



Republic of the Philippines
Tourism Infrastructure & Enterprise Zone Authority

PROJECT SPECIFICATIONS

I. GENERAL CONDITIONS

The work to be undertaken shall include the furnishing of labor, materials, tools and equipment for the following:

**Project : SUPPLY, DELIVERY AND INSTALLATION OF LED SCREEN PANELS AT
INTERNATIONAL AND DOMESTIC ARRIVAL AREAS**

Location : NAIA Terminal 2, Pasay City

A. Scope of Work

The construction work must be executed strictly in accordance with the plans and specifications. The following principal items of work shall include but not limited to the following:

I. General Requirements

II. Electrical Works

III. Civil Works

The construction procedures shall be done in accordance with the DPWH Standard Specifications, and in full compliance with the approved plans and specifications.

All items not specifically mentioned in the specifications or noted on the plans but which are obviously necessary for the completion of the work shall be included.

II. SITE WORKS

A. Scope of Work

Furnish all materials and equipment and perform labor required for the disposal of surplus excavated materials, rubbish and debris resulting from site clearing, stripping, site grading and trenching, demolition, removal and foundation excavation.

B. Clearing the Site

The building site shall be leveled according to the plans and cleared of rubbish, roots and other perishable and objectionable matters to a suitable sub-grade.

Surplus materials not required or suitable for fill or backfill and all debris and other materials resulting from demolition work shall be immediately removed from the site premises by the contractor and be disposed off in areas provided by the contractor. Debris and rubbish shall be removed and transported in a manner that will prevent spillage on streets or adjacent areas. In cases of spillage, clean up the streets and adjacent areas that were affected.

III. CARPENTRY WORKS

A. Scope of Work

1. Furnish materials and equipment and perform labor required to complete wooden framings and related rough carpentry works as indicated in the plans and/or specified herein.
2. Include in the works nailing strips, scaffoldings, plates, straps, joists, hangers, rods, dowels, rough hardware, fasteners, and other miscellaneous iron and steel items pertinent to rough carpentry work.

B. Materials

1. Lumber shall be of approved quality of the respective kinds required for the various parts of the work, well-seasoned, thoroughly dry, straight and free from large, loose or unsound knob, sap shakes or other imperfections impairing its strength, durability or appearance.
2. Framing lumber shall be of rough dimensions shown on drawings.
3. All exposed woodwork shall be smoothly dressed and well sand papered.
4. Moisture content shall not exceed 18% unless otherwise specified.
5. All lumber, excluding scaffoldings, are to be pressure treated, conforming to 67% stress grade lumber in accordance to the requirements of the Phil. National Building Code, latest edition.
6. Fastening shall be common nails, glue as specified flat head wood screws, round head wood screws, bolts or log screws where specifically called for.
7. Conceal fastenings as far as possible, where not possible, locate them in inconspicuous place, where nailing is permitted through woodwork face conceal nail heads.

C. Substitution of Lumber

1. Any lumber equally good for the purpose intended may be substituted for kinds specified provided however, that the substitution be authorized in writing by the Project Engineer.

D. Rough Hardware and Metal Fasteners

1. Plates, straps, nails, spikes, bolts, joists, hangers, rods, dowels, fasteners and miscellaneous iron and steel items shall be of sizes and types to rigidly secure member in place.

IV. STEEL WORKS

A. Scope of Work

1. Furnish all materials and equipment and perform labor and services required to complete fabrication and erection of all structural steel and other miscellaneous steel in accordance with the plans.

B. Materials

1. Structural steel shall conform to American Society of Testing Materials (ASTM) A-36, with F_y of 248 MPa.
2. Electrodes for welding shall conform to the latest requirements of the American Welding Society (AWS).
3. Use only approved brand of red lead paint and linseed oil for all shop painting for structural steel.

C. Execution

1. Tighten all bolts to a bolt tension not less than the proof load given in the applicable ASTM Specifications for the type of bolt used.
2. Never let compression members deviate from straightness by more than 1/100 of the axial length between points which are to be laterally supported.
3. Let completed members free from twists, bends, and open joints. Sharp kinks or bends shall be the cause of rejection of materials.
4. Give all steelwork, except those to be encased in concrete, one coat of shop paint.
5. Make all work well formed to shape and size shown and assemble as detailed in the plans.
6. Weld or bolt connections as indicated in the plans. Make all details of assembly strong with sufficient stiffness. Form joints exposed to weather in a manner that excludes water.
7. Provide all work with proper clearances. Fabricate and install in a manner to provide for expansion and contraction but will ensure rigidity and provide close fitting of sections.
8. Provide a protective coating which is resistant to alkaline, mortar and plaster to be applied to all sections after fabrication.

