

Republic of the Philippines
Department of Science and Technology
PHILIPPINE ATMOSPHERIC, GEOPHYSICAL AND
ASTRONOMICAL SERVICES ADMINISTRATION
(P A G A S A)

SPECIFICATIONS FOR THE PROPOSED UPGRADE OF WEATHER FLOOD FORECASTING CENTER STREET LIGHTS LOCATED AT WFFC BLDG., BIR RD., BRGY. CENTRAL, QUEZON CITY

Project Title:

Proposed upgrade of Weather Flood Forecasting Center Street Lights

Location:

Weather & Flood Forecasting Center Bldg., BIR Road, Brgy. Central, Quezon City, 1100

SECTION 1: SCOPE OF WORK

- A. The Contractor shall conduct thorough inspection of the existing job site conditions.
- B. The scope of work shall include all additions necessary in order to implement the whole set of approved Plans, Working Drawings and Specifications.
- C. The Contractor shall secure and do all the legwork necessary for all pertinent permits needed for the Procuring Entity to occupy and use the building,
- D. The Contractor shall construct All Architectural, Structural, Electrical, Sanitary/ Plumbing, Mechanical / in accordance with the Plans and Specifications. All items shown on the Plans but not mentioned in the Specifications shall be included. Discrepancies shall be verified with the Procuring Entity.
- E. The Contractor shall submit details and shop drawings, templates, and schedules required for the coordination of the work of the various trades. Drawings should include information on all working dimensions, arrangement and sectional views, connections and materials.
- F. The Contractor shall consult the Procuring Entity on portion of the work not mentioned in the Specification and not illustrated on the Plans. **He shall not work without proper instruction or detailed plans approved by the Procuring Entity**, otherwise he shall be responsible for the in acceptance of the work done without details. In such case, the Contractor shall make good the work at his own expense.
- G. The Plans and specifications shall be interpreted by the Procuring Entity and or his/her representative. The Contractor is enjoined to confer with the Procuring Entity on items for clarification before submitting his bid. No excuses shall be entertained for misinterpretation of the Plans and specifications after the award of contract. All work as deemed required by the Procuring Entity shall be carried out properly by the Contractor.
- H. In case discrepancies exist between this Section and its corresponding elaborated sections, notify the Procuring Entity immediately for clarification; their decision shall be final.
- I. The Contractor shall bear the responsibility of checking all the numbers and units as indicated in the Bill of Quantities. It is understood that the Contractor shall supply and install the required units in accordance with the Plans and the Specifications.

- J. In their bid proposal, the bidders may propose materials or equipment or makes other than those specified in the BOQ and/or Specifications, provided they are of equivalent specifications and functionalities.
- K. During project implementation, the winning bidder/contractor may propose substitution of materials or equipment or makes other than those specified in the Contract documents shall be subject to the approval of the Procuring Entity.
- L. **Final Cleaning As Pre-requisite To Final Acceptance:** Final cleaning shall be by the Contractor prior to the Procuring Entity's final inspection for certification of final acceptance. Final Cleaning shall be applied on each surface or unit of work and shall be of condition expected for a first class building cleaning and maintenance program.
- M. The Contractor shall be responsible for the safety and safe working practices of its respective employees, servants and agents.
- N. **The Contractor shall surrender the dismantled old lamp post, wires and other inclusive materials to the Procuring Entity.**

SECTION 2: SITE WORK

A. VISIT AND ACCEPT SITE, AS IS. The following works shall be included:

- 1. **Site Clearing:** Protection and/or removal of existing structures with the approval from the Procuring Entity.
- 2. **Removal of improvements above and below grade** (if any) necessary to permit construction and other work as indicated. The Procuring Entity and Lessor must be consulted prior to any demolition. Coordination with PAGASA Authorities / Facilities Group & proper investigation is to be conducted to avoid damage on existing utilities. Rubbish shall be legally and properly disposed of.

B. TEMPORARY SITE FACILITIES

- 1. Temporary Provisions:
 - 1. The Contractor shall provide all temporary lighting, power, water supply and all necessary facilities sufficient enough for the simultaneous use of all possible fields of work to complete the project.
 - 2. The Contractor shall provide at necessary no. of units of Fire extinguishers.

D. STORAGE AND FILING OF MATERIALS

- 1. **Delivery:** Contractor shall ensure that materials are properly turned over and delivered on site in good quality and condition. A time and delivery record shall be available.
- 2. **Storage:** Contractor's materials shall be arranged properly and accordingly in terms of sizes, quality, quantity, category and time of use.
- 3. All cement, lime and other materials affected by moisture shall be stored on platforms and protected from weather. Materials shall be stored as to insure the preservation of their quality and fitness for their work. Stored materials shall be located so as to facilitate prompt inspection.

4. Should it be necessary at any time to move materials, sheds or storage platforms, the Contractor shall do so at his own expense.

SECTION 3: REMOVAL OF STRUCTURES AND OBSTRUCTION

In the event that there are existing buildings, septic tanks, concrete foundations, utilities or any other private or public improvements directed by the Engineer for removal but located in areas other than those established for clearing and grubbing, the said structures and obstructions shall be removed by the Contractor.

The Contractor shall remove any and all materials not suitable for use in the Work, obstructions, obstructing fences, existing culverts, and all other structures or part of structures within the highway right of-way, which are to be replaced, relocated, or interfere with or are rendered useless by new construction, unless otherwise provided on the plans or in the Special Specifications. The Contractor shall remove and dispose all foundations, debris, trash, and remains left after the previous removal by others of vacated dwelling houses or other buildings.

The disposal of materials outside the project boundaries shall be the responsibility of the Contractor. He shall make his arrangements with the property owners of disposal sites outside the project boundaries as indicated on the Plans or Contract Documents.

The Contractor shall obtain a written permit from the property owner of the disposal site. He shall submit to the Engineer the said permit absolving the PIDC and the government from any and all responsibility in connection with the disposal of materials on his property. No material shall be disposed without prior authority from the Engineer.

When materials are disposed as provided above and the site is visible from the highway, the Contractor shall make the disposal in a neat and presentable manner to the satisfaction of the Engineer.

SECTION 4: EXISTING UTILITIES

The Contractor shall assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including poles, signs, signals, fences, trees, service connections, water pipes, hydrants, sewers, drains, electric and telephone cables, gas lines, whether or not they are shown on the Drawings.

The Contractor shall carefully support and protect all such structures and utilities from damage of any kind. Any damage resulting from the Contractor's fault or negligence in his operations shall be repaired by him at his own expense. The Contractor's responsibilities shall apply even in the event damage occurs after backfilling.

Before commencing any excavation, the Contractor shall ascertain from records or otherwise, the existence, horizontal and vertical positions and ownership of all existing utilities and service connections.

If the Contractor discovers any utility or service connections in the line of the work that is not shown on the Drawings, he shall immediately notify the Engineer upon determination of the actual position of existing utilities and service connections. No work shall commence on affected utilities shall be done until proper coordination and adjustments have been made.

Service connections of utilities shall be kept operational. If it is necessary to remove or disturb a utility or service connection, the Contractor shall notify both the utility Company and the Engineer prior to proceeding with the Work.

The utility companies and private owners affected by the Work shall have the right to enter when necessary upon any portion of the Work for the purpose of maintaining service and of making changes in, or repairs to its facility.

Any utility or property removed or damaged shall be reconstructed as promptly as possible (in close coordination with the utility company or private property owners) to its original or other authorized location in a condition as good as its original condition.

In the event of interruption to water or utility services as a result of accidental breakdown, or as a result of being exposed or unsupported, the Contractor shall promptly notify the proper authority and shall cooperate with the said authority in the restoration of services. If essential public utility service is interrupted, repair work shall be continuous until the service is restored. No work shall be undertaken around fire hydrants until provisions for continued service have been approved by the local fire authority

SECTION 5: EXCAVATION

It shall be understood that the hauling of excavated fill material to stockpiles and areas of fill and disposal of unsuitable materials to disposal areas is at any distance and therefore no overhaul will be paid.

Any excavation carried beyond the limits and dimensions shown or described on the Drawings or Specifications shall be backfilled with acceptable materials.

The sides of pits, trenches and other excavations shall, where required, be adequately supported and braced to the satisfaction of the Engineer, and all such excavations shall be of sufficient size to enable the pipes and concrete to be laid accurately and proper refilling and compaction to be carried out.

Should excavations be effected to a greater depth or width than is necessary then the Contractor shall at his own expense, backfill the excess excavation with approved materials, compacted to the density of the adjacent ground to the correct levels and dimensions to the approval of the Engineer.

The Engineer's approval is required before placing concrete in all excavations for structures made through water bearing strata that require dewatering.

SECTION 6: COMPACTION

Materials shall be placed and spread so that no single layer exceeds 200 mm in thickness after compaction. Each layer, except layers consisting of rock, shall be moistened or dried to uniform moisture content within 2% of the optimum moisture content, then thoroughly compacted to a minimum of 95% of the maximum density as determined by AASHTO T 180.

It shall be compacted with compaction equipment over the full width until there is no visible movement of the rock fill materials when under the compacting equipment.

SECTION 7: REINFORCING STEEL

Rebar Fabrication and Installation

Fabrication and installation of rebar shall be done by a competent steel man to ensure good workmanship. There shall be proper supervision by the Contractor for the "cutting and bending" of reinforcing bars and frequent checking of bar schedule and clearances, from the beginning until the re-bars are installed.

SECTION 8: STRUCTURAL CONCRETE

Class A (21Mpa) shall be used to the structures and restoration.

Protection of Concrete from Environmental Conditions

1) General

Precaution shall be taken, as needed, to protect concrete from damage due to weather or other environmental conditions during placing and curing operations. Concrete that had been damaged by weather conditions shall be either repaired to an acceptable condition or removed and replaced.

2) Rain Protection

Under conditions of rain, the placing of concrete shall not commence or shall be stopped unless adequate protection is provided to prevent damage to the surface mortar or damaging flow or washing of the concrete surface.

3) Hot Weather Protection

When the ambient temperature is above 32 0C (90 0F), the forms, reinforcing steel, steel beam flanges, and other surfaces which will come in contact with the mix shall be cooled to below 32C (90F), by means of a water spray or other approved methods.

The temperature of the concrete at the time of placement shall be maintained within the specified temperature range by any combination of the following:

Shading the materials areas or the production equipment.

- Cooling the aggregates by sprinkling with water to conform to the requirements.
- Cooling the aggregates or water by refrigeration or replacing a portion or all the mix water with ice that is flaked or crushed to the extent that the ice will completely melt during mixing of the concrete.
- Liquid nitrogen injection

SECTION 9: PLAIN CEMENT PLASTER FINISH

Plain Cement Plaster Finish: to all exposed concrete structures surfaces, as indicated in the Drawings and for all areas not otherwise noted with other finishes.

SECTION 10: LAMP POST

"See detail drawing"

1) POLES

lighting poles are used, they shall be made of hot-dip galvanized iron and steel products. Pole surface shall be matte or dull finished to prevent glare.

Material and Finish

- a. Independent lighting poles shall have minimum thickness of 3.0 mm and shall be hot dipped galvanized in accordance with material and finish. Generally, pole shaft shall be made in accordance with ASTM A53/A53M Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- b. All lighting poles, made of steel, shall be hot-dip galvanized based on ASTM A 123/A 123M Standard Specification for Zinc (hot-dip galvanized) Coating on Iron and Steel Products.
- c. The zinc coating shall be relatively smooth and reasonably uniform in thickness. The parts shall be free from uncoated areas, blisters, flux deposits, block spots, dross inclusions, and other defects not consistent with good galvanizing practice.
- d. Pole surface shall be matte or dull finished to prevent glare.

Strength Requirement. Pole shall be so designed to adequately bear the additional load imposed by the lighting equipment/facilities on the distribution poles and shall meet the strength requirements specified in the latest edition of PEC 2 and NSCP.

2) Mast Arm (Mounting Bracket). The mast arm which is the same as horizontal bracket that is used to support the luminaire shall have a length that is coordinated with the proper photometric distribution.

Material and Finish

The mast arm shall be fabricated using galvanized iron (GI) pipe and to be fully hot-dipped galvanized after fabrication that are manufactured in accordance with PNS 26:1992, Steel - Black and hot-dipped zinc coated (galvanized) longitudinally welded steel pipes or ASTM A123- Black and Hot- Dipped Zinc Coated (galvanized) Longitudinally Welded Steel Pipes (for ordinary use) -

Specification.

- It shall be provided with mounting plate and stiffener to supplement its load bearing capacity.
- It shall be designed in accordance with the strength requirements of the latest edition of PEC 2 and NSCP.

SECTION 11: ELECTRICAL SPECIFICATION

1.0 GENERAL DESCRIPTION

1.1 The work to be done under this DIVISION of the Specifications consist of the fabrication, furnishing delivery and installation, complete in all details of the Electrical Work, at the subject premises and all work 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 done in accordance with the governing Codes and Regulations and with the Specifications, except where same shall conflict with such codes etc., which latter shall then govern. The requirements with regards to materials and workmanship specify the required standard for the furnishing of all labor, materials and appliances necessary for the complete installation of the work specified herein and indicated on the drawings. The Specifications are intended to provide a broad outline of the requirement and are not intended to include all details of design and construction.

1.2 LAWS/CODES and REGULATIONS:

The work under this DIVISION shall be executed in accordance with the latest requirements of the following:

- Building Code of the Philippines
- Philippine Electrical Code
- Laws, ordinances, and regulations of the locality having jurisdiction over the project.
- Power and telephone utility companies
- UAP Doc. 301

The requirements of the above mentioned governing laws/codes and the requirements of the companies having involvement/participation are hereby made part of this Specifications and the ELECTRICAL CONTRACTOR is required to comply with the same.

This does not relieve the ELECTRICAL CONTRACTOR from complying with requirements of specifications or drawings in excess of above laws and ordinances, codes and requirements which are not prohibited by the same.

1.3 GUARANTEE

The ELECTRICAL CONTRACTOR shall guarantee that the electrical system is free from all grounds and defective materials and workmanship for a period of one (1) year from the date of acceptance of the work. All defects arising within the guarantee period shall be reminded by the ELECTRICAL CONTRACTOR at his own expense.

The ELECTRICAL CONTRACTOR shall indemnify and save harmless PROCURING ENTITY from and against all claims, suits, actions, or liabilities for damages arising from injuries, disabilities or loss of life to persons or damage to public or private properties resulting from fault or any act of contractor or his representative in the execution of this work.

The partial acceptance of the work for the purpose of making partial payments, based on the estimated cost satisfactorily completed by the ELECTRICAL CONTRACTOR, shall not be considered as final acceptance of that portion of the work.

1.4 DRAWINGS & SPECIFICATIONS

1.4.1 The electrical plans, which constitute an integral part of these Specifications, shall serve as the working drawings. The plans indicate the general layout and arrangement of the complete electrical system and other works.

1.4.2 The drawings and specifications are meant specifically to be complementary to each other and where it is called for by one shall be binding as if called for by both. Anything which is basically required to complete the installation for proper operation but not expressly mentioned on the drawings and/or specifications shall be furnished and installed by the ELECTRICAL CONTRACTOR at no extra cost to the PROCURING ENTITY as though specifically stipulated or shown in both.

1.4.3 Procuring Entity shall have the final decision on any apparent conflict between the drawings and specifications or on any under and controversial point in either or both.

1.4.4 All dimensions and locations shown on the plans are approximate and shall be verified in the field, as actual locations, distances, and levels are governed by actual conditions.

2.0 SCOPE OF WORKS

2.1 Work Included

The work to be done under this section of work shall include the furnishing of all tools, labor, equipment, fixtures and materials, each complete and in proper working condition unless one or other is specifically excluded or stated otherwise in these Specifications but not limited to the following principal items of work:

- 2.1.1 Excavation
- 2.1.2 Layout of PVC pipes. Pipe cement shall be applied to the conduit connections.
- 2.1.3 Installation of street lighting poles.
- 2.1.4 Installation of electrical wire (Cable pulling).
- 2.1.5 Installation of lighting poles and fixtures.
- 2.1.6 Layout of warning tape and backfilling.
- 2.1.7 Installation of Panel board, metallic conduits and pullboxes with hangers and supports.

- 2.1.8 Furnishing and installation of a complete grounding system.
- 2.1.9 Perform terminations for all electrical system.
- 2.1.10 Complete the testing of all electrical systems.
- 2.1.11 Preparation of "As-built" drawings.
- 2.1.12 If any item of works or material has been omitted which are necessary for the completion of the Electrical Work as outlined herein before, then such items shall be and hereby included in this section of work.

3.0 PROCEDURES

3.1 Workmanship

The ELECTRICAL CONTRACTOR shall execute the work in the most thorough, prompt and workmanlike manner and in accordance with the plans and specifications. The installations shall be done thru standard methods and good engineering practices.

3.2 Materials

All materials to be installed shall be brand new except as otherwise noted on the plans or specifications. The materials shall be as specified. No substitution of materials is allowed. Should the ELECTRICAL CONTRACTOR find it necessary to use another type/brand of materials instead of the specified item, he shall first obtain approval from the PROCURING ENTITY prior to installation. Any substituted material installed without the approval of the PROCURING ENTITY shall be subject to replacement.

3.3 Coordination

It is the sole responsibility of the ELECTRICAL CONTRACTOR to conduct coordination of his activities with the following:

- 3.3.1 Other trades and suppliers
- 3.3.2 Procuring Entity/Engineer
- 3.3.3 PAGASA

3.4 Deviation From The Plans

No deviation from the plans is to be made unless given notice or approval by the PROCURING ENTITY.

3.5 Record Drawings and „As-Built” plan.

The ELECTRICAL CONTRACTOR is required to keep an active record of the actual installation during the progress of the job. This shall be the reference in the preparation of the „As-Built” plans which shall include all pertinent information, complete in all aspect of the actual installation, and all new information not originally shown in the contract drawings. The „As-Built” plans shall be prepared by the ELECTRICAL CONTRACTOR at his expense and shall be submitted to the Procuring Entity for approval upon the completion of the work. The approval of the „As-Built” drawings shall be a **pre-requisite for the final acceptance of the electrical works.**

Submit two (2) copies of the "As-Built" drawings signed and dry sealed by the ELECTRICAL CONTRACTOR'S Professional Electrical Engineer. Original tracing/reproduceable copy shall also be submitted to the PROCURING ENTITY.

3.6 Samples & Shop Drawings

3.6.1 30 days prior to the installation or fabrication of materials the ELECTRICAL CONTRACTOR shall submit to Procuring Entity the following for approval.

- a. Shop drawings of panel boards showing arrangements of circuit breakers, bus bar sizes, lugs, etc. Indicate all dimensions.
- b. Shop drawings or samples required as noted in the drawings.
- c. Samples and catalogs of materials intended to be installed.

3.6.2 The ELECTRICAL CONTRACTOR shall also submit to the Procuring Entity without delay shop drawings and other submittals which may be required by Procuring Entity during the progress of construction.

3.6.3 The above requirements shall be submitted to the Procuring Entity at the earliest possible time to give allowance for checking and verification. These shall be complete in all aspects.

3.6.4 Submit two (2) sets of each shop drawings.

3.7 Electric Power

The ELECTRICAL CONTRACTOR shall be responsible for his own electric power needed for the execution of the job.

3.8 Test

Conduit tests on all electrical conductors installed in the presence of the PROCURING ENTITY's representative.

- 3.8.1 Insulation resistance test
- 3.8.2 Continuity test
- 3.8.3 Check circuit connections at panel boards, all single phase circuit shall be connected to phase as shown in the load schedule.

