PROPOSED RENOVATION OF PGH NURSES' HOME
PGH COMPLEX, TAFT AVENUE,
ERMITA, BGRY, 670, MANILA CITY

ELECTRICAL SPECIFICATIONS

SIGNED AND SEALED BY:

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PRC : 0004017 ISSUED ON : 01-04-2021
PTR : 8666468 ISSUED AT : MARIKINA

ELECTRICAL SPECIFICATIONS
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SECTION 1: **GENERAL PROVISIONS**

1.1 GENERAL DESCRIPTIONS

The work to be done under this Division of the specifications consists of the fabrication, complete in all details, of the Electrical Work, at the subject premises, and all work and materials incidental to the proper completion of the installation, except those portions of the work, which are expressly stated to be done by others. All work shall be in accordance with the governing Codes and Regulations and with the Specifications, except where the same shall conflict with such codes, etc., in which case, latter shall be then govern. The requirements in regard to materials and workmanship specify the required standards for the furnishing of all labor, materials and appliances necessary for the complete installation of the work specified herein and indicated on the drawings. These specifications are intended to provide a broad outline of the required installation, but are not intended to include all details of design and construction.

1.2 WORKS INCLUDED

Under this Division of Specifications, provide all materials and equipment and perform all the works necessary for the complete execution of all electrical works as shown on the electrical drawings, and on the general construction drawings, 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. Incoming Primary power service provision as per plan and specifications.

B. Power Distribution equipment including normal panelboard and circuit breakers

C. A system of lighting and power wiring, including all feeders, branch circuits, and connections to all lighting, power outlets, motor, and other necessary appliances.

D. Installation of all Supplied lighting fixtures and Kilowatt Hour Meter.

E. Complete Telephone system

F. Complete Grounding System of equipment except as noted

G. Complete CATV system

H. Complete Testing of all electrical & auxiliary systems

I. Painting of all electrical conduits, enclosures & equipment

J. Securing and payment of electrical wiring permits & Certificate of Electrical Inspection (CEI)

K. Application and securing the approval for electrical power, telephone service connections including the preparation of the necessary plans, forms & related documents, payment of fees and charges and coordination with Electric, Telephone and Cable Television companies and other authorities or persons involved in the procedures.

1.3 CODES, INSPECTION, PERMITS AND FEES

A. The work in this contract is to be installed according to the latest requirements of the following:

Electrical - Philippine National Building Code
Philippine Electrical Code 2017
Manila Electric Company
Philippine Long Distance Company

Nothing contained in these specifications or shown on the drawings shall be construed as to conflict with the National and Local ordinances or laws governing, the installation of electrical work, and all such laws and ordinances are hereby made part of these specifications. The contractor is required to meet the requirements thereof.

1.4 RECORD DRAWINGS

A. Maintain on a daily basis at the project site a complete black and white set of "as built drawings", reflecting an accurate dimensional record of all deviations between work shown on drawings and that actually installed.

1.5 GUARANTEE

The contractor shall guarantee that the electrical system is 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. This contractor at his own expense shall remedy any defects, appearing within the aforesaid period.

1.6 WORKMANSHIP

The work throughout shall be executed in the best and most thorough manner to satisfaction of the Architect, and the Engineers, who will jointly interpret the meaning of the drawings and specifications and shall have power to reject any work and materials, which in their judgment are not in full accordance therewith.

The Contractor shall assume unit responsibility and shall provide the service of a qualified Engineer to supervise the complete installation of equipment and systems and who shall be available for conducting the final acceptance test.

SECTION 2: **BASIC MATERIALS & METHODS**

2.1 REFERENCE

Requirements of Section 1 apply to all works under this section

2.2 GENERAL

2.2.1 EQUIPMENT AND MATERIAL

A. If products and materials are specified or indicated in the drawings for a specific item or system, use those products or materials. If product and materials are not listed in either of the above, use products and materials approved by the Employer's representative.

B. Provide product and materials that are new and unused, clean, free of defects, damage or corrosion.

C. Provide name/data plates on major components of equipment with manufacturer's name. Model, number, serial number, capacity data, and electrical characteristics attached in a conspicuous place.

2.2.2 EXECUTION

A. Install materials and equipment with qualified trade people and personnel.

B. Maintain uniformity of manufacture of equipment used in similar applications and sizes.

C. Follow manufacturers' instructions for installing, connecting, and adjusting equipment. Produce one copy of such instructions to the employer's representative before installing any equipment. Provide a copy of such instructions at the equipment during work on the equipment.

2.2.3 PAINTING

A. All manufactured electrical equipment such panelboards and control equipment, fixture-housing etc., shall have factory applied finish as specified in the appropriate article in the specifications.

B. All other un-coated steel items such as boxes, supports, hangers, rods, etc., shall be galvanized or have shop coat of paint applied under this part of the Specification. Normally, shop coats shall be an approved primer containing at least 50 percent rust inhibitive pigment, applied before assembling the different parts.

2.3 INTERMEDIATE METALIC CONDUIT

A.	General	: Standard trade sizes, UL approved
B.	Manufacturer	: **MATSUSHITA, SMART TUBE or Approved equal**
C.	Material	: Mild steel, hot dipped galvanized
D.	Sizes	: 15 mm diameter minimum
E.	Couplings	: Unions and fittings; standard, treadeds

2.4 POLYVINYL CHLORIDE (PVC)

A.	General	: Standard trade sizes, schedule 40.
B.	Manufacturer	: **MOLDEX, EMERALD, NELTEX, CROWN or Approved equal**
C.	Material	: Polyvinyl Chloride, extruded
D.	Sizes	: 20 mm diameter minimum Sch. 40
E.	Couplings	: Standard joint by cement solvent

2.5 FLEXIBLE GALVANIZED STEEL CONDUIT

A.	General	: Standard trade sizes,
B.	Manufacturer	: **NICHI, ARROWTITE, FUMACO or Approved equal**
C.	Material	: Steel, galvanized
D.	Sizes	: 15 mm diameter minimum
E.	Couplings	: Standard
F.	Use limitations	: Drop to Recessed type lighting fixtures

2.6 CONDUIT INSTALLATION

A. Install work in accordance with applicable codes and recognized standards as best in industry practice and the following

B. Conduits buried in concrete shall be securely fixed to prevent displacement and shall have 40mm depth of cover over its entire length. Conduits buried in plaster shall be securely fixed and shall have 6mm depth of cover over its entire length.

C. Clean and swab inside by mechanical means to remove all foreign materials and moisture before wires or cables are installed.

2.7 JUNCTION AND OUTLET BOXES

A. Provide junction boxes for pulling and splicing wires and other outlet boxes for installation of wiring devices, as required, or as shown in drawings.

B. Material: steel galvanized finish Ga. 16. deep type

C. Sizes
: Utility box 80x50x60mm
: Square box 120x40mm
: Octagonal box 100x40mm

D. Finish : Applied with rust inhibiting primer

F. Manufacturer : FUMACO, AMTEC, STEEL CITY or Approved equal

2.8 CONDUCTOR

A. Material: Copper, annealed

B. Manufacturer : **PHELPS DODGE, PHILFLEX, COLUMBIA WIRE or Approved equal**

C. Stranding : Standard stranding for 8.0mm² and above or as specified in the drawings

D. Minimum Size : 3.5 mm² for lighting and power wiring or as specified in the drawings

E. Color Code
: Identified ground conductor in accordance with the Code
: Multi-wire branch circuits and grounded conductor in accordance w/ the Code
: Power Distribution: 3-phase 3 wire in accordance with the Code
: Other Circuits: establish consistent color coding scheme throughout.

F. Insulation
: Feeders and general use: THHN/THWN insulation
: Fixture wires: in accordance with the code.
: Wiring in Fluorescent Fixtures: in accordance with the code.

2.9 CONDUCTOR INSTALLATION

A. Installation works shall conform to this specification and conform to the best principles of modern installation practice and be carried out by fully competent tradesmen of appropriate grade.

B. No exposed wiring is allowed.

C. The lighting and power circuits will have their own separate conduits and raceways where applicable.

D. Marking
Mark each end of every power or control cable with plastic tag securely fastened to it bearing circuit use identification. Also mark cables in pull boxes or junction boxes.

2.10 FIELD TESTS AND ADJUSTMENT

1. Every Installation shall be inspected and tested during erection and/or on completion before being put into service. A report recording all the test results shall be submitted to the Employer's Representative.

2. Continuity Test
   - Continuity of protective conductors (including main and supplementary bonding conductors).
   - Continuity of ring final circuit conductors.
3. Insulation Resistance Tests
4. Between phases/neutral and between phases neutral against earth, within the remaining phases/neutral earthed.

SECTION 3: **WIRING DEVICES**

3.1 REFERENCE

Requirements of section 1 apply to all works under this section

3.2 GENERAL

Furnish and install wiring devices as shown in the plans.

3.3 DEVICES AND PLATES

Manufacturer	**: NATIONAL, TOSHIBA, Bticino, or Approved equal**
Wall Switches	: quit type, spring operated, flush type, single pole and 20 ampere, 240 volts
General Purpose Receptacle	: flush mounting, single pole, 20 amp, 240 volts or as required
General Purpose Wall Plates	: type, color, plating and appearance or device plates shall be selected by the Architect.

3.4 MOUNTING

Wall Switches	: 1400mm above floor finish level
Wall Mount Receptacle	: 300mm above floor finish level

3.5 INSTALLATION

Connect wiring device grounds in accordance with Code requirements.

SECTION 4: **PANELBOARDS**

4.1 REFERENCE

Requirements of section 16010 apply to all works under this section

4.2 GENERAL

Furnish and install panel board as listed in the "Load Schedule". Manufacturers shop drawings, and catalogs shall be submitted for approval by the Engineers prior to Manufacture.

4.3 TYPES AND RATINGS

1 NEMA type Enclosure, 3 phase, 3 wires, 240 Volts

2 All panel board shall contain a single brand of circuit breaker.

3 Manufacturer (Enclosure and circuit breakers) : **GENERAL ELECTRIC (G.E.), CUTLER HAMMER, or Approved equal**

4 Breakers are bolt-on type, molded case, thermal magnetic protective, quick-make, quick break, trip free from handle, trip indicating, number and size as shown in Load Schedule. Internal common trip for two and three pole breakers.

5 Breakers minimum interrupting capacity based on NEMA and UL test procedures:
230 breakers: 10,000 rms symmetrical amperes

4.4 PANEL AND BOX

1. B.I box gauge 14 minimum, plain steel front, complete with hinged door, polished metal catch and lock. All panels keyed alike. Manufacturer's standard finish.

2. Mounting: flush or surface mounted as required

3. Cardholders on inside of door, with clean plastic cover and complete schedule of panel branch circuits.

SECTION 5: **GROUNDING**

a. REFERENCE

Requirements of section 1 apply to all works under this section

b. GENERAL

Furnish all materials and labor required to ground motor controls, panel boards, transformer neutrals and cases, motor frames, conduit systems and other electrical equipment.

c. MATERIALS

Ground Rod	: Copper clad 16mm dia. x 3000mm size
Ground Bus and taps	: Stranded soft drawn Bare Copper Wire
Bus Size	: As shown in the drawings

d. INSTALLATION

A. Raceway Grounding

1. Ground all conduit systems. Use bonding jumpers if conduits are installed in concentric knockouts.

B. Equipment Grounding

1. Ground separately switches and outlets through grounded conduit system.

C. Ground Rods

1. Locate ground rods at approximate locations shown.
1. Install in firm soil and drive top of rod to depth below grade as shown in plans

e. TEST

A. Ground rod Resistance Test

- Test each ground rods by single-test. "Megger" method in accordance with the code requirement.
- Ground Resistance shall not be more than 5 ohms

SECTION 6: **TELEPHONE SYSTEM**

6.1 REFERENCE

Requirements of section 1 apply to all works under this section

6.2 GENERAL

The telephone system shall consist of an interior system of wires and cables, conduits, outlets, outlets boxes, junction boxes, terminal cabinet, etc. as shown on the plans ready to receive the telephone instrument to be furnished and installed by others.

6.3 INSTALLATION

A. All wiring shall be through rigid PVC conduit. Cables for telephone branch circuits shall be 0.65 mm AWG, 4 pairs CAT. 5E UTP Cable PVC jacketed with number of runs as shown on the plans. All telephone cables between junction boxes and telephone panel shall be #24 AWG, plastic insulated, jacketed and shielded.

SECTION 7: **COMMUNITY ANTENNAE TELEVISION (CATV) SYSTEM**

7.1 REFERENCE

Requirements of section 1 apply to all works under this section

7.2 GENERAL

The contractor shall finish and install completes community antennae television system and master antennae television (CATV/MATV) as shown in the drawings.

The CATV/MATV system shall consist of terminal cabinet amplifiers, splitters, coaxial transmission, and distribution cables, conduits, and other necessary accessories required for efficient system operations.

All materials and equipment to be furnished shall be new and standard products of a single manufacture regularly engaged in the production of such equipment.

Installation of the system shall be governed by the provisions of the latest edition of the Philippine Electrical Code (PEC) and other existing rules and regulations of locality and governing agencies.

7.3 TAP-OFF DEVICE

Tap-off device shall be flush-mounted, with back matching outlet plates. It shall provided with bushing and cable connectors to accept RG-6 coaxial cable, sized as required. Input and output impedance shall be 75 ohms. Tap-off shall have low uncertain loss and shall be provided with end of line resister when required

7.4 CABLES:

Cables shall be of the coaxial type with characteristic impedance of 75 ohms, plus or minus 10 percent over the entire frequency range of the system. All cables shall be frequency-swept for abnormal losses and conductors shall be copper. Insulation shall be solid or expanded polyethylene. Shielding shall be copper braid.

The contractor shall be responsible for all supervision, commissioning, test, and adjustment for the system. Such work shall be performed by or under the direct supervision of an Electronics and Communication Engineer.

The equipment supplier shall guarantee the equipment for a period of two years to be free from inherent defects in materials and workmanship. Any defective part or equipment shall be repaired or replaced free of charge.

7.5 WARRANTY

A warranty for a period of one (1) year shall be provided against failure of components resulting from normal use and or factory defects.