



Project Title: REPAIR/REHABILITATION OF PAGASA TUGUEGARAO SYNOPTIC STATION

Project Location: PAGASA, Cagayan Provincial Capitol, Tuguegarao City, Cagayan

SCOPE OF WORKS AND SPECIFICATIONS

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 for the effective implementation of 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 matters 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 to the areas due to the contractor's ongoing works shall be refurbished at their expense.

Part B – Other General Requirements

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)



Mobilization / Demobilization

- This item includes the mobilization process and 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.

Removal of Structures and Obstruction

Note: Salvaged materials which are damaged thru negligence shall be replaced or restored at the Contractor's expense.

Scope of Works

- The contractor shall request to the end-user for a temporary shut-off of power and water supply for the preparation of demolition.
- Furnish, install, and maintain in safe conditions at all times temporary protection is required to ensure safety for persons and property during demolition and removal work.
- Furnish, install, and maintain dust covering to prevent the spread of dust beyond the immediate area where demolition is being performed.
- Remove existing lighting fixtures and replace new, refer to the approved drawing plan.
- Existing floor tiles and wall tiles of the common toilet are to be removed and replaced with new ones.
- All existing ceilings are to be removed and replaced with new, refer to the approved drawing plan.
- The existing fascia board is to be removed and replaced with a new one.
- All existing roof sheets and gutter are to be removed and replaced with new as shown in the drawings.
- All existing downspout and pipe clamps are to be removed and replaced with new.
- Existing water closet, lavatory, floor drain and faucets are to be removed and replaced with new.

Hauling

Description

This item shall consist of hauling of existing furniture or movable equipment inside of the building. Bookcases, chairs, cabinets, bed frames, and tables are examples of items that should be turned over to the end-user or Project Monitoring Engineer and shall be stored in a secured location.

Part E – FINISHING AND OTHER CIVIL WORKS

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 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.
 - o 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. **(1 set)**
 - o Lavatory shall be white ceramic with a single hole and complete fittings. Faucets shall be made of stainless steel. **(1 set)**
- Installation of Bathroom/Toilet Accessories;
 - o 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. **(1 set)**
 - o 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. **(1 set)**
 - o Bidet spray shall be 304 stainless steel with a 2-way angle valve with complete fittings. **(1 set)**
 - o Stainless Steel Toilet Handrail shall be 304 stainless steel, 25mm diameter tube x 50 cm length. **(1 set)**

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.
 - **PVC Laminated, Acoustic Panel**
 - 600mm x 600mm PVC Laminated, Lemon Skin
 - Frame: Main T-runner, 1" x 1 1/2" spaced at 1200mm O.C., Cross Tee-runner, 1" x 1" x 1.2m spaced at 1200mm O.C, Cross Tee-runner, 1" x 1" x 0.6m spaced at 600mm O.C. and Wall Angle, 1" x 1" Wall Angle at every side, and angle of the wall Provide all the necessary preparation of the ceiling.



- Twisted Hanger and rod with adjustable clip shall be 1.20m 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 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

➤ **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 Fascia Fiber Cement Board Ceiling Panel on C-Purlin.
- Painting of new ceiling in latex paint.

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 (D1,D2)**
 - ✓ Material: Brass
 - ✓ Universal 4-way latch
 - ✓ Fits standard doors
 - ✓ 2 3/8 in and 2 3/4 in backsets
 - ✓ Exterior keyed locking entry door
 - ✓ 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 Knob (D3 Doors)**
 - ✓ With PVC Door Pad
 - ✓ Japan Brand
 - ✓ Brass Cylinder
 - ✓ Type: Cylindrical Lock (retracting bolt)
 - ✓ Materials: Satin Stainless Steel
 - ✓ Suitable for DIN left and right-hand
 - ✓ Door Range: 1 3/8in to 1 3/4in standard
 - ✓ Backset : Universal Latch Standard, fits either 2 3/8in or 2 3/4 in backsets.
- **Hinge for PVC Doors (D3)**
 - ✓ 3 sets of Flag hinge for PVC Doors

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) - 2400mm(H) x 1400mm(W), (W2) – 1300mm(H) x 700mm(W)**
 - ✓ Swing Type Casement
 - ✓ Steel Frame and grills w/ 6 mm thk. glass
 - ✓ Hinges and lock set
 - **(W3) – 800mm(H) x 700mm(W)**
 - ✓ Awning Type Casement
 - ✓ Steel Frame and grills w/ 6 mm thk. glass
 - ✓ Hinges and lock set

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
 - ✓ 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
 - ✓ Varnish Finish

Metal Roof Accessories

- 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

Pre-painted Metal Sheets

- 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 24 (0.60mm)
- **Fabricated Metal Roofing, Pre-painted, Gutter**
 - ✓ Thickness: Gauge 26 (0.551mm)
 - ✓ Ordinary

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.



Scope of Works

- **Lay-out and Installation of Unglazed Tiles**
 - Unglazed tiles shall be hard dense tiles of homogeneous composition.
 - ✓ T&B Floor Tiles: 30cm x 30cm Unglazed Tiles
- **Lay-out and Installation of 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 : 60cm x 30cm Glazed Tiles
 - ✓ Floor Tiles for Office, Radio Room, Observer's Quarter and Storage Room: 40cm x 40cm Glazed Tiles

PVC Doors and Frame

- This Item shall consist of furnishing and installing all pre-fabricated PVC door and frames equipped with fixing accessories and locking devices in accordance with the Plans and/or shop drawings and this specification.
 - **(D3) – 0.70m(W) x 2.10m(H)**
 - ✓ PVC Swing Panel Door and PVC Jamb
 - ✓ with smoke glass
 - ✓ 3 sets of Flag hinge for PVC
 - ✓ 1 set of entrance lock knob type

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

- 4" CHB laying for Radio Room.
- **Material Requirements:**
 - Use Portland cement which conforms to the requirements of ASTM C-150 Type for normal Portland Cement.
 - Use fine aggregates that shall be free from injurious amounts of clay loam and deleterious materials and shall conform to ASTM C-33 or C-330.
 - Concrete Hollow Blocks, 4", shall be standard manufacture, machine vibrated, and shall have fine and even texture, and well-defined edges. Mortar, filler, and plastering shall be Class "B".
 - 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 4" CHB Wall with 10mmØ deformed round bars at 0.60m on centers both ways. Verify the actual location.
 - Concrete mixture shall be Class "B"
 - Provide the plastering at 20mm thick using a Class "B" mixture.



Cement Plaster Finish

- This Item shall consist of furnishing all cement plaster materials, labor, tools, and equipment required in undertaking cement plaster finish in accordance with the Plans and Specifications
 - Materials Requirements:
 - ✓ Mixture: Class B
 - ✓ Thickness: 20mm

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.
 - Painting Schedule:
 - Masonry Surfaces
Interior and 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).
 - Ceiling, Fiber Cement Board
 - Smooth finish (Flat, Semi-gloss).
- New Painting:
1st 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.



2nd and 3rd 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.
- Primer: Epoxy Primer Red oxide
1st and 2nd 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 B-1254 sanded lightly before topcoat application.
 - Final coat: Clear Gloss Lacquer B-1250

Scope of Works

- Re-painting of Interior, Exterior Walls, and Concrete Water tank.
- New Painting for Ceiling.
- New Painting for Wooden Panel Doors.
- New Painting for window frames and grills.

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.

ADDITIONAL ITEMS

Scope of Works

Tempered Fixed Glass

- Supply and Installation of Aluminum Powder-Coated Frame with 6mm Thick Clear Tempered Fixed Glass.
- The frame will hold a 6mm thick clear tempered glass panel, which is fixed in place to provide a robust and elegant barrier or partition.



Office Window Blinds

- Supply and Installation of office window blinds including duo roller blinds with brackets and screws.
- The duo roller blinds feature dual layers that allow for adjustable light filtration. The installation will include all necessary components, such as brackets and screws, to ensure secure and functional placement.

Stainless Steel Logo and Letters

- Supply and Installation stainless steel company logo and letters.
- The signage will be manufactured and installed according to the specifications detailed in the approved drawing plan, ensuring that it aligns perfectly with the intended design and placement.

Part F - ELECTRICAL

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 Rigid Steel Conduit in service entrance.
- 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.
- 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).
- All conduits that will cross the line canal shall be in concrete encasement without compromising the flow of water in line canal.

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.
- Testing all items mention above.

Specifications:

- All wires shall be High Quality 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 2.0mm² 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.

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 new panel board 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 grounding terminal in panel board.
- The contractor shall submit a proposal of preliminary Test and Inspection Plan.

Specifications:

- Panel Boards shall be MINIATURE CIRCUIT BREAKER ENCLOSURES, 16 WAYS, unless otherwise specified in the plan.
- Circuit Breakers shall be of HIGH QUALITY.
- The main circuit breaker shall be a 2-pole single-phase type, and branch circuit breakers shall be 2-pole single-phase types according to the schedule of loads.
- Panel boards shall have busbar capacity greater than the full-load current as specified in the Plan.



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 recessed type LED panels (according to the Plan) shall be fitted into the ceiling, properly reinforced for mounting, and correctly grounded. Refer to the Plan.
- Installation of downlight fixtures, both surface type and recessed type. Refer to the Plan.
- Installation of LED Emergency lights at the corresponding locations. Refer to the Plan.
- Provide individual power outlets for each emergency light.
- All lighting fixture bodies shall be properly grounded.
- Installation of LED bulbs in all lighting fixtures.
- Upon completion of the installation of lighting fixtures and after the circuitry has been energized, electrical energy shall be applied to demonstrate capability and compliance with requirements. When possible, malfunctioning 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 **60cm x 600cm surface 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.

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 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 split-type ACU shall be embedded in concrete.
- The Contractor shall provide metal brackets, housing, or casing of all ACU units.
- The Contractor shall provide a 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 the 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 supervision 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 split 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.
- 1HP split type 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.

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