3.9 Submit Reports on Tests

- 3.9.1 All reports must be formal, typewritten and properly identified.
- 3.9.2 All defects found during the test shall be repaired immediately by the ELECTRICAL CONTRACTOR.
- 3.9.3 All tools, equipment and instruments needed to conduct tests shall be on the account of the CONTRACTOR.

4.0 METHODS & MATERIALS

4.1 Conduits

4.4.1 Polyvinyl Chloride Conduit (PVC)

- a. Standard trade sizes, schedule 40

- b. Coupling & fittings - standard couplings for joints by solvent weld process.
- c. Telephone System & other auxiliary system.

4.4.2 Installation of Conduits

- a. Installation is in accordance with PEC and of good engineering practice.
- b. Use standard trade sizes locknut and bushing at each end terminating in boxes/panel boards. Ensure electrically continuous conduit system.
- c. Provide independent conduits supports using hangers, supports or fastenings spaced in accordance with good engineering practice and PEC.
- d. Conduits must be securely fastened with approved cups and screw in wall and in ceiling, nails are not acceptable
- e. Conduit threads cut on job shall have same effective lengths, thread dimensions, and taper as factory threads.
- f. Cut ends of conduit square with hand or power saw and ream to remove burrs and sharp edges.
- g. Clamps shall be galvanized malleable iron one-hole straps, beam clamps or other approved device with necessary bolts and expansion shields.
- h. All underground conduits installed shall be buried in a minimum depth of 18 in. or 45cm.
- i. The new color coded supply/feeder wires shall be laid out properly up to the New Electrical Room of DIC Building using the specific conduit and fittings. Submit sample for approval.
- j. No wiring shall be exposed.

4.2 Wires

- 1. Wires shall be annealed copper, 98% or better conductivity, insulated, single, except as noted in the drawings.
- 2. 600 volt class type as indicated in the plans.
- 3. Wires greater than no. 8 mm² shall be stranded.
- 4. Use standard methods in pulling wires.
- 5. Splices of wires/cables shall be done inside junction boxes or auxiliary gutters using standard connectors. No wires shall be spliced inside conduits.
- 6. All wires and cables shall be color coded as follows:
 - a. For three phase : Line 1 (Red), Line 2 (Yellow), Line 3 (Blue), Ground (Green)
 - b. For single phase: Line (Black), Ground (Green)

4.2 Connectors

Use solderless mechanical pressure - type lugs, copper

4.3 Insulation

All splices shall be properly insulated using 3M electrical tape. Application of insulation tape shall be equivalent to the insulation of the wire concerned.

4.4 Panel board & Circuit Breaker

4.5.1 NEMA type/enclosure unless noted, PEC rules and regulations, circuit breaker type shall be 230V, number of pole as required.

4.5.2 Panel boards shall contain a single brand of circuit breakers and as manufactured by "Schneider Electric" or "GE".

4.5.3 All circuit breakers used shall be "Bolt on" type .

4.6 Lightning

4.6.1 All lighting fixtures when installed shall be free of leaks, warps, dents and other irregularities.

4.6.2 All lighting fixtures, sample and catalogue shall be submitted for PAGASA review and approval prior to order. NO lighting fixture shall be installed without approval of PAGASA.

4.6.3 Lighting fixtures shall be wired with approved fixture wire. Each fixture shall be wired to a single point with an adequate slack for proper connection.

4.6.4 All lighting fixture shall be protected from damage during installation. Any broken lighting fixtures, gloves, receptacles, stems and the like, shall be replaced with new parts, at no cost to PAGASA.

4.6.5 Specifications:

LED STREET LIGHTS CLASSIC TYPE 50W

Power:	50W
Input Voltage:	AC85~265V
CCT:	2700-6500
Light Color:	Warm White
Power Efficiency:	>0.88
Power Factor:	>0.95
Luminous Flux:	110 lm/w
Working Temperature:	-30?~50?
Installation Height:	30W to 50W: 3-5m, 100W/150W: 8-12m
Beam Angle:	120 degree
Life span:	50,000 Hrs
Main Material:	Die Cast Aluminum
Product Size (mm):	50W: 620*280*100mm

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