



Transfer of (14) Air-Conditioning Units installed in SSS Pasay - Roxas Branch Office to the Proposed Relocation Site located at Seascape Village, Atang Dela Rama cor. Zoilo Hilario St., CCP Complex, Pasay City

**PROJECT** : **Transfer of (14) Air-Conditioning Units installed in SSS Pasay – Roxas Branch Office to the Proposed Relocation Site**

**SUBJECT** : **Technical Specifications**

**DATE** : **April 29, 2021**

---

## **SECTION I: GENERAL PROVISIONS**

### **1.0 SUMMARY**

This section includes the scope of work, system description and general requirements to complete the air-conditioning systems of the project.

### **2.0 GENERAL REQUIREMENTS:**

The contract drawings indicate the extent and general arrangement of the air conditioning systems. If departures from the drawings are deemed necessary, details of such departures and the reasons therefore shall be submitted to the Engineer and/or his representative for approval. No such departures shall be made without the prior written approval of the Engineer or his authorized representative.

- 2.1 **APPLICABLE STANDARDS:** All materials, machinery, and equipment shall be of the required quality used in good commercial and trade practice and shall be essentially the standard products of reputable manufacturers. The acceptability of these items including their workmanship and method of installation shall be established by the following:
- a. Philippine National Standard (PNS)
  - b. The Philippine Mechanical Engineering Code.
  - c. The Philippine Electrical Code.
  - d. Fire Code of the Philippines.
  - e. Building code of the Philippines
  - f. American Society of Heating, Ref & Air-Conditioning Engineers (ASHRAE).
  - g. American Society of Mechanical Engineer (ASME).
  - h. National Fire Protection Associations (NFPA).
  - i. Air Moving and Conditioning Association (AMCA).
- 2.2 **EQUIPMENT SCHEDULE:** As soon as practicable, after date of the award of the contract, a complete schedule of the equipment proposed for installation shall be submitted for the approval of the Engineer showing dimensions and arrangement of the equipment necessary clearances. The schedule shall include catalogs, diagrams, and drawings. In the event any items or equipment contained in the schedule fails to comply with the specifications, such item may be rejected. ***If applicable***
- 2.3 **SHOP DRAWINGS:** As soon as practicable, after award of the contract and prior to installation, complete shop drawings, showing the sizes and the type of equipment, together with complete duct and piping layout and electrical connections shall be submitted to the Engineer for approval. ***If applicable***
- 2.4 **AS-BUILT PLANS:** "As -Built" drawings is required prior to issuance of certificate of completion. "As -Built" drawings shall be furnished the building owner. The As-Built plan shall be of 20" x 30" blue print, signed and sealed by a Professional Mechanical Engineer. The As-Built plans shall include all contract drawings with the necessary revisions and modifications resulting in change from the original drawings, supplemented by such schematic, isometric, or other types of drawings as may be necessary to provide a clear understanding of installed systems "AS-BUILT".
- 2.5 **LOCAL LAWS AND ORDINANCES:** Aside from herein specified, the equipment and materials to be furnished and the installation of the systems shall conform to local laws, codes and other ordinances that are in force. If necessary, the contractor shall secure a permit to install from authorized agency having a jurisdiction over the place of installation and before final acceptance by the Owner a final certificate of inspection and a permit to operate the system shall be secured from the same government agency. Fees and other expenses due on these permits shall be borne by the contractor.
- 2.6 All tools, equipment, safety gadgets, medical kits shall be provided to ensure safety of the personnel and property against accidents and any untoward incidents that may affect the execution of the project.



### **3.0 COORDINATION OR WORK DONE BY OTHER TRADES:**

- 3.1 It shall be the responsibility of this Contractor to closely coordinate his work with other trade concern to avoid conflicts and to insure the smooth and proper installation of the project.
- 3.2 This contractor shall carefully check space requirements to make sure that his equipment, air ducts, pipes, dampers, motor controllers, etc. can be installed in the space allotted for the same.

### **4.0 DESCRIPTION OF SYSTEMS:**

All Air-conditioning units are installed at the existing SSS Pasay – Roxas Branch Office and will be transferred to the proposed relocation site located at Seascope Village, Atang Dela Rama cor. Zoilo Hilario St., CCP Complex, Pasay City.

### **5.0 DESCRIPTION OF WORKS:**

#### **5.1 WORKS INCLUDED:**

In general, the work under this section shall include but is not limited to the following principal items:

