annex “I” of the IRR of RA 9184, as amended, shall apply to this contract.
- 11.) Warranty
In accordance with pertinent provisions of the IRR of RA 9184, as amended, the warranty against structural defects and failures shall be fifteen (15) years from final acceptance of the project, except those occasioned by force majeure.
- 12.) As-Built Plans
The contractor shall cause the preparation and submission of “as-built” plans duly signed and sealed by a professional architect/ civil/ electrical/ mechanical/ auxiliary/ sanitary engineer in the same sheet size and scale as the original drawings.

XVI. PROVISIONS FOR STORAGE AND MATERIAL HANDLING:

- 1. The Designer/Contractor shall store his materials, equipment and tools in one place of the site. The area shall be coordinated with EVSU. It shall be kept neat and clean at all times. Any damage thereto or to the surrounding area arising from any accident or damage shall be repaired and/or restored to its original condition.
- 2. Provisions for securing and safekeeping of stored materials, tools and equipment during the construction project shall be for the account of the Designer-Builder.

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XVII. CLEARING OF THE SITE:

The Designer/Contractor shall clean the whole area by removing debris, discards, and other construction wastes and leave the entire premises free from rubbish caused by their work to the satisfaction of EVSU at no extra cost.

XVIII. CONSTRUCTION SAFETY:

The Designer/Contractor shall refer to the Department of Public Works and Highways (DPWH) Department Orders and DOLE Guidelines for the construction safety on site and should be included in the submission of the Project Execution Plan.

XIX. CONFIDENTIALITY:

All relevant data such as maps, reports, plans, diagrams, designs, statistics, specifications, and other supporting records or materials prepared in the course of the design-and-build shall be the property of EVSU and shall not be used by the Designer/Contractor without the prior written approval. Print and electronic copies of such documents shall be turned-over to EVSU.

In addition, all data and information related to the project shall be treated with strict confidentiality and in no instance shall they be released or revealed to a third party without written consent of EVSU.

XX. ASSIGNMENT AND SUBCONTRACTING:

Except with prior written approval of the Procuring Entity, the Designer/Contractor shall not assign nor sub-contract any part of the design-build scheme.

XXI. INDEPENDENT CONTRACTOR:

Nothing contained herein shall be construed as establishing or creating an employer-employee or principal-agent relationship, it being understood that the position of EVSU and Contractor is that of an independent contractor.

XXII. INDEMNIFICATION:

The Designer/Contractor shall hold EVSU free and harmless from all claims, liabilities, suits and actions, demands, or damages arising from death, loss, or injuries to persons, entities, or properties, in relation to the delivery of design-and-build scheme.

In addition, the Contractor Designer agrees to protect and defend, at its own expense, EVSU against claims and liabilities arising from acts or omissions committed by the Contractor or its staff in the performance of the services including the use of copyrighted materials, patented inventions, articles or appliances, and indemnify EVSU for any damages or liabilities that EVSU may be compelled to assume arising from said acts or omissions.

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XXIII. CHANGES:

EVSU may at any time, by written notice to Designer/Contractor, issue additional instructions, changes, or alterations to the work with no additional cost unless it is mutually agreed upon and in conformance with RA 9184 and its RIRR.

XXIV. WARRANTIES OF THE DESIGNER/CONTRACTOR:

- 1) The Designer/Contractor warrants that it shall conform strictly with the terms and conditions of the Terms of Reference.
- 2) The Designer/Contractor warrants, represents and undertakes reliability of the service and that their manpower complement is hardworking, qualified, reliable and dedicated to do the service required to the satisfaction of EVSU. It shall employ highly skilled, well-behaved and honest employees with proper identification cards displayed conspicuously while working within the compound. It shall not obtain the services of any personnel of EVSU to work in any category.
- 3) The Designer/Contractor shall comply with the laws governing employee's compensation, PhilHealth, Social Security, labor standards and other laws, rules and regulations applicable to its personnel employed on account of the contracted services.
- 4) The Designer/Contractor, in the performance of its services, shall secure and maintain at its own expense all registration, licenses or permits required by national or local laws and shall comply with the rules, regulations and directives of regulatory authorities and commissions;
- 5) The Designer/Contractor, shall coordinate with authorized and/or designated personnel of EVSU in the performance of their services;
- 6) The Designer/Contractor shall be liable for loss, damage, or injury as may be due directly through the fault or negligence of its personnel. It shall assume responsibility, and EVSU shall be specifically released from any responsibility arising therein;
- 7) The Designer/Contractor shall comply with all the documentation to be required by the Commission on Audit (COA) even after completion of the Project at no additional cost to EVSU;
- 8) The Designer/Contractor shall neither assign, transfer, pledge, nor subcontract any part of or interest in the design-build contract; and
- 9) The Designer/Contractor who drew up the plans and specifications for a building shall be held liable for damages within fifteen (15) years for the design of the fit-out works they designed from the completion of the structure; the same should collapse by reason of a defect in those plans and specifications, or due to the defects in the ground.

XXV. PROJECT ACCEPTANCE AND TURNOVER:

- 1) EVSU shall coordinate with concerned entities to ensure that the Contractor and its completed work is:
 - 1.1 In accordance with the Construction Contract documents (plans and specifications) approved by EVSU.

ANNEX "D"

- 1.2 Able to perform as expected and that the building was properly constructed to allow successful testing, commissioning, and certification.
- 2) Should EVSU and concerned entities notice minor defects after completing the punch list, new items may be added to the list which the Contractor shall correct prior to final acceptance without cost to EVSU.
- 3) EVSU shall release the retention money upon Final Acceptance of the project.

The Warranty Security shall be returned after the completion of the construction of the Three (3) Storey EVSU-Burauen Academic Building one (1) year after the issuance of the Certificate of Final acceptance.

XXVI. CONFLICT OF INTEREST:

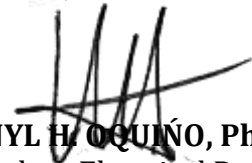
The Designer/Contractor shall provide professional, objective, and impartial advice and at all times hold EVSU's interest's paramount, without any consideration for future work, and strictly avoid situations where a conflict of interest shall arise with their other projects or their own interests. Designer/Builder shall not be hired for any project that would be in conflict with their prior or current obligations to other entities, or that may place them in a position of not being able to carry out the Project in the best interest of EVSU.

Should a conflict-of-interest situation arise in the course of the implementation of this Design-Build scheme, not attributable to any act of the Designer/Contractor, the Contractor must disclose the nature and extent of the conflict within ten (10) days from notice.

Prepared by:



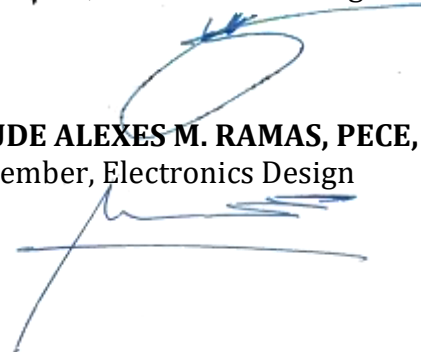
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ANNEX “D”

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Member, Geodetic & Civil/Structural Design

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Vice President for Administration and Finance

Approved by:



DENNIS C. DE PAZ, PhD
University President

ANNEX “D”

Annex - A
Architectural Design Checklist of Requirements/References

Architectural design shall conform to the following standards:

1. National Building Code of the Philippines (PD 1096) and its latest amended IRR;
2. The Architectural Act of 2004 (RA 9266) and its latest amended IRR;
3. Accessibility Law (BP 344) and its latest amended IRR;
4. Fire Code of the Philippines (RA 9514) and its latest amended IRR;
5. National Structural Code of the Philippines (NSCP) 2010;
6. National Plumbing Code of the Philippines (NPCP);
7. Sanitation Code of the Philippines;
8. Mechanical Engineering Code of the Philippines;
9. Philippine Electrical Code;
10. National Electric Code;
11. Existing Local Codes and Ordinances;
12. City Green Building Ordinance;
13. Bureau of Product Standards;
14. Energy Efficiency and Conservation Act (RA11285);
15. The Philippine Green Building Code (RA 11393)

