IMPROVEMENT OF MULTI-PURPOSE BUILDING, UP SPORTS COMPLEX, UP MINDANAO, DAVAO CITY

SCOPE OF WORKS AND TECHNICAL SPECIFICATIONS

JULY 2023

Prepared by:

Ar. MODESTO OMERGLENN D. TOLENTINO
Jr. Architectural Associate
DC – UP Sports Complex

Reviewed by:

Engr. EDMUND D. GEMELO
Sr. Engineering Assistant
DC – UP Sports Complex

Endorsed by:

Ar. OLIVER DR. TELMO
Campus Architect
Campus Planning and Development Office

Ar. JEAN MARIE V. JUANGA
Asst. Vice Chancellor for Administration
Campus Planning and Development Office

Recommending Approval:

PROF. JEZREEL M. ABARCA, PhD
Department Chair, Department of Human Kinetics

A/PROF. LEO MANUEL B. ESTAÑA
Vice Chancellor for Administration

Approved by:

PROF. LYRE ANNI E. MURAO, PhD
Chancellor

Project : U.P. MINDANAO SPORTS COMPLEX, IMPROVEMENT OF THE MULTI-PURPOSE BUILDING
Location: UP Mindanao Complex, Brgy. Mintal, Tugbok District, Davao City
Project Duration : 365 Calendar Days
Subject : Technical Performance Specifications and Parameters

Program of Works:

1. Supply and Installation of ECB400- Enclosed Circuit Breaker @ 400AT/400AF, 3P MCCB with Nema12 enclosure, location at substation building.
2. Supply & Installation of main secondary power lines from LVSG-1 to ECB400 with 3-250mm2 (LL) + 1-100mm2 (G) THW copper wire inside at 1-105mmØIMC Pipe or 200mm x 100mm fabricated cable duct, located at substation building.
3. Supply and installation of secondary power supply lines from ECB400(substation area) to DP01 (electrical room no.1 of multi-purpose building) w/ 3-250mm2 THW copper wire (LL) + 1-100mm2 TW copper wire (G).
4. Construction of manhole and concrete encasement w/ HDPE spiral conduits or PVC Pipes.
5. Supply and installation of Distribution Panel -1 (DP01), see attached details.
6. Supply and installation of 250kVA/200kW, 3phase, 60hz step down dry type transformer, 460V (pri.) / 230V (sec.).
7. Supply and installation of MPB01 panel.
8. Supply and installation of LPB1A, PPB1A, LPB1B & PBB1B panels.
9. Supply and installation of secondary power supply lines from DP01 to DT250, MPB1A, LPB1A, PPB1A, LPB1B & PBB1B panels.
10. Permanent secondary power lines from DP01 to FPP1A.
11. Secondary power supply lines for the airconditioning units.
12. Rewiring of circuit home-runs for the lighting fixtures and replace defective lighting fixtures at the ground floor and second floor area.
13. Replacement of all defective power outlets.
14. Removal of existing ceiling & hangers, re – painting of steel trusses for the second floor stadium building excluding the offices, VIP and media room; repair of G.I. roof drip edge along existing roof fascia.
15. Testing and commissioning.
16. Project Closure.

PART 1.00 - GENERAL CONDITIONS

1.01 GENERAL

A1. All works under this section of the specifications shall be done in accordance With all governing codes and regulations, which are hereby, made part of these specifications. The plans and these specifications are complementary, and what is called for in one shall be as if called for in both.

A2. Materials and workmanship deemed necessary to complete the works, but not specifically mentioned in the specifications, working drawing, or in the other Contract Document, shall be supplied by the Contractor without extra cost to the owner. Such materials shall be of the highest quality available, and installed or applied in a workman-like manner at prescribed or appropriate locations.

A3. Materials and finishes for on-site improvements and facilities as listed below are part of the Scope of Work and shall be supplied and installed by the Contractor;
a. Demolition, clearing and site grading works in preparation for construction.
b. Construction of:
i. Driveway, curbs and gutter, walks, ramps, steps and miscellaneous slabs.
ii. Septic vault, Manhole yard basins, trenches

A3. For soil poisoning use Dursban Premium mixed with potable water applied on excavation for foundation and footing; slab on fill bed and with the area of the proposed building and extended about one meter from the building line perimeter; follow mixing proportion on manufacture's label.

