



# **CALAMBA WATER DISTRICT**

Lakeview Subdivision, Halang, Calamba City

Tel. Nos.: (049) 545-2863; 545-1614; 545-7895; 545-7981; 545-1389; 545-2728

Fax: (049) 545-9752

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## **Design and Construction of Multipurpose Roof Deck and Roofing with Solar Panel of CWD Main Building (Outsource – Supply of Labor and Materials)**

### **Terms of Reference**

#### **1.0 BACKGROUND**

Calamba Water District (CWD) a government owned and controlled corporation was created under Presidential Decree (P.D) 198, as amended, otherwise known as the Local Water Utilities Administration (LWUA) Act of 1973. On September 4, 1976, LWUA awarded the Conditional Certificate of Conformance No. 29 to CWD after the latter had completed the minimum requirements granting the rights and privileges to function within its territorial jurisdiction.

For twenty four (24) years the CWD Main Building became the 3<sup>rd</sup> symbol of stability, security and unity of its employees. Despite of all natural calamities that occurred like, earthquakes and typhoons that struck the area, where edifice was built it is still rigid. However, due to heavy rain fall, aging, and wearing of the roof top slab it causes leaks and even affects the walls of the building particularly from the fourth floor down to the second floor. The walls includes electrical circuits, and panel boards. In addition, because of the heavy rain fall, rainwater causes floods on the ceilings, floors, and stairs. Thus, it will address the perennial problem of leakages on the building as a whole.

#### **2.0 OBJECTIVES**

1. To maintain the building in good condition.
2. To evaluate the existing capacity and safety of the electrical system of CWD main building or building one (1).

#### **3.0 ARCHITECTURAL, CIVIL, STRUCTURAL, PLUMBING, ELECTRICAL AND MECHANICAL DESIGN AND BUILD SERVICES**

##### **Scope of Work**

1. The building consultant/contractor shall be responsible for the architectural planning and civil, structural, plumbing, electrical and mechanical engineering

design and construction of the proposed roof top office with an approximate area of 242 square meter.

2. The building consultant/contractor shall be responsible for the evaluation of the existing electrical system and preparation of enhancement or revision to serve its purpose. It includes the following:
  - a. The building consultant/contractor shall investigate the structural capacity of CWD main building, collect site and existing data and several materials specification from procuring entity if available which may be required for the purpose of drawing up preliminary plans and estimates. The building consultant/contractor will present preliminary plans until finally accepted approved by the procuring entity.
  - b. Preparation of all working drawing (in suitable scale) based on the approved preliminary plans sufficient in detail for submission to Building Official of the City. The drawing submitted shall also show existing water supply, sewerage (if any) and drainage system.
  - c. The building consultant/contractor should have at his/her office the latest Structural Architectural software like Staad and Autocad respectively and Primavera system / MS Project.
  - d. Preparation of detailed estimate, technical specifications and modification of the estimates as when required by the procuring entity shall also be done by the building consultant/contractor.

#### **A. Conceptual Design:**

##### **STAGE 1**

##### **Preliminary Plans / Estimates**

The building consultant/contractor shall present the preliminary plans and estimates until they are finally approved by the procuring entity. Plan shall follow the following criteria.

1. Roof shall be solar panel and with electricity that can be derived shall be used by the roof top subject for the approval of CWD upon the submission of the advantageous and disadvantageous and cost recovery of the solar panel.
2. Walls-jack built
3. Ceilings-acoustic ceiling board. (Soundproof)
4. Windows-follow existing specs and colors.
5. Structural-Rebars FY66 follow standard weight/kg.
6. Airconditioning-follows existing
7. Fire exit shall be provided
8. Draft design shall be provided by the Owner subject to alteration during the conceptual process.

## **STAGE 2**

1. The building consultant/contractor shall submit bill of quantity and detailed engineering design and drawing and estimate based on CWD format, technical, specification, structural analysis, schedule of work, scope of work, manpower and equipment utilization, all working drawings in suitable scale based/or standard scale for building construction on approved plans with building permit in details for construction building process.

### **Construction**

2. The winning building consultant/contractor shall supply Scaffoldings.

## **B. SCHEDULE AND COMPLETION TIME**

1. Conceptual Design
  - It is the intent of the Calamba Water District that design and all requirements (structural analysis, BOQ, technical specifications, all drawings, schedule of works) and necessary Building Permit for roof top roofing and building 1 to be completed within two (2) months counted from the day after received of Purchase Order.
2. Construction Schedule shall be done 6 months after the approval of the design.

## **C. SUBMISSION OF DOCUMENTS**

1. Preliminary planning/design seeking comments and approval in 30"x20" size tracing paper and blue print and 1 soft copy. 1 hard copy each
2. Proposed Drawing Signed and Sealed in 30"x20" Size tracing paper And 1 soft copy 1 hard copy
3. Preliminary and final BOQ and detailed estimate respectively both in soft and hard copy (1 copy each).
4. Technical Specification, scope of work, structural and electrical analysis, schedule of work in A4 size paper, both in soft and hard copy (1 copy each)
5. Submit study of the solar panel and details plan for implementation.

## **D. Execution**

1. The building consultant/contractor is obliged to make free of cost for the minor changes in the plan if needed during the execution of the work or in any additional work in the plan as per requested by the procuring entity.

**E. TERMS AND CONDITIONS**

All terms and conditions shall be in accordance with the RA 9184.

Legend: CWD – Calamba Water District



# Calamba Water District

Lakeview Subd., Halang, Calamba, Laguna

Tel. Nos. 545-1614: 545-7895: 545-1389: 545-7981: 545-2863

## PROPOSAL FOR CALAMBA WATER DISTRICT SOLAR POWER GENERATING SYSTEM

### Product Requirement/Technical Specification

1. The project will cover the conduct of feasibility study of the Solar Power Generating System, grid interconnection, final design, procurement, construction, permitting, commissioning, operation and maintenance must be done by the winner bidder, to wit:

Solar Power Generating System – is a set up that includes all components required to convert solar radiation to useable Alternating Current (AC) power. This includes Solar Modules, Inverter, Mounting Structures, Balance of Systems (DC and AC cables and other protective devices that may be necessary).

Feasibility Study – involves the conduct of preliminary structural assessment, system sizing and identification of specifications. This also includes the application of a Distribution Impact Study (DIS) and Net-metering with the Distribution Utility (DU).

Grid Interconnection – includes the execution of the DIS and actual interconnection to the grid.

Final Design - incorporates the results of the DIS and completes the Bill of Materials of the System that will make it compliant to the standards of the DU.

Procurement – is the acquisition of the Bill of Materials of the System as indicated in the Design.

Construction – involves all the activities required to execute the Final Design. This will be carefully monitored in order to ensure workmanship quality,

Permitting - includes the application of a Certificate of Electrical Inspection (CEI) from the local government, DU Certification, and Certificate of Compliance (CoC) from the Energy Regulatory Commission (ERC).

Commissioning – involves the conduct of a functionality test using the protection setting prescribed by the DU. This ensures the successful operation between the System and the distribution grid.

Operation and Maintenance – an optional package that covers all required activities to ensure the performance of the Solar Generating System.

2. The Solar Power Generating System will be installed at the roof of Calamba Water District (CWD) main building, Lakeview Subdivision, Halang, Calamba City.
3. **Panel Selection, the PV Capacity will be 10.56 kwp**
4. Contractor may install other panel brands and type of equivalent or better quality without reducing the size of the system.
5. **PV Module will be 32 pieces JS-330P-P160,**

6. PV Inverter will be 2 pieces SMA SB50000TL-21
7. PV Mounting Systems will be Antai Solar
8. Operations and Maintenance Package cost must be limited to 1% per year onwards.

Maintenance Activity	Frequency
Panel cleaning and I-V curve measurement	Semi-annual
Check panels for damage and corrosion	Semi-annual
Check Voc and Isc of PV strings	Semi-annual
Check DC cable termination. Perform IR scan	Semi-annual
Check mounting structure	Semi-annual
Check surge protection and fuses	Semi-annual
Transformer maintenance (if applicable)	Annual
Check inverters	Semi-annual
Check AC wiring termination	Semi-annual
Check inter-connection point (panels and bus bars)	Semi-annual

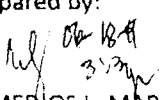
#### Financial Analysis

1. The price per kw will be P90,725.06 while the electricity bill per kwh will be from P7.50 to P9.50
2. The aged degradation will be 2.5% in the first years and .7%
3. The Performance Ratio must be 75%

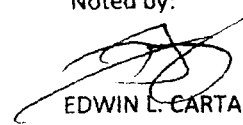
#### Benefit

1. The total energy production will be 14,989kwh/year
2. There will be oil reduction consumption at around 189 pcs
3. There will be reduction of carbon dioxide emission by 540 pcs
4. Solar provider must provide a 10-year warranty for equipment and a 25-year warranty for module power output.
5. Solar provider is available and ready to assist with any kind of issues whether on technical side.
6. Return on Investment based on energy rate of MERALCO is at P6.5912 per kwh and will have a payback period of 9 years with an IRR of 10%.
7. The System is expected to deliver the yearly estimated savings of P100,000.00.

Prepared by:

  
 REMEDIOS L. MARFORI  
 General Services Division

Noted by:

  
 EDWIN L. CARTAGO  
 Administrative Department Manager