ANNEX “D”

Annex - B
Structural Design Checklist of Requirements/References

Structural Design shall conform to the following standards:

1. National Building Code of the Philippines (PD 1096) and its latest amended IRR;
2. National Structural Code of the Philippines (NSCP) 2010;
3. Accessibility Law (BP 344) and its latest amended IRR;
4. Existing Local Codes and Ordinances;
5. City Green Building Ordinance;

Standards:

1. Bureau of Product Standards (BPS);
2. Philippine National Standards (PNS)
3. Underwriters Laboratory (UL);
4. DPWH Blue Book;
5. American Concrete Institute (ACI);
6. American Society for Testing Materials (ASTM);

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Annex - C
Sanitary/Plumbing Design/Works Checklist of Requirements/References

Sanitary/Plumbing design/works shall conform to the following standards:

Codes:

1. National Building Code of the Philippines (PD 1096) and its latest amended IRR;
2. Fire Code of the Philippines (RA 9514) and its latest amended IRR;
3. National Plumbing Code of the Philippines (NPCP);
4. Sanitation Code of the Philippines;
5. Existing Local Codes and Ordinances;
6. The Philippine Green Building Code (RA 11393)

Standards:

1. Bureau of Product Standards (BPS);
2. Philippine National Standards for Drinking Water;
3. Underwriters Laboratory (UL);
4. National Water Resources Board (NWRB);
5. National Plumbers Association of the Philippines (NAMPA);
6. Philippine Society of Sanitary Engineers, Inc. (PSSE)

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Annex - D
Mechanical Design/Works Checklist of Requirements/References

Mechanical design/works shall conform to the following standards:

Codes:

1. National Building Code of the Philippines (PD 1096) and its latest amended IRR;
2. Fire Code of the Philippines (RA 9514) and its latest amended IRR;
3. Mechanical Engineering Code of the Philippines (ME Code);
4. Existing Local Codes and Ordinances;
5. Energy Efficiency and Conservation Act (RA11285);
6. The Philippine Green Building Code (RA 11393)

Standards:

1. Bureau of Product Standards (BPS);
2. Philippine National Standards for Drinking Water;
3. Underwriters Laboratory (UL) and Factory Manual (FM);
4. International Electro-Technical Commission (IEC) 1998;

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Annex - E
Electrical and Electrical Auxiliaries Design/Works Checklist of
Requirements/References

Electrical and Electrical Auxiliaries design/works shall conform to the following standards:

Codes:

1. National Building Code of the Philippines (PD 1096) and its latest amended IRR;
2. Fire Code of the Philippines (RA 9514) and its latest amended IRR;
3. Philippine Electrical Code;
4. Existing Local Codes and Ordinances;
5. Energy Efficiency and Conservation Act (RA11285);
6. The Philippine Green Building Code (RA 11393)

Standards:

1. Bureau of Product Standards (BPS);
2. Underwriters Laboratory (UL);
3. International Electro-Technical Commission (IEC) 1998;
4. Illumination Engineering Society (IES);
5. National Electrical Manufacturers Association (NEMA)

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Annex - F

Fire Protection Design/Works Checklist of Requirements/References

Fire Protection design/works shall conform to the following standards:

Codes:

1. National Building Code of the Philippines (PD 1096) and its latest amended IRR;
2. Fire Code of the Philippines (RA 9514) and its latest amended IRR;
3. Mechanical Engineering Code of the Philippines (ME Code);
4. National Plumbing Code of the Philippines (NPCP);
5. Existing Local Codes and Ordinances;

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Annex - G
Permits and Clearances

