

SCOPE OF WORK AND SPECIFICATIONS ATTACHMENT

A Spanish translation will be supplied as a matter of courtesy. If any difference is found between the Spanish version and the English version, the English version will prevail.

The following is a list of the principal features of the work required, which will be performed at the Joaquín Paris Military Fort at San Jose del Guaviare (Guaviare Department).

1. SCOPE OF WORK

The Project to be executed consists of providing preventive and corrective maintenance to twenty-eight (28) air conditioning (AC) units supplied and installed in August 2010 in a one-story housing facility (barrack). There are twenty-five (25) mini-split systems (Model SJ 122 CD with a capacity of 12,000 BTU, LG brand) and three (3) mini-split systems (Model S363 SP with capacity of 36,000 BTU, LG brand).

The service must be provided by a company certified by LG for the maintenance and repair of their ACs *or ten years experience in refrigeration systems, including at least five projects with maintenance, repair, or installation of LG air conditioning units.* The contractor shall provide skilled labor under the on-site supervision of a mechanical engineer with experience in air conditioning as well as required specialized workers including, but not limited to, refrigeration technicians, electricians and auxiliary people needed to download, transfer, install, boot and perform tests for each system. The technician who will be working on-site shall attach a certificate from LG indicating that he is certified to repair these units *or a training certificate received in air conditioning units' maintenance, repair, and installation from another well-known brand in the country or from a technical institute.*

The proposal shall include the CVs of the Mechanical Engineer and certified technicians who will be working on site.

2. SERVICE CONDITIONS

The specifications and materials for Air Conditioning shall conform to the following US standards: "AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR CONDITIONING ENGINEERS (ASHRAE)", "ASME", and "NEMA".

For the acceptance of each maintenance service, the company shall fill out a technical sheet for each unit detailing the maintenance to be done (see detailed data sheet to be completed); send photos of the points where they found "leakage" and failures; verify status of the unit before maintenance and photo indicating the repair to be done; and test pressure of the pipe to ensure no leaks in the pipe. The technical report shall include the name of the technician who provided the service, date, time and comments. The technician must attach a certificate from LG indicating that he is certified to repair these units *or a training certificate received in air conditioning units' maintenance, repair, and installation from another well-known brand in the country or from a technical institute.*

3. PREVENTIVE MAINTENANCE AND DIAGNOSIS

Preventive Maintenance:

The contractor must provide preventive maintenance for twenty-eight air conditioning units. There are twenty-five 12,000 BTU mini-split units, each with its own condenser; and three (3) 36,000 BTU mini-split units, each with its own condenser. The mini-split units are located in the interior of a single-story building with the condensers on the outside. Drainage pipes as well as pipes connecting the evaporators with their corresponding condensers are embedded in the walls and floor slab. The contractor shall verify leaks and blockages. In the event that these leaks and blockages cannot be corrected, the contractor shall make new connections over walls, according to the manufacturer's instructions. Diameters of the cooling pipes and their layout must follow the rules given by ASHRAE to achieve the oil return to the compressor. The isolation will be in Rubatex in both lines according to the manufacturer's instructions.

The maintenance consists of internal and external cleaning; adjustment of parts; review of levels of refrigerant gas; inspection of outputs, gas and electrical pipelines and connection systems. A pressure test shall be performed using dry nitrogen and a small amount of coolant. While the system is being tested for pressure, an electronic detector will be used to check for leakages.

The following activities are the minimum to be covered for each unit:

- Cleaning: cleaning of the condenser coil and the evaporator coil; cleaning or change of filters; cleaning of the tray of drain water.
- In the mechanical area, contractor shall lubricate engines; change bands; and adjust the bearings.
- In the electric area, contractor shall measure voltage and amperage and shall change or revise the electric or electronic components such as contactors, relays, capacitors, temperature sensors, humidity sensors and pressure sensors.
- In the hydraulic area, contractor shall check the pressure of the refrigerant; check oil levels; repair refrigerant leaks; and, if necessary, supply oil or coolant gas to the air conditioning equipment.

Diagnosis:

Contractor shall submit a detailed report as indicated in item 2, which shall include a technical sheet for each unit detailing the maintenance to be done; photos of the points of leakage and failure; status of the unit before maintenance works; and photo indicating the repair to be done.

The diagnosis, corrective maintenance, and technical and economic proposals shall include layout of proposed installation in case clogged pipes are found. Masonry, carpentry, patch and painting works shall be included, if required.

The contractor shall include the detailed value of each unit repair. Likewise, contractor shall include a data sheet for the unit, to include a summary of all works scheduled and performed on that particular unit. The report shall include a detailed description of activities to be performed on each unit; cost charts detailed by unit and a summarized breakdown chart of costs, including materials, labor and other expenses such as travel and transport of staff; proposed execution schedule; and engineer's and technicians' CVs who will supervise and complete the works.

4. CORRECTIVE MAINTENANCE AND OPERATION OF ALL AIR CONDITIONING UNITS

Before starting any corrective maintenance, the Contracting Officer shall submit a written authorization to the contractor indicating notice to proceed, after having analyzed and approved activities, materials and schedule proposed by the contractor. Once approved by the Contracting Officer, the contractor shall make the corrections and deliver each of the units in fully operational and working order.

All equipment and materials shall be installed according to the manufacturer's recommendations, including the required tests.

5. PREVENTIVE MAINTENANCE DURING GUARANTEE PERIOD

The contractor shall provide preventive maintenance for the twenty-eight air conditioning units for six (6) months, performing two (2) visits every three months. Three months after the initial corrective maintenance visit (which should leave all AC units functioning correctly), the first preventive maintenance visit shall be done. The contractor shall cover all costs and expenses, including transportation of the technicians, travel expenses, materials and labor needed to provide the maintenance.

This six-month period covers a guarantee of the materials and labor of parties, replaced parts and new equipment supplied and installed in the corrective maintenance.

The contractor shall submit work reports to the Embassy with a copy to the Base. After the initial maintenance and during the preventive maintenances, if the contractor detects that any part - different from the originally replaced ones (which will still be under warranty) - needs to be replaced, he shall include it in the report with the proposed solution and cost.

The contractor shall cover each of the activities described in Item 3 above.

6. CORRECTIVE MAINTENANCE DURING THE GUARANTEE PERIOD (if applicable)

Before starting any corrective maintenance, the Contracting Officer shall submit a written authorization to the contractor indicating notice to proceed, after having analyzed and approved activities, materials and proposed schedule. Once approved by the Contracting Officer, the contractor shall make the corrections and deliver each of the units in fully operational and working order.

All equipment and materials shall be installed according to the manufacturer's recommendations, including the required tests.

7. DELIVERABLES AND GUARANTEE

For each delivery, the contractor must submit two copies: one for the Embassy and another for the Base, as follows:

Format data sheet for each unit duly completed, accompanied by a certificate from LG stating that the technician is authorized by LG to provide maintenance and repair on their units *or a training certificate received in air conditioning units' maintenance, repair, and installation from another well-known brand in the country or from a technical institute*; photo report of the points where they found leaks and failures as well as state of the unit before the maintenance; photo showing the repair done; and documentation of pressure test on pipes to ensure that leaks are not present.

- Guarantee of the replaced parts.

- In case of new equipment, contractor shall submit the guarantee of the units for the time indicated by the manufacturer. Equipment shall be of similar characteristics to the ones already installed, for ease of maintenance purposes.

8. TIMELINE AND PAYMENTS

Partial payments will be done, according to the receipt of each of the six (6) described stages.

	Description	Calendar Days	Result
I	Initial Preventive Maintenance and diagnosis presentation	20	Technical data sheet per reviewed unit; diagnosis and costs
	Review and approval by the Embassy	15	
II	First Corrective Maintenance after written approval	15	Equipment/units functioning correctly; data sheet per unit; guarantee of parts and equipment substituted
	Handover/Receipt	5	
III	Second Preventive Maintenance during guarantee period and report	90	Equipment/units reviewed and functioning correctly; report
	Review and approval by the Embassy (if applicable)	15	In case of any part failure, include diagnosis, proposed solution with costs
IV	Second Corrective Maintenance after written approval	15	Equipment/units functioning correctly; data sheet per unit; guarantee of parts and equipment substituted
	Handover/Receipt	5	
V	Third Preventive Maintenance during guarantee period and report	90	Equipment/units reviewed and functioning correctly; report
	Review and approval by the Embassy (if applicable)	15	In case of any part failure, include diagnosis, proposed solution with costs
IV	Third Corrective Maintenance after written approval	15	Equipment/units functioning correctly; data sheet per unit; guarantee of parts and equipment substituted
	Handover/Receipt	5	
	Total	305	