

Air Conditioning Works and kitchen works

Air conditioning works

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	<u>CONFERENCE ROOMS AIR CONDITIONING</u>				
	<u>Variable Refrigerant Flow(VRF) Air Conditioning System</u>				
	VRF air conditioning system consisting of a series of interconnected outdoor units serving a number of indoor units. The capacities of the units are as outlined below:				
	<u>4 - Way ceiling cassette Indoor Unit - 7.1 kW</u>				
	Four Way ceiling cassette type direct expansion indoor unit of cooling capacity 7.1Kw (24,000 BTU/HR) & complete with the following: <ul style="list-style-type: none"> *Minimum air flow rate of 17 Cubic metres per minute *A wireless remote control *Refrigerant (R410a) initial charge *Thermostat to control room temperature *Inbuilt condensate pump *decoration panel 				
A	*ceiling mounting Kit *Sound pressure level of 31 dBA *Neoplasma purifying filter	2	No		
	The indoor unit to be mounted on the ceiling with prefabricated autoelevation grill brackets or any other approved anchoring method. The indoor unit to be as LG or equal and approved.				
B	Ditto of capacity 4.5KW (15,000 Btu/hr).	8	No.		
C	Ditto of capacity 3.5KW (12,000 Btu/hr).	20	No.		
	<u>Outdoor Unit - 74.2 kW</u>				
D	1 No. Outdoor unit of capacity 74.2 KW and capacity control in the range of 10 - 130% according to the indoor cooling load. It shall operate on R410a refrigerant. or any other non-ozone depleting refrigerant. It shall be provided with anchoring accessories including rawl bolts complete with anti-vibration rubber mountings. To be complete with wall mounted simple controllers to be mounted in each room and the control cable. The entire system shall be able to start automatically after power failure with a 3 minute delay. The outdoor unit to be as 'LG VRF Series outdoor unit or approved equivalent	1	No.		
D	Ditto but of capacity 46 KW	1	No.		
	Sub Total c/f to Summary Page				

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	PIPEWORK AND ACCESSORIES				
	Control Cable Installation Works				
A	Allow for wiring & conduit works including but not limited to interconnecting cable between the outdoor unit, indoor units, wired remote control & control system. cable to be CVV-SB 1.25mm ² x 2C Supply, deliver and instal copper tubing to BS 2871: part1 and capillary and compression fittings to BS 864: part 2. Tubing must be solid drawn round, clean, smooth and free from defects and from deleterious films in the bore. The fittings must be free from internal fins or other irregularities. Compression fittings shall be Type A (non-manipulative). Allow in pipework prices for pipe support, clips and cradles, bends, tees, insulation, branches, joining fixing and any other accessories for proper and satisfactory functioning of the system.	320	Lm		
	Copper Pipework and Insulation				
B	28.575mm diameter insulated copper pipe	45	Lm		
C	22.225mm diameter insulated copper pipe	60	Lm		
D	15.875mm diameter insulated copper pipe	90	Lm		
E	12.70mm diameter insulated copper pipe	100	Lm		
F	9.525mm diameter insulated copper pipe	120	Lm		
	Y-Branches				
G	Copper Y-branches complete with reducers and tees to connect indoor units from/to both gas and liquid main refrigerant pipe. The Y-branches to be as Toshiba RBM-series or approved equivalent.	72	No		
	Bend				
H	28.875mm diameter copper bend	25	No		
I	22.225mm diameter copper bend	25	No		
J	15.875mm diameter copper bend	40	No		
K	12.7mm diameter copper bend	30	No		
L	9.525mm diameter copper bend	40	No		
Sub Total c/f to Summary Page					

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	<p>PVC Drain Pipework Supply and instal uPVC pipes for drainage of the indoor units. The pipes are to B.S 5235 with fittings fixed as per the manufacturer's instructions and BS 5572. Tenderer must allow in their prices for all sizes of connectors, adapters, socket, reducers, holderbats, clips e.t.c. required for the satisfactory running of the system.</p>				
A	25mm diameter grey uPVC pipework	80	LM		
B	25mm diameter bend and U-trap	30	No		
	<p>Simple Central Controller Unit Central controller unit complete with operational switches shall be installed in the reception area or any other convinient place. The unit shall be capable of controlling 16 indoor units. The unit shall incorporate pilot lamps to enable operating conditions to be checked. The system casing shall be of mild steel and anodized and shall be complete with all other accessories necessary to automatic operations of the air conditioning system. The controls system functions shall be:-</p> <ul style="list-style-type: none"> . Controlling indoor units in each floor (16No. maximum) . Individual operation and monitoring . Group Management . set lock/lock release for remote control of each indoor unit at place where its installed. . Schedule automatic operation management/energy saving . Self diagnosing function (display system errors) <p>The controls system shall be complete with:-</p> <ul style="list-style-type: none"> . Central control network interface unit (CNU) . 5No. product interface unit (PI485), . Independent built-in battery (minimum 2 hours) . Ethernet (Cross UTP Cable) . 30 meters long 0.75mm² x 2C (shield) cable <p>The controls system shall be Simple Central Controller Unit BMS compatible as manufactured by LG or equal and approved.</p>				
	<p>Refrigerant Allow R410A extra refrigerant for charging all the VRF air conditioning systems described above.</p>				
D		2	No.		
		1	Item		
Sub Total c/f to Summary Page					