V. FINISHING

All finishing materials should be of best quality. Submit sample for approval of the designer prior to installation.

A. Painting

1. Scope of Work

- a. This item consists of furnishing all paint materials, varnish, and other related products, tools, equipment, and labor required in undertaking the proper application of painting, varnishing, and related works indicated on the plans. See drawings for location, quantity, and extent of surfaces to receive paint and varnish.

2. Materials

- a. Tinting colors shall be first grade quality, pigment ground in alkyd resin that disperses and mixes easily with paint to reduce the color desired. Use the same brand of paint and tinting color to effect good paint body.
- b. Concrete neutralizer shall be first grade quality concentrate diluted with clean water and applied as surface conditioner of new interior and exterior walls thus improving paint adhesion and durability.
- c. Silicon water repellent shall be transparent water shield especially formulated to repel rain and moisture on exterior masonry surfaces.
- d. Patching compound shall be fine powder type material like calcimine that can be mixed into putty consistency, with oil base primers and paints to fill minor surface dents and imperfections.
- e. Varnish shall be a homogeneous solution of resin, drying oil, drier and solvent. It shall be extremely durable clear coating, high resistant to wear and tear without cracking, peeling, whitening, spotting.
- f. Sanding sealer shall be quick drying lacquer, formulated to provide quick dry, good holdout of succeeding coats, and containing sanding agents to allow dry sanding of sealer.
- g. Glazing putty shall be alkyd-type product for filling minor surface unevenness.

f. Painting Schedule:

For New Concrete/ Masonry Surfaces:

One coat of Acrylic Flat base paint

Two coats of Acrylic Semi-Gloss base paint

3. Execution

- a. All paints shall be evenly applied. Coats shall be of proper consistency and well brushed out so as to show a minimum of brush marks.
- b. All coats shall be thoroughly dry before the succeeding coat is applied.

- c. Where surfaces are not fully covered or cannot be satisfactorily finished in the number of coats specified such preparatory coats and subsequent coats as may be required shall be applied to attain the desire evenness of surface without extra cost to the owner.
- d. Where surface is not in proper condition to receive the coat the Engineer shall be notified immediately. Work on the questioned portion(s) shall not start until clearance be proceed is ordered by the Engineer.
- e. Hardware, lighting fixture and other similar items shall be removed or protected and re-installed after completion of the work.

VI. ELECTRICAL WORKS

A. Scope of Work

- 1. The work of the contractor consists of furnishing of all tools, labor, equipment, and materials and performing all operations in connection with the electrical and fire alarm system shown on the drawing, their test and inspection, complete and in accordance with these specifications and drawings and subject to the terms and conditions of the contract, and all other labor and materials not specifically mentioned under sections, to bring the electrical system to operating conditions and be ready for use by the Owner.

B. Applicable Documents

- 1. The works covered by these specifications shall be governed by the requirements of the Philippine Electrical Code, US Federal Specifications, NEMA standards.

C. Materials

- 1. Intermediate metal conduit shall be hot-dipped galvanized mild steel pipe and shall 3m lengths including coupling.
- 2. IMC electrical conduit shall be supplied in standard effective lengths of 3.0m.
- 3. Wires and cables shall be insulated for 600 volts. Feeder and branch circuit wires and cables shall be type TW or THHN as manufactured.
- 4. Conduit's fittings shall be US Underwriters Laboratories (UL) listed or approved local equivalent.
- 5. Outlet boxes shall be hot-dipped galvanized or case metal as required. Thickness of pressed steep boxes shall be less than gauge #16.
- 6. Circuit breakers for panel boards shall be molded case circuit breaker with quick-made, quick-break, trip-free mechanisms. They shall meet US Federal Specifications and NEMA standard.
- 7. Panel board shall be as manufactured by bolt-on type NEMA or approved equal.

8. Wiring devices such as switches and convenience outlets shall have ratings of 15 amperes, 250V and 16 amperes, 250V, respectively.
9. LED panels should have a cabinet size of 1.0 x 0.5m, with max. power consumption of 3150W and Avg. power consumption of 1050W, input voltage of 200 - 240V.
10. Angle bar shall be 38mm x 38mm x 4mm in standard effective length of 6.0m.

D. Installation

1. Grounding

The following shall be grounded in accordance with the drawings and the requirements of the Philippine Electrical Code with standards grouping practices:

Metallic conduit and raceway system including gutters, cabinets and boxes.

Non-current carrying metal parts of all electrical equipment including fixtures and motors.

2. Feeders

Distribution voltage shall be 240V, 1-phase, 3-wire feeder conductors and conduit shall be installed as shown on the drawing and no change in size shall be made without consent of the Owner. Feeder conductors shall be continuous and without splices between terminals.

3. Branch Circuit

The drawing indicates the general methods of installations of all circuit wiring and the outlet which are to be supplied from this circuit. Branch circuit conduits shall be run from outlets to panel boards as directed as the building conditions will allow. Circuit allocations shall be indicated on the drawings where it becomes necessary to correct any outlet to circuit other than shown on the drawings. This shall be done without extra charge and only upon written consent of the Owner. No wire smaller than 3.5mm² (#12AWG) and 5.5mm² (#10 AWG) shall be used for any lighting and power circuits, respectively.

4. Panel boards and cabinets

Panel boards shall be mounted with their centers at 1.40m above the floor unless otherwise indicated by field conditions.

5. Wires and boxes

No wire shall be drawn into the raceway until works, which may cause injury to the wires, is completed and until permission is given by the Owner in writing. Only powdered lubricant not injurious to cable insulation and raceways shall be used only when lubrication is necessary.

6. Splices

Branch circuit splices shall be soldered or joined by used insulated splicing device (wire nuts). All soldered joints shall be made mechanically strong before soldering and shall be carefully soldered without the use of acid, then taped with rubber tape to a thickness equal to that of the insulation and with a covering of friction tape of two layer. . Where solid conductors are to be connected directly to devices without the use of lugs, such as lighting switches and plug receptacles, the wires shall be formed into a clockwise loop fitted around the screws.

7. Outlets, switches and junction boxes

The contractor shall install standard boxes at all outlets for lights, appliances and switches and other point as required by the constructions.

8. Conduit System

Not more than four 90 degrees bend shall occur in any run. When it becomes necessary to have more than four 90 degrees bends in any run, an intermediate pull box shall be installed to facilitate pull-in wires. All conduits run shall as called for on the drawings. Conduits shall be installed in such manner as not to weaken or interfere with the structure or the building. No horizontal runs embedded conduit shall be permitted in solid wall and partitions. Conduits below grade line shall be encased in concrete enveloped with minimum thickness of 50mm (2") or embedded in floor slab. Exposed conduit shall run parallel or at right angles with lines of the buildings and shall be securely fastened in place by means of approved fastening. Conduits support shall be fastened to walls by means of screws or bolts with expansion sleeves. The use of wooden or lead plug is not permitted. Conduits shall be cut by hacksaw, the ends shall be reamed after being firmly attached to cabinets or boxes by means of locknuts.

9. Testing

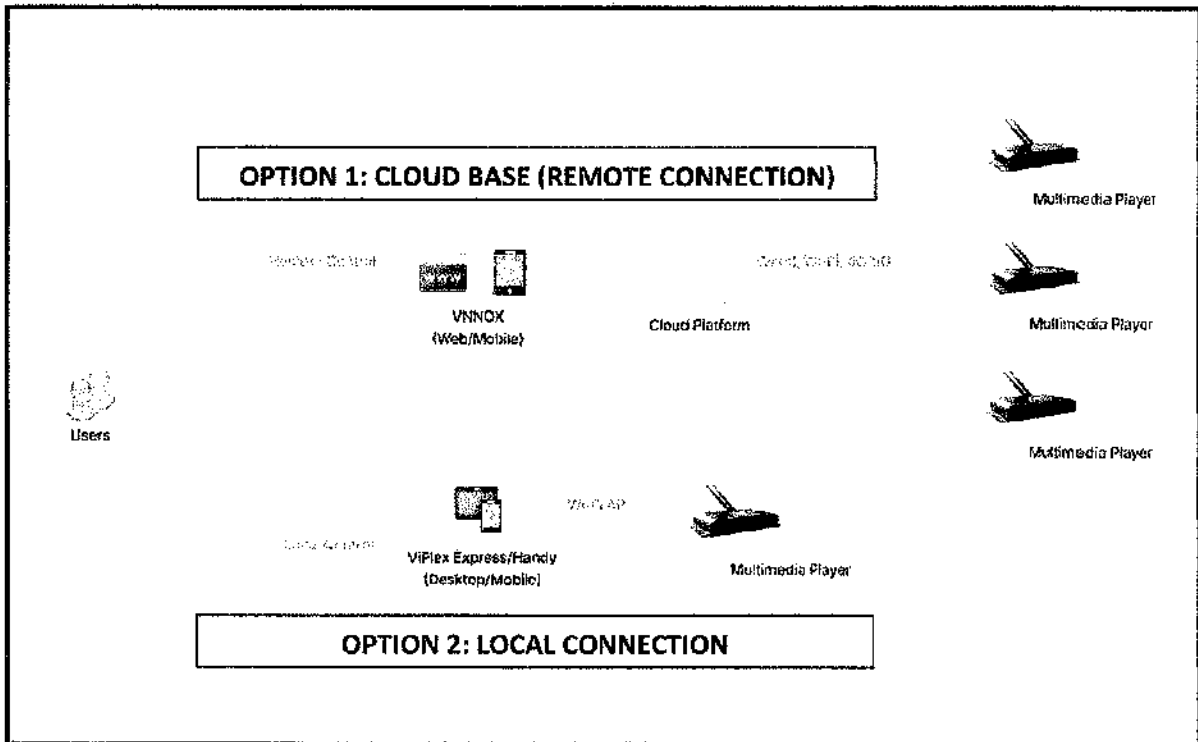
a. Ground test

The entire installation shall be free from improper ground and from short circuits. Each panel shall be tested with means connected. Lamps removed or omitted from the sockets and all switches closed. Each individual power equipment shall be connected for proper and intended operation. In no case shall the resistance be less than that allowed by the Regulations for electrical equipment of building. Failures shall be corrected in any manner satisfactory to the Architect and Engineer.

b. Performance test

The electrical contractor shall test all system of entire electrical installation for proper operational conditions. These conditions shall apply to the power and lighting installation, voltage drop, grounding defects.

VII. NETWORK TOPOLOGY



Prepared by:

ENGR. JUNRIH PAPERAS
Electrical - Estimator/ Designer

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Civil - Estimator

Checked by:

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Noted:

ENGR. GEOFFREY L. MACALALAD
Officer-in-Charge, PEPD



Republic of the Philippines
Tourism Infrastructure & Enterprise Zone Authority

MANPOWER & EQUIPMENT

Project: **SUPPLY, DELIVERY AND INSTALLATION OF LED SCREEN PANELS AT INTERNATIONAL AND DOMESTIC ARRIVAL AREAS OF NAIA TERMINAL 2**

Location: Terminal 2, Pasay City

Duration: 90 CD

Minimum Required Manpower	Quantity
a. Project Manager	1
b. Project Engineer	1
c. Materials Engineer	1
d. Project Foreman	1
e. Skilled Worker	3
f. Helper/Laborer	8
g. Safety Officer	1

Minimum Required Equipment	Quantity
a. Basic Construction Tools	1 lot
b. Basic Scaffolding Equipment	1 lot
c. Welding Machine	1

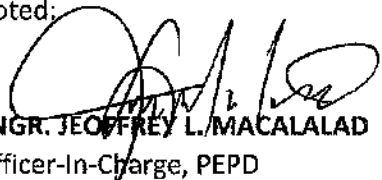
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Noted:


ENGR. JEFFREY L. MACALALAD
Officer-In-Charge, PEPD

BILL OF QUANTITIES

Project : **SUPPLY, DELIVERY AND INSTALLATION OF LED SCREEN PANELS AT INTERNATIONAL AND DOMESTIC ARRIVAL AREAS OF NAIA TERMINAL 2**

Location : Terminal 2, Pasay City

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT COST	AMOUNT
I.	GENERAL REQUIREMENTS				
	A. HEALTH AND SAFETY PROGRAM	lot	1.00		
	B. TEMPORARY BARRACKS	mo.	3.00		
	C. PROJECT SIGNAGE	lot	1.00		
	D. TEMPORARY ENCLOSURE	lot	1.00		
II.	ELECTRICAL WORKS				
	A. SUPPLY, DELIVERY AND INSTALLATION OF LED SCREEN PANELS (L&M)	set	10.00		
	B. PANEL BOARD	lot	1.00		
	C. WIRES, CONDUITS & ACCESSORIES	lot	1.00		
	D. MISCELLANEOUS	lot	1.00		
III.	CIVIL WORKS				
	A. INSTALLATION OF 10 SETS LED FRAME STRUCTURAL	lot	1.00		
	B. PAINTING	lot	1.00		
GRAND TOTAL		In Words: Pesos			
		In Figures: Php			

Submitted By

Name of the Representative of the Bidder

Name of the Bidder

Position