



**Project Title:** CONSTRUCTION OF PAGASA BOAC SYNOPTIC BUILDING,  
OBSERVER'S QUARTER, POWERHOUSE, FENCE GATE AND  
SIGNAGE

**Project Location:** Brgy. Tanza, Boac, Marinduque

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## SCOPE OF WORKS AND SPECIFICATIONS

### SCOPE OF WORKS

- Staking and Layout
  - Stake out the building footprint as per architectural drawings.
  - Ensure accurate positioning of corners, walls, and other structural elements.
- Building Permit Application
  - Prepare and submit the building permit application.
  - Address any additional requirements as requested.
- Site Preparation
  - Clear the site of existing structures, vegetation, and debris.
  - Excavate, grade, and level the site.
  - Prepare the site for utility installation (water, electricity, sewage).
- Foundation
  - Excavate and prepare the foundation.
  - Install appropriate foundation systems (footings, tie beams).
  - Place and compact fill material.
  - Reinforce and pour concrete to form the foundation.
- Structural Elements
  - Erect structural walls and columns.
  - Install beams and roof supports.
  - Construct the roof structure (trusses, framing system).
- Building Envelope
  - Install exterior wall systems (masonry wall).
  - Construct the roof (roofing materials, insulation, drainage system).
  - Install windows, doors, and exterior openings.
- Mechanical, Electrical, and Plumbing Systems
  - Install plumbing systems (piping, fixtures, drainage).
  - Install electrical wiring, outlets, and lighting fixtures.
  - Install emergency lights.
- Interior Finishes
  - Install interior walls.
  - Install ceiling (framing system, ceiling board)
  - Apply finishes to walls (plastering, painting, tiles)
  - Install flooring materials (tiles)
  - Install interior doors, frames, and hardware.
  - Install cabinetry.
- Exterior Work
  - Complete exterior finishes (painting)
  - Install ceiling eaves
  - Install Fascia board
  - Install exterior fixtures (lighting, signage)
  - Construct concrete bench.



- Construct pavements between the two buildings.
- Project Closeout
  - Perform final inspections and address any punch list items.
  - Prepare as-built drawings and documentation.

## **GENERAL REQUIREMENTS**

- The Contractor shall provide all materials, equipment, tools, labor, and supervision required for the complete construction of the project.
- To ensure proper phasing or scheduling of work, the Contractor must coordinate all work with all parties.
- Contractor must provide end-user with complete specifications and a product sample for evaluation. Inspection of the Project-in-Charge shall be required prior to installation of any item/material during the construction.
- The Contractor shall promptly remove from the premises all trash, debris, and such weekly and after the completion of all works. Restore all areas that were damaged as affected by the construction works and leave the site clean to the satisfaction of the Project Inspector or his representative and the End-user.
- All materials removed from the unit shall be properly documented prior to turn-over to the End-user for proper safekeeping.
- Provision of Temporary Facility for workers shall be coordinated with the Project-in-Charge in order to provide a proper location and establish rules and regulations as the site consists of equipment and is on the premises of a workplace.
- To protect the building, create a temporary enclosure in each location. All of the building facilities must be adequately covered by such covers throughout the duration of the project.
- To ensure proper installation of all framing systems and protection of the area, the Contractor should provide, at its own expense, the necessary scaffoldings, board-ups, safety nets, and similar items.
- Construction requirements of each pay item must be in accordance with the DPWH “Standard Specifications for Public Works Structures Volume II”

## **UTILITY SERVICES**

- For the Utility Services/Consumption such as water and electric power, provision of electric and water meter shall be provided by the Contractor. All utility consumption shall be provided with meters to limit the usage of such during the construction period. Payments of the bill shall be at the expense of the Contractor.



## **SITE MONITORING**

- Site Monitoring shall be a must for the Contractor to effectively implement the Project. Any discrepancies in plans and on the actual site shall be properly coordinated with the Project Monitoring Engineer for verification.
- Regular coordination meetings shall be done between the Contractor or its representative and the Project Monitoring Engineer.
- Progress Photographs shall be documented by the Contractor
- A logbook shall be available at the site. It shall contain the daily activities on the site, including weather conditions, delivery, manpower, and other matter pertaining to the situation of the project. It will also serve as data for the Contractor and Project Monitoring Engineer.
- Existing conditions of the work site shall be documented by the contractor and photos shall be taken before the commencement of work to ensure such status. Any damage on the areas due to the contractor's ongoing works shall be refurbished at his expense.

## **SPECIFICATIONS**

### **Part B – OTHER GENERAL REQUIREMENTS**

#### **1. Project Billboard / Safety Signage**

- The Contractor shall install two (2) Project Information Signs at/or near the beginning and the end of the project or at the discretion of the Engineer. The new billboard layout and dimensions are as follows:
  - Tarpaulin Dimensions: 1.22m x 2.44 m
  - Thickness of Marine Plywood: 5mm
  - Background: White

The billboard shall consist of the following data:

- ✓ Name of Project
- ✓ Location
- ✓ Name of Contractor
- ✓ Date Started
- ✓ Contract Completion Date
- ✓ Contract Cost
- ✓ Implementing Office
- ✓ Sources of Fund

#### **2. Emergency Evacuation Signage**

- The Contractor shall install four (4) Emergency/Fire Evacuation Plans: two (2) in the Office Area and two (2) in the Observer's Quarter. These plans shall be posted on every floor and in strategic areas of the building, prominently displayed on the door.



The plans must clearly show the route from each room to the appropriate exits. The specifications are as follows:

- ✓ Dimensions: 8.5 in x 13 in
  - ✓ Material: Arcylic base with a photoluminiscent background
- The Contractor shall install three (3) Fire Exit Signs on doors leading to accessible exits. The specifications for the signs are as follows:
    - ✓ Dimensions: 4 in x 12 in x 3mm
    - ✓ Material: Red Arcylic base with a photoluminiscent “Fire exit” label

### **3. Occupational Safety and Health Program**

- This item covers the implementation of construction safety in all stages of project procurement, including requirements, provisions, and instructions for the guidance of the Engineer.
- The Contractor shall furnish their workers with protective equipment for eyes, face, hands, and feet, lifeline, safety belt/harness, protective shields, and barriers whenever necessary due to the hazardous work process or environment.
- For General Construction Work, the required basic PPEs for all workers shall be Safety Helmet, Safety Gloves, and Safety Shoes. Workers within the construction project site shall be required to wear the necessary PPE at all times. Moreover, all other persons who are either authorized or allowed to be at a construction site shall also wear appropriate PPEs.
- All Personal Protective Equipment (PPE) is subject to the approval of the Project Monitoring Engineer and should meet specified standard requirements:
  - The Safety Helmets/Hard hat shall meet the specifications contained in the technical guidelines issued by the Specialize department in accordance to international standards- OSHA or ANSI z89. Safety Helmets should be inspected by the safety officer to ensure that it is safe and reliable to use. It should be free from cracks and proper shock-absorbing lining of the helmet and should be in good condition.
  - Safety Shoes must meet the minimum requirements according to PNS ATM F2412:2016 and PNS ASTM F2413:2016 for the impact resistance and compression resistance at the toe area of the footwear
    - Impact Resistance – 75 ft-lbs (101.7 J)
    - Compression Resistance – 2500 lbs (11,121 N)

### **4. Mobilization / Demobilization**

- This item includes the mobilization process, relocation/transfer of existing office furniture and equipment to the designated temporary location.
- The demobilization process shall include clearing the affected areas of all rubbish, debris, and all unnecessary building materials. It aims to restore all areas that were damaged by the works and leave the site clean to the satisfaction of the Project Monitoring Engineer and/or the End-user.



## Part C – EARTHWORK

### 1. Item 803(1)a – Structure Excavation

- This Item shall consist of the necessary excavation for the foundation of the building. This Item shall include the removal of all materials of whatever nature encountered including all obstructions of any nature that would interfere with the proper execution and completion of the work.

#### Scope of Work

- Clearing and Grubbing of the area
- Foundation excavation
- Compaction of soil

#### Material Requirements

- The excavation of the following shall be in accordance to the measurements provided at the plan;
  - ✓ Column Footing
  - ✓ Wall Footing
  - ✓ Septic Tank
  - ✓ Concrete Canal

### 2. Item 804(1)a – Embankment

- This Item shall consist of the construction of an embankment using suitable materials of various compositions and compacted in accordance with this Specification and in conformity with the lines, grades, and dimensions shown on the Plans or established by the Project Monitoring Engineer.