- a. Dismantling, hauling & re-installation of the following air – conditioning units including Enclosed Circuit Breakers from the existing SSS Pasay – Roxas Branch Office and will be transferred to the proposed relocation site:
  - Seven (7) 6HP Floor Mounted Inverter AC Units, Daikin Brand
  - Five (5) 4HP Floor Mounted Inverter AC Units, Daikin Brand
  - Two (2) 2HP Wall Mounted Inverter AC Units, Daikin Brand
- b. Supply and Installation of Refrigerant Piping System for all units transferred (refer to manufacturer's recommendation for refrigerant pipe sizes), Hard-drawn and Drainage Piping System, 1inØ complete with fittings and essential accessories and rigidly secured with appropriate supports and mounting brackets.
- c. Fabrication and installation of FCU and ACCU platforms and refrigerant hangers for all transferred units. Fabricated ACCU platform, mounting brackets, supports and other metal structures shall be painted with epoxy primer and finish with QDE paint suitable for outdoor application.
- d. Furnish and installation of refrigerant, flushing agents and other consumables.
- e. Supply and installation of electrical wiring system from indoor to outdoor units and feeder lines from AC power panel. Enclosed Circuit Breakers shall be re – utilized.
- f. Supply and installation of materials and other services not mentioned but are necessary to be rendered to complete the installation of electro-mechanical equipment and facilities and all other works/services. See to it that sufficient number of anchorage is provided to safely secure the equipment and facilities for this project. Cleaning and housekeeping shall be observed during the entire project implementation.

## **SECTION 2: BASIC MATERIALS AND METHODS**

### **1.0 REFRIGERANT PIPING**

- a. Refrigerant piping shall be type L, hard drawn seamless copper, suitable for a working pressure of 2413kPa/350psig (refer to manufacturer's recommendation for refrigerant pipe sizes). Fittings shall be wrought copper or brass designed for use with high temperature solder and suitable for a working pressure of not less than 2413kPa/350psig. Joints from soldered to threaded joints shall be made with standard adapter fittings using high temperature solder. Pipes or tubing shall be cut accurately to measurements established at the building lines. All piping shall be laid straight and no pipe shall be laid against other metal without insulation. After cutting, the tubing shall be reamed, all burrs removed



*Transfer of (14) Air-Conditioning Units installed in SSS Pasay - Roxas Branch Office to the Proposed Relocation Site located at Seascape Village, Atang Dela Rama cor. Zoilo Hilario St., CCP Complex, Pasay City*

and the internal surfaces thoroughly cleaned. While soldering pipes and fittings together, a continuous flow of inert nitrogen gas must be applied to sweep the internal surface of the tubing to avoid the formation of oxide inside.

- b. Condensate drain piping shall be of PVC pipe and sized to liberally dispose of the condensate to the nearest floor drain. A P-trap with a clean out plugs shall be provided at the outlet for each drain pan.
- c. Pipe supports, and hangers shall be provided and fabricated in a workmanship manner out of steel angles, rods and flat bars. Metal to metal contact between pipes and hangers must be avoided by providing a 3mm. Thick rubber in between.
- d. Supports on horizontal lines shall be spaced at not more than 1.80 meters on center. All piping must be properly anchored so that no stress placed on equipment connection by expansion.
- e. Pipe sleeves shall be of standard PVC pipes with sufficient diameter to provide a minimum clearance of 6mm around the pipe and in case of insulated pipe approximately 6mm around the insulation. Pipe sleeves shall be installed whenever a pipe passes masonry or concrete. Pipes should not be permitted to pass through bearing walls, beams, or columns.
- f. Piping insulation shall be applied on all refrigerant suction and condensate drain lines. Insulation material shall be flexible elastomeric pipe insulation 2.5mm thick. Joints shall be sealed with appropriate contact adhesive. All refrigerant pipes shall be wrapped by polyethylene film cladding together with the wiring conduit.
- g. Refrigerant pipe sizes to be installed should be confirmed with the equipment supplier prior to installation at the job site.
- h. Upon completion of the installation, the entire refrigerant circuit shall be pressure and leak tested. Dry nitrogen gas should be used with a tracer of the type of refrigerant charge of the system. The high and low side shall be subjected to a pressure of 350 psig. These test pressures should be maintained for 24 hours and any leaks found within the period must be immediately corrected. Leak detector to be used shall either be halide or electronic type. Dehydration should be in accordance with the equipment manufacturer recommendations. The triple evacuation should be employed bringing down the vacuum to 0.180 inch mercury absolute in each step or equivalent to 32° F indicated by the wet bulb vacuum indicator.

## **2.0 REFRIGERANT VALVES**

- a. Refrigerant valves shall be installed in the suction and discharge lines adjacent to the compressor and on the liquid line discharge side of the condenser. The valves shall be wrought copper or brass for use with R-32, suitable for a working pressure of 2413kPa.
- b. Thermostatic expansion valves of the proper capacity shall be installed in the refrigerant supply line to the evaporator. They shall be of the diaphragm type, externally equalized and must be of such optimum size as to maintain a full active evaporator under all load conditions and yet reduce the possibility of flooding the refrigerant to the compressors during part load conditions.
- c. Dehydrators in combination with strainers shall be installed in the refrigerant line on the inlet side of the thermostatic expansion and solenoid valves. They shall have brass or copper bodies designed for a working pressure of 2413 KPa.
- d. Sight glasses shall be combination of liquid and moisture indicators and shall be installed in the refrigerant lines to indicate whether or not the systems are properly charged and whether or not refrigerant in the system is dry.

## **3.0 CONTROL SYSTEM**

- a. Operation of the air conditioning system shall be fully automatic. They shall be capable of maintaining at full or partial loads inside conditions of 25°C D.B. (plus or minus 1.11 C) and 50% relative humidity (plus or minus 5% RH). Room thermostat shall control the operation of the compressor thru relays.
- b. The controls shall be wired in such a way that whenever a condensing unit is in operation the fan coil unit is also in operation.