1. BUILDING PERMIT

A. Locational Clearance Requirements (1 Copy per Document)

1. Locational Clearance Application Form duly accomplished and notarized.
2. Certified True Copy of Transfer Certificate Title (Blue Copy from Register of Deeds).
3. Certified True Copy of Tax Declaration of the property from the City Assessor’s Office.
4. Pro-Forma Affidavit
5. In case the property is not registered in the name of the applicant, submit a **duly notarized Deed of Sale or Deed of Donation or Contract of Lease or Authorization** allowing the use of the property whichever is applicable plus photocopy of Owner’s Certificate of Title or in the absence of Title, the Tax Declaration and Pro-Forma Affidavit as described in item 4.
6. Vicinity Map
5. Tax Clearance (Current Year) from the City Treasurer’s Office.
5. Barangay Clearance giving consent to the construction of the Building.
6. Project Cost (including Bill of Materials and Machineries/ Capitalization).
7. Sketch of Subdivision Plan (whichever is applicable).
8. First PAGE of Plans (Site Development and Vicinity Map).
9. Long File Folder with Fastener.
10. Long Brown Envelope.

ADDITIONAL REQUIREMENTS (AS MAY BE APPLICABLE)

11. Plumbing and Drainage Plan for two (2) or multi-storey buildings.
12. Certificate of Non-Coverage (CNC) from EMB-DENR for commercial buildings and residential buildings with 2-Storey with Roof DECK or Multi-Storey Building.
13. Environmental Compliance Certificate (ECC) for projects such as gasoline stations, warehouses, hotels, etc..
14. Special Power of Attorney (SPA) for non-owner or representative.
15. Other requirements deemed necessary for the approval of the application.

ZONING CERTIFICATION (1 Copy per Document)

1. Duly accomplished and notarized Application Form.
2. Vicinity MAP indicating clearly and specifically the exact location of the proposed site and the existing land uses and/or landmarks with a radius of at least 500 meters duly signed by a Licensed Geodetic/Civil Engineer or Architect.
3. Lot/Sketch Plan (for new structures, lot plans should be signed and sealed by a Geodetic Engineer).
4. Photocopy of Title or any proof of ownership, or right over the property and or Latest Tax Declaration.

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5. Fencing Plan (for Fencing Permit).
6. Photocopy of Deed of Sale or any applicable instrument of transfer (ROD).
7. Long File Folder with fastener.
8. Long Brown Envelope.

B. Fire Safety Evaluation Clearance Requirements

1. Fire Safety Evaluation Clearance Application Form
2. Fire Protection Plans, if applicable (refer to the Fire Code of the Philippines)
3. Cost Estimate/Bill of Materials (signed and sealed)

C. Building Permit Requirements

Technical Documents: Application forms must be duly accomplished, signed and sealed by the professionals & signed by the owner/s)

1. Building Permit Application duly filled-up and notarized Form (7 copies)
2. Sanitary/Plumbing Permit Form (5 copies)
3. Electrical Permit Form (5 copies)
4. Mechanical Permit Form (5 copies)
5. Electronic Permit (5 copies)
6. Materials Specifications (3 copies)
7. Bill of Materials, Scope of Works & Cost Estimates (6 copies)
8. Land Ownership or Permit to Use/Deed of Absolute Sale (Certified True Copy from Original)
9. Locational Clearance (from MPDC/HLURB Office) (3 copies)
10. Latest Tax Declaration (3 copies)
11. Latest Land Tax Receipt (3 copies)
12. Long Brown Envelope (5 pcs)
13. Barangay Clearance
12. Photocopies of each professional’s valid Professional Regulation Commission (PRC) ID and current Professional Tax Receipts with seal; and 3 specimen signatures of each professional

D. Building Plans at Minimum Scale 1:100m
Plans must be duly accomplished, signed and sealed by the professionals & signed by the owner/s) in Standard A1 Blueprint.