1.02 WORK IN GENERAL

The work shall consist of providing all items, materials, operations or methods listed, implied, mentioned or scheduled on the drawings and/herein, including all labor, know-how, and equipment necessary to the proper completion and execution of the construction of substation building and installation of electrical system of the proposed power station facility, except those portions of the work that are clearly stated to be done by others.

1.03 REQUIREMENTS OF REGULATORY AGENCIES

Comply with Regulatory Requirements and Reference Standards and the following code requirements:

A. All work under this contract is to be construct and installed according to the Requirements of the latest Building and Philippine Electrical Code latest edition, the rules, regulations and requirements of the local power utility company. Nothing contained in these specifications or shown on the drawings shall be construed as to conflict with the National and Local Ordinances are hereby made part of these Specifications. The contractor is required to meet the requirements Thereof. In case of conflict to the provision the judgment of the Owner (LGU) will result in a better installation shall be followed.

B. It shall be Contractor’s responsibility to provide equipment and Installation methods, which shall passed inspection by Local Building Inspection Department or City Engineering Office, Local Bureau of Fire Department, Local Power Company and be certified for building occupancy.

C. Work to comply with requirements of all legally constituted authorities having jurisdiction, including the regulations of the local government unit.

D. Plans and specification requirements shall govern where they exceed Code requirements.

E. Where requirements between governing codes and regulations vary, The more restrictive provision shall apply.

F. Material contained in the contract documents shall not be construed As authority or permission to disregard or violate legal requirements.

1.04 WORK INCLUDED

The work shall include the furnishing and installation of the following items;

A. A complete and functional Multi – Purpose Building (Stadium Phase 1 & 2)

B. All works and materials for the Multi – Purpose Building and improvement of Multi – Purpose building shall be brand new and quality.

C. A complete grounding system of equipment and others as required by governing codes.

D. A complete testing for concrete strength and electrical system.

E. Where materials are furnished and supplied by the Owner, the Contractor shall receive, unload, transport, assemble, and install completely. The Contractor shall be responsible for breakages, pilferage, etc. of such equipment from the time he accepts delivery until the Owner accepts the installation.

F. All other items incidental to and / or required for the proper completion of the installation such as painting of boxes, conduits, etc.

1.05 INJURY TO PERSONS OR DAMAGE TO PROPERTY

The Contractor shall be responsible for all injury to persons and damages to properties caused by the work or his men and shall be liable for any claims against the Owner as a result of this injury and/or damages. This Contractor shall likewise protect the property of the Owner against theft and weather. Where such exposure to inclemency of the weather and theft is due to the work or negligence of the Contractor, he then shall be liable for such damage or loss.

1.06 PERMITS AND FEES

The Contractors shall secure at his expense all permits including inspection fees and associated paper-works, as built plans as required by the approving authorities.

1.07 MATERIAL AND EQUIPMENT

A. General: Provide products new, and of same manufacture and type for similar uses, except as otherwise accepted.

B. All materials shall be new and shall conform with standards of the National Building Code of the Philippines, Underwriters Laboratory (UL), Philippine Standard (PS), National Electrical Manufacturer's Association (NEMA), and American National Standards Institute (ANSI).

C. Industry or Trade Standards: Where industry or trade standards are in effect, provide products complying with applicable standards as minimum criteria of quality and workmanship.

1.08 SHOP DRAWINGS/AS-BUILT PLANS

A. The Contractor shall furnish the Shop Drawings (including a reproducible original) which shall include details of actual installations, such as conduit

runs, wiring, location of equipment, and other pertinent information to illustrate deviation and changes from the original plans.

B. All permits and government fees required for this work shall be obtained by and at the expense of the Contractor. The Contractor shall furnish the owner (UP Mindanao) all approved permits form the proper government authorities after the completion of work.

C. The Contractor shall provide all as-built plans to the owner (UP Mindanao) after the completion of work.

1.09 SUBMITTALS

A. All materials where not specified shall be the best of their respective kind. Samples of not specified material shall be subject for approval to the project in charge.

B. Manufacturer's data of substitute material shall be submitted for approval. The Contractor shall within ten (10) days after the award of the contract, submit a list of the materials he proposed to use. All materials installed without prior approval shall be at risk of the contractor.

1.10 MEASUREMENT/RECORDS TEST

All necessary tests on the construction and installation shall be made by the Contractor in the presence of the Owner's (UP Mindanao) authorized representative (project engineer, construction/project manager). Records or approved test results shall be relayed to the owner (UP Mindanao) in writing.

1.11 COORDINATION

The Contractor shall be familiar with the specifications of the other trades, coordinate with them thoroughly, so that he can arrange his work and dispose his materials without interfering the works of other contractors.

1.12 GUARANTEE

The Contractor shall guarantee that the power supply station/ substation facility shall be free from all defects in workmanship, factory defect and defective parts, and that it will remain so for a period of (1) year from the date of acceptance by the Owner (UP Mindanao). Any remedy to correct defects deemed to be caused by such be made at the expense of this Contractor.

1.13 TEMPORARY LIGHT AND POWER

The Contractor shall make all arrangements and pay for the provisions of the necessary electrical power of the type and capacity required for the performance of the work of all trades engaged in the proposed solar powered road streetlight.

1.21 CLEANING UP

The Contractor shall remove all dirt, debris, and rubbish and waste materials caused by him in the process of his work. He shall also remove all tools, temporary power installation, scaffolding and surplus materials after completion and acceptance of work.

PART 2.00 - MATERIALS AND METHODS

A. SITE WORK

Earthworks

a. Fill or barrow materials granular non-plastic materials, inert materials from offsite source.

b. Excavated materials use as back fill, approved and clean materials. Free of stones not larger than 50mm diameter (2"dia), roots and organic matter.

B. CONCRETING

a. Concrete Electrical Manhole – use 150mm thick CHB, 1000mm(Width) x 1000mm(Width) x 1200mm(Depth).

b. Concrete Formworks - use 12mm (1/2 • thk) plywood.

c. Concrete Steel Reinforcement - as manufactured by the national Steel Corporation or its equivalent (conforming with ASTN standard):

i. Intermediate Grade Steel - 275.8 MPA (FYE = 40,00 psi), refer to structural plans.

ii. Cast-In Concrete: Cement- Davao Union Cement or its equivalent. Use one (1) branded for whole structural and masonry works.

iii. Aggregates:
Gravel - clean, washed gravel use 1 "maximum for slabs and 19mm (314") for columns and slabs.
Sand - clean, washed sand
Water - fit for drinking, free from injurious amount of oil, acid, alkali organic materials.

iv. Concrete Mixtures:
Class A -1:2:3 -20.7 Mpa (3,000 psi) for footing, beams, columns and suspended slabs, concrete gutter, reinforced walls, parapet and canopy.
Class B -17.2 Mpa (2,500 psi) for slabs on fill, grade and pipe concrete encasement.

v. Concrete Admixtures:

Air-entraining Admixture - DAREX-AEA or approved equal to improve workability or durability of concrete mixes. Integral Water Proofing Hydratite WR approved equal. Concrete Bond - Daraweld C or Approved equal for binding new to old concrete, repair of cracks or bonding grout.

C. MASONRY

a. Concrete hollow blocks (C.H.B): SAFECON or approved equal. Use 150 mm (6") thick C.H.B. (450 psi as indicated in the plans).

b. Reinforcing bars : bars and the wire : See C.00

c. Mortar and Plaster Works: Consisting of scratch and finish coat, both consisting of one (1) part Portland cement and two (2) coat part of clean, washed sand, measured by volume.

d. For all interior masonry surfaces to be painted, where called for in the drawing and where plastering 1s essentials to complete the work.

D. LUMBER

D1. Yakal species shall be used for the following specified wooden items whenever there is a need for such item in this project;
a. Door frames, window sills, jambs, mullions and headers
b. Wood plates and shims
c. All wood in contract with concrete and masonry surface
d. structure wood such as girders, girt, wood post and stair treads and stringers.

D2. Red Lauan or Equivalent specie shall be used for following specified wooden

items whenever there is a need for such items in this project:

a. Wood cleats
b. Wood doors (kiln dried)
c. Interior partition stubs and plywood
d. Fascia and other face board (sun dries and well-seasoned)
e. Wood jalousies, sashes and frames (Kiln dried)
f. Other wood member not specifically mentioned
g. Ceiling joists and hangers.

E. WATERPROOFING

E1. Apply with surface preparation, methods of application and density as per manufacturer's specifications.
E2. Waterproofing: by REBTECH Enterprises (Hygard Water Proofing System (Capillary/Osmosis): Installation of waterproofing materials shall be as per manufacturer specifications.
E3. Integral Waterproofing: Hydratite WR or Sahara.

F. HARDWARES

a. Locks and Larches - use Yale brands made in U.S.A.
b. Hinge - use eagle, Stanley, Yale brands, brass finish.
c. Locks - use fort locks for drawer and cabinet's door to be specified.
d. Cabinets/Closet door Pulls and handles - use U.S. brands.
e. Nails - use PAG-ASA brands.
f. Wood Screws - use standard metal manufacturing co.
g. Machine Bolts - use Metal products.

2.02. ELECTRICAL

1.0 WIRING METHODS

A. G.I. Cable Tray for exposed wirings and HDPE Flexible Conduit or uPVC Pipe (PNS14) for underground wirings shall be used for the 13.80kV Primary Supply Feeder Lines to MVSG and to Distribution Power Transformers.

B. Fabricated & pre-painted G.I. Cable Duct or Intermediate Metal Conduit shall be used from ECB400 and Distribution Panels. HDPE flexible conduit for underground wiring inside the substation building.

2.0 CONDUIT

All wires unless noted on the drawings or in these specifications shall be installed in conduit. Conduit shall be delivered to the site in not less than 3.0m (10') and of standard weight. Intermediate metal conduit shall be hot dipped galvanized. Flexible metal conduit shall be use with corrosion resistant and has an excellent resistance to vibration. The conduits shall be rigid non-metallic conduit, PNS 14 or Sched. 40. Conduit runs shall be installed in such manner as not to waken or interfere with the structure of the building. No horizontal runs of embedded conduits or tubing shall be permitted in solid walls and partitions. Conduit below grade shall be buried at least 0.60m with sand bed all throughout as shown on the plans.

The Contractor shall provide all necessary excavation below rough grading and shall support and space conduits. All conduits and fittings on exposed work shall be secured by machine screws. All conduits on exposed work shall be run at right angles to and /or parallel to the surrounding walls. Standard manufactured elbows shall be used for all conduits 40mm dia. (1-1/2") or larger in diameter. Field bends may be used in conduit 40mm dia. (1-1/2") or smaller on condition that their radii conform to the minimum established by code.

No sharper bends than those specified shall be permitted unless approved fittings with access to cables are supplied. Field bends and offsets where necessary, shall be made with conduit bending machines. All fields cut threads shall be painted with white lead. All ends of conduits shall be provided with an insulated bushing except at coupling. Rigid steel conduit (RSC) shall be as manufactured by Mc Gill/Panasonic or equivalent. PVC schedule 40 shall be of Condu-Tech, Moldex or Emerald, or any approved equivalent by the professional electrical engineer.

3.0 WIRES, CABLES AND CONNECTORS

All conductor wires and cables for the 460volts AC supply, shall be copper, soft drawn and annealed, of 98% conductivity, type THW or THHN as called for in the plans and shall be plastic insulated for 600V working pressure.

All wires shall be stranded. Wires shall be of recent manufacture and in no case be more than six months old. Any conductor whose insulation shows signs of deterioration within one year from final acceptance of work shall be replaced by the Contractor at his own expense.

All wires shall be continuous from outlet to outlet, and there shall be no splices except in outlet, junction and pull boxes. Sufficient length shall be left at point for splicing and/or connecting to apparatus without straining.

Wire size for the smaller circuit homerun shall be not less than 3.5mm2, 600V cable.

Wiring shall only be permitted if conduit installation has been completed and approved by the Owner, or their representatives. Permission to wire shall be given by the Professional Electrical Engineer (PEE) in writing.
All power, with approved wire shall be color coded as follows:

For the 230 & 460Volts Supply

Red	-	Line 1
Yellow	-	Line 2
Blue	-	Line 3
Green	-	Ground Wire

4.0 PULLBOXES

Pull boxes for pulling, nesting and concealment of wires and cables shall be provided where indicated or where required although not indicated. Pull boxes shall be provided on all conduit runs exceeding 30 meters between connectors. In general, pull boxes shall be of code gauge steel with angles iron support and braces. All pull boxes installed outdoors type shall be of the approved type and make. Access shall be by means of removable screw-covers fastened with brass machine screws.

5.0 SUPPORTS

The Contractor shall provide all supports and braces where required for the proper installation of conduits, panels, pv modules, inverters, raceways and other electrical equipment installed and connected in accordance with these specifications and accompanying drawings.

6.0 CABLE CONNECTORS AND SPLICES

The connection of conductors from size 8mm sq. (AWG #8) and larger shall be made without damaging or trimming of wire strand and shall be made with the use of compression connectors of the pressure double indent type. Connectors shall be provided with proper insulating covers wherever required. Branch circuit splices shall be compression type connector, or joined by the insulated splicing devices (wire-nuts). All joints shall be carefully crimp without the use of acid, then taped with plastic tapes to the thickness equal to that of the insulation with a covering of friction tape of two layers.

7.0 PANELS AND CABINETS

A. All panels shall have an inside cover construction furnished with trims of flush or surface mounting as required. Manufacturer's shop drawings or samples shall be submitted for approval by the Electrical Engineer prior to manufacturer. Cabinets shall be of Ga. 16 steel with gutters of 110mm (minimum) width and wider if necessary. The trim of all panels shall be finished in gray enamel over a coat of rust inhibitor. Directories shall be typed and plastic laminated to indicate load served by each circuit and mounted in holder behind a protective covering.

B. Panels and cabinets shall be provided with push lock door lock and manufacturer's shop drawings in triplicate shall be submitted before manufacturing. Use powder coated panels and cabinets. Panels shall have phase bus bars of which rating shall be based on the ampere trip rating of protective breaker and a ground bus based on 50% of the phase bus bars. Enclosures shall be of general purpose, NEMA 1 type, except where specifically noted on plans or assembled in panel cabinets for indoor installations and NEMA 3R for outdoor installations.

All protective devices shall meet NEMA and Underwriters Laboratories, Inc. (ULI) specifications.

8.0 DISTRIBUTION TRANSFORMERS AND CIRCUIT BREAKERS/PROTECTIVE DEVICES

A. Dry Type Transformer shall designed, manufactured and tested in accordance with the all applicable ANSI/NEMA, & PEC standards and shall be rated 600 volts and below for supplying appliance, lighting and power loads from electrical distribution systems. All insulation materials are flame-retardant and do not support combustion.
Transformers are insulated at 220°C with 150°C rise. Required performances are obtained without exceeding the above rise in a 40°C maximum 30°C average ambient temperature. The dry type transformer shall have a tap changers for both input and output voltage. The ideal voltage shall have an input voltage of 460V and 230Volts for output voltage.

A. Air Circuit Breakers (ACB) draw out type at 460V AC main breakers for LVSG and Molded Case Circuit Breaker (MCCB) for the DP01, MPB1A, LPB1A, PPB1A, LPB1B & PPB1B shall be use.

B. Branches Circuit breakers for 230/460voltsAC shall be of the size and rating as shown and/or required in the plans. They shall be completely enclosed in a molded case or assembled in panel cabinets, operated by a toggle type handle shall have a quick-break over-center switching mechanism that is mechanically trip free from the handles so that the contacts cannot be held closed against short circuit and abnormal current. Tripping due to overload or short circuit shall be clearly indicated by the handle automatically assuming the position of mid-way and trip simultaneously. No bracing on handles of single pole breakers shall be used or allowed in lieu of two or three pole types.

9.0 PIPE ENTRY SEALANT

A. Fire Resistance Silicone Sealant shall applied to all pipe entry points for locations such as electrical manholes, concrete stub holes and for buttom entry panels. The purpose is to prevent any dirts, rats or insects that will cause early deterioration of wire insulators. This will also prevent direct penetration of water inside the underground pipings during rainy season. The application shall be made only after the cable pulling and wiring activity. Any spare pipe provisions shall require for this kind of application.

B. The silicone sealant type to be use shall be fire resistance that will sustain for a maximum time period of at least 240 minutes.

C. Allowed color of silicone sealant, Neutral, White or Black.

13.0 GROUNDING

All metallic conduits, cabinets, equipment and the like shall be properly grounded and bonded by means of copper straps. All non-ground connections shall have clean contact surfaces and shall be tinned and sweated while being bolted. All non-metallic conduits shall be provided with ground wires of the proper size type approved by the code, and shall continuously ground all fittings throughout the entire system. Appropriate ground tests shall be performed at contractor's expense and remedies shall be made by him with no additional costs to the Owner until the test results are within the safe acceptable limits. Ground resistance shall not exceed 5 Ohms. Additional ground rods shall be installed to obtain this value necessary. Exposed or any accessible ground connection shall be secured by ground clamps, pressure connectors and/or bushings. Concealed or inaccessible ground shall be braced. Main Grounding shall be 60mmsq Bare Copper Wire with 3/4in dia. X 3M Copper Clad Ground Rod buried at least 0.60M with 6in dia PVC Pipe every grounding rod from finished grade line. And Grounding wire for power outlets shall 2.0mm2 THW Copper wire.

PREPARED BY:

ANDREW E. DAPDAP, PEE, MEP-EE
Project Manager
Borromeo Enterprises

END OF SPECIFICATIONS