*Transfer of (14) Air-Conditioning Units installed in SSS Pasay - Roxas Branch Office to the Proposed Relocation Site located at Seascape Village, Atang Dela Rama cor. Zoilo Hilario St., CCP Complex, Pasay City*

- c. The compressor crankcase heater must be of such capacity as to provide sufficient heat to the oil in the crankcase during inoperative periods so that serious oil foaming and slogging shall be prevented. The heater must be automatically energized whenever compressor operation stops and de-energized when the compressor starts.

#### **4.0 WIRING**

All electric power and control wiring necessary to be provided by the Contractor shall be accomplished in accordance with the requirements of the electrical plans and specifications and shall conform to the PEC. Wiring system including materials shall also comply with the Manufacturer's Recommendation.

#### **5.0 PAINTING AND FINISHING**

Pipe hangers, duct hangers, un-insulated piping and other ferrous metal work that have not received factory painting shall be thoroughly cleaned and apply two (2) coats of rust preventive paint such as epoxy primer or red oxide.

#### **6.0 VIBRATION ABSORBING FOUNDATION**

All items for mechanical equipment shall be properly isolated from the building structure by means of vibration absorbing foundation. Each foundation shall include an adequate number of standard vibration isolation units. The Contractor is advised to submit a shop drawing of the proposed steel platform for the condensing units at the roof that is signed and sealed by a structural engineer for approval by the Architect prior to fabrication.

#### **7.0 TESTING AND BALANCING**

Upon completion of installation and when the system is ready for operation, capacity and general test shall be conducted by a competent and experienced engineer to be furnished by the Contractor. These tests shall demonstrate the specified capacities of the equipment and in accordance with the manufacturer's recommendation.

All instruments to be used shall be of the Industrial Grade, recently calibrated and of the proper type to suit the type of system being tested and balanced.

All piping shall be pressure tested at 1½ times the design working pressure. The pressure shall be held for 24 hours and no pressure loss shall appear at the end of this period. All leaks shall be repaired and test repeated.

During this test, the Contractor shall demonstrate to the satisfaction of the Owner that all parts are installed correctly and operating properly. The Contractor shall be responsible for the satisfactory performance and all operating parameters such as temperature, current, voltage, electrical controls, etc.

#### **8.0 GUARANTEE AND SERVICE**

The air conditioning equipment and accessories furnished/installed under this part of the specifications shall be guaranteed one (1) year on workmanship from date of acceptance thereof, and materials and equipment furnished shall be free from any defects in the materials, workmanship and design. At any time within the warranty period after acceptance and upon proper notice, the Contractor shall rectify any and all deficiencies including replacement of parts or the entire units without additional cost to the Owners/SSS, if such deficiencies have been caused directly or indirectly by inferior materials, faulty workmanship and/or defective design or parts. Expendable items such as oil, refrigerant, belts, filters, etc., are included in this one year guarantee. During the guarantee period the Contractor shall perform free quarterly cleaning and servicing for all installed units and free monthly inspection for the proper and efficient operation of the system.

#### **9.0 HOUSE KEEPING**

Any damaged incurred during the activity shall be restored by the Contractor at his own expense and shall be done at the satisfaction of the client/SSS. Paint dropping and other stains relative to the project shall be removed from all areas. During the process of the work and on the completion of the project, the Contractor shall remove from premises all dirt, debris, rubbish and waste materials caused by him in the performance of his work. He shall remove all tools, scaffolding and surplus materials after completion and acceptance of the work. All affected areas that will be damage for the access of roughing-in installation shall restored at its original state/conditions.



*Transfer of (14) Air-Conditioning Units installed in SSS Pasay - Roxas Branch Office to the Proposed Relocation Site located at Seascape Village, Atang Dela Rama cor. Zoilo Hilario St., CCP Complex, Pasay City*

**GENERAL CONDITIONS**

- a. Prospective bidders are required to conduct site inspection to determine all necessary considerations and include the same in their proposal of any incidentals, materials and activities those are necessary to be furnished and executed to complete the project.
- b. Extra precautionary measures shall be observed. Otherwise, any damage incurred due to the fault of the contractor shall be replaced with a new one for the account of the supplier/contractor.
- c. Prior to the implementation of the project, the contractor is required to present to the Branch Head or his/her authorized representative all the materials required for the installation and repair job to determine that all technical specifications are complied with.
- d. The completed project shall be presented to the Branch Head for acceptance provided with complete documents including the actual record of the operating parameters such as voltage, current and pressure reading of the air-conditioning unit. The actual record of the operating parameters shall be conducted by the winning contractor in the presence of EMD representatives.
- e. Certificate of Completion and Acceptance (CCA) shall be issued after due observation of the equipment's performance. Duly accomplished (CCA) shall be issued by the Branch Head & Cluster Head prior to the release of payment.
- f. Completion- thirty (30) calendar days from receipt of approved Job Order/ Purchase Order.

Prepared by:

**ANTONIO V. TRINOS, JR**  
Senior Engineer, EMT – 1