BILL OF QUANTITIES

VENTILATION SYSTEM

Item	Detail
Project	Council for Development & Reconstruction - CDR
System	Roof Plant Heat Extraction - Ventilation System
Revision	Rev 01
Date	August 2026
Prepared by	A.CHEHAB Architects & Engineers



SUMMARY		
PART	**DESCRIPTION**	**Total Price US.$**
3	MECHANICAL ENGINEERING WORKS	
4	ELECTRICAL ENGINEERING SERVICES	
4A	ELECTRICAL ENGINEERING SERVICES (Optional)	
	Total Price $ Including Optional Items	
	Total Price $ Without Optional Items	



GENERAL PREAMBLE

SPECIFICATIONS

The Works as shown on the Drawings and described in the Bill of Quantities shall be executed and completed fully in accordance with the provisions and the requirements contained in Specifications.

DRAWINGS

The Drawings pertaining to the Works are identified and listed hereunder and they are to be read and construed in conjunction with the Solicitation and Contract Documents, Specifications, and Bill of Quantities.

The Contractor's attention is drawn to the necessity for all dimensions and elevations shown on the Drawings to be physically checked and co-ordinated on the Site prior to the setting out of works, during the progress of works and prior to ordering, purchasing or manufacturing of installed components and equipment. The Contractor shall be deemed to have made due allowance in his Bid for identifying and resolving any such dimensional discrepancies which may arise.

The Drawings are as numbered and listed on Drawing G-001, entitled 'List of Drawings'.

BILL OF QUANTITIES

Symbols and Abbreviations

The following symbols and abbreviations, where used in this Bill of Quantities, have the following meanings:

m or lm	=	linear metre
m2	=	square metre
m3	=	cubic metre
cm	=	centimetre
mm	=	millimetre
Nr or No	=	number
kg	=	kilogramme
T	=	tonne
"	=	inches
LS	=	lump sum amount
Item	=	Package works
%	=	percentage
Qty	=	quantity
Drg or Dwg	=	Drawing

Generally

The Bill of Quantities are to be read in conjunction with the Solicitation and Contract Documents, Specifications, the Drawings, and these Preambles, all of which shall be taken as being mutually explanatory to each other, and construed accordingly.

The Works have been measured in accordance with the descriptions and notes described in the Bill of Quantities, which shall apply equally to both proposed and executed Works.

The Bidder shall not rely upon the descriptions, the dimensions therein, nor the quantities given in the Bill of Quantities for the purpose of ordering, purchasing or manufacturing of any materials, components or equipment.

The Contractor is required to provide with his Bid, in accordance with the requirements prescribed in the Bidding Documents, a detailed analysis of all unit rates and prices inserted in the Bills of Quantities. This shall include a break down of each unit rate and price, showing the allocation of cost for labour, materials, plant, equipment and other charges. The Employer or the Engineer shall have the right, and the Contractor shall provide if so requested, a further analysis of any or all unit rates and prices, including a detailed breakdown of "other charges".



Descriptions

The descriptions of the work items as set out in the Bill of Quantities are approximations only and are not necessarily, nor are they to be taken as the precise and complete descriptions of work to be performed by the Contractor in the execution and completion of the Works, and in fulfillment of his obligations under the Contract. Headings and sub-headings to groups of items in the Bill of Quantities are to be read as part of the descriptions of the items to which the headings and sub-headings apply.

The general and detailed requirements of the Specification are not repeated in the descriptions of the items in the Bill of Quantities, other than cross-referencing for the purposes of identification.

Quantities

The quantities set out in the Bill of Quantities are estimated quantities only and they are not to be taken as the actual and correct quantities of work to be performed by the Contractor in the execution and completion of the Works, nor are they intended to limit the amount of work to be performed under the Contract. Upon completion, all work will be re-measured in accordance with the Contract, following the descriptions and notes contained in the Bill of Quantities and these Preambles.

Works are measured net as fixed in position except where otherwise stated in a measurement note applicable to the work. Excavation and earthwork in particular, are measured as stated in the Bill of Quantities

Pricing

The Contractor shall be deemed to have fully checked the descriptions and quantities contained in the Bill of Quantities against the Drawings and Specifications to ensure that the unit rates and prices inserted by him in his Bid, include for the full cost of executing and completing the work described, including for all ancillaries and associated works which are indicated or reasonably inferred from the Drawings and Specifications and necessarily required for the proper and timely execution and completion of the Works in accordance with the Contract.
Unit rates and prices inserted in the Bill of Quantities shall be fixed and, except as provided for in the Contract not subject to adjustment, in respect of any rise or fall in the cost to the Contractor of undertaking, executing and completing the Works.

The Bill of Quantities shall be priced in United States Dollars. All payment made to the successful Bidder in accordance with all certificates, accounts and similar documents relating to this Contract shall be in US$.

The Bidder shall be deemed to take all adequate measures to ensure utmost safety conditions with no exceptions such as providing personal protective equipment PPE, protections around excavations, ladders, scaffolding, working at heights, etc... and any other HSSE measures as well as Prevention of Sexual Exploitation and Abuse- PSEA Posters, awareness sessions and other plans and activities including utilization of dedicated entrance for the Contractor's staff, etc..

The Bidder shall price all items excluding VAT.
The Bidder shall allow in his rates for protecting all Works against damage by whatever method deemed necessary and approved. Any work damaged before the Works are handed over shall be replaced or made good at the Tenderer’s expense and to Engineer's satisfaction.

The Bidder shall include in his rate the cost and time effect of coordinating and fully assisting any Nominated Sub-Contractors, if any, appointed by the Employer, during schedule overlapping in the utilization of all equipment and facilities, and maintaining all equipment (cranes, generators, safety barriers, site security, etc.) operational until the end of all trades of the entire project. No claim for additional payment or extension of time will be considered in these respects.

The Bidder shall provide photos for monthly progress reports as per the requirements of the Employer.
The Bidder shall provide one set of all the workshop and six sets of the As-built drawings for all the disciplines for the Employer's review & approval in addition to soft copies in executable format (Autocad).

The cost of any items of work in the Bill of Quantities, for which no unit rate or price has been inserted by the Contractor, shall be deemed to be covered by and included in the other rates and prices inserted in the Bill of Quantities.

Unless otherwise stated, all costs necessarily incurred in complying with the provisions and requirements of the Conditions of Contract and General Requirements are deemed to be included in the works as applicable.
Unit rates and prices inserted by the Contractor against the work items in the Bill of Quantities, shall be deemed to cover for all such costs; including but not necessarily limited to the following, as applicable:

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- on-site and off-site supervision and management,
- site administration and security,
- insurances, bonds and guarantees,
- water for the works,
- lighting and power for the works,
- temporary roads, hardstandings, crossings and the like,
- temporary fencing, hoardings, screens, barriers, foot-ways, guardrails and the like, concrete strength test & steel bars test as stated in the BOQ
- giving notices and making applications, including the payment of fees and charges in connection therewith,
- safety, health and welfare of workpeople, and of employees, users and occupants of existing buildings and facilities on the Site,
- compliance with traffic regulations,
- maintenance of public and private roads, services and adjoining property,
- control of noise and pollution, prevention of fire and compliance with all other statutory and general obligations,

- Contractor shall submit for the consultant all samples of materials and testing of materials, (including providing equipment for testing) for approval. The consultant will coordinate with the client representative for final approval (Quality and colors).

- preparation and submittal of drawings, reports, records, certificates, notices, proposals, designs, details, calculations and other information and data required by the Specification,

- compliance with all other requirements, provisions, responsibilities and obligations contained in the Contract Documents.

- Temporary facilities for the Consultant / Engineer

Unless otherwise stated, all costs necessarily incurred in complying with the provisions and requirements of the Specifications and Drawings are deemed to be included with the work, as applicable.

Unit rates and prices inserted by the Contractor against the work items in the Bill of Quantities, shall be deemed to cover for all such costs; including but not necessarily limited to the following, as applicable:

- mobilisation: including bringing to and providing on Site, all Contractor's Equipment and temporary works; carrying out enabling tasks and providing all temporary services necessary to commence and undertake the Works,

- labour and all costs in connection therewith,

- materials, products, equipment, goods, supplies and consumables, and all costs in connection therewith,

- Contractor's Equipment, including but not limited to: plant, machinery, scaffolding, tools, vehicles and the like, and all costs in connection therewith,

- temporary works and all costs in connection therewith, including but not limited to: designing; preparing and submitting shop drawings; installing, maintaining, adapting, clearing away and making good as necessary,

- work at any location or depth,
- work in small or isolated quantities,
- curved, sloping, raking or battered work,
- cleaning and protection of all work,
- protection of all existing buildings and facilities, structures, utilities, site improvements, trees and vegetation, features, pavements and other facilