



## SUPPLEMENTAL/BID BULLETIN NO. 1

**Date:** October 07, 2024  
**Title:** IB-2024-09-28 CONSTRUCTION OF LIBRARY BUILDING PHASE II  
**Reference No.:** 11275964

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.

AMENDMENT/ADDITIONAL REFERENCE	
• Checklist of Technical and Financial Documents	
(h)	Site inspection certificate
• Section IX. Checklist of Technical and Financial Documents	

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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BIDS AND AWARDS COMMITTEE



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

OUTLINE SPECIFICATIONS

NAME OF PROJECT: **CONSTRUCTION OF LIBRARY BUILDING PHASE II**

LOCATION: **EVSU TANAUAN CAMPUS, TANAUAN LEYTE**

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 Tanauan Leyte.

ITEM B.3 – PERMITS AND CLEARANCES

**GENERAL**

The Contractor shall secure necessary permits and clearances as per revised National Building Code of the Philippines before the construction commences. Clearances from other government institutions must also be acquired if deemed necessary to comply with other existing building laws and ordinances.

The Contractor shall complete the application of building permits as reflected in their submitted PERT-CPM and Construction schedule. It is the contractor's obligation and responsibility to pay all fees pertaining to building permit application including the basic fees of all the professionals/designers signing and sealing the building plans.

Once the approved building permit is given to the contractor, it is their duty to submit the approved building permit to the procuring entity thru the Physical Plant and Infrastructure Development Office (PPIDO) and post the same on site using the required tarpaulin size by the Office of the Building Official (OBO) and Commission on Audit.

ITEM B.3 – PROJECT BILLBOARD

Preparation and installation of project billboard:

1. the billboard design layout, dimension and letter sizes on white background shall be depicted on a standard billboard measuring 1200mm x 2440mm (4ft x 8 ft.) using 12.50mm (½ inch) marine plywood or tarpaulin of the same size posted on 5mm (3/16 inch) marine plywood.
2. Billboard shall be replaced with the new one adopting the above guidelines.
3. The billboard shall be installed in front of the project site.
4. Name(s) and/or picture(s) of any personages should not appear in the billboard.

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 and Fire bextinguisher for welders and painters or paint applicators.
- All other persons who are either authorized or allowed to be at a construction site shall wear appropriate PPE.







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**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 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 with 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 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.



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- (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 a 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.

**(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 stacked 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.





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**ITEM 804 (4)- GRAVEL FILL**

**SCOPE**

The work consists of gravel filling specifications required by the drawings.

**MATERIAL**

Gravel fill is composed of sand, gravel, crushed stone or mixtures thereof. They shall be selected as necessary to avoid the inclusion of organic matter, clay balls, excessive fine particles or other substances that would interfere with their free-draining properties. Unless specified in the plans, the material shall be well graded with 3-inch maximum size, no more than 50 percent by weight finer than the #4 sieve and no more than 5 percent by weight finer than the #200 sieve. The types of material used in the various fills shall be specified as one of the types described above or as described on the drawings.

**SPECIAL ITEM – COMMON BORROW**

**DESCRIPTION**

This item shall consist of the excavation and placing of suitable material obtained from locations outside the right-of-way. Excavation of roadways, roadway ditches and slopes thereof, in accordance with the typical drawings and/or as noted in the Special Provisions, either inside or outside of the right-of-way, will not be classified as Borrow Excavation. When the Consultant directs that a roadway excavation be widened from that shown on the typical drawings or as noted in the Special Provisions, for the purpose of obtaining additional material, the material excavated outside the right-of-way will be classified as Common Excavation.

**BORROW PLACEMENT**

- Place roadway excavation or borrow or both in the embankment section with the highest quality material in the top portion of the embankment.
- Scarify and compact the top 8 inches of the surface of the working platform or foundation to at least 90 percent of maximum laboratory density when the embankment height is 6 ft or less.
- Break and scarify all underlying concrete pavement surfaces so that pieces do not exceed 1 ft<sup>2</sup> before placing embankment over an existing concrete pavement surface that is outside the limits of removal or excavation shown.
- 1. Remove other pavement surfaces that are not Portland Cement Concrete
- Maintain Drainage
  - 1. Grade and maintain the roadway to ensure adequate drainage.
  - 2. Maintain drainage pipes and drainage ditches or provide temporary facilities when interrupting items such as irrigation systems, sewers, and under-drains.
- Place an initial layer to act as a working platform over soft, wet ground when approved by the Engineer.
  - 1. Density requirements do not apply to the working platform.
  - 2. Meet density requirements for embankment placed above the working platform.
- Do not place initial layer of embankment until Engineer inspects and accepts the working platform or foundation.
- Spread embankment materials uniformly in layers not exceeding 1 ft (uncompacted depth) and compact to the density requirements.
  - 1. Reduce the lift thickness or modify operations if tests show unsatisfactory density.
- Finish subgrade surface within  $\pm 0.2$  ft of line and grade.
- Do not use rock or broken concrete materials over 1 ft in any dimension.
- Distribute larger particles so space exists for placing and compacting embankment material.
- Do not place rocks larger than 4 inches or broken concrete within 1 ft of the subgrade surface.
- Do not use compacting equipment that causes shear failure in the embankment.

**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	Alternate	Class	Class	Class	Class	Class
Mm	US Standard	A	B	C	P	Seal
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 meter and air content (gravi- Metric) of concrete

T 121

Sieve analysis of fine and coarse aggregates

T 27





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Slump of Portland Cement Concrete

T 119

Specific gravity and absorption of fine aggregate

T 84

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 m <sup>3</sup>  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/m <sup>2</sup> (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





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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 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.

**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 continuous rate unless delayed by the placing operations. The intervals between deliveries 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







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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 1.5m<sup>3</sup> or less. For mixers having a capacity greater than 1.5m<sup>3</sup>, 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 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 insure 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 0.5m<sup>3</sup> 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.







**BIDS AND AWARDS COMMITTEE**

**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 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°C, 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°C, 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 insure 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.

**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 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





**BIDS AND AWARDS COMMITTEE**

(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.

**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 10mm thk and below, use grade 40.
- If RSB 16mm thk and above, use grade 40.

**ITEM 903 (2)- FORMS AND FALSEWORKS**

- Forms shall be used whenever necessary to confined concrete and shapes it requires lines and dimensions and to protect from contamination.
- Forms shall have a sufficient strength to withstand pressure resulting from placement and vibration of concrete.
- Before placing of concrete, all contact surfaces of the forms shall be cleaned of entrustment of mortals, grout and other foreign materials. Forms must be coated with standard oil that can effectively eliminate stick and stain on concrete surfaces.
- Forms shall be removed in a manner that shall prevent damage of a structure and if possible, this activity shall require a concurrence of the supervising engineer following the minimum time schedule.
- Support bottom of structures with shoring after removal of bottom forms until 28 CD.
- Any repair of surface imperfection shall start as soon as the surface is sufficiently hard to permit repair without causing further damage to concrete.



**BIDS AND AWARDS COMMITTEE**

**ITEM NO. 1004(1),(2) – HARDWARE**

**DESCRIPTION**

This item shall consist of various type 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. 2" dia. G.I pipe
- b. 1 ½" dia. G.I. pipe
- c. 2"x4" Rectangular Tube
- d. 10mm square bar
- e. 2" Tek Screw
- f. 1" Tek Screw

**ITEM NO. 1007 (1) a, b – ALUMINUM FRAMED GLASS DOORS**

**DESCRIPTION**

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

**MATERIALS REQUIREMENTS**

**Tempered Glass**

- . Glass panel shall be cleared with a thickness of 12 millimeters.
- a. All exposed edges shall be polished and rounded.
- b. All holes and notches to be drilled prior to the tempering process.

**Aluminum Channels and Hardware**

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

**Hinges**

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

**Frames**

- a. Shall be on Powder coated finish

**Adhesive- Silicone Sealant clear**

- a. Adhesive shall be water resistant resins and shall be non-staining.

**CONSTRUCTION REQUIREMENTS**

**Fabrication**

Aluminum Swing & Sliding Type Glass Doors, including frames and accessories, 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.

**INSTALLATION**

- a. Aluminum Frames shall be set plumb and square in concrete or masonry shall be fix with aluminum 100 mm lag screws for anchorage.

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**

Heavy Duty Shall be properly installed on floor.

**c. Sliding Doors Tracks**

Sliding Door Floor tracks, standard locally manufactured as per Plans shall be installed level and mounting bracket secured in place with lag screws supplied with the set.

**d.) 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.

**ITEM NO. 1008(1) a, d – ALUMINUM FRAMED GLASS WINDOWS**

**DESCRIPTION**

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

**MATERIALS REQUIREMENTS**

**Glass Panes**

-shall be 12 millimeter in thickness

**Frames**





**BIDS AND AWARDS COMMITTEE**

-shall be on powder coated finish

**CONSTRUCTION REQUIREMENTS**

**Fabrication**

Aluminum Swing & Sliding Type Glass window, including frames and accessories, 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.

**INSTALLATION**

a. Aluminum Frames shall be set plumb and square in concrete or masonry shall be fix with aluminum 100 mm lag screws for anchorage.

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. 1016 – WATERPROOFING**

Concrete Slab shall be properly graded to drain rainwater. Provide minimum pitch of 1:100 to satisfactorily drain rainwater freely into the drainage lines

**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 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.



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- 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.
- 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.

**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 insure 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 have 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.

Pull 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.

**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,





## 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;

##### Technical Documents

- (b) 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**
- (c) 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**
- (d) Valid PCAB License or Special PCAB License in case of Joint Ventures **and** registration for the type and cost of the contract to be bid; **and**
- (e) 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**
- (f) Project Requirements, which shall include the following:
  - a. Organizational chart for the contract to be bid;
  - 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**
- (g) 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.
- (h) Site inspection certificate

##### Financial Documents

- (i) The prospective bidder's computation of Net Financial Contracting Capacity (NFCC).

#### *Class "B" Documents*

- (j) 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.

### II. FINANCIAL COMPONENT ENVELOPE

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





Other documentary requirements under RA No. 9184

- (l) Original of duly signed Bid Prices in the Bill of Quantities; **and**
- (m) 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**
- (n) Cash Flow by Quarter.