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
A	Surge Protector Power protection unit as "Solatek" or equal and approved.	30	No		
B	Cleaning and Flushing the Installation Allow for cleaning and flushing the whole installation with appropriate medium before charging the system with refrigerant.	1	Item		
C	Electrical Connections Allow electrical cabling from the isolator provided by the others, switchgear and any other items necessary for optimum functioning of the systems.	1	Item		
D	Training of maintenance staff and operators Allow for training of three personnel on the operation and maintenance of the air conditioning installation. The training to be structured such that the personnel will undergo a course on the working of the machines, operations, settings, trouble shooting and maintenance of the machines.	1	Item		
E	As-built Drawings and Maintenance Manuals Allow for preparation of as-built drawings and maintenance manuals. All these will be handed to project Engineer in three hard copies and soft copy in 4Gb flash disk and compact disk.	1	Item		
F	Testing and Commissioning Allow for testing and commissioning of the air conditioning installations to the satisfaction of the Engineer.	1	Item		
Sub Total c/f to Summary Page					

KITCHEN EXTRACT SYSTEM

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	<u>KITCHEN EXTRACT SYSTEM</u>				
	Supply, deliver, install and fix the following equipment/ items as described. alternative brands shall not be accepted without approval.				
	Cooking Island Extract Hood				
A	4200 x2800 x 600mm deep kitchen extract hood manufactured from 16 SWG anodized Aluminium sheet complete with its framework, supports and stiffened by a frame of 38 x 38mm galvanized mild steel R.H.S. The hood shall have a 75mm wide by 25mm deep grease drainage channel all round with 2No. 20mm diameter drain holes and a plenum box.	1	No		
	Grease Filter Bank				
B	The grease filter unit consisting of a double-sided V-bank housing with top exit for use in island canopy applications for housing 5No. 508 x 508mm top exit washable type stainless steel filter panels. The unit shall have removable grease trays and framework made out of stainless steel. As "Vokes" DS 20/6 double sided V-bank housing with top exit or equal and approved.	1	No		
	Grease Filter				
C	The grease filters of size 508 x 508mm washable type stainless steel filter panels. The unit shall have removable grease trays and framework made out of stainless steel. The filter shall be composed of folded woven metal material interspersed with layers of expanded metal mesh of stainless steel and shall be capable of filtering a total of 2100m ³ /hr. The filter panels shall be easily removable for washing as and when necessary. As "Vokes" or equal and approved.	5	No		
	Ductwork				
D	500 x 500mm extract duct from hood to fan, constructed from 18 S.W.G. rolled galvanized steel sheet and connected to the fan by flexible connections and flanged joints. All joints and seams shall be sealed with mastic to make them airtight.	4	SM		
	Sub Total c/f to Summary Page				

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
A	allow for all ductwork fittings associated with the complete installation of the ductwork for satisfactory functioning of the ductwork system.	1	Item		
	Extract Fan				
B	Pullin mounted centrifugal fan capable of extracting 0.6m ³ /s of air against 300Pa static pressure. The fan will run at a maximum speed of 930 revolutions per minute and be driven by an electric motor. The fan shall be installed complete with roof cowl, plenum box and adaptor, base 1 No support with acoustic upstand, duct flange, sealing frame, inlet and bird guards and isolators in accordance with the manufacturer's printed instructions. To be as S &P' Model or equal and approved.				
	Fan Installation				
C	Allow for fixing of fan, sealing and water proofing of the exit area of duct through the roof.	1	Item		
	Anti-vibrations Mounting				
D	Anti-vibrations mounting to isolate vibrations between the fan and the roof structure shall be able to withstand a load range of upto 50Kg per mounting and shall be as "WOODS" part No. 76518 or equal and approved.	1	No		
	Fan Control Panel				
E	Splash proof control panel manufactured from 1.2mm thick sheet with stove enamel finish and clear perplex front cover. The panel shall incorporate isolator contactor phase failure relay, motor starter, overload relay and overheat safety control and fuses.	1	No		
	Vapor Proof Light Fitting				
F	Vapor proof light fittings, capacity 65 watts in a heat resistant and watertight enclosure all complete with in approved heat resistant conduits and wiring in the kitchen hood.	1	No		
	Fire Damper				
G	Shutter fire damper complete with fusible link and micro switch for de-activating the fan when damper closes.	1	No		
	Sub Total c/f to Summary Page				

