

TECHNICAL SPECIFICATION

FOR

THE SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF

VENTILATION AND AIR CONDITIONING SYSTEM

AT

UMGUZA STAFF ACCOMMODATION

IN

MATABELELAND NORTH PROVINCE

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TECHNICAL SPECIFICATION

1.0 GENERAL

The contract will cover the supply, delivery, installation, testing and handing over in full working order with a 12-month guarantee of four (4) 18 000 Btu/Hr. Air Conditioning ceiling cassette units and four (4) extract fans at Umguza staff accommodation in Matabeleland North.

1.1 REGULATIONS

All mechanical equipment shall conform to the requirements of the Zimbabwe Factory and Works regulations, published under the government notice No: 279 of 1976 or any amendments promulgated subsequently.

1.2 DRAWINGS

Drawing No:is supplied, but the contractor is required to provide detailed installation drawings and As-installed drawings after installation is completed.

1.3 CONTRACTOR'S DRAWINGS

The successful Tenderer shall have all his layout and assembly drawings approved in writing by the Engineer before work is commenced on the contract.

1.4 TYPE OF INSTALLATIONS

The air-conditioning subcontractor will carry out the following: supply, delivery, installation, testing, commissioning and provide a 12month guarantee for the items listed below: four (4) 18 000 Btu/Hr. Air Conditioning ceiling cassette units and four (4) extract fans at Umguza staff accommodation in Matabeleland North.

1.5 NOISE LEVEL

The noise level in the rooms shall not exceed noise rating 50dB at 1000Hz centre frequency of octave band.

1.6 FIXING TO STRUCTURES

Fixing of all brackets etc to the structure shall be by means of expansion bolts of redheads shooting will not be allowed into pre-stressed concrete.

1.7 PIPEWORK

All pipe work to be concealed and welded except where otherwise specified.

- a) All pipe work shall be installed in such a manner as to maintain maximum headroom and shall be parallel to or right-angled to adjacent walls.
- b) No section of the pipe-work insulation shall be permanently closed up or insulated until it has been tested and approved as called elsewhere in this specification.
- c) Final connection to equipment shall be flanged over 50mm diameter and made with spherical seated unions up to 50mm. Where a connection is made to equipment, the flange shall be the same as the equipment e.g. pump.
- d) Screw fitting may be banded or pattern and shall be of the taper screw type BS21.
- e) All flanges shall be machined full face and welded to the pipe work as specified. Flange joints shall be made with the approved full face joint rings and compound all bolts shall be have 15mm free thread when the joint is fully made.

- f) All pipes shall remain capped during installation.
- g) All pipe work shall be installed so as to allow for expansion to eliminate undue stress to either pipe work or equipment.
- h) All pipe work going through wall beams to be sleeved.
- i) Jointing tapes/ compound to be used on all joints.

1.8 ITEM 2: Air conditioning unit, ceiling cassette type

QTY - 4

- The air conditioning units will be used for heating and cooling and moisture removal in the building.

Features on the units include:

- Cooling capacity of 18 000 Btu/h
- Power input of 1 kW
- Running current of 7.8A
- Power supply: 1phase, 220-240V,50Hz
- Moisture removal of 3.8l/h
- Noise level of 43-50dB
- Approximate weight: 20kg.
- Refrigerant: R410A

1.9 ITEM 3: Extract fan

QTY - 4

The extraction fan shall be installed as indicated on the drawing. The capacity shall be 85m³/hr. The sound level shall not exceed 50dB when the fan is working. Dampers should be installed to minimize noise and vibration.

- Required capacity – 300m³/hr.
- Flow rate – 0.15m³/s.
- Peak power – 0.08kw.
- Rated motor power – 0.08kw, 240v, 50Hz, single phase
- Full load current – 1.45A
- Starting current – 2.2

SCHEDULE OF PRICES

All prices shall be in United States dollars. The prices on this section shall only be for supply of the equipment plus respective materials (or ancillary equipment) required completing the whole installation of each of the air conditioning units and extract fans tendered for. **The tender shall also quote for the upgrade of the electrical reticulation to the nearest board.**

NOTE: the cost price in this schedule refers to the price of the supplier/manufacturer of the equipment (excluding VAT).

Item	Description of Equipment & Materials	Unit cost	Qty	Total cost
1	Air-conditioning ceiling cassette type Size 18 000BTU/hr Input Power – 2Kw 220-240V/50Hz/Ø1 Input current – 9.8Amps Refrigerant piping Insulation Mounting accessories (specify) Total	4
3	Extract fan wall mounted Extract fan (300m ³ /hr.) Inlet & outlet guards specify Other – (specify) Total	4
	Total Equipment Cost		

Total to be carried over to form of tender summary US\$.....

2.3 MAINTENANCE

The successful tenderer shall also quote for the maintenance costs that are not covered by the guarantee period.

2.4 TRAINING

The successful tenderer shall also quote for basic O&M training for two people. The training shall cover the theory, servicing and simple troubleshooting of the installed equipment.

2.5 ACCEPTANCE TESTING

The contractor also provides an acceptance test document showing the installed equipment, spares, faults and normal operation. The ministry will be involved in these tests and commissioning will only be done when these are successfully conducted.

2.6 TOTAL COST OF ALL EQUIPMENT AND SERVICES (Exclusive of VAT) TO BE CARRIED OVER TO SECTION 10 US \$.....

VARIATIONS AND OMISSIONS TO SPECIFICATION

All omissions and variations to the specification shall be set out below making reference to the corresponding clause numbers in the specification in serial order. If the tender is completely in accordance with the specification, the tenderer shall state 'Nil'.

.....
Signature of tenderer

.....
Date & Seal

SCHEDULE OF TECHNICAL PARTICULARS

The generation of the equipment to be used in the installation should be less than 2 years at the time of bidding.

The tenderer shall complete the schedule below giving the manufacturers of the equipment or materials proposed to be used on which the tender is based. Illustrations and catalogues of the equipment covered by the tender must be provided at the time of tendering.

No alteration to the equipment or materials offered or the information given will be permitted in the execution of the works unless such alteration is approved by the engineer.

3.0 SUPPLY PARTICULARS

3.1 AIR CONDITIONING ceiling cassette type

Type – ceiling cassette

Cooling capacity - 18 000 BTU/hr

Makers Name

Country of origin.....

Model and type.....

Cooling capacity.....

Heating capacity.....

Air circulation.....

Power rating.....

- a) Current rating of units (max).....
- b) Phases of supply required (max).....

REFRIGERANT

- a) type/name of refrigerant.....
- b) Saturation vapor density.....

3.2 EXTRACT FAN

Makers Name

Country of origin.....

Model and type.....

Fan speed.....

Peak power.....

Rated motor power.....

Current rating of units (max).....

Phase of supply required (max).....

SCHEDULE OF MATERIALS AND BASIC PRICES

- 4.1 Orders for purchase of materials shall be placed with all of the contractor's suppliers *within four weeks from date of receipt of verbal or provisional acceptance letter*. Photocopies of these orders shall immediately be submitted to the project Engineer and shall be the basis for claims of fluctuation in prices.

It is brought to the attention of the contractor that he shall only change suppliers with the Written authority of the Project Engineer upon submission of documents from the original supplier (at time of tender) stating his grounds for failure to meet his obligations.

4.2 ESCALATIONS FOR MATERIALS

The following is a schedule listing basic prices supplied to the Ministry by suppliers. These prices shall be used as a basis for adjustments of any increases in cost of materials irrespective of the tenderer's basic price during the duration of the contract. The successful tenderer shall substantiate such increases with receipted invoices, dated and having the contract number on them. The claim for such escalation shall be made within three (3) months of their being incurred failing of which such claims shall be disallowed. The Ministry does not accept the contractor's stores requisitions and these cannot be used to claim for price increases.

4.3 NOTE

No material increases shall be paid unless accompanied by the supplier's invoices.
No increased labour costs shall be paid unless accompanied certified copies of workers time sheets.
All claims for payment should be certified by the Mechanical Inspector before they are passed to the Mechanical Engineer for processing.

.....
Signature of tenderer

.....
Date & Seal

ESCALATIONS FOR LABOUR

5.1 The contractor shall complete a schedule of his labour rates for professional, skilled and unskilled workers. The schedule shall clearly show the number of each category of workers he intends to employ during the contract period.

Such numbers shall be changed with the approval of the engineer from time to time due to fluctuations in workload during the course of the construction period. The contractor shall also clearly show the build up of his worker’s wages i.e. he shall stimulate the National Employment Council (NEC) for the Construction Industry of Zimbabwe contributions such as pensions and general funds. The rates so specified shall be the basis for escalations for labour rates, however if no rates are specified the current labour rates stipulated by the NEC shall be applied. No contributions shall be applied to temporary or casual labourers.

5.2 CLASSIFICATION	No. of Workers	Rate (US\$ per hour)
General hands		
Installation Wireman		
Worker grade 4		
Worker grade 3		
Worker grade 2		
Worker grade 1		
Fitter/electrician		
Worker grade 4		
Worker grade 3		
Worker grade 2		
Worker grade 1		
Foreman/charge hand		
Any other (specify)		

5.3 The contractor is required to keep a record of all employees on site. Time sheets showing hours worked and amount paid per hour should be signed by the employees and the clerk of works. The number of hours worked per week by each employee should not exceed forty-four hours unless permission is granted by the Engineer to do so. A copy of the time sheets should be sent to the project Engineer before submitting your claims.

.....
Signature of tenderer

.....
Date & Seal

TENDER SUMMARY

6.1. Cost of all material as specified in **Part 5** US\$.....

SERVICES

6.2 Delivery cost US \$.....

6.3 Installation cost US \$.....

6.4 Commissioning cost US\$.....

6.5 Services Cost US \$.....

6.6 Sub- Total US\$.....

6.8 Total to be carried over to Main summary US\$.....

Amount to be carried over to Summary of Tender in Words.....

.....
.....

6.11 CONTRACT PERIOD

Tenders shall state herewith the period in days/weeks required to effect delivery of all equipment, installation and commissioning.

- Delivery
- Installation
- Acceptance Testing
- Commissioning
- **Total time required (Contract period)**

NAME OF TENDERER.....

SIGNATURE..... DATE&SEAL.....

OPERATING MANUAL, MAINTENANCE MANUAL, AND AS FITTED DRAWINGS

7.1 OPERATING & MAINTENANCE MANUALS

The successful tenderer shall provide a minimum of three copies of all operating and maintenance manuals and as fitted drawings to be provided to the client at the time of handover.

7.2 The operating and maintenance manuals shall give full details of the following: -

- (a) A description of the operation of all items of the plant, including any necessary diagrams
- (b) Instructions on how to stop and start the plant and make any adjustments to the operating conditions. Attention should be drawn to any safety precautions and requirements.
- (c) Details of all materials required in the maintenance of the equipment, including any lubricants, replacement filters, etc.
- (d) Schedule of routine and planned preventive maintenance.
- (e) Maintenance checklist.
- (f) Details of each item of plant, including name and address of manufacturer and agent/stockiest, type and serial number and also duty rating.