1. Architectural Plans (signed and sealed by Architect with IAPOA ID (6sets)
2. Structural Plans (with PRC ID & PTR of the Structural Engineer/Civil Engineer who signed the plans)(6sets)
3. Structural Design Analysis (for 2-Storey and above) (signed and sealed by Structural Engineer/Civil Engineer) - ATTACH SOIL BORING TEST FOR 3 STOREY AND ABOVE BUILDING (3 sets)
2. Sanitary/Plumbing Plans (signed and sealed by Sanitary Engineer/Master Plumber Engineer)(6sets)
3. Electrical Plans (signed and sealed by Professional Electrical Engineer) - ATTACH ELECTRICAL DESIGN ANALYSIS (6sets)

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4. Mechanical Plans (signed and sealed by Professional Mechanical Engineer) (6sets)
5. Electronics Plan (signed and sealed by Professional Electronics Engineer) for CCTV, Telephone/PABX, LAN, POS/computer systems, fiber optic, & Fire Detection and Alarm System (6sets)

2. GREEN BUILDING PERMIT

A. Preliminary Certificate

- a. Mandatory Requirements
 1. Construction Activity Control Pollution Prevention System
 2. Energy Efficiency Plan
 3. Water Use Reduction System with Water Efficient Fixtures
 4. Waste Management Plan
 5. Designated Smoking Area in the building layout
 6. Sewage Treatment Plant
- b. Elective Requirements
 - Land/Site Sustainability
 - i. Construction Plan with flood mitigation study
 - ii. Construction plan providing access of the public (for mixed use neighborhood)
 - iii. Construction plan providing access to establishments or services (for community connectivity)
 - iv. Parking lots with bicycles and attendant storage cabinets (for transportation involving bike racks on parking lots)
 - v. Parking Plan and layout prescribed by NBC (for transportation involving provision of adequate parking capacity)
 - vi. Construction Plan and layout showing landscape in open spaces
 - vii. Construction Plan with light-colored paving or open grid
 - viii. Construction Plan with Green Roof for plants and trees
 - ix. Construction Plan with Storm Water Management
 - Energy Efficiency (RA 1152)
 - i. Building Envelope Design
 - ii. Electrical Plan and calculations adopting highest Energy Efficient Ratio (EER)
 - iii. Architectural Plan with natural ventilation
 - iv. Electrical Plan with electric consumption reduction
 - v. Construction Plan with Renewable Energy System
Renewable Energy
 - vi. Construction Plan with Renewable Energy System
Water Efficiency
 - vii. Construction Plan with water use reduction
 - viii. Construction Plan with water use reduction involving grey water or rainwater
 - Materials and Resources
 - i. Construction Plan for construction waste management
 - ii. Architectural and Structural Plan showing layout, elevation and sectional views
 - iii. Use of rapidly renewable materials from plant
 - iv. Construction Plan of water diversion/reduction

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- v. Construction Plan of refuse disposal equipment
 - Indoor Environment
 - i. Construction Plan with indoor air quality performance
 - ii. Construction Plan with low-emitting materials involving Volatile Organic Compound
 - iii. Construction Plan with refrigerant management involving low Ozone Depleting Potential (ODP) or Global Warming Potential (GWP)
 - iv. Refrigerant Management with use of equipment long service life
 - Green Points for Management
 - i. Professionals are BERDE accredited
- B. Final Certificate
- a. Application for Final Certification for Green Building (must be applied within the time of construction period)

3. DENR CERTIFICATE OF NON-COVERAGE

Documents required:

- 1) Project Plan with Project Description, Project Layout, and Vicinity Map;
- 2) Statement of Accountability by Project Proponent on DENR Template;
- 3) Photo Documentation of the Project Site; and
- 4) Photo Documentation of the Environmental Impact Area.

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ANNEX - H

Electronics Design/Works Checklist of Requirements/References

Electronics design/works shall conform to the following standards:

Codes / law:

1. National Building Code of the Philippines (PD 1096) and its latest amended IRR;
2. Fire Code of the Philippines (RA 9514) and its latest amended IRR;
3. Philippine Electronic Code;
4. Existing Local Codes and Ordinances;
5. RA 9292 (Electronics Engineering law);
6. Energy Efficiency and Conservation Act (RA11285);
7. The Philippine Green Building Code (RA 11393)

Standards:

1. American National Standards Institute / Telecommunications Industry Association ANSI/TIA-568.2-D
2. ISO/IEC 11801-1 Ed 1.0
3. Copper certification
4. Fiber certification