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
A	Associated Electrical Work Electrical works including but not limited to wiring & conduits to both kitchen extract fans and control panels from local isolators provided by others. It shall include a push & turn safety switch near the fan for isolation during servicing & maintenance.	1	Item		
B	Testing and Commissioning Testing and commissioning, setting to work to the requirements of the specification and to the satisfaction of the Project Engineer.	1	Item		
Sub Total c/f to Summary Page					

Item	Description	Qty	Unit	Rate Kshs	Amount (Kshs)
COLDROOM INSTALLATIONS					
A	<p>3.5 KW evaporator unit The fan assisted evaporator shall be constructed out of hammered aluminium with white enamelled finish while the coil shall be of special copper tubing with aluminium fins. The fans shall have a range of operation up to -40°C and incorporating a thermal breaker. The unit to be complete with an electric defrost as SCHMITZ & SOHN MUNCHEN with a spacing of 7.0mm.</p>	1	No.		
B	<p>Semi-hermetic condensing unit To have capacity matching Item A above. To be as BITZER or equal and approved.</p>	1	No.		
C	<p>Coldroom Door. Supply and install an insulated kitchen coldroom door size 1800x1000x175mm. Complete with the following:- (i) 20mm diameter rubber seals on door edges, (ii) light sensor to switch off internal lighting when the door is closed. (iii) Inside release door lock</p>	1	item		
D	<p>0.9mm (SWG 20) thick aluminium sheet fixed firmly on the coldroom walls and the roof complete with the corner panels.</p>	45	Sm		
E	<p>1.62mm (16 SWG) thick chequered aluminium plate reinforced with GI steel sheet underneath and fixed firmly on the floor</p>	12	Sm		
F	<p>Control panel The panel shall be of mild steel and anodized. To be complete with contactors, timers and all other accessories necessary for the automatic operation of the coldstore. Other accessories to include but not restricted to:- (i) Starter (ii) Indicator lights indicating "compressor running" (iii) Indicator light indicating compressor trip. (iv) Indicator light indicating "defrost cycle in progress"</p>	1	No.		
G	<p>1200mm x 600mm x 1200mm high 3-tier stainless steel racks</p>	2	No.		
Sub Total c/f to Summary Page					

Item	Description	Qty	Unit	Rate Kshs	Amount (Kshs)
	Meat Rail 80mm				
A	diameter galvanised mild steel rail complete with 6No.stainless steel meat hooks.	1	item		
	The following Refrigeration Controls. (All refrigeration controls shall be as DANFOSS or equal and approved).				
B	Room Thermostat.To cut compressor in and out,depending on the room temperature.	1	No.		
C	Dial Thermometer range-40 to 50 oC	1	No.		
D	Thermostatic Expansion Valve	1	No.		
E	Solenoid valve	1	No.		
F	Filter drier	1	No.		
G	LP/HP Cut – out switch complete with High/Low pressure gauge	1	No.		
H	Sight glass	1	No.		
I	Anti-Vibration Mountings for the equipment as WOODS P.N.50417 or equal and approved.	2	set		
J	Refrigerant pipework-Suction Line To be of 16mm Type L hard copper tubing,insulated externally with Armaflex which shall be held securely to the pipe.	24	LM		
K	Refrigerant pipework-Liquid Line To be of 10mm Type B hard copper tubing,also insulated externally with Armaflex.	24	LM		
L	65W vapor proof light fittings	1	No.		
M	Vapour Seal as flinktone type 3 or equal and approved. the sealant shoud be evenly applied.	40	SM		
	Thermal Insulation Supply &				
N	lay 50mm thick pre-fabricated insulation in two layers with a coat of vapour seal between layers.	40	SM		
O	Allow for the charging of the refrigeration system with necessary amount of refrigerant for initial testing and eventual operation of the coldstore.	1	item		
P	Electrical works including but not limited to individual cold room machine isolators as a safety measure when machines are being serviced,connection from isolator/consumer unit to cold room to machinery, including wiring and conduits through control panel	1	item		
	Sub Total c/f to Summary Page				

SUMMARY PAGE

Item	Description	Amount (Ksh)
1	Total for Preliminaries and General Items as b/f from page D-4 AIR CONDITIONING	
2	Total as b/f from page D-5	
3	Total as b/f from page D-6	
4	Total as b/f from page D-7	
5	Total as b/f from page D-8 KITCHEN EXTRACT SYSTEM	
6	Total as b/f from page D-9	
7	Total as b/f from page D-10	
8	Total as b/f from page D-11	
	Total Amount for Air conditioning and Kitchen Extract Carried to grand summary	

Amount in Words:

Tenderer's Name & Stamp.....

Postal Address:

Sub Contract Period.....

Signature:

Date:

Pin No.....

VAT Certificate:

Witness:

Signature:

Address: