

TERMS OF REFERENCE

MAINTENANCE OF VITAS ELECTRICAL AND LIGHTING SYSTEM PIER 18, VITAS, TONDO, MANILA (MPF-NCN-10-2026)

I. RATIONALE

Philippine Ports Authority-Port Management Office-NCR North aims to ensure that its port facilities are properly maintained to properly cater and provide efficient services that will meet the demands of its port users.

A well-maintained administrative building not only enhances the productivity of PMO employees but also reflects the Authority's standards and values to port users and visitors.

II. OBJECTIVE

PPA PMO-NCR North intends to perform preventive maintenance to Vitas electrical and lighting system to ensure continuous, safe, and reliable operation of the facilities. The project aims to restore and maintain adequate illumination of the areas indicated in the plans.

The procurement of the project shall be made through Alternative Mode of Procurement particularly Small Value Procurement in accordance with Section 34, of the implementing rules and regulations of the Republic Act No. 12009 or New Government Procurement Act.

III. SCOPE OF WORKS AND SERVICES

BILL NO. 1 GENERAL EXPENSES

- 1.1 Mobilization / Demobilization
- 1.2 Provide construction safety and health program in the execution of project

BILL NO. 2. PIER LIGHTING MAINTENANCE

- 2.1 Removal of existing abandoned wires, trimmings and removal of tree branches obstructing the designated pier lighting system to ensure adequate illumination coverage
- 2.2 Construction of reinforced concrete foundation including excavation, formwork, reinforcement placement, concrete casting for lighting pole installation, backfilling and pavement restoration
- 2.3 Supply and Install wiring, electrical conduit pipes including fittings and necessary accessories as indicated in the plan
- 2.4 Supply and install electrical safety devices, weather resistant convenience outlet enclosed in NEMA 3R enclosures, and all necessary accessories
- 2.5 Supply, Deliver, and Install 2 sets- 9 meter high single cross Light Post with 3-sets 200 watts, 220volts floodlights, including necessary wiring and accessories
- 2.6 Supply and Install 200 watts, 220 volts floodlights on existing light posts

BILL NO. 3. SAFETY MARKINGS AND SIGNAGES

- 3.1 Cleaning, Surface preparation and application of 1-coat epoxy primer and 2-coats yellow traffic paint on pedestrian walkway and crossing as indicated in the plan
- 3.2 Supply, Fabricate, Paint, and Install Steel Signage Stand, Including Supply of Safety Signages and Mounting of Signages on Steel Stand

IV. ELIGIBILITY OF THE SERVICE PROVIDER

The prospective contractor must submit the following equipment and documentary requirements:

A. Equipment Required:

Quantity	Description
1-unit	Chipping Hammer, Owned or Leased
1-unit	Power Unit for Chipping Hammer, Owner or Leased
1-unit	Concrete Saw, Owned or Leased
1-unit	Compressor for Breaker, Owned or Leased
1-unit	Concrete Vibrator, Owned or Leased
1-unit	Truck Mounted Telescopic Boom, Owned or Leased
1-unit	Welding Machine, Owned or Leased

B. Prospective bidders shall submit Quotation together with the herein documents:

1. PCAB License – At least Small “B” for Building
2. PhilGEPS Registration
3. BIR Certificate of Registration
4. Income/ Business Tax Return
5. Duly Notarized Omnibus Sworn Statement
6. Mayor’s Permit/Business Permit

V. APPROVED BUDGET CONTRACT

The Approved Budget for the Contract (ABC) shall be the amount **Nine Hundred Eighty-Five Thousand Two Hundred Forty-Three Pesos (Php 985,243.00)** inclusive of 12% VAT.

VI. CONTRACT DURATION

The target number of days to complete the project is fifty (50) days reckoned upon receipt of by the winning bidder of the Notice to Proceed (NTP).

VII. TERMS OF PAYMENT

The payment shall be paid in full to the contractor upon completion and acceptance of the project by PPA PMO-NCR North subject to accounting and auditing rules and regulations.

VIII. PERFORMANCE SECURITY

To guarantee the faithful performance by the winning bidder of its obligations under the contract in accordance with the Bidding Documents, it shall post a performance security prior to the signing of the contract. The winning bidder shall ensure that the performance security remains effective until the issuance of the Certificate of Final Acceptance.

The performance security shall be in the form chosen by the procuring entity and in the amount not less than the required percentage of the total contract price in accordance with the following schedule:

Form of Performance Security	Amount of Performance Security (Not less than the required percentage of the Total Contract)
a) Cash or cashier's or Manager's check issued by a bank	Ten percent (10%)
b) Bank draft or guarantee or irrevocable Letter or Credit issued by a bank. If issued by a foreign bank it shall be confirmed or authenticated by a local bank.	
c) Surety Bond callable upon demand issued by a surety or insurance company dully certified by the Insurance Commission as authorized to issue such security	Thirty percent (30%)

IX. LIQUIDATED DAMAGES

In case the prospective Contractor fails to perform satisfactorily the maintenance activities within the agreed contract period, the Contractor shall be held liable for damages for the delay and shall pay the Procuring Entity liquidated damages, an amount equal to one-tenth (1/10) of one-percent (1%) of the cost of the delayed project scheduled for completion, for every day of delay until such project is finally accomplished and accepted by the procuring entity concerned.

X. RESPONSIBILITY OF THE PROSPECTIVE CONTRACTOR

- a. The Contractor shall at all times utilize the most cost effective and widely accepted standards and practices in accomplishing the maintenance activities provided for in the Terms of Reference.
- b. The Contractor shall keep the PPA fully informed and updated on all matters relating to the maintenance activities accomplished.

XI. RESPONSIBILITY OF THE PHILIPPINE PORTS AUTHORITY

- a. For and in consideration of full, satisfactory and full performance by the Contractor of all maintenance activities provided for in the Terms of Reference (TOR), PPA shall pay the full amount considered to the Lowest Calculated Responsive Bid of all the bid proposals submitted.
- b. PPA shall assign a qualified engineering personnel to monitor, supervise and oversee the work direction of the maintenance activities being implemented by the Contractor to determine the actual progress and accomplishments of the project.

X. GENERAL REQUIREMENTS AND TECHNICAL SPECIFICATIONS OF PROJECT

ITEM 01 : DEMOLITION AND REMOVAL WORKS

A. DESCRIPTION OF THE PROJECT ITEM

- The work includes the furnishing of all labor, materials and equipment required to carry out the demolition and removal of old structures, port accessories and obstructions including demolition of miscellaneous concrete curbs etc., as required for the execution of the Contract.
- The Contractor shall submit the proposed methodology or procedure of demolition work with detailed drawings and calculations if necessary, to the PPA Engineer for approval, before the execution of the Works.
- The Contractor shall keep all pavements and landing areas to and from the site of the disposal area clean and free of mud, dirt and debris during and after the execution of disposal. Disposal of debris and materials shall be as directed by the PPA Engineer.

B. GENERAL PROVISIONS

- The Contractor shall be deemed to have satisfied himself of the site conditions, and to have included in his unit prices provision for all risks that may arise during or in connection with the work.
- The demolition shall be carried out by approved methods and equipment such as concrete breakers, gas-cutters, hydraulic jacks, compressed air disintegrators,

etc., however, no blasting shall be used unless approved in writing by the PPA Engineer and after obtaining the written permission of the concerned authorities.

- The Contractor shall provide suitable equipment, skilled labor and appropriate temporary works such as scaffoldings to ensure safety in his demolition works as well as in the adjacent area.
- Contractor shall demolish all the structural members above the level on which the subsequent and permanent works under this Contract will begin. To this end, the temporary construction works such as excavation shall be conducted by the Contractor.
- Materials coming from the demolition works, except general earth, shall remain the property of the Procuring Entity, the designated part of which shall be stored by the Contractor at places specified by the PPA Engineer/ Accepting authority. Receiving copy of Turn-Over Report shall be provided.
- In case of demolition of wharf deck and platform, the contractor shall ensure that no debris will be remained/deposited at seabed.

C. INTERFERENCE WITH PORT OPERATIONS

- During the execution of the work, the Contractor shall not interfere with the shipping, navigation and other traffic in the port.
- The Contractor shall coordinate with the concerned office regarding the schedule of demolition and other related works to ensure port operations remain uninterrupted at all times.
- Prior to commencement of the demolition works, the Contractor shall inform/announce to port users the schedule of disconnection of utilities.

D. STORAGE AND DUMPING

- Prior to the commencement of the demolition work, the PPA Engineer shall submit to the Contractor a list in which all the materials to be salvaged and overhauled, as property of PPA, and the description of the location of their storage. Materials embedded in concrete units shall not be salvaged.
- The Contractor shall separate materials to be salvaged from debris. Salvaged materials shall be loaded, transported and unloaded by the Contractor at the specified locations.
- The Contractor may dump debris or extracted rocks on land areas but out of the site, which areas shall be procured and prepared at his own expense. In this case, safety measures shall be undertaken in the transporting, unloading, covering and others as requested by the PPA Engineer.
- The approximate distance of the disposal site from the project site is about five (5) kms., as designated by the PMO thru the implementing office.

E. EXECUTION OF THE PROJECT ITEM

- Prior to the commencement of demolition works, the alignment of new construction works to existing structure shall be checked.
- The width and alignment of portion of existing structure to be demolished shall be marked by paint.
- With these lines as guides, concrete shall be broken and reinforcing bars cut, such that panels or portions of the structure can be lifted out for disposal elsewhere outside of the operational work area.
- Rocks removed from existing slope protection shall be stored for re-use in new construction.
- Demolish pavements, curbs, fences, utilities, services, navigation aids and the likes as determined in the field for each project and as shown on the drawings or as directed by the PPA Engineer.
- Materials coming from the demolition works shall be properly disposed by the Contractor.

F. SAFETY

- During the course of survey and clearing, any obstacles which are recognized and seemed to be explosive or hazardous to workers shall be removed from the site by the proper Authority.
- At the end of each day's work, the Contractor shall keep the workplace in safe condition and clean so that no part is in danger of falling or creating hazard to personnel or equipment.

ITEM 02 : PAINTING WORKS

A. GENERAL REQUIREMENTS

The work shall include all labor, materials, equipment, plant and other facilities and the satisfactory performance of all works necessary to complete all field painting and as specified herein. All paints and coatings shall be applied by painting subcontractors and workmen approved by the PPA Engineer.

B. SCOPE

The following surfaces to be painted except where otherwise specified or shown:

1. Above ground piping and other metal surfaces.
2. All exposed concrete.
3. All structural and miscellaneous metal
4. All equipment furnished without factory finished surfaces.

5. All exposed steel mullions, tubular frames, door frames, steel sash, and metal windows.
6. All sheet metal and ferrous metal trim.
7. Interior and exterior surfaces of the building including all concrete block masonry.

The following surfaces are not to be painted:

1. Ferrous metal having approved plating or factory paint finishes.
2. Non-ferrous metals, unless otherwise noted or indicated; galvanized metal shall not be considered a non-ferrous metal.
3. Equipment with factory finished surfaces unless otherwise noted.

No concrete, wood, metal or any other surfaces requiring protection shall be left unpainted even though not specifically defined herein.

Loose paints and rust on spiral steel stair, handrails, railing, antenna mast, exhaust hoods, steel doors, window grills and G.I. pipe fence frames shall be removed and repainted.

C. RIGHT OF REJECTION

Exterior painting or interior finishing shall be done under conditions which shall not jeopardize the appearance or quality of the painting or finishing in any way. The PPA Engineer shall have the right to reject all material or work that is unsatisfactory, and require the replacement of either or both at the expense of the Contractor.

D. PROTECTION OF THE WORK

The Contractor shall endeavor to protect the work of others during the time painting work is in progress. The Contractor shall be responsible for any and all damage to any other work in the course of his painting job.

Protective coverings shall be used to protect floors, fixtures, and equipment while painting, care shall be exercised to prevent paint being spattered unto surfaces which are not to be painted.

E. WORKMANSHIP

All painting work shall be first class and in accordance with the best standard practices of the trade.

The Contractor shall examine carefully all surfaces to be painted and before beginning any of his work shall make sure that the work of other trades has been installed in a workman like condition ready to receive paint. Metal surfaces shall be clean, dry and free from mill scale, rust, grease, oil or any other substance which could affect the quality of the painting.

Paint shall be applied at the proper consistency and each coat shall be brushed evenly free of brush marks, sags, and runs. Care shall be exercised to avoid lapping of paint on glass or hardwares. Paint shall be sharply applied to required lines. Finished paint surfaces shall be free from defects or blemishes. Surfaces from which

such paint cannot be removed satisfactorily shall be painted or repainted, as required to produce a finish satisfactory to the PPA Engineer.

Succeeding paint coatings shall be applied only when the previous coat is hard and dry.

All painting materials shall be used in strict accordance with manufacturers directions, spread or flowed on smoothly with proper film thickness and without runs, sags, skips or other defects.

F. STORAGE OF MATERIALS

All painting materials and equipment not for immediate use shall be stored in a room approved by the PPA Engineer for that purpose. The receiving, opening and mixing of all paint shall be removed from the premises at the end of each day's work, or stored in metal containers with metal covers.

G. PREPARATION OF PAINT

Paint containers shall be delivered to the job site in manufacturer's unopened containers and shall be opened only when required for use. Paint shall be mixed only in the designated room or space in the presence of the PPA Engineer or his representative. Paint shall be thoroughly stirred or agitated to uniformly smooth consistency suitable for proper application. Unless otherwise specified or approved, no materials shall be reduced, changed, or used except in accordance with manufacturer's label or tag on container. In all cases, paint shall be prepared and handled in a manner to prevent deterioration and inclusion of foreign matter.

H. CLEAN-UP

Upon completion of his work, the Contractor shall remove all surplus materials. All paint spills shall be removed and the entire premises shall be cleaned of all rubbish, and debris, caused by his work. He shall present the work clean and free from blemishes so that it is acceptable in every way. All glass, fixtures and doors shall be cleaned of paint spots and polished, and the job made for occupancy by the owner.

I. MATERIALS

1. **Materials** – The Contractor may substitute other paint materials provided he first receives written approval from the PPA Engineer stating that said proposed substituted materials are equal to that specified and are approved for use. The painting material shall be delivered to job site in original containers properly labeled without evidence of tampering, substitution of contents, or of deterioration. A complete list of materials proposed for use shall be submitted for the PPA Engineer's approval.
2. **Colors and Samples** – All finish colors shall be as selected by the Owner. In multicoat work using color pigmented paints, each coat shall have sufficient variation of color to easily distinguish it from preceding coat.

Using specified or approved materials, 3 sample panels of each finish, including all coats thereof shall be prepared and submitted for the Owner's approval. Completion work shall match approved colors and samples.

J. PREPARATION OF SURFACES

1. General Scope – Except as otherwise specified, surfaces to be painted shall be clean, smooth and dry. The Contractor shall report to the PPA Engineer in writing any surface which cannot be properly prepared for painting. If work is commenced before defects have been reported and corrected, any resulting unsatisfactory finish shall be rectified at no cost to the PPA.
2. Concrete and Masonry – all concrete and masonry surfaces shall be cured thirty days prior to painting. Dirt, dust, oil, grease, efflorescences, loose cement, chalk and other deleterious matter shall be removed and surface roughened when necessary to insure good paint adhesion. the method of surface preparation shall be left to the discretion of the contractor, but results obtained shall be satisfactory to the PPA Engineer. Before application of resin emulsion paint, surfaces shall be prepared in accordance with manufacturer's directions. Before application of oil base or latex paints, surfaces shall be tested for presence of alkali; if alkali is present, neutralized as recommended by the manufacturer of the paint materials to be applied.
3. Plaster – Dirt, dust, loose plaster and other deleterious matter which would prevent good paint adhesion shall be removed. All holes, cracks and depression shall be neatly filled with patching plaster, missed and applied to match existing plaster. Patches shall be sanded flush and smooth and properly sealed before applying prime coat. After priming surfaces, suction spots shall be touched up with additional prime coat material until surfaces evidence a uniform coating. Enamel undercoats on smooth plaster shall be sandpapered by hand (with No. 00 sandpaper) and dusted clean before applying succeeding coat.
4. Metal – Dirt, weld, splatter, rust, scale and other contaminants shall be removed by scrapping, wire brushing and sanding or sandblasting as required. Oil and grease shall be removed with mineral spirits or appropriate solvent. Before painting ferrous metal surfaces, including galvanized ferrous metal, surfaces shall be pretreated with approved phosphoric acid etching cleaner in accordance with manufacturer's directions to produce a chemically clean surface. Unless already performed in accordance with specifications of other sections, abrasions and bare spots in shop prime coatings shall be touched up with metal primer matching the shop coatings. Enamel undercoats shall be sandpapered by hand (with No. 00 sandpaper) and dusted clean before applying succeeding coat.
5. Woodwork – Unless already properly sanded, woodwork shall be sandpapered smooth by hand. Before priming surfaces, knots, pitch pockets and sap streaks shall be thoroughly cleaned of residue and touched up with shellac varnish coating. After priming surface, nail holes, cracks and depressions shall be neatly filled with putty or other approved filler, colored to match required finish. Enamel undercoats shall be sanded by hand (with No. 00 sandpaper) and dusted clean before applying succeeding coat.

K. APPLICATION OF PAINT

1. General Scope – All painting and finishing shall be performed by skilled craftsmen. Each coat of paint shall be applied with proper consistency, evenly, free of laps, sags and runs and cut sharply to required lines. Paint shall be applied only under dry and dust free conditions that will insure properly finished surfaces, free of defects and blemishes unless otherwise directed by the PPA Engineer. Paint shall not be applied when temperature is likely to be above 90°F. Sufficient time shall be allowed between application of coats to ensure proper drying of the preceding coat. All primer and intermediate coats shall be unscarred and completely integral at time of application of each succeeding coat. The PPA Engineer shall be notified when each coat has been applied and is ready for inspection; until coat is inspected and approved by the PPA Engineer, no succeeding coats shall be applied. Whenever two coats of a dark colored paint are specified the first coat shall contain sufficient powdered aluminum to act as an indicator for proper coverage when applying the second coat.
2. Method of Application – Paint should be applied by brush, spray, or other application method approved by the PPA Engineer.
3. Priming and Back Painting
 - a. Priming – Before installation, all surfaces of millwork which are to be painted shall be primed giving particular attention to sealing of cross-grained surfaces. In all cases, all work shall be primed as soon as possible after delivery to buildings, before or after installation, as required, or in case prefabricated items, at fabricator's shop or mill before shipment, if practicable. Except as otherwise specified, primings shall consists of first coat herein after specified under "Finishes".
 - b. Back-Painting – Woodwork, millwork and casework to be installed against concrete, masonry or plaster shall be back painted with one coat of exterior oil paint.

L. PAINTING SCHEDULE

Paint manufacturers shall be BOYSEN, DAVIES or an approved equivalent.

INTERIOR WALLS / EXTERIOR WALLS

1. Concrete Acrylic Concrete Primer and Sealer
2. Concrete Putty
3. Acrylic water based, odor less, semi-gloss latex paint

STAIR AND HANDRAILS

1. Epoxy Primer
2. Epoxy Enamel (2 coats)

GENERATOR ROOM FLOORING

1. Chlorinated Rubber Base Paint Finish

ITEM 03 : CONCRETE WORKS

A. SCOPE OF WORK

The work shall include all labor, materials, equipment, plant and other facilities for the satisfactory performance of all works necessary to complete all concrete and reinforced concrete work shown on the Drawing and specified herein.

B. MATERIALS

- a. Cement – Cement used shall be Type I Portland Cement conforming to the requirements of the latest revision of ASTM C 150 “Standard Specifications for Portland Cement”.
- b. Coarse Aggregates – Coarse Aggregates shall be washed, well graded, hard pieces of gravel, crushed gravel, rock or other approved inert materials of similar characteristics, or combination thereof, having hard, strong, durable pieces and free from any adherent coatings. It shall conform to the requirements of ASTM C 33 “Standard Specifications for Concrete Aggregates.
- c. Fine Aggregates

Fine Aggregates shall be natural sand, stone screenings or other inert materials with similar characteristics, or any combination thereof, having clean, hard, strong and durable particles, uncoated grains and free from injurious amount of dust, lumps of clay, shale, and organic matter approved by the PPA Engineer. It shall conform to the requirements of ASTM C33 “Standard Specifications for Concrete Aggregates”. Beach Sand shall not be used unless approved by the PPA Engineer. Fine aggregates from different sources shall not be mixed or stored in the same pile nor used in the same class of concrete without the approval of the PPA Engineer.
- d. Admixtures – Air-entraining admixtures shall conform to the requirements of AASHTO M154. Chemical admixtures, if specified or permitted, shall conform to the requirements of AASHTO M194. Unless otherwise required by Field conditions admixtures may be used subject to the expressed approval of the PPA Engineer. The cost thereof shall be considered as already included in the unit cost bid of the Contractor for the concrete.
- e. Water – Water used in mixing, curing and other designated application shall be reasonably clean and free of oil, salt, acid, alkali or other substance which would adversely affect the concrete. Water will be tested in accordance with, and shall meet the suggested requirements of AASHTO T26.
- f. Reinforcing Bars – It shall be standard commercial deformed steel bars and must conform to the requirements of ASTM A 615, grade 40 and/or AASHTP M42, M31 and M53.
- g. Tie Wire – It shall be commercial G.I. wires, gauge 16 and must be in accordance with ASTM A 615 and/or AASHTO M31 and M42.

- h. Forms – It shall be of well-seasoned, quality lumber and well-graded plywood. All forms shall be straight, free from warps and of adequate

strength to resist distortion. Formwork shall be coated with form oil of approved make.

- i. Storage of Materials – Cement shall be stored on waterproof building or watertight shed, and on platform off ground. The Contractor shall handle and store fine and coarse aggregates separately in a manner to provide good drainage, and to prevent segregation or inclusion of foreign materials. All reinforcing bars shall be protected from mechanical injury and surface deterioration caused by exposure to conditions producing rust until used.

C. TRIAL BATCH FOR CONCRETE

Thirty (30) calendar days before the start of concreting works, the Contractor shall submit design mixes and the corresponding test results made on sample thereof. Sampling and testing shall be in accordance with the ASTM Standard procedures for sampling and testing, for the particular design strength required.

The particulars of the mix such as the slump and the proportionate weights of cement, saturated surface dry aggregates and water used shall be stated. Test results shall show 28-day strength(s) fifteen (15) percent higher than the ultimate strength(s) required.

D. CONCRETE PROPORTION AND CONSISTENCY

Concrete proportion should produce mix consistencies that will work readily into angles and corners of the forms and around reinforcements irrespective of the method of placing employed, without permitting the materials to segregate or excess water to collect on the surface of the concrete and with separate individual particles of aggregates showing coating of mortar with proportionate amount of sand. The total aggregate in the proportion used shall be such that when sieved, the weight passing the No. 4 standard sieve shall be thirty percent (30%) of the total.

The methods used for measuring materials going in to the concrete mix shall permit easy checking and control of proportions at any time during the work.

E. MIXING OF CONCRETE

All concrete used shall be machine-mixed at the site. Each batch shall be mixed at the mixer's design speed, for at least 1-1/2 minutes after all concrete materials are simultaneously placed in the mixer. The ideal rotation speed of the mixer shall be between 14 and 20 rpm.

All mix contents of the mixer shall be thoroughly removed before any succeeding batch is placed.

The materials for the first batch shall contain sufficient excess cement, sand and water to coat the inside walls of the mixer without reducing the required mortar content of the mix.

The mixer shall be provided with devices for accurately measuring and controlling the amount of water used in each batch and for automatically recording the number of revolutions of the mixer.

Hand mixing of concrete will only be allowed in case of mixer breakdown, in which case it shall be stopped as soon as pouring for the particular section is completed, or at a construction joint as directed by the PPA Engineer.

Retempering or remixing of partially hardened concrete with the addition of water will not be permitted.

Inserts, sleeves, anchors, bolts and other materials in connection with concrete construction shall be placed and secured in position before concrete is placed.

F. JOINTS

No reinforcement, corner protection angles or other fixed metal items shall be run continuous through joints containing expansion-joint filler, through crack-control joints in slabs or grade and vertical surfaces.

Joints with Joint Sealant: At expansion joints in concrete slabs to be exposed, and at other joints indicated to receive joint sealant, pre-molded expansion joint filler strips shall be installed at the proper level below the elevation with a slightly tampered, dressed and wood strip temporarily secured to the top thereof to form a groove, when surface dry, shall be cleaned of foreign matter, loose particles, and concrete protrusions, the filler approximately flush with joint sealant so as to be slightly concave after drying.

Finish of concrete at joints: Edges of exposed concrete slabs along expansion joint shall be nearly finished with a slightly rounded edging tool.

Construction Joints: Unless otherwise specified herein, all construction joints shall be subject to the approval of the Owner. Concrete shall be placed continuously so that the unit will be monolithic in construction. Fresh concrete may be placed against adjoining units, provided the set concrete is sufficiently hard not to be injured thereby. Joints not indicated shall be made and located in a manner not to impair strength and appearance of the structure.

Placement of concrete shall be at such rate that the surfaces of concrete not carried to joint levels will not have attained initial set before additional concrete is placed thereon. Lifts shall terminate at such levels as indicated or as to conform to structural requirements as directed. If horizontal construction joints are required, a strip of 25 mm square-edge lumber, leveled to facilitate removal shall be taken to the inside of the forms at the construction joints. Concrete shall be removed 1 hour after the concrete has been placed, any irregularities in the joint lines shall be leveled off with wood float, and all laitance removed. Prior to placing additional concrete, horizontal constructed joints shall be prepared as specified in "Bonding".

G. FORMS AND FALSEWORK

All forms and falsework to be used in the work must be designed, and constructed by the Contractor for rigidity and adequacy for carrying the loads of the green

concrete and/or additional superimposed construction loads. The Authority may from time to time verify the adequacy and safety of such temporary works and

may require the Contractor to submit detailed designed drawings of forms and falsework proposed to be used. Approval of such drawings or design of forms, however, shall not relieve the Contractor of his liability on imperfections or damages to the finished concrete, or other damages which may directly result therefrom.

Forms may be re-used but shall be scrapped by a wire brush of all clinging mortar. Bulges should be planed and realignment prior to its use.

Prior to placing concrete form surfaces should be oiled for easy from removal. However, the oil coating should not be so thick as to stain and soften the concrete surface. Oil coatings should be applied before rebars are in placed.

H. PLACING REINFORCEMENTS

Metal reinforcement shall be placed as accurately detailed on drawings and properly secured by the approved means.

All bars shall be cold bent unless approved otherwise by the PPA Engineer. Minimum distance between parallel bars shall be one and one half ($1 \frac{1}{2}$) times the diameter for round bars and twice the side dimension for square bars. The clear distance between bars shall not be less than 2.54 cm. (1 in.) nor less than one and one third ($1 \frac{1}{3}$) times the maximum size of the coarse aggregate, whichever is bigger.

All reinforcing steel shall be cleaned of all rust or scale deleterious materials which tend to destroy the bond between the concrete and the steel.

Generally, splice/s of reinforcement at points of maximum stress specially in slabs, beams and girders shall be avoided. Such splice/s may however be approved by the PPA Engineer in writing provided the lap if bonded or butt welded is sufficient to transfer tensile stress between bars by at least 125% of the specified yield strength of the reinforcing bar. For adjacent bars splices shall be staggered.

I. PLACING CONCRETE

Concrete shall be handled from mixer to transport to place of final deposit in a continuous manner, as rapidly as practicable, and without segregation of loss of ingredient until the approved unit of work is completed. Placing will not be permitted when the sun, heat wind or, limitations of facilities furnished by the Contractor prevent proper finishing and curing of the concrete. Concrete shall be placed in the forms, as closed as possible in the final position, in uniform approximately horizontal layers not over 300 mm deep. Forms splashed with concrete and reinforcement splashed with concrete or form coating shall be cleaned in advance of placing subsequent lifts. Concrete shall not be allowed to drop freely more than 10 meters in unexposed work nor more than 1 meter in exposed work; where greater drops are required, tremie or other approved means shall be employed. The discharged of the tremies shall be controlled so that the concrete may be effectively compacted into horizontal layers not more than 300 mm thick, and the spacing of the tremies shall be such that segregation does not occur. Concrete to receive

other construction shall be screeded to the proper level to avoid excessive skimming or grouting. Conduits and pipes shall not be embedded in concrete unless specifically indicated or as directed by the Owner.

Time Interval Between Mixing and Placing: Concrete mixed stationary mixers and transported by non-agitating equipment shall be placed in the forms within 45 minutes from the time ingredients are charged into the mixing drum. Concrete transported in truck mixers or truck agitators shall be delivered to the site of work discharge in the forms within 45 minutes from the time that the ingredients are discharged into the mixing drum. Concrete shall be placed in the forms within 45 minutes after discharged from the mixer at the jobsite.

Earth-foundation placement: Leveling concrete for concrete foundations, exterior slabs and exterior foundations receiving equipment or machinery shall be placed upon undisturbed surfaces. The surfaces shall be clean and free from mud and water. The concrete foundations may be placed over the leveling concrete surfaces.

Conveying Concrete by Chute, Conveyor or Pump: Concrete may be conveyed by chute, conveyor, or pump if approved in writing. In requesting approval, the contractor shall submit his entire plan of operation from time of discharge of concrete from the mixer to final placement in the forms, and the steps to be taken to prevent the formation of cold joints, in case the transporting of concrete by chute, conveyor or pump is disrupted. Conveyor and pump shall be capable of expeditiously placing concrete at the rate most advantageous to good workmanship. Approval will not be given for chutes or conveyors requiring changes in the concrete materials or design mix for efficient operation.

- a. **Chutes and Conveyors:** Chutes shall be of steel or steel line wood, rounded in cross section rigid in construction, and protected from overflow. Conveyors shall be designed and operated and chute sections shall be set, to assure a uniform flow of concrete from mixer to final place of deposit without segregation of ingredients loss of mortar, or change in slump. The discharge portion of each chute or conveyor shall be provided with a device to prevent segregation. The chute and conveyor shall be thoroughly cleaned before and after each run. Waste material and flushing water shall be discharge outside the forms. When using titled chutes, the inclination should not be flatter than (1) vertical and (2) horizontal. From the outlet/mouth of the chute to the concrete surface, the maximum allowable height shall be 1.50 meters.
- b. **Pumps** shall be operated and maintained so that a continuous stream of concrete is delivered into the forms without air pocket, segregation of change in slump. When pumping is completed, concrete already placed.

After each operation, equipment shall be thoroughly cleaned and the flushing water shall be splashed outside the forms.

Placing concrete reinforcement: Where congestion of the steel or other conditions will make placing or compaction of concrete difficult, a layer of mortar shall be first deposited in forms to a depth of approximately 25 cm. Mortar proportions shall be the same as the concrete minus the coarse aggregate.

J. COMPACTION

Immediately after placing, each layer of concrete shall be compacted by internal concrete vibrators supplemented by handspading, rodding, and tamping. Tapping or other external vibration of forms will not be permitted unless specifically approved by the Owner. Vibrations shall not be used to transport concrete inside forms. Internal vibrators submerged in concrete shall maintain a speed of not less than 7000 impulses. The vibrating equipment, shall at all times be adequate in number of units and power to properly consolidate all concrete.

Spare units shall be on hand as necessary to insure such adequacy. Duration of vibrating equipment shall be limited to time necessary to produce satisfactory consolidation without causing objectionable segregation. The vibrators shall not be inserted into lower courses that have begun to set.

Vibrators shall be applied at uniformity spaced points not further apart than the visible effectiveness of the machine.

K. BONDING

Bonding/depositing new concrete on or against concrete has set. The surfaces of the set concrete shall be thoroughly cleaned so as to exposed coarse aggregate and be free of laitance, coatings, foreign matter and loose particles. Forms shall be retightened. The cleaned surfaces shall be moistened, but shall be without flowing water when concrete is placed.

L. FINISHES OF CONCRETE

Within 12 hours after forms are removed, surface defects shall be remedied as specified herein. Fine and loose material shall be removed. Honeycomb, aggregate pockets, voids over 13 mm in diameter, and holes left by the rods or bolts shall be cut out to solid concrete, reamed, thoroughly wetted, brush-coated with neat cement grout, and filled with mortar. Mortar shall be a stiff mix of 1 part Portland cement to not more than 2 parts fine aggregates passing the no. 16 mesh sieve, and minimum amount of water. The color of the mortar shall match the adjoining concrete color. Mortar shall be thoroughly compacted in place.

Holes passing through walls shall be completely filled from the inside face by forcing mortar through to the outside face. Holes which do not pass entirely through wall shall be packed full. Patchworks shall be finished to match adjoining surfaces in texture and color. Patchworks shall be damp cured for 72 hours. Ambient temperature shall not be less than 10 degrees C. Dusting of finish surfaces with dry material or adding water to concrete surfaces will not be permitted.

M. CURING

Concrete shall be protected against moisture loss, rapid temperature change, mechanical injury from rain or flowing water, for a minimum period of 7 days.

Concrete shall be maintained in a moist condition at temperature above 10 degrees C throughout the specified curing period and until remedied work started. Curing

activities shall be started as soon as free water has disappeared from surface of the concrete after placing and finishing.

Form under surface shall moist cured with forms in place for the full curing period or, if forms are removed prior to the end of the curing period by other approved means. Curing shall be accomplished by any of the following methods of combination thereof, as approved.

Water: Water used in curing shall be reasonably cleaned and free of oil, salt, acid, alkali, or other substances injurious to the concrete. Drinking water may be used for curing test.

Moist Curing: Uniformed surfaces shall be covered with burlap or mats, wetted before placing and over-lap at least 150 mm. Burlap or mats shall be kept continually wet and in intimate contact with the surface. If the forms are removed before the end of the curing period, curing shall be continued on uniformed surfaces, using suitable materials.

N. FIELD TESTS

Field tests as may be deemed necessary to check on the quantity of the materials and mixtures and the manner of construction employed shall be conducted by the Project Engineer assigned to the project. And when such tests result to values less than that tolerated by standards set in applicable provisions of the ASTM Specifications referred to herein, or contrary to accepted good engineering practice, the Contractor shall comply to any instructions given by the project Engineer to upgrade the materials used and method of construction employed.

ITEM 04 : ELECTRICAL WORKS

A. SCOPE OF WORK

The Contractor shall provide all materials and equipment and perform all the works necessary for the complete execution of all the electrical plans as shown on the Electrical Drawings, and as herein specified, or both, except as otherwise excluded and which, without excluding the generality of the foregoing shall include but not limited to the following principal items of work:

- a. Supply and installation of complete electrical conduit and wiring for light and power.
- b. Supply and installation of lighting fixtures, outlets and wiring devices;
- c. Supply and installation of electrical panels;
- d. Complete testing and commissioning of all electrical and auxiliary works; and
- e. If anything has been omitted for any item of work or materials usually furnished which are necessary for the completion of the entire work as outlined herein before, then such items must be and hereon included in this division of work.

B. EXECUTION AND INSTALLATION OF WORKS

The work under this contract shall be in accordance with the provisions of the latest edition of the Philippine Electrical Code and in compliance with the requirements of the local utility company.

C. GUARANTEE

The Contractor shall guarantee that electrical system are free from all grounds and from all defective workmanship and materials and will remain so for a period of one year from the date of acceptance of the work. Any defects, appearing within the aforesaid period, shall be remedied by the Contractor at his own expense.

D. WORKMANSHIP

The work thorough shall be executed in the best and most thorough manner under the direction of and to the satisfaction of the Architect who will interpret the meaning of the Drawings and Specifications and shall have the power to reject any work and materials which in his judgment, are not in full accordance therewith.

E. STANDARD OF MATERIALS

All materials shall be new and shall conform with the standards of Underwriter's Laboratories, Inc., IEEE, NEMA and Philippine Standard Agency (PSA) for every case where such a standard has been established for the particular type of materials in question.

All materials on all system shall comply with the specifications, unless specially excepted and all materials where not specified shall be of the best of their respective kind.

F. APPROVAL OF MATERIALS

All electrical materials shall be new and shall meet the requirements and shall bear the inspection label wherever standards have been established. Before any materials or equipment are ordered, the Contractor shall submit to the PPA Engineer for approval, a complete list of the materials, apparatus, and equipment, in triplicate, giving the manufacturer's name, address, descriptive data, trade name of item, rated capacities, certified analysis, catalogue numbers, etc., and when called upon to do so, complete specifications and cut or drawings of each item, of whole or portion of list, as required by the PPA Engineer which he proposed to use and install.

G. LIGHTING SYSTEM

The Contractor shall provide labor and materials for the installation of lighting systems to be included but not limited to the following:

- a. A system of exterior and interior lighting including all feeders, branch circuits and connections to all lighting outlets and fixtures.
- b. All distribution and lighting panels completed.

- c. If anything has been omitted in any item of work or material usually furnished which are necessary for the completion of the lighting system work as outlined hereunder, then such items must be and hereby included in this section of the work.
- d. The Contractor shall provide and install all lighting fixtures of the size and type as indicated in the drawings.
- e. All fixtures shall be wired and installed completely including all lamps and/or tubes, transformers, ballasts, supports, brackets, canopies, globes, and other parts and devices necessary for the complete installation and operation.

H. WALL SWITCHES

Wall switches shall be rated at 10 amperes, 250 volts, one-way or three-way as required. The type of switch shall be tumbler or snap on as required. National brand or equivalent. Where switches are installed surface mounted, they shall be installed in type FS conduit fittings and provided with surface mounting covers. Switches shall not be during switching operations. Wall switches shall be mounted 1400 mm. from finish floor.

I. OUTLET AND SWITCH BOXES

At all outlets or whatever kind of all systems, there shall be provided suitable outlet boxes or other fittings specially designed to receive the type of devices to be mounted thereon.

All outlet boxes shall be pressed metal boxes with metal thickness not less than gauge 18.

All metal parts of outlet boxes shall be galvanized and shall have covers having thickness as the box with screws attached.

Boxes installed in damp or wet locations shall be specifically approved for the purpose and shall be so placed and constructed as to prevent moisture from entering or accumulating within the box.

In walls or ceiling constructed of wood, concrete or other similar materials, boxes and covers shall be flushed with finished surfaces. Number of wires and devices contained in the box shall be in accordance with the Code. Where necessary flush square outlet boxes shall be fitted with extension rings or raised coverlets.

Boxes shall be securely and rigidly fastened to surface upon which they are mounted, or embedded in concrete or masonry, and shall be supported from a structural member or building either directly or by using substantial and approved metal braces.

Outlet boxes installed exposed other than in wet location shall have thickness not less than gauge 16 while boxes concealed above closed ceiling and those embedded in masonry shall have a thickness of gauge 18, hot dipped galvanized.

Standard outlet boxes shall be of the octagonal, square or rectangular shapes and only deep types no less than 54 mm. depth shall be used for installation.

J. CONDUITS

Unplasticized Polyvinyl Chloride (PVC) conduit shall be schedule 40, uniform thickness. It shall be compression and impact resistant, non corrosive, weatherproof as manufactured by Emerald or equivalent. The material shall not deteriorate when exposed to sunlight, rain and other elements.

Liquid-tight flexible materials metallic conduit shall be raintight suitable for wet and damp locations complete with special fittings and connectors approved for the purpose.

K. INSTALLATION OF CONDUIT SYSTEM

Conduit shall be installed and supported in a rigid and satisfactory manner.

No conduit shall be used in any system smaller than 15 mm. (1/2 inch.) diameter trade size, nor shall have more than four quarter bends in any one run between outlets and/or fittings. When necessary, pullboxes shall be provided as directed by the PPA Engineer

All cut ends of conduit shall be reamed to remove rough edges. Where a conduit enters a box or fitting, bushing shall be provided to protect wire from abrasion, unless design of box or fittings is such as to afford equivalent protections.

Raceways shall be installed at right angles or parallel to building lines. Conduit shall be firmly fastened within 0.3m. of each outlet box fitting or cabinet by means of standard lumps and intermediately spaced not more than 1.0 meter. All clamps, bolts, straps, etc. shall be galvanized and painted metal.

Support and braces may be welded to structural steel after specific approval by the PPA Engineer. When running over concrete surfaces, the screws shall be held in place by expansion sleeves.

L. WIRES AND CABLES

600 volt grade wire shall be copper, hard drawn and annealed and shall be 98% conductivity.

Wire or cable for lighting and power systems shall be plastic insulated type TW, THW or THHN as note on plans or as specified. All wires 3.5 sq.mm. and larger shall be stranded unless noted on plans.

No wire smaller than 3.5 sq.mm. shall be used except where otherwise specified. Control leads for motors shall be type THW, unless otherwise indicated.

All wires shall be color coded (Black, Red, Yellow, Green) wires and cables shall be as manufactured by Phelps Dodge, Phlflex or equivalent.

Underground conductors shall have distinct insulation color from grounded and grounding wires. Grounding wires and cables shall be colored green or white or as

M. LIGHTING AND POWER PANELS

Electrical panels and cabinets shall be dead front construction furnished with trim flush or surface mounting as required. Cabinet and panels shall be of code gauge steel with gutters at least 100 mm wide. Doors shall be swing type and shall have latches and locks.

All protective devices shall meet NEMA and Underwriter Laboratories Inc. specifications. In multiple circuit breaker, all poles shall be interrupted simultaneously during fault conditions.

All busbars and current carrying parts shall be high conductivity copper and shall have current density not more than 1.5 amperes per sq.mm. of cross-sectional area and shall be heavier where for mechanical strength. Supply with non-ferrous or galvanized bolts, nuts, washers and other required attachment devices.

Each and every panel shall be provided on the inside of the door, with directory frame protected by a transparent plastic window, containing typed card indicating the member and designation of the circuits.

All panels and switchboard shall have grounding bus or lugs with pressure type terminals of sufficient quantity and size and so located inside as to permit easy termination of cables.

Panels, switchboards and MCC's shall be painted with coat of antitrust primer and finish coat of baking enamel paint preferably colored gray.

N. CIRCUIT BREAKERS

Circuit breakers shall consist of quick-make, quick break operating mechanism, thermal magnetic trip unit on each pole and enclosed in a molded phenolic case. The thermal magnetic trip unit shall provide time delay overload and instantaneous trip short circuit in any one pole.

Rating of circuit breaker shall be suitable for each service application shall be specified as to rated voltage, current, type, frame, size and frequency as manufactured by Westinghouse or equivalent.

O. INSPECTION TESTS

Inspection and tests shall be conducted by the Contractor in the presence of the PPA Engineer or the Owner's representative. These tests shall be for the normal operation of the entire electrical system of the project. The decision made by the PPA Engineer for correction on any item or work, alteration of incorrect installation, or replacement of defective materials, or any other defects as found by him shall be final and must be complied by the Contractor within forty-eight (48) hours after receipt of the official written communication before final acceptance can be made.

P. TEMPORARY LIGHT AND POWER

The Contractor shall provide, install and maintain adequate incoming service transformer, light feeders, branch circuits, outlets, lamps and fixtures, as required for performance of the work by all trades engaged in the construction of the building structures and installation.

ITEM 06 : STEEL SIGNAGES

A. SCOPE OF WORK

The Contractor shall provide all labor, supervision, tools, equipment, and materials necessary to complete the supply, fabrication, painting, delivery, and installation of steel signage stands, including the supply and mounting of safety signages, in accordance with the approved drawings, specifications, and applicable safety standard.

B. MATERIALS

All materials shall be brand new, free from defects, and compliant with industry standards. Structural steel members such as steel pipes, square tubes, angle bars, or other approved sections shall conform to applicable ASTM standards or equivalent specifications and shall have dimensions and thicknesses as indicated in the approved plans. Anchor bolts, nuts, washers, clamps, rivets, and other fastening devices shall be galvanized or stainless steel to provide adequate corrosion resistance.

All joints, connections, and intersections of the steel frame members shall be fully welded unless otherwise indicated in the approved plans. Welding works shall be performed using appropriate welding electrodes conforming to applicable standards. Welds shall be continuous, sound, and free from cracks, porosity, undercutting, slag inclusions, and other defects that may affect the structural integrity of the steel signage stand. After welding, all weld areas shall be cleaned, ground smooth where necessary, and treated with anti-corrosive primer prior to the application of finish paint to ensure adequate protection against rust and weathering.

Safety signages shall be fabricated from Aluminum Composite Panel (ACP) of approved thickness and quality suitable for outdoor application. The signages shall be weather-resistant, UV-resistant, and capable of withstanding environmental exposure without significant deterioration. Graphics, symbols, colors, and legends shall conform to applicable Occupational Safety and Health Standards (OSHS) and other relevant government regulations. The dimensions of the signages shall vary and shall be in accordance with the sizes, details, and locations indicated in the approved plans. Mounting accessories, including brackets, bolts, screws, rivets, and other fastening devices necessary for complete installation, shall be provided by the Contractor.

C. EXECUTION AND INSTALLATION OF WORKS

The fabricated steel signage stand shall be erected, aligned, leveled, and securely fixed in place. After erection, all welded joints and damaged painted surfaces shall

receive touch-up painting to maintain corrosion protection. Safety signages shall be firmly mounted on the steel stand using approved bolts, screws, rivets, brackets, or other fastening devices to ensure durability and stability under normal operating conditions. The Contractor shall ensure that all signages are properly oriented, clearly visible, and legible from the intended viewing distance.

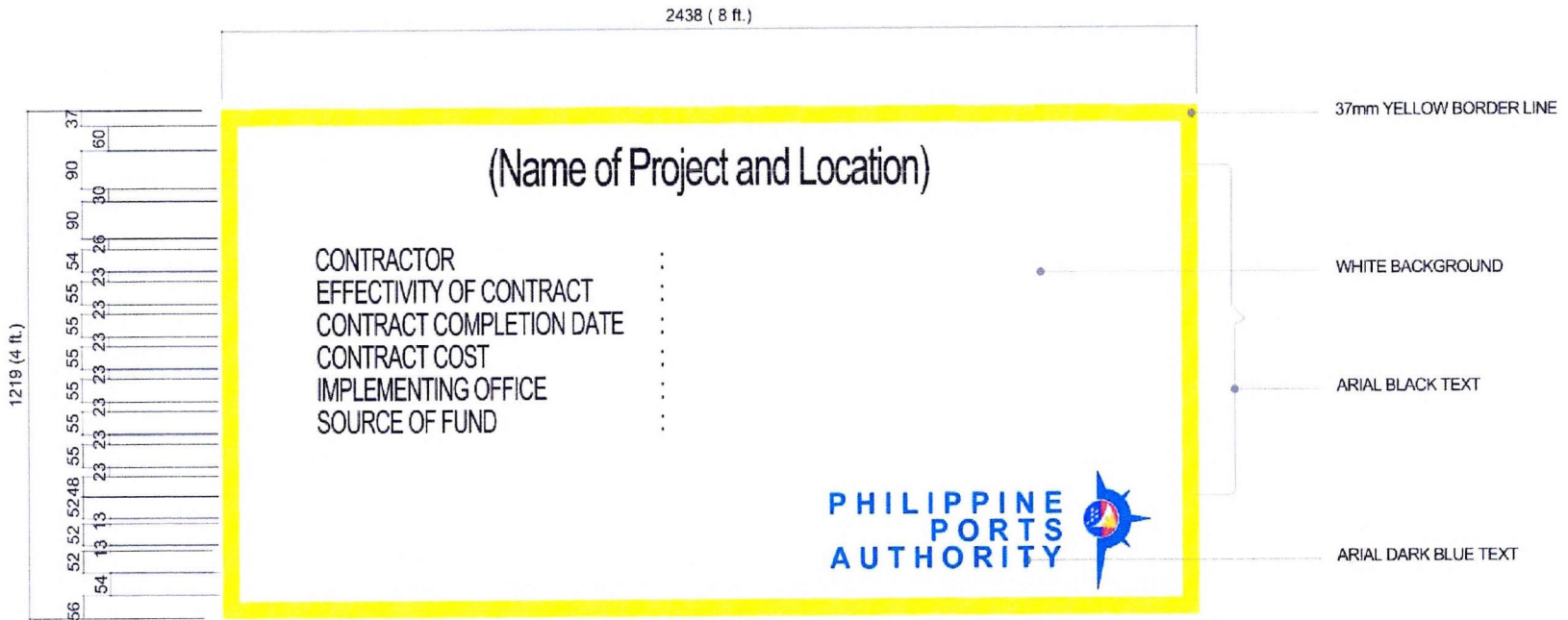
ITEM 07 : PROJECT BILLBOARD

A. SPECIFICATION

The Project Billboard shall be installed at location(s) designated by the PPA Engineer. (for reference, ***Annex A*** is attached herein)

The size and specifications of materials for the standard billboard shall be 4ft. x 8ft. (1,200mm x 2,400mm) using ½ inch (12mm) marine plywood or tarpaulin poster on 3/16 inch (5mm) marine plywood.

Project billboards shall not contain Name(s) and/or picture(s) of any personages.



STANDARD PROJECT BILLBOARD

ITEM 08 : SAFETY SIGNAGES AND BARRICADES

A. DESCRIPTION

This work includes the furnishing and installing of safety signages and barricades in accordance with the specifications and to the details shown below in the drawings, or as directed by the PPA Engineer.

B. SPECIFICATION

The Signage's and Barricades shall be installed at location(s) designated by the PPA Engineer.

The sizes of the standard signages shall be 2-2/3ft x 4ft (800mm X 1,200mm) for fixed type and 2ft x 2-2/3ft (600mm x 800mm) for mobile type. For barricade standard 2ft x 2-2/3ft (600mm x 800mm) shall be provided.

The materials to be used for signages and barricades are ½ inch (12mm) marine plywood or tarpaulin poster on 2" x 2" (50mm x 50mm) good lumber frame (see drawing below).

The printing or painting shall be the discretion of the PPA Engineer.

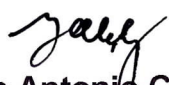
XI. RESERVATION CLAUSE

The employees of the Contractor are not employees of the PPA, and thus, the latter shall not in any way be responsible for any liability resulting or arising from the conduct of activities of the former, in whatever kind or nature.

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