#### Scope of Work

- Soil Embankment using suitable materials free from debris and shall be compacted.

#### Material Requirements

- Use suitable materials that is free from debris and shall be compacted.

### 3. Item 804(7) – Gravel Bedding / Gravel Fill

- This Item shall consist of the construction of embankment using gravel and compacted in accordance with this Specification and in conformity with the lines, grades, and dimensions shown on the Plans or established by the Project Engineer.

#### Scope of Work

- Gravel Fill shall be constructed below the original ground elevation.
- Compaction of Gravel Bedding

#### Material Requirements

- The compacted thickness for each bedding are as follows:
  - ✓ Column Footing: 100mm thick
  - ✓ Wall Footing: 100mm thick



- ✓ Grade Beam: 100mm thick
- ✓ Slab on Grade: 100mm thick
- ✓ Pavement: 100mm thick
- All subsequent layers shall be spread and compacted in a similar manner. Gravel fill shall be in accordance with the approved Plan and conform to the applicable requirements of earth embankment.

## **Part D – REINFORCED CONCRETE**

- This Item shall consist of furnishing, placing, and finishing concrete in buildings and related structures in accordance with this Specification and conforming to the dimension shown on the Plans.

### **1. Item 900 – Structural Concrete**

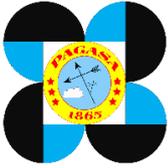
- The work to which this refers includes all operations necessary for the supply and delivery of all materials, labor, equipment, and all associated activities. This shall conform in the recommendations of the “National Structural Code for Buildings” published by the Association of Structural Engineers of the Philippines.

#### Scope of Work

- Concreting works of the following:
  - ✓ Footing
  - ✓ Wall Footing
  - ✓ Grade Beam
  - ✓ Column
  - ✓ Beams
  - ✓ Slab on Grade
  - ✓ Concrete Gutter
  - ✓ Concrete Bench
  - ✓ PWD Ramp

#### Material Requirements

- Class “A” Mixture Concrete
- 3000 psi Compressive Strength
- Cement to be used shall be Type I conforming to the ASTM C-150
- Fine and coarse aggregates shall be obtained from the approved source as determined by DPWH and shall conform to ASTM C-33
- Water shall be potable and free from deleterious amounts of acids, alkalis, oils or organic matters.
- The quality of concrete shall comply with Section 5.04 of the National Structural Code of the Buildings.
- Testing of samples from concrete pours shall be as required by Section 5.05 of the National Structural Code of Buildings.
- Should further testing of the finished concrete be necessary due to non-compliance of test specimens, as required by the Engineer. It shall be carried out in accordance with the approved procedure laid down in National Structural Code of Buildings, Section 5.04 clause(e).



- Hardened concrete that is deemed not to comply with the specifications above, but which the Engineer permits to be further tested, shall be tested for compressive strength.
- Any concrete will be rejected under the specifications above if the results fail to meet the requirements Section 5.03 of National Structural Code of Buildings.
- Hardened concrete may also be rejected for any one of the following conditions:
  - ✓ It is porous, segregated or honeycombed.
  - ✓ Its placing has been so interrupted that there is a construction or similar joint not in accordance with Section 5.03 clause (d) of the National Structural Code of Buildings.
  - ✓ The reinforcing steel it incorporates has been displaced.
  - ✓ Construction tolerances have not been met.
  - ✓ The required surface finish has not been met.
  - ✓ The concrete can be shown to be otherwise defective.
- When the above condition happened, the Engineer has the option to let the Contractor to demolish the rejected portion.

## **2. Item 900 – Reinforcing Steel**

- This item shall consist of furnishing, cutting, bending, fabricating, welding, and placing of steel reinforcement with or without an epoxy coating of the type, size, shape, and grade required in accordance with this Specification and in conformity with the requirements shown on the Plans.

### Scope of Work

- Reinforcement of the following
  - ✓ Footing
  - ✓ Wall Footing
  - ✓ Grade Beam
  - ✓ Column
  - ✓ Beams
  - ✓ Slab on Grade
  - ✓ Concrete Gutter
  - ✓ Concrete Bench
  - ✓ Pavement
  - ✓ Concrete Canal
  - ✓ Septic Tank

### Material Requirements

- All steel bars to be used during construction should be in accordance with the guidelines of the National Structural Code of Buildings.
- The support and tolerance in placing of reinforcement shall comply with section 5.07 of the National Structural Code of Buildings.
- Lap Splicing and/or welding of reinforcement shall comply with section 5.07 of the National Structural Code of Buildings.
- Welding of reinforcement shall not be carried out unless shown on the drawings, specified, or otherwise approved by the Project Monitoring Engineer.



- All reinforcing bars shall be high tensile strength (Grade 60) except for the lateral ties, stirrups, and any reinforcing bars with 12mm  $\varnothing$  and below which shall be a structural grade (Grade 40).

### **3. Item 903 – Formworks and False works**

- This Item covers the furnishing, fabrication, installation, erection, and removal of forms and falseworks, including scaffoldings.
- Scaffoldings, comprising the frame, platform, and clamps, are included in this pay item.
- The contractor shall be responsible for the design, erection, and adjustment of all formworks, falseworks, and scaffoldings in accordance with Section 5.06 of the National Structural Code for Buildings.
- All materials used in the construction and support of formwork shall be of timber, with alternative materials only allowed upon approval by the Project Monitoring Engineer.
- The contractor is responsible for ensuring that the forms are placed to the shape, lines, and dimensions indicated on the drawings, with sufficient strength to withstand the pressure from concrete placement and vibration. They must also ensure that the forms and scaffoldings are rigidly maintained and sufficiently tight to prevent excessive leakage of mortar.
- All debris, particularly chipping, shavings, and sawdust, must be removed from the interior of the forms before concrete placement. All form surfaces shall be cleaned and thoroughly wetted before pouring concrete.
- Before the placement of any concrete, the Project Monitoring Engineer shall inspect the formworks and scaffoldings, and may reject any materials or setups that do not conform to these specifications.
- The deflection of forms between joints and/or studs shall not exceed one five-hundredth (1/500) of the joints or stud spacing.
- The recommended minimum stripping time for horizontal slabs is twenty-four (24) hours after approval by the Project Monitoring Engineer.

## **Part E – FINISHING AND OTHER CIVIL WORKS**

### **Item 1000– Termite Control Work**

- This Item shall consist of furnishing and applying termite control chemicals, including the use of equipment and tools performing such operations in accordance with this Specification.

#### **Material Specifications:**

- Proven effective against termites by providing a barrier
- Longer lasting protection
- Higher dilution rate
- Wider area coverage
- Less hazardous
- Assurance of high quality and proven efficacy

### **Item 1002– Plumbing**

- This item shall consist of furnishing all materials, tools, equipment, and fixtures required as shown on the plans for satisfactory performance of the entire plumbing and fire protection system including installation in accordance with the latest edition of the

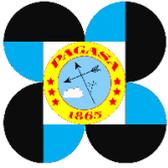
*“tracking the sky...helping the country”*



Revised National Plumbing Code, Uniform Plumbing Code of the Philippines, The Fire Code of the Philippines, The National Building Code, and this Specification.

### Scope of Works

- Installation of plumbing fixtures and fittings.
  - Water closet shall be vitreous china, free-standing toilet combination, elongated front, bottom outlet siphonic washdown bowl with push button, double flushing, concealed trapway, 4/6 liters per flush, measuring 705 x 400 x 775 mm with cover, complete with fittings and mounting accessories. Sample models and colors shall be submitted for approval prior to delivery at the job site by the Monitoring Engineer/End-user or unless otherwise specified on the plans. **(4 sets)**
    - Water Closet Bowl (4 sets) with seat cover , Tank with cover & fittings, Lavatory (4 sets) Wall Hang basin round white (4 sets) , Tissue holder white (4 sets), soap holder white (4 sets), Accessories 1 1/4 P-Trap w/ clean out (4 sets) , (4 sets) angle valve & supply pipe, (4 sets) lavatory bracket cast iron, pop-up w.swivel plate, (4 sets) SS304 Single Lever lavatory faucet.
  - Lavatory shall be white ceramic with a single hole and complete fittings. Faucets shall be made of stainless steel. **(4 sets)**
  - Kitchen Sink shall be stainless with a single hole with complete fittings. Gooseneck faucet shall be made of stainless steel. **(1 set)**
- Installation of Bathroom/Toilet Accessories;
  - Shower head and fitting shall be movable, round hand shower and rain shower measuring 8 inches diameter with escutcheon arm complete with stainless steel shower valve and control lever, all exposed surface to be chromium finish. Faucets shall be made of stainless steel for interior use. **(2 sets)**
  - Floor drains shall be made of stainless steel beehive type, measuring 4in x 4in, and provided with a detachable stainless strainer, expanded metal lath type. **(4 sets)**
  - Bidet spray shall be 304 stainless steel with a 2-way angle valve with complete fittings. **(4 sets)**
  - Vanity Wall Mirror shall be mounted on the wall measuring 500x700mm **(4 sets)**
  - Steel Grab Bar shall be 304 stainless steel and wall mounted, measuring 1" dia. x 600mm with pipe flange cover. **(4 pcs)**

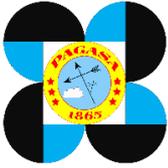


- Pipes laying for water lines. Pipes and fittings for water lines shall conform to PNS 65:1993 – Unplasticized Polyvinyl Chloride (uPVC) Pipes for Potable Water Supply.
- Tapping from an existing public water main of the site distribution to include supply & installation of the main water meter and sub-water meters.
- 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.
  
- Unplasticized Polyvinyl Chloride - Non-Potable Water (Sanitary and Sewer Line)
  - a. Pipes and fittings for sanitary lines shall conform to PNS 1950, Plastic piping system for soil and waste discharge (Low & High Temp.) inside buildings – Unplasticized Polyvinyl Chloride (PVC – U), conforming to specification requirements defined in ASTM D2729, Standard Specification for Polyvinyl Chloride (PVC) Sewer Pipe and Fittings for pipes, and ASTM D3311, Standard Specification for Drain, Waste and Vent (DWV) Plastic Fittings Patterns for fittings.
  - b. Pipes and fittings for sanitary and sewer lines, sizes 57mm and larger shall be designed for solvent cement joining connection conforming to specification requirements defined in ASTM D2564.
  
- Septic Tank
  - a. The septic tank shall be provided as shown on the plans including all pipe vents and fittings. The various construction materials such as concrete or masonry work shall conform to the latest edition of the Revised national Plumbing Code and Uniform Plumbing Code of the Philippines.
  
- Bathroom and Toilet Accessories
  - a. 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.
  - b. Grab bars shall be made of stainless steel pipe provided with safety grip and mounting flange.
  - c. Floor drains shall be made of stainless steel beehive type, measuring 100mm by 100mm, and provided with detachable stainless strainer, expanded metal lath type.
  - d. Toilet paper holder shall be vitreous china wall mounted. Color shall reconcile with adjacent fixture and facing tiles.
  - e. Soap holder shall be vitreous china wall mounted. Color shall reconcile with the adjacent tile works.
  - f. Faucet(s) shall be made of stainless steel.
  - g. Hose bib(s) shall be made of bronze cast finish.
  
- Special Plumbing Fixtures
  - a. Kitchen Sink shall be made of stainless steel self-rimming, single compartment complete with supply fittings, strainer traps, dual control lever and other accessories or plastic made of a high quality polypropylene virgin



material composition, with stainless steel strainer, lock-nut, rubber gasket and flexible connector unless otherwise specified on the plans.

- Roof Drains, Downspout, Overflow Pipe and Steel Grating
  - a. The contractor shall provide, or install necessary drains with strainers, where shown on the plans. Each drain with strainer shall fit the size of the corresponding downspout (or roof leader) over which it is to be installed and in conformity with the following schedule:
- Construction Requirements
  - a. The Contractor before any installation work is started shall carefully examine the Plans and shall investigate actual structural and finishing works 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 Engineer.
- Protection and Cleaning
  - a. Thoroughly clean all fixtures and accessories to leave the work in polished condition.
- Inspection
  - a. All pipes, fittings, traps, fixtures, appurtenances and equipment of the plumbing and drainage system shall be approved by the Engineer and inspected both by the Engineer and Contractor's duly designated representative (Licensed Master Plumber or Sanitary Engineer) to insure compliance with all requirements of all Codes and Regulations referred to in its Specification.
- Water Test on System
  - a. Upon completion of the rough-in and before connecting fixtures the entire cold water piping system 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.
  - b. The water test shall be applied to the drainage and vent systems either in its entirety or in sections. If applied to the entire system, all openings in the piping shall be tightly closed, except the highest opening, and the system filled with water to the point of overflow.
- Defective Work
  - a. The entire water distribution system shall be thoroughly flushed and treated with chlorine before it is operated for public use
- As-Built Drawings



- a. Upon completion of the work, the Contractor shall submit two (2) 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.
- Method of Measurement
- a. The work done under this Item shall be quantified per length and/or number of units as provided in the Bill of Quantities, tested and accepted to the satisfaction of the Engineer. Plumbing Fixtures shall be measured by set, piece, square meter and/or lump sum.

### **Item 1003– Carpentry and Joinery**

- The work under this Item shall consist of furnishing all required materials, fabricated woodwork, tools, equipment, and labor and performing all operations necessary for the satisfactory completion of all carpentry and joinery works in accordance with the Plans and this Specifications.

➤ **Ceiling 4.5mm thk Fiber Cement Board on Metal Furring, painted finish**

- On Metal Furring, puttied, sanded, and ready to receive paint primer coating
- Surface preparation for 4.50mm thk Fiber Cement Board Ceiling Panel on Metal Furring.
- Painting of new ceiling in latex paint
- Frame: 19mm x 50mm x 0.40mm thk. Double Metal Furring spaced at 400mm O.C. 12mm x 38mm x 0.8mm thk. Carrying Channel spaced at 1200mm O.C 25mm x 25mm x 0.50mm Wall Angle at every side, and angle of the wall
- Provide all the necessary preparation of the ceiling.
- Hanger rod with adjustable clip shall be 1.00m interval both ways but provide additional hanger and support on critical areas.
- Provide all the necessary accessories and framing for proper installation.
- Ensure adequate hanger and support at all the utilities on the area

➤ **Ceiling Eaves 4.5mm thk Fiber Cement Board on Metal Furring, painted finish**

- On Metal Furring, puttied, sanded, and ready to receive paint primer coating
- Surface preparation for 4.50mm thk Fiber Cement Board Ceiling Panel on Metal Furring.
- Painting of new ceiling in latex paint
- Framing: 19mm x 50mm x 0.40mm thk. Double Metal Furring spaced at 400mm O.C., 12mm x 38mm x 0.80mm thk. Carrying Channel spaced at 1200mm O.C., 25mm x 25mm x 0.50mm Wall Angle at every side, and angle of the wall.
- Provide all the necessary preparation of the ceiling.
- Hanger rod with adjustable clip shall be 1.00m interval both ways but provide additional hanger and support on critical areas.
- Provide all the necessary accessories and framing for proper installation.



- Ensure adequate hanger and support at all the utilities on the area.
- **Modular Kitchen Cabinet using Melamine Laminated Marine Plywood 3/4" (Dark Brown)**
  - w/ Heavy Duty Hydraulic Soft-close Hinges (US Brand) & Heavy Duty Door Handles (Stainless Solid Pull handle) 192mm, 10mm dia
  - Framing: 2"x2" Ecofor Lumber (smooth 4 sides)
- **Fascia Board, 9mm thk. x 10" Fiber Cement Board**
  - On 2" x 4" x 1.2mm thk. C-Purlin, puttied, sanded, and ready to receive paint primer coating
  - Surface preparation for 12.00mm thk Facia Fiber Cement Board Ceiling Panel on C-Purlin.
  - Painting of new ceiling in latex paint.

#### **Item 1004– Hardware**

- This Item shall consist of furnishing and installing all building hardware required to (1) ensure rigidity on joint/connections of different parts of the structure; and (2) equip in a satisfactory operating condition parts of the structure such as doors, windows, cabinets, lockers, drawers and other similar operating parts in accordance with the Plans and this Specification.
  - **Lever-type Door Lockset – Bolt Thru Door Knob (D1,D2)**
    - ✓ Material: Stainless Steel
    - ✓ Flange diameter: 75mm
    - ✓ Adjustable Backset: 60mm (2-3/8") to 70mm (2-3/4")
    - ✓ Door Thickness: 35mm (1-3/8") to 45mm (1-3/4")
    - ✓ Type: Tubular Lock (thumb turn bolt)
    - ✓ Exterior keyed locking entry door
    - ✓ 3 keys
    - ✓ Meets ANSI Grade 3 Standards
  - **Cylindrical Door Lockset - Privacy Door Knob (D3)**
    - ✓ Material: Stainless Steel
    - ✓ Flange diameter: 75mm
    - ✓ Adjustable Backset: 60mm (2-3/8") to 70mm (2-3/4")
    - ✓ Door Thickness: 35mm (1-3/8") to 45mm (1-3/4")
    - ✓ Type: Tubular Lock (thumb turn bolt)
    - ✓ Function: Privacy
    - ✓ 3 keys
    - ✓ Meets ANSI Grade 3 Standards
  - **Single Cylinder Deadbolt (D5)**
    - ✓ Material: Stainless Steel
    - ✓ Adjustable backset 60/70mm
    - ✓ Suits door thickness: 35-45mm
    - ✓ 1.2mm stainless steel faceplate
    - ✓ 1.2mm stainless steel strike plate
    - ✓ 3 keys
    - ✓ Meets ANSI Grade 3 Standards



- **Stainless Steel Ball Bearing Hinges (D1,D2,D3)**
  - ✓ Size: 4" x 4" x 3mm
  - ✓ Material: Stainless Steel 304
  - ✓ Loose Pin
  - ✓ Knuckles with 4 ball bearings
  - ✓ Suitable for DIN left and right hand
  - ✓ Suitable for Wooden Flash Door
  - ✓ Comes with stainless screws
  
- **Door Stopper**
  - ✓ Material: Stainless
  - ✓ Protection for lockset
  - ✓ Prevent wall from damage
  - ✓ With hardened mounting screws
  - ✓ For wood and metal door applications
  
- **Cylindrical Hinges (Main Gate)**
  - ✓ Size: 5/8" (16mm) x 75mm
  - ✓ Material: Carbon Steel
  - ✓ Long Round Tube Shaft
  - ✓ Cylindrical Hinges Welding Gate Heavy Duty
  
- **Gate Lock / Barrel Bolt (Main Gate)**
  - ✓ Size: 12 inches
  - ✓ heavy-duty barrel bolt lock designed for maximum security and durability
  - ✓ Crafted from high-quality steel
  
- **Long Type Padlock (Main Gate)**
  - ✓ Material: Stainless steel
  - ✓ Size: 50MM
  - ✓ 3 keys
  - ✓ Heavy Duty Door Stainless Weatherproof

#### **Item 1005– Steel Windows**

- This Item shall consist of furnishing and installing steel windows (fixed, project-in, project-out, side hung-out or side hung-in) fully equipped with flying accessories and looking devices in accordance with the Plans and this Specification.
  - Material Requirements:
    - **(W1) - 1300mm(H) x 2100mm(W), (W2) – 1300mm(H) x 1400(W), (W3) – 1300mm(H) x 700mm(W), (W5) – 650mm(H) x 750mm(W),**
      - ✓ Swing Type Casement
      - ✓ Steel Frame and grills w/ 6 mm thk. glass
      - ✓ Hinges and lock set
  
    - **(W4) – 600mm(H) x 500mm(W), (W5) – 2400mm(H) x 600mm(W)**
      - ✓ Awning Type Casement
      - ✓ Steel Frame and grills w/ 6 mm thk. glass



- ✓ Hinges and lock set

- **Louver Window**

- ✓ Size: **W6- 0.90m W x 1.00m H x 1.2mm thk & W7- 0.45m W x 1.00m H x 1.2mm thk**
- ✓ Fixed Louver Type
- ✓ Framing: Rectangular Tubular 1"x2" – Blade
- ✓ Framing: Rectangular Tubular 2"x3" - Frame
- ✓ including louver, tubular frame, and screen

**Item 1010– Wooden Doors**

- 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 in accordance with the Plans and this Specification and applicable Specifications of Item 1003, Carpentry and Joinery Works.

- **(D1) – 2.10m(H) x 0.90m(W)**

- ✓ Flush Door Swing Type
- ✓ With 2" x 4" Tanguile Door Jamb
- ✓ 3 pairs of 4" x 4" x 3mm Stainless Steel Ball bearing hinge
- ✓ 1 set of entrance lock lever type, Bolt thru door knob
- ✓ Varnish Finish

- **(D2) – 2.10m(H) x 0.80(W)**

- ✓ Solid Wood Panel Door Swing Type
- ✓ With 2" x 4" Tanguile Door Jamb
- ✓ 3 pairs of 4" x 4" x 3mm Stainless Steel Ball bearing hinge
- ✓ 1 set of entrance lock lever type, Bolt thru door knob
- ✓ Varnish Finish

- **(D3) – 2.10m(H) x 0.70(W)**

- ✓ Solid Wood Panel Door Swing Type
- ✓ With 2" x 4" Tanguile Door Jamb
- ✓ 3 pairs of 4" x 4" x 3mm Stainless Steel Ball bearing hinge
- ✓ 1 set of entrance lock lever type
- ✓ Varnish Finish

**Item 1006– Steel Doors and Frames**

- This item shall consist of furnishing and installing all fabricated steel doors and frames equipped with fixing accessories and locking devices in accordance with the Plans and Specifications.

- **(D5) – 2.10m(H) x 1.70m(W)**

- ✓ Double Swing Type
- ✓ Steel Louver Door and Frames
- ✓ 3 pairs of 4" x 4" x 3mm Stainless Steel Ball bearing hinge
- ✓ 1 set of entrance lock , single cylindrical dealbolt



#### Item 1007– Glass Door and Frame

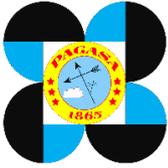
- This item shall consist of furnishing and installing all fabricated glass doors and frames equipped with fixing accessories and locking devices in accordance with the Plans and Specifications.
  - **(D4) – 2.10m(H) x 0.9m(W)**
    - ✓ Double Swing Type
    - ✓ Analok Framed
    - ✓ ¼” thick clear tempered glass
    - ✓ Automatic door closer hinge
    - ✓ Handle bar

#### Item 1013– Metal Roofing Accessory

- This Item shall consist of furnishing all pre-painted metal sheet materials, tools, equipment, and plant including labor required in undertaking the proper installation complete in accordance with the plans and this Specifications.
  - **Fabricated Metal Roofing, Pre-painted, Ridge Roll**
    - ✓ Thickness: Gauge (0.60mm)
  - **Fabricated Metal Roofing, Pre-painted, Wall Flashing**
    - ✓ Thickness: Gauge (0.60mm)
  - Gutters, valleys, flashing ridge, and hip rolls shall be fastened where indicated on the Plans by self-tapping screws or galvanized iron straps and rivets. Always begin flashing installation from the bottom and work up, so that flashings are lapped on top of the lower flashings. This will prevent moisture from leaking under the flashings and into the structures.

#### Item 1014 & 1047– Pre-painted Metal Sheets & Structural Steel Trusses

- This Item shall consist of furnishing all equipment, tools, materials, and labor required to properly install and complete the corrugated metal roofing, together with the related accessories such as ridge/hip rolls, valleys, gutters, and flashing in accordance with the Plans and this specification.
  - **Pre-painted Metal Sheets, Gauge 24 (t = 0.6mm.), Rib Type, Long span**
    - Materials Requirements:
      - ✓ Panels: Ga. # 24 (0.60mm) thick. Pre-painted Rib-type roof, Long-span
      - ✓ Roof Trusses for Synoptic and Quarters Building: A36 Top and Bottom Chord (Double Angle Bar 2L) 2” x 2” x ¼” mm thick.
      - ✓ Plates for Synoptic and Quarters Building: A36 Gusset 4.5mm. thick and A36 Base Plate 6mm thick. x 200mm. x 200mm.
      - ✓ Web Members for Synoptic and Quarters Building: A36 1 ½” x 1 ½” x ¼” mm thk. (Double Angle Bar 2L)
      - ✓ Purlins for Synoptic Building: 100mm.x 50mm. x 15mm.x 2.0mm. thick LC-Purlins



- ✓ A36 Sagrods: 10mmØ x 0.65m. w/ standard nuts and washers
- ✓ Insulations: 10mm thick. Double Sided P.E Foam Insulation.
- Steel Connections shall be fully welded. Welding electrodes shall be E60 series of ASTM Specifications A233.
- Provide all necessary accessories for proper installation.
- Verify plans for necessary details.
- All structural steel frames shall be applied with Acrylic epoxy paint.
- All Steel sections shall be primed and painted two coats with final coating colors as to be specified by Project Monitoring Engineer and End-user

### **Item 1016– Waterproofing**

- This Item shall consist of furnishing all waterproofing materials, labor, tools equipment, and other facilities in undertaking the proper installation works required in accordance with this Specification.
- **Item 1016(1)a – Waterproofing, Cement-base**
  - Material Requirements for the waterproofing:
    - Superior water impermeability
    - Flexible and fiber-reinforced
    - Most compatible to concrete substrates (being cementitious)
    - High water vapor transmission
    - UV Resistant (high-grade polymer plus cement)
    - Monolithic
    - Guaranteed water protection; virtually a “waterproofed concrete skin”
    - Excellent adhesion to concrete (chemical & mechanical bonding)
    - Releases retained water vapors in concrete; prevents blistering.
    - Longer service life of waterproofing film

### Scope of Works

- Waterproofing of the concrete gutter, septic tank, and second-floor toilets.
- Clean the area to be applied with waterproofing. All laitance, contaminants, dust, oil, and previous coatings shall be removed
- Wet the application area with water until water absorption is none to minimal with no water ponding.
- Brush on one (1) coat of waterproofing primer to the substrate to ensure all pores are sealed off.
- Once the primed surface is dry to touch, apply the waterproofing cement-base mixture. Allow the first coat to cure from 1-2 hours, then apply the second mixture over the first coat (applied on the opposite direction).
- Let dry for 24 hours before flood testing.

### **Item 1018– Ceramic Tiles**

- This Item shall consist of furnishing and installing ceramic tiles materials including cementitious/adhesive materials, tools, and equipment including labor required in the proper installation of floor, wall, and countertop as shown on the Plans and in accordance with these Specifications.

#### ➤ **Unglazed Tiles**

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- Unglazed tiles shall be hard dense tiles of homogeneous composition.
  - ✓ T&B Floor Tiles: 30cm x 30cm Unglazed Tiles
  - ✓ Hallway Floor Tiles: 40cm x 40cm Non-skid Tiles
  - ✓ Stair Tiles: 40cm x 40cm Non-skid Tiles with stair nosing
- **Glazed Tiles and Trims**
- Glazed Tiles and trims shall have an impervious face of ceramic materials fused onto the body of the tiles.
  - ✓ T&B Wall Tiles : 30cm x 30cm Glazed Tiles
  - ✓ Floor Tiles for Office and Radio Room: 40cm x 40cm Glazed Tiles
  - ✓ Kitchen countertop – Synthetic granite slab with trims
- **Stone Cladding Tiles**
- Masonry tiles shall be hard dense tiles of homogeneous composition.
  - Outdoor wall tiles (Signage Wall)
  - Size: 30x45cm

**Note:**

- *The contract must submit a design sample of tile selection for approval of the end user or Project monitoring engineer.*

**Item 1027- Cement Plaster Finish**

- This Item shall consist of furnishing all cement plaster materials, labor, tools, and equipment required in undertaking cement plaster finish accordance with the Plans and Specifications

Scope of Works

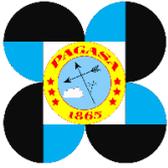
- Cement Plaster for Interior and Exterior Wall

Material Requirements

- ✓ Class “B” Mixture
- ✓ 20mm thick plaster

**Item 1032– Painting, Varnishing, and Other Related Works**

- This Item shall consist of furnishing all paint materials, varnish and other related products, labor, tools, equipment required and undertaking the proper application of painting, varnishing and related works in accordance with the Plans and this Specification.
- Number of coats, where specified, is minimum. The contractor shall apply as many as required to meet specifications for a solid, uniform appearance. Where film thickness in mils is specified, spot checks will be made to determine compliance with the specified thickness.
- Submit 2 samples of each and every color or finish (including all coats). Where the same color or finish is to be applied over different materials, samples of each shall be submitted.
- All works fittings, furniture, etc., are to be suitably protected during the execution of the work. Splashes on floors, walls, etc. are to be removed during the progress of work and on the whole, left clean and perfect upon completion.
- All defective or damaged work shall be restored to its initial condition.



- All voids, cracks, nicks, etc., will be repaired with proper patching material and finished flush with surrounding surfaces.
- Marred or damaged shop coats on metal shall be spot-primed with appropriate metal primer.
- Upon completion of the project, the Contractor shall remove all paint spots from all finished work, remove all empty cans and leave the entire premises free from rubbish or other debris caused by his work. They shall remove their equipment from the premises. They shall clean off all glass free from paint spots and smears and shall present the work clean and free from all types of blemishes.
- For Surface Preparation: Allow new concrete to dry for 14-28 days under normal weather conditions before painting. Surface to be painted should be clean and dry, free from oil, grease, dust, dirt, contaminants, and all loose grit and mortar.
- Painting Schedule:
  - Masonry Surfaces
    - Exterior Surfaces*
    - Smooth finish (Flat, Semi-gloss). Using a 100% acrylic water based elastomeric wall paint that is especially formulated to bridge micro/hairline cracks and crevices thus providing good waterproofing and protection from rain, carbon dioxide or other acidic gases (acid rain).
    - New Painting:
      - 1<sup>st</sup> coat: Treat with masonry neutralizer.
      - 2<sup>nd</sup> coat: Concrete Primer and Putty spot
      - 3<sup>rd</sup> Coat: Flat Late – 1 coat
      - 4<sup>th</sup> Coat: Acrylic water based elastomeric wall paint – 2 coats
    - Interior Surfaces*
    - 1<sup>st</sup> coat: Treat with masonry neutralizer.
    - 2<sup>nd</sup> coat: Concrete Primer and Putty spot
    - 3<sup>rd</sup> Coat: Flat Late – 1 coat
    - 4<sup>th</sup> Coat: Acrylic water based elastomeric wall paint – 2 coats
  - Ceiling, Fiber Cement Board
    - Smooth finish (Flat, Semi-gloss).
    - New Painting:
      - 1<sup>st</sup> coat: Prime bare substrate with Flat latex (100% Acrylic Water-based) w/ putty and mesh on the joint and minor surface imperfections with Joint Compound. Let dry for one (1) hour. Spot-primed puttied portions.
      - 2<sup>nd</sup> and 3<sup>rd</sup> Coat: Finish with two (2) coats of Latex Paint with low-odor water-based coating. Let dry for one (1) hour in between coats.
  - Metal Surfaces
    - Gloss Finish (Epoxy type) for window frames, metal railings, canopies and stair railings.
    - Primer: Epoxy Primer Red oxide
    - 1<sup>st</sup> and 2<sup>nd</sup> Coat: Water-based Acrylic Epoxy paint (Black)
  - Varnishing, Wood, Doors and Jamb
    - Gloss Finish (Gloss Lacquer)
    - Sand the surfaces thoroughly



- All the cracks and wood imperfections shall be applied with putty and wood paste filler.
- Application of oil wood stain (maple)
- Application of lacquer sanding sealer sanded lightly before topcoat application.
- Final coat: Clear Gloss Lacquer

**Note: Choice of Color**

*The End-user or Project Monitoring engineer must first be consulted after he/she has given the color scheme. No painting job shall be done unless it has met the approval of the end user or Project Monitoring engineer regarding the color.*

**Item 1038 – Reflective Insulation**

- This Item shall consist of furnishing all thermal insulation materials of one or more low emittance surfaces bounding one or more enclosed air spaces, tools, and equipment, plant including labor required in undertaking the proper installation complete in accordance with the Plans, and this Specification.
- The reflective insulation specified shall be 10mm double-sided P.E. foam insulation.

**Item 1046- Masonry Works**

- This Item shall consist of furnishing all necessary materials, tools, equipment, and labor necessary to complete the execution of the masonry works as shown on the Plans.

Scope of Works

- Construction of Interior Wall
- Construction of Exterior Wall
- Construction of Signage Wall
- Wall Plastering

Material Requirements

- Interior Wall
  - ✓ 4" Concrete Hollow Blocks, shall be standard manufacture, machine vibrated, and shall have fine and even texture, and well defined edges.
  - ✓ Provide 10mmØ Vertical deformed round bars at 0.60m on centers and 10mmØ Horizontal deformed round bars at every 3 layers of CHB.
- Exterior Wall
  - ✓ 6" Concrete Hollow Blocks, shall be standard manufacture, machine vibrated, and shall have fine and even texture, and well defined edges.
  - ✓ Provide 10mmØ Vertical deformed round bars at 0.60m on centers and 10mmØ Horizontal deformed round bars at every 3 layers of CHB.
- For Mortar, Filler, Plastering, Deformed Round Bar, Tie Wire
  - ✓ Mortar, filler and plastering shall be Class "B".
  - ✓ Use Portland cement which conforms to the requirements of ASTM C-150 Type for normal Portland Cement.



- ✓ Use fine aggregates which shall be free from injurious amount of clay loam and deleterious materials and shall conform to ASTM C-33 or C-330.
- ✓ Deformed steel bars shall conform to ASTM A-305. It shall be clean and free from loose, rust, scales and any coatings that will reduce the bond.
- ✓ #16 G.I tie wires shall be used for reinforcing bar connectors
- ✓ Provide the plastering at 20mm thick using Class "B" mixture.

### **Item 1047 - Metal Structures**

- This work shall consist of furnishing, fabricating, hauling, erecting, welding and painting of metal structure and accessories constructed in accordance with the Plans and this Specifications.

#### Scope of Works

- Fabrication and Installation of Canopy Framing
- Fabrication and Installation of Gate
- Fabrication and Installation of Stairs

#### Material Requirements

- Canopy Framing
  - ✓ 2" x 3" x 1.5mm thk. G.I Tubular
  - ✓ 2" x 4" x 1.5mm thk. G.I Tubular
  - ✓ 4" x 8" x 12mm thk. Base Plate
  - ✓ 5/16" Anchor Bolt
- Gate
  - ✓ 1" x 1" x 1.5mm thk. G.I Tubular
  - ✓ 2" x 4" x 1.5mm thk. G.I Tubular
  - ✓ 4" x 8" x 12mm thk Base Plate
- Stairs
  - ✓ Stringer – 2" x 6" x 20mm thk. G.I Tubular
  - ✓ 1" x 3" x 1.5mm thk. G.I Tubular for Handrailing
  - ✓ 1" x 1" x 1.5mm thk. G. I Tubular for railings
  - ✓ 2" x 2" x 6.0mm thk. Angle Bar
  - ✓ 10" x 10" x 20mm thk. Base Plate
  - ✓ 5/16" Anchor Bolt

### **Item 1051 - Railings**

- This Item shall consist of furnishing, fabricating, and installing of railings for buildings and other similar structures of the material or combination of materials in accordance with this Specifications and in conformity with the Plans.

#### Scope of Works

- Fabrication and Installation of Railings



### Material Requirements

- Railings
  - ✓ 1" x 2" x 1.5mm thk. G.I Tubular
  - ✓ 2" x 2" x 1.5mm thk. G.I Tubular
  - ✓ 1" x 3" x 1.5mm thk. G.I Tubular
  - ✓ 4" x 8" x 12mm thk. Base Plate
  - ✓ 3" x 4" x 12mm thk. Base Plate
  - ✓ 5/16" Anchor Bolt

### **Item A.1.1 (11) – Provision of Furniture for PAGASA Personnels**

- The field offices, laboratories, and living quarters shall have at least the floor area prescribed on the Plans and shall contain sufficient furniture/fixtures, equipment, appliances, apparatus, and publications specified in the Contract. If the Contractor cannot provide or intends to supply an equivalent substitute, the Contractor shall secure the approval of the Engineer.

#### Synoptic Station Office

- 700 mm x 1400 mm x 740 mm, Light Gray Office Table with center drawer and mobile pedestal cabinet – **4 sets**
- Office Chair, Ergonomic office chair with headrest and armrest, High back – **4 sets**

#### Observer's Quarter

- Double Deck Steel Bed Single Size (Black) – **2 sets**
- Foam Urethane Mattress (Single) – **4 sets**
- Gentle Bounce Pillows – **4 sets**
- Stand fan 16inch w/ thermal fuse, 65watts – **2 sets**
- 4 Seater Rectangular Table Dining Set – **1 set**

- ✓ Measurement:

##### **Table**

Width: 120 cm

Depth: 60 cm

Height: 75 cm

##### **Chair**

Width: 40 cm

Depth: 43 cm

Height: 84 cm

Seat Height: 44.5 cm

- ✓ Materials:

Panels: 15 mm thick MDF with PVC cover

Frame & legs: Metal tube in powder coated finish



- ✓ Weight Capacity:  
Table: 50 kgs  
Chair: 80 kgs

## **Stainless Steel Logo and Letters**

### Scope of Works

- Supply and Installation of 300x300mm Stainless steel PAGASA logo and DOST logo.
- Supply and Installation of 2.5-3inhes Stainless steel letters.
- Supply and Installation of 5 inches Stainless steel letters.

## **Fencing Chain link (Cyclone wire galvanized 4" Gauge 10)**

### Scope of Works

- Layout and installation of 4' galvanized cyclone wire (gauge 10) for the perimeter fence.
- The wire must be welded onto 38mm diameter G.I. steel pipes.

## **Fencing Post**

### Scope of Works

- Layout and installation of 38mm diameter, schedule 40 G.I. steel pipes for the perimeter fence.

## **Flagpole**

- This work shall consist of furnishing, fabricating, hauling, erecting, welding, and painting of metal structure and accessories constructed in accordance with the Plans and Specifications.

### Scope of Works

- Construction of Flag pole
- Construction of flagpole pedestal and concrete platform shall conform with the specifications under Item Nos. 803(1)a, 804(4), 1705, 900, 902(1), 903(2) and 1027(1).

### Material Requirements

- Tapered Flagpole
  - ✓ Hot-dip galvanized.
  - ✓ Thickness = 3.0mm.
  - ✓ Top diameter = 3"
  - ✓ Bottom diameter = 6"
  - ✓ Height = 6.0m.
  - ✓ Base plate, anchor rods with nuts and washer, pulley holder, pulley
- Philippine Flag
  - ✓ Fabric Material: Nylon

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- ✓ 2 feet x 4 feet
- ✓ Stars and Sun are sewn/patched
- ✓ With non-rust eyelet ready for hanging
- Rope
  - ✓ 7mm. dia. x 10m. Vinylon rope

## **Part F - ELECTRICAL**

### **Item 1100 – Conduits, Boxes and Fittings**

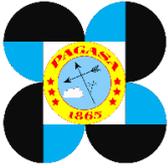
- This item shall consist of furnishing and installation of the complete conduit work consisting of electrical conduits; conduit boxes; conduit fittings and other electrical materials in accordance with the Plans and this Specification.

#### Scope of Works

- All conduits, conduit boxes, conduit fittings, pull boxes and other electrical materials base on the Plans and Specification shall be installed including furnishing.
- All conduits and boxes shall be embedded in concrete unless otherwise specified on the plan.
- All Junction boxes shall install covers.
- Where a conduit enters a box, fitting, or other enclosure, a locknut and bushings shall be installed to protect the wire from abrasion unless the design of the box, fitting, or enclosure is such as to afford equivalent protection.
- Installation of pull-boxes above and below the panel boards.
- Installation of Rigid Steel Conduit in service entrance post.
- All conduits buried underground shall be at least 300mm depth and with electrical warning mesh tape.
- All lighting outlet shall have 1.5m flexible metal conduit connected to metal straight connector to metal cover.
- Installation of service entrance conduit for telecommunication cabling in radio room.
- The contractor shall laid and buried 2 – 50mm dia. PVC from Service Entrance Post to Gen. Set room and to Synoptic Building.
- The contractor shall provide 25mm dia RSC pipe with 20mm dia. weatherhead at service entrance post for Auxiliary System.
- Installation of 20mm dia. conduits for perimeter fencing and signage and trenching to MDP shall be done by the contractor, refer to the plan.
- Testing of all items mention above.

#### Specifications

- Threadless couplings and connectors shall not be used in threaded conduit ends unless listed for the purpose.



- Exposed conduit in Service Entrance Post shall be Rigid Steel Conduit (RSC).
- RSC shall be made of steel with protective coatings, aluminium, red brass or stainless steel.
- Markings in each length of RSC shall be clearly and durably marked at least every 3000mm with the letters RSC. Each length shall be marked as required in Subsection 1.10.1.21 (A) of Article 1.10, Requirements for electrical installations of PEC, Part I.
- The standard length of RSC shall be 3000mm, including an attached coupling, and each end shall be threaded.
- RSC shall be having a minimum size of metric designator 16 (trade size ½) and a maximum size of metric designator 103 (trade size 4).
- PVC Conduit shall be made of rigid (non-plasticized) polyvinyl chloride (PVC).
- PVC conduit and fittings shall be composed of suitable non-metallic material that is resistant to moisture and chemical atmosphere.
- Markings in each length of PVC conduit shall be clearly and durably marked at least every 3000mm as required in Subsection 1.10.1.21 (A) of Article 1.10, Requirements for Electrical Installations of PEC, Part I.
- The physical and mechanical properties of PVC conduit shall conform to the requirements of PNS 14:2005, Unplasticized Polyvinyl Chloride (uPVC) electrical conduit – Specification.
- PVC shall have a minimum size of metric designator 16 (trade size ½) and a maximum size of metric designator 155 (trade size 6).
- Pull boxes shall be grey coated and shall have cover.
- Service entrance conduit for telecommunication cables in radio room shall be 50mm dia. PVC and with weatherhead including conduit layout embedded in concrete. Height of the conduit shall be just below the ceiling. Inside the radio room shall have pull box with a height from finish floor line shall 300mm. Pull box shall have cover.
- All conduits that will cross the line canal shall be in concrete encasement without compromising the flow of water in line canal.

### **Item 1101 – Wires, Cables and Wiring Devices**

- This item shall consist of furnishing and installation of all wires and wiring devices consisting of electric wires and cables, wall switches, convenience receptacles, heavy duty receptacles and other devices in accordance with the approved Plans and this Specification.

#### Scope of Works

- All wires and wiring devices specified in the plan shall be installed including furnishing.
- All branch circuits and main feeder shall have grounding wire from Panel Boards to electrical devices.
- The contractor shall have labelled all electrical devices such as convenience outlets and switches with corresponding branch circuit in the Panel Board for easy troubleshooting. Refer to schedule of loads.



- The contractor shall allot 150mm minimum extension of wire for switch boxes and convenience outlet boxes.
- The contractor shall allot minimum of 1500mm extension of wire for lighting fixture junction boxes inside a flexible conduit.
- All wires shall be terminated to wiring devices and to circuit breakers according to the plan.
- All wires going in panel board shall be neat and tidy.
- Installation of power source to Intermediate Distribution Panel (IDP).
- Testing all items mention above.

### Specifications

- All wires shall be Phelps Dodge Thermoplastic High Heat-Resistant Nylon-Coated (THHN) copper wires rated 600V.
- All wires shall be stranded type.
- All branch circuits and main feeder shall have grounding wire from Panel Boards to electrical devices.
- The minimum diameter size of conductors shall be 2.0mm<sup>2</sup> for copper
- Switches shall have LED indicator.
- Receptacles shall be 3-pin socket (grounding type).
- All electrical devices shall be high quality that will last for long.

### **Item 1102 – Panel Boards and Other Overcurrent Protection Devices**

- This Item shall consist of furnishing and installation of the distribution panel boards at the location shown on the approved Plans complete with circuit breakers, all accessories completely wired and ready for service.

### Scope of Works

- Installation of panel boards shall be embedded in wall concrete.
- Main and branch circuit breakers for panel boards shall have the rating, capacity and number of poles as shown on the approved Plans.
- Panel boards, main and branch circuit breakers shall be labelled accordingly to the schedule of loads.
- The contractor shall provide decorative electrical panel board cover to hide the panel board in a wall. Probably painting with wood frame.
- The body of the metal panel boards shall be properly grounded.
- The contractor shall provide grounding terminal in each panel board.
- Installation of panel boards of lighting and power outlets.
- The contractor shall submit a proposal of preliminary Test and Inspection Plan.

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### Specifications

- Panel Boards shall be NEMA 1 enclosure and shall be grey coated unless otherwise specified in the plan.
- Circuit Breakers shall be Schneider Electric.
- Main circuit breaker shall be 2-pole single phase and branch circuit breaker are 2-pole single phase according to the schedule of loads.
- Panel boards shall have busbar capacity more than the full-load current accordingly to the Plan.

### **Item 1103 – Lighting Fixtures and Lamp**

- This Item shall consist of furnishing all lighting fixtures, accessories and fixings necessary for installation as shown on the Plans and in accordance with this Specifications. A light fixture or luminaire is an electrical device to create artificial light that serves as a tool to direct light using reflective and shielding materials.

### **Item 1103 – Lighting Fixtures and Lamp**

- This Item shall consist of furnishing all lighting fixtures, accessories and fixings necessary for installation as shown on the Plans and in accordance with this Specifications. A light fixture or luminaire is an electrical device to create artificial light that serves as a tool to direct light using reflective and shielding materials.

### Scope of Works

- Installation of LED panels recessed type, surface type and suspended type (accordingly to the Plan) shall be fit into ceiling, properly reinforced the mounting and properly grounded. Refer to the Plan.
- Installation of downlight fixture, surface type, recessed type. Refer to the Plan.
- Installation LED Emergency light at corresponding location. Refer to the Plan.
- Provide individual power outlet for emergency light.
- All lighting fixture body shall be properly grounded.
- LED panel in generator room shall be suspended type.
- Installation of lighting fixtures in perimeter fence and signage shall in accordance to the plan.
- Installation of LED bulbs in all lighting fixtures.
- Upon completion of installation of lighting fixtures and after circuitry has been energized, electrical energy shall be applied to demonstrate capability and compliance with requirements. When possible, malfunctioned units at the Project Site shall be rectified, then retested to demonstrate compliance; otherwise, defective items shall be removed and replaced with new units and another test shall be conducted.



### Specifications

- LED panel light **120cm x 30cm surface type** shall be 60Watts with LED driver and color temperature shall be 6000k.
- LED panel light **120cm x 30cm suspended type** shall be 60Watts with LED driver and color temperature shall be 6000k.
- 6" vertical downlight fixture surface type and recessed type shall be aluminium material, water proof and color black. The color temperature of bulbs shall be 3000k 9watts. Refer to the Plan for location.
- LED emergency light shall be 3.6V 900mAh Ni-CD battery with overcharge and discharge protection. Injection-moulded thermoplastic ABS housing. Adjustable Headlamps. 3000k color temperature.
- Wall lamp shall be modern, upside down lighting, 2 bulbs, IP65 waterproof, aluminium material, black in color, E27 socket with 3watts LED bulb.
- Floodlight/Spot light shall be LED, 220V input, warmwhite in color temp., 20Watts each, outdoor waterproof, aluminium material, black in color.
- 

### **Item 1104 – Auxiliary System**

- This Item shall consist of furnishing and installation of all materials, components and equipment to complete the requirements for Auxiliary System in accordance with the Plans and this Specification.

### Scope of Works – CATV System

- Installation of wall plate CATV outlet (See specified plan).
- Installation of conduits for Co-axial cable shall be embedded in concrete. Refer to the Plan.
- Installation of Co-axial cable and termination of cables.
- Installation of outdoor CATV box.
- Labelling of CATV outlet is a must.
- At the completion of the installation works, the entire installation shall be subject to the test before final placing in service under the full responsibility of the Contractor. Unless otherwise specified, all test shall be carried out in conformity with the requirement of Philippine Electrical/Electronics Code or with this Specification.
- After each test, the contractor shall immediately submit copies of a test report to the Engineer.
- Testing certificates shall be provided by the speciality contractor prior to final turnover.

### Specification – CATV System

- CATV Outlet shall be single port, with wall plate cover unless otherwise specified on the plan.
- Co-axial cable shall be RG-6.



- Outdoor CATV panel box shall be place outside the building (See plan for location).
- Conduit, boxes and fittings shall conform to the requirements if **Item 1100**.
- Cable and wiring devices shall conform to the requirements of **Item 1101**.

#### Description – Network and Cabling System

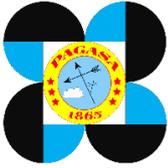
- This Item shall consist of furnishing and installation of Network Cabling, equipment and associated components to form a complete coordinated system ready for operation in accordance with the Plans and Specifications.

#### Scope of Works – Network and Cabling System

- Installation and layout of conduits for UTP cable shall be embedded in concrete.
- Installation of UTP cable in every data outlet/port is directly from Main Distribution Frame (MDF). Splicing is strictly prohibited.
- Installation of Data outlet/port with grid and plate.
- Managed switch, patch panel and Intermediate Distribution Frame (IDF) shall install by the contractor.
- Termination of UTP and STP cables in every port and to managed switched/patch panel shall be done by the contractor.
- Configuration of the network system shall be done by the contractor.
- Installation of WIFI access point shall be done also by the contractor.
- Provide pull boxes for MDF.
- STP Outdoor Cabling shall be installed from service entrance post to MDF.
- All cables and hardware shall be 100% tested for defects in installation and to verify cable performance under installed conditions. All conductors of each installed cable shall be verified useable by the Contractor prior to system acceptance.
- All UTP and fiber optic cable field testing shall be.
- and shall all result to PASS remarks channel or permanent link.
- All field tester shall be factory calibrated each calendar year by the field test equipment manufacturer.

#### Specifications – Network and Cabling System

- Conduit, boxes and fittings shall conform to the requirements if **Item 1100**.
- Cable and wiring devices shall conform to the requirements of **Item 1101**.
- UTP cable shall be CAT6.
- Data outlet shall be single port with grid and plate.
- WIFI access point shall be 300Mbps ceiling mounted.
- IDF shall be complete set (power outlets, brackets and other accessories, etc.).
- POE injector shall be 8 port for LAN and 8 port for POE.
- Manage Switch shall meet the specifications below:
  - **Power consumption:** Max Power (w/o PoE): 33W
  - **Input Voltage:** 100-127 VAC / 200-240 VAC



- **External I/O Ports:** 24x ports 10/100/1000BASE-T ports 4x 1G SFP ports
- **Latency:** 1 Gbps: 1.5  $\mu$ Sec
- **Routing Capabilities:** Static
- **Switching Capacity:** 56 Gbps
- **Throughput:** 41.6 Mpps
- **Memory and Processor:** Dual Core ARM Cortex A9 @ 1016 Mhz 8 GB DDR3, maximum, depending on model 16 GB eMMC
- **PoE Capability:** non-PoE model
- **Warranty Standard Statement:** Limited Lifetime Warranty
- **Weight (imperial):** 5.78 lbs
- **Weight (metric):** 2.6 kg
- **Product Dimensions (imperial):** 1.73 x 17.4 x 7.92 in
- **Product Dimensions (metric):** 4.4 x 44.2 x 20.1 cm
- **Operating Temperature:** 32°F to 113°F (0°C to 45°C) up to 5000 ft (1.5 km) derate - 1°C for every 1000 ft (305 m) from 5000 ft (1.5 km) to 10000 ft (3.0 km)

### **Item 1109 – Grounding System**

#### **1109.1 Description**

This item shall consist of furnishing all grounding system materials, labor, tools, equipment and others in undertaking the proper installation works required in accordance with the Plans and this Specification.

#### **Scope of Works**

- Trenching and excavation shall be done by the contractor.
- Installation of ground rod and conductors shall be done by the contractor.
- The contractor shall inform and ask on where to install the air terminal.
- Exothermic weld connector shall be done by the contractor.
- Base supports, air terminal braces and single spool rack shall be included at the installations.
- Chemical grounding rod, grounding enhance material, grounding busbar terminal and ground rod copper clad shall be delivered and install by the contractor.
- Sealing gum shall be use whenever it is needed.
  
- Terminal lugs shall be install by the contractor.
- Access well or test well of chemical ground rod shall be install by the contractor.
- Ground resistance test shall be done by the contractor and with PAGASA personnel for witness.



### Specifications

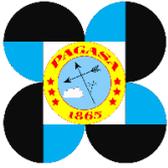
- Copper clad ground rod shall be 3 meters in length and 18mm in diameter, and must be UL listed.
- Conventional lightning arrester shall have its base, shall be copper and UL listed.
- Chemical grounding rod shall be 1.2 meters in length and 50mm in diameter.
- Ground bus bar shall be 6mm x 50mm x 250mm in size, wall mounted with 12 terminal positions, insulator and mounting bracket.
- Down conductor from air terminal shall be 50mm<sup>2</sup> THHN copper wire.
- Bare copper wire must be 30mm<sup>2</sup> in size.
- Exothermic powder shall be #45 and #90 for WX and GET connections.
- Exothermic mold shall be SSS 35 for straight connection, GTS 14235 for cable to ground rod and DRS 1635 for cable to rebar.
- Ground enhancement terminal shall maintain constant resistance for the life of the system once in its set form, performs in all soil conditions even during dry spells, does not require periodic charging treatments or placement, does not require the continuous presence of water to maintain its conductivity, fully sets within 3 days, fully cures within 28 days, does not dissolve, decompose, or leach out with time, non-corrosive, exceeds IEC® 62561-7 which sets the benchmark for corrosion, leaching, sulfur content, and other environmental regulations.
- Terminal lugs shall be ring type, 35-8.
- Hangers and support shall be well built and sturdy.
- Minimum requirements for ground resistance shall be less than 1ohm.

### **Item 1111 – Miscellaneous Electrical/Civil Works**

- This item shall consist of construction of pedestal poles, manhole, concrete encasement, handhole, wire trench, furnishing and installation of cable tray, mounting bolts/ eye bolts, and spool insulator wire rack and shall conform to the alignment, grades, design, dimensions and details in accordance with Plans and Specifications.

### Scope of Works

- Construction of service entrance post shall be in accordance with the plans and specifications.
- Trench excavation from service entrance post to generator room and to synoptic building. Refer to the plan.
- Hand hole shall be located according to the plan.
- Installation of electrical warning mesh tape above the trenching.
- Installation of 3 spool insulator spool secondary rack base on the plan.



- Installation of Loop hangers and threaded rod for 50mm dia. PVC pipe, for instruments cables.

### Specifications

- Service entrance post shall be in accordance to the plan.
- Service entrance post, encasement and handholes shall be in accordance with the applicable requirements of Item 900, Structural Concrete.
- Handhole shall be 500mm x 500mm x 600mm.
- Other materials to be used shall be in accordance with Section 3.14.2.16, Handhole Enclosures and Section 1.10.5, Manholes and Other Electric Enclosures Intended for Personnel Entry of the Philippine Electrical Code (PEC), Part 1.
- Trench excavation shall be minimum of 300mm in depth.
- Insulator post strut shall be rounded to ensure that the spool insulator will not be damaged while being strung. All components of secondary rack shall be hot-dip galvanized conforming to the requirements of ATSM A123, Zinc (hot-dip galvanized) coatings on iron and steel products.

## **Part G. MECHANICAL**

### **Fire Extinguisher**

- Fire Extinguisher shall be installed in accordance with section 10.2.6.7, Portable and Wheeled Fire Extinguisher of Fire Code of the Philippines and NPFA 10, Chapter 6, Installation of Portable Fire Extinguisher.

### Scope of Works

- Supply of four (4) sets of 4.54 kg ABC dry chemical refillable multipurpose fire extinguisher with bracket.
- It must be verified for compliance with safety standards and installed in a suitable, easily accessible location within the premises, following fire safety guidelines.

### **Item 1200 – Air Conditioning and Ventilating System**

- This Item shall consist of furnishing and installation of air conditioning, refrigeration and ventilation systems, inclusive of necessary electrical connections, ductworks, grilles, pipes and condensate drains and all other necessary accessories, ready for service in accordance with the Plans and this Specification.

### Scope of Works

- Installation and layout of conduits for window type ACU and Exhaust Fans shall be embedded in concrete. Refer to the Plan.
- Installation of exhaust fan wall mounted type. Refer to the Plan.

*“tracking the sky...helping the country”*



- Providing individual power outlet for each exhaust.
- The Contractor shall provide metal brackets, housing or casing of all ACU units.
- The Contractor shall provide power supply at the pull box installed beside ACU and shall furnish and install the main circuit breaker with suitable ratings and capacities, conduits, wirings, fittings, devices and all other equipment and electrical connections needed to complete the electrical installation of the system. Refer to schedule of loads of ACU.
- Air conditioning equipment shall be tested for 8hr per day for three (3) consecutive days or longer when so directed, under the supervisions of manufacturers qualified and authorized representative, who will make necessary adjustments and instruct designated operating personnel for each operation and maintenance of refrigerating equipment and controls.
- Test of air flow, temperature and humidity shall be made to demonstrate that each complies with the requirements as indicated in the manufacturer's specifications.

### Specifications

- 2HP window type inverter ACU shall be with free bracket, 14.3 EER rating, 4 fan level, R410A refrigerant, auto swing, sleep mode, LCD remote, cycle function, dehumidifying feature, econo feature, turbo function, run our timer, slide out chassis, blue fin protection, energy saving plug, 8in1 air filter system, sensor error warning, hydrophilic evaporator, 24Hr On and Off timer, over temperature protection, under/over voltage protection, condenser grill protection, cool-dry-fan operation modes.
- 1/2HP window type non-inverter ACU shall be with free bracket, 12.0 EER rating, 12hr timer, energy saving plug, econo and sleep mode, multi-pore filter, R410a refrigerant, sleek modern design, atleast P1.94/hour power consumption.
- The Contractor shall supply, deliver, install and conduct testing of Air Conditioning Units mentioned above.
- Exhaust fan shall be 220V, 12in x 12in dimension, color white.