



**BILL OF QUANTITIES**

<b>NAME OF PROJECT: IMPROVEMENT OF FOOD PROCESSING BUILDING</b> <b>ABC: ₱ 2,528,352.56</b> <b>COLLEGE/UNIT/CAMPUS: MAIN CAMPUS</b>					
			<b>Bill of Quantities</b>		
Item No.	Description	Unit	Quantity	Unit Price (Pesos)	Amount (Pesos)
I	<b>Dismantling/Chipping Works</b> (Pesos _____ _____ and _____ centavos)				
II	<b>Earthworks</b> (Pesos _____ _____ and _____ centavos)				
III	<b>Concrete Works</b> (Pesos _____ _____ and _____ centavos)				
IV	<b>Masonry Works</b> (Pesos _____ _____ and _____ centavos)				
V	<b>Miscellaneous Works</b> (Pesos _____ _____ and _____ centavos)				
VI	<b>Electrical Works</b> (Pesos _____ _____ and _____ centavos)				
VII	<b>Plumbing Works</b> (Pesos _____ _____ and _____ centavos)				
VIII	<b>Fire Detection and Alarm System</b> (Pesos _____ _____ and _____ centavos)				
IX	<b>Painting Works</b> (Pesos _____ _____ and _____ centavos)				

<b>GRAND TOTAL</b>	_____
<b>Write grand total in words</b>	_____ _____ _____

Submitted by: \_\_\_\_\_ Date: \_\_\_\_\_

Name of Bidder/Bidder's Representative: \_\_\_\_\_  
 \_\_\_\_\_  
 (Signature over Printed Name)

Position: \_\_\_\_\_

Construction Company/Contractor: \_\_\_\_\_

## **CAVITE STATE UNIVERSITY**

### **SCOPE OF WORKS:**

#### **IMPROVEMENT OF FOOD PROCESSING BUILDING**

##### **A. GENERAL DESCRIPTION**

1. The project should be finished in 120 calendar days.
2. Actual site inspection is a must.
3. The area should be cleared/cleaned before and after the construction work. Unusable used formworks, excessive soil fill and all other unwanted debris of construction works should be disposed properly.
4. Cleaning up of site, clearing, hauling and disposal of waste and construction debris. Restoration of any damages shall also be done before exiting the area.

##### **B. TECHNICAL DESCRIPTION**

###### **I. Dismantling/Chipping Works**

This work consist of chipping of the existing tiles, and some portion of concrete flooring for the proposed trench inside the building to conform with good manufacturing practices as per requirements in Food Processing Building, also included the dismantling of the existing aluminum frame wall partition, doors & windows and interior ceiling particularly the fiber cement board excluding the frame and to be replaced by spandrel ceiling.

###### **II. Earthworks**

This work consists of excavation, removal and disposal of all materials required for the construction of structures including backfilling, compacting, sloping, disposing of surplus materials and cleaning up of the site. It also includes all necessary clearing & grubbing within the area and additional fill.

###### **A. Staking out the building lines**

1. The building lines shall be staked out and all lines and grades shown in the drawing established before any excavation is started. Batter Boards and reference marks shall be erected at such places where they will not be disturbed during the excavation of the building.

###### **B. Mobilization**

Provide the following:

- Billboard, Bunkhouse with office, Temporary comfort rooms, Site enclosure

###### **C. Excavation**

1. All excavations shall be made to grade indicated in the drawings. Where the building site is covered with any kind of fill, the excavation for footings should be made deeper until the stratum for safe bearing capacity of the soil is reached.
2. Excavations carried below indicated depths will not be permitted except to remove unsatisfactory materials. Unsatisfactory materials encountered below grades should be removed and replaced as directed with satisfactory materials at no additional cost to the end user and the same shall be placed and compacted as specified.
3. Satisfactory excavated materials required for backfill shall be separately stockpiled as directed. Unsatisfactory and surplus excavated materials not required for backfill shall be disposed in the designated waste area.
4. Whenever water is encountered in the excavation process, it shall be removed by bailing or pumping, care being taken that the surrounding soil particles are not disturbed or removed.

###### **D. Backfills**

1. After concrete for foundations is hard enough to withstand pressure resulting from fills, materials removed from excavations shall be used for backfill around them.
2. Backfill and fills shall be placed in layers not exceeding **150mm** in thickness, and each layer shall be thoroughly compacted by wetting, tamping and rolling.

###### **E. Earthfill**

1. Earthfill is composed of natural earth materials that can be placed and compacted by construction equipment operated in a conventional manner to level the area to be filled with concrete.

###### **F. Grave fill**

1. Filling of gravel at least 2" of thickness in compacted soil before concrete pouring operated in a conventional manner to level the area to be filled with concrete.

#### **G. Disposal of excess and unsuitable materials**

1. Any excess materials resulting from all earthwork operation not required or unsuitable for backfill as directed by the project inspector, shall be disposed by the contractor at his expense.

### **III. Concrete Works**

#### **A. Cast-in place Concrete**

1. This work includes furnishing of materials, equipment and perform labor required to complete cast-in-place concrete works. Refer to drawings and plans for sizes, details, locations and extent of work required.
2. All concrete works shall be done in accordance with the standard specifications for plain and reinforced concrete as adopted by the Government. Portland cement shall conform to the specifications for **PORTLAND CEMENT ASTM C 150** for Type I Portland Cement; Type III for High early strength portland cement. Cement shall be any standard commercial brand in 40 kgs. Per bag such as: Filipinas, Union, Republic, Apo or other locally available equivalent.
3. The fine aggregates shall consist of natural sand, or of inert materials with similar characteristics, having clean, hard and durable grains, free from organic matter or loam and shall conform to ASTM C-33 or C-330.
4. The coarse aggregate for concrete shall consist of crushed rock of durable and strong qualities, or clean and hard gravel. Size of coarse aggregate to be used shall vary from 20mm to 40mm (3/4" to 1-1/2"). Maximum size of aggregate shall not be larger than 1/5 of the narrowest dimension between sides of the forms nor larger than 3/4 of the minimum clear spacing between reinforcing bars.
5. Water to be used for mixing concrete shall be clean and free from injurious amount of oil, acids, alkalis, salts and other organic materials.
6. Concrete strength to be adopted shall be 3,500 psi @ 28 days. All applicable provisions of the ACI-318-71 Building Code Requirements for Reinforced Concrete shall be applied herein.
7. The following proportions of concrete mixtures shall be used for the various parts of the building:
  - a. **Columns and footings - Class A (1 : 2 : 4)**
  - b. **Wall footings - Class B (1 : 2.5 : 5)**
  - c. **Reinforced concrete beams and slabs - Class A (1 : 2 : 4)**
  - d. **Concrete slab floor on fill - Class C (1 : 3 : 6)**
  - e. **Septic vault cover - Class A (1 : 2 : 4)**
8. All concrete shall be mixed thoroughly until there is a uniform distribution of the cement and the aggregates, and should be deposited as nearly as practicable in its final position, care being taken to avoid segregation of the aggregates.
9. All concrete work shall be protected from drying out after removal of forms by covering with waterproof paper, polyethylene sheeting, burlap, with a coating of approved membrane curing compound having a moisture retention equal to 90% based on ATM C-309 and C-156, applied in accordance with the manufacturer's instruction for use.
10. Wet burlap as often as required to keep concrete wet throughout each day for a period of at least 7 days where normal portland cement is used and 3 days where high early strength cement is used.
11. Reasonable number of tests on the concrete may be required by the owner during the progress of the work. Not less than two (2) cylindrical specimens shall be reserved for the 28th day test. The Contractor shall pay for the cost of material testing.
12. Compression and slump test shall be made for every 50 cu.m. of concrete or a fraction thereof; but not less than 1 set of test shall be made from any one batch of concrete and all 3 tests shall be made from the same batch.
13. In case of failure of test cylinders to meet the specified strengths, the Contractor shall at his expense obtain concrete core samples from the poured concrete and the compressive strength of same be taken by a competent testing authority to determine the conclusive strength and integrity of the concrete poured.

#### **B. Metal Reinforcement**

1. All steel reinforcing bars to be used in this construction shall consist of round deformed steel bars with lugs or projections on their sides to provide a greater bond

between the concrete and the steel. All steel reinforcing bars to be used shall be Grade 40. Reinforcing bars shall conform to ASTM Specifications A-615.

2. All steel reinforcing bars shall be accurately placed and secured against displacement by tying them together at each bar intersection with Gauge No. 16 galvanized iron wire. Provide bar supports and other accessories necessary to hold reinforcing bars in the proper positions while concrete is being placed.
3. The steel reinforcing bars indicated for footings, columns, slabs, beams, girders and other concrete members shall all conform to the number, size and spacing as indicated in the drawings or schedule of steel reinforcements.
4. No metal reinforcement shall be installed in place unless it is free from rust, scale or other coatings, which will destroy or reduce the bond with concrete.
5. The contractor shall furnish 2 copies of the manufacturer's certificate of mill tests of all reinforcing steel. The contractor shall at his own expense employ an approved testing laboratory which shall conduct testing of all reinforcement sizes of each bulk under the supervision of the project inspector.

#### IV. Masonry Works

This work includes furnishing of materials, equipment and perform labor required to complete concrete unit masonry and tile works. This also include plastering as required and specified in the plans.

##### A. CHB Laying

1. Concrete unit masonry work of the type and thickness indicated shall be provided and shall be properly coordinated with the work of other trades. All concrete masonry works shall be in accordance with the requirements of the Building Code.
2. Concrete hollow blocks shall be of standard manufacture, machine vibrated and shall have fine and even texture and well-defined edges.
3. All exterior concrete hollow blocks to be used for walls shall be at least **150mm. thk.** while concrete hollow blocks for interior walls unless otherwise indicated, shall be **100mm. thk.** For interior CHB where plumbing pipes and fittings shall be located, the thickness shall be at least **150mm. thk.**

The concrete hollow block walls shall be laid, and the cells filled with cement mortar consisting of 1 part portland cement and 3 parts sand by volume. They shall be reinforced with round deformed reinforcing bars **10 mm. Ø**, spaced not more than **0.80m** on center, both ways. The mixture of cement plaster for concrete hollow block wall finishes shall be 1 part cement and 3 parts sand.

4. All exposed surfaces of concrete hollow block walls shall be finished with the specified materials indicated on the elevation drawings.

#### V. Miscellaneous Works

1. This work includes the furnishing of materials, equipment and labor required for the completion/installation of doors and windows as shown in the drawing. See architectural drawings for details, locations and other requirements.
2. Supply and installation of the following:

##### Doors

- |          |  |
|----------|--|
| 1.0 set  | D-1 1.40m x 2.50m Manual galvanized 0.6mmm shutter roll-up door with box |
| 1.0 set  | D-2 1.60m x 2.50m Manual galvanized 0.6mmm shutter roll-up door with box |
| 1.0 set  | D-3 0.80m x 2.10m Steel door   |
| 3.0 sets | Door Closer 80kgs. Capacity Y604-H                                       |

##### Windows

- |          |                                     |
|----------|-------------------------------------|
| 4.0 sets | W-1 0.85m x 2.35m uPVC Fixed Window |
| 3.0 sets | W-2 1.17m x 1.17m uPVC Fixed Window |
| 2.0 sets | W-3 1.15m x 2.35m uPVC Fixed Window |

3. Safety precaution and procedure shall be observed in determining the sizes and in providing the required clearances by measuring the actual opening to receive the glass.
4. Glass breakage caused in executing the work or by faulty installation shall be replaced by the contractor without extra cost.
5. All glass shall be accurately cut to fit openings and set with equal bearing on the entire width of plane.

6. Improperly installed glass which does not fully meet the requirements of its grade will not be accepted and shall be replaced without extra cost.
7. Doors, windows, door frames and window frames shall conform to the sizes, designs and kind of materials shown in the detail or schedule of doors and windows.
8. Trench Cover  
Use galvanized steel grating sewer cover drain plate 300 x 1000 x 30 x 3
9. Stainless Railings  
Use 1 3/4" stainless pipe for steel handrails and railings.
10. Spandrel Ceiling  
Use 0.40mm thk spandrel for the interior ceiling with 6" x 8' end molding.
11. PVC Curtain Strip Kit  
Use PVC curtain door strip kit complete with hanging rail kit stainless steel ss 304 size: 2mm thk. X 200 mm (w) x 2.20 m (l)
12. Scaffolding Rental  
Scaffolding for RENT (H-frame) Galvanized Iron(H-frame) Thickness: Schedule 40  
Height : 1.7m Width : 1.2m .  
1 set is inclusive of 2 cross braces.

## VI. Electrical Works

1. Supply and installation of panel board and circuit breakers in accordance with the plan.
  - a. MDP - Main (150AT, 200AF, 3P, 230V, MCCB) and Branches (1-50 AT 3P, 2-50 AT 2P, 8-30 AT 2P, 1-20 AT 2P, 1-15 AT 2P, and 1-spare
  - b. Disconnecting Mean - Main (150AT, 200AF, 3P, 230V, ECB) in Nema 3R enclosure (1 set) to be installed in service entrance concrete pedestal.
  - c. 50 AT, 2P, 230V circuit breaker w/ NEMA 3r Panel enclosure for Special Equipment (2 sets).
  - d. 50 AT, 3P, 230V circuit breaker w/ NEMA 3r Panel enclosure for Special Equipment (1 set).
  - e. 30 AT, 2P, 230V circuit breaker w/ NEMA 3r Panel enclosure for ACU (2 sets).
  - f. Manual Transfer Switch with 2-150 AT MCCB and NEMA 3r Metal Enclosure (1 set).

**NOTE: Bolt-on type, NEMA Standard should be used.**
2. Supply and installation of copper conductors wires, PVC/IMC/RSC conduit, junction, AMCO & utility box electrical panels to electrical devices.
  - a. PVC orange conduit pipe for all embedded electrical raceway.
  - b. RSC or IMC pipe for service entrance and all exposed electrical raceway.
  - c. THHN/THWN copper conductor wire. Phelps dodge or approved equal.  
Refer to Schedule of loads for proper color coding of wires.
  - d. Utility and junction boxes should be PVC deep type.
  - e. Support brackets/hangers, clamps and rods should be galvanized steel
3. Supply and installation of electrical fixtures/switches/outlets and other electrical devices in accordance with the plan.
  - a. 36W LED Panel lighting, recessed, 4 ft. (15 sets).
  - b. 18W LED Panel lighting, recessed, 2 ft. (1 set).
  - c. Emergency light twin head and outlet (2 sets).
  - d. Wide series switches (Bticino, National or its equivalent).
  - e. Two-gang universal type convenience outlets with ground (Bticino, National or its equivalent).
  - f. Two-gang universal GFCI type, 20 Ampere for SPO (5 sets).
  - g. Electric KWH meter, Three Phase, 230V, 200 Amps, 60 Hz, 4 wire, Digital Type with ST7 Meter base."
  - h. Ceiling mounted Exhaust Fan (6 sets). Include air duct and vent.
4. Supply and installation of electrical service entrance concrete pedestal, copper conductor wires, metal conduits and accessories. See E-6 specification and details.
5. Electrical wiring and layout is to be connected from MDP to the existing feeder line. Provide the necessary connectors & equipment for the wiring installation.
6. 30 kW, three phase, 230 V, 60 Hz, Diesel Power Generator set (including its generator housing with slab and lock).

7. Include tapping to the source, electrical testing and commissioning.
  - a. Phase sequence test.
  - b. Continuity test.
  - c. Insulation test.

**NOTE: Electrical testing and guarantee, electrical supervision and final electrical inspection report should be signed and sealed by Professional Electrical Engineer with notary public.**

8. Consult inspectors for details and extent of work.

## **VII. Plumbing Works**

1. This work includes the furnishing of materials, labor, tools and equipment to complete the plumbing system of the building. Refer to the drawings for location and extent of work involved.
2. This work shall include the furnishing and installation of the following each complete and in proper operating condition.
  - a. Single compartment and three compartment stainless 304 kitchen sink with foot operated faucet complete with all accessories.
  - a. Brass floor drain

All works shall be executed in full accordance with the requirements of all governmental agencies having jurisdiction thereof and with the requirements and recommendations of the following:

- a. National Plumbing Code of the Philippines
  - b. Underwriter's Laboratories
  - c. All applicable codes and ordinance of the municipality and laws of the Republic of the Philippines
3. It is not intended that the drawings shall show every pipe, fitting and valve. However, all such items whether or not specifically mentioned or indicated in the drawings, shall be furnished and installed if necessary to complete the system in accordance with the best of trade and to the satisfaction of the project inspector.
  4. Pipes and fittings for water supply line shall be **Polypropylene Random Copolymer (PPR)**
  5. For soil, vent, waste pipes and fittings, all pipes and fittings for sewer lines must be **Polyvinyl Chloride (ORANGE) S-1000**.
  6. Clean-outs shall be of the same size as the pipe consisting of a long sweep quarter bend or 1/4 bend extended to an easily accessible place.
  7. Joining material shall be **polyvinyl chloride cement**.
  8. Septic tank shall be of the size, shape and design indicated and shall be provided complete with all appurtenances required including manhole cover.
  9. Plumbing fixtures including faucets shall be with the best quality. American standard or its equivalent. See plans for the extent of work required.
  10. Install pipes approximately as shown on the drawings and as directed during installation, as straight and as direct as possible, forming right angles or parallel lines with walls and other pipes neatly spaced. Keep all horizontal runs of piping except where concealed in partitions, as high as possible and close to walls. Maintain a minimum slope of 0.01 (1/8" fall/foot) on all soil and drain lines.
  11. Horizontal waste pipe 3" Ø and smaller shall have a minimum grade of 6 mm (1/4") per foot and 4" Ø and larger shall be 1/8" per foot. Vertical vent pipes may be connected to a vent line carrying other fixtures. The connection must at least be 1.20 m. (4 feet) above the floor on which the fixtures are located to prevent the use of any vent lines. Horizontal waste lines receiving the discharge from two or more fixtures shall be provided with vents, unless separating venting of fixtures is noted.
  12. Do not cover or enclose work until it has been properly and completely inspected and approved. Should any work be covered up or enclosed prior to all required inspections and approvals, uncover the work as required. After it has been completely inspected and approved, make all repairs and replacements with such materials as necessary to the approval of the project inspector.

## **VIII. Fire Detection and Alarm System**

1. Supply and Installation of conductors, PVC conduit/junction box and accessories.
2. Supply and Installation of the following:

- a. 2-units stored pressure type HCFC 123 CEA fire extinguisher
- b. 1-unit fire alarm bell with control
- c. 1-unit fire alarm control panel (addressable type)
- d. 3-units smoke detector
- e. 1-unit heat detector
- 3. Include testing and commissioning.
- 4. Consult inspectors for details and extent work

## IX. Concrete Works

### A. Concrete/Masonry

- 1. This work includes the painting of some portions of CHB wall and interior flooring using a power floor to conform the requirements with good manufacturing practices.
- 2. Repair minor surface imperfections with a skim coat. Let dry, sand then, spot coat with top coat color.
- 3. Apply two coats of colored factory mixed dirt resisting semi-gloss latex.  
**Note: Color of paint will depend upon the preference of the end-user. Paints and its accessories should be BOYSEN or approved equal.**
- A. For color/types of any fixtures or materials to be used on site, consult the end-user and the inspector for approval. Consult the plan and the scope of work for the extent of tasks of the contract. If possible, let the end-user sign your sample as proof of approval.
- B. The plans, detailed drawings and these specifications shall be considered as complementing each other, so that what is mentioned or shown in one, although not mentioned or shown in the other, shall be considered as appearing on both. **In case of conflict between the two, generally, the scope of work prevails.**
- C. Resident site engineer is a must for the projects to be undertaken by the contractor of the university. Safety engineer is a must as per DOLE requirement. **Note: All key personnel should be included in the list of personnel for submission.**
- D. In cases of participation in two or more projects, the set of workers and foreman shall be different per project, however, the set of engineers and equipment may be reused.
- E. Construction safety and health program as well as construction schedule (PERT/CPM/S-Curve) shall be provided by the winning bidder.
- F. All public utilities used by the winning contractor in the construction of the project, such as electricity, water, telephone, etc., shall be for the sole account of the contractor.
- G. See plans/consult the end-user and project inspector for details and extent of work. The silence of specifications, plans, special provisions and supplementary specifications as to any detail, or the apparent omission therein of detailed description or definition of the quality of materials and workmanship shall be regarded to mean that only materials and workmanship of first-class quality are to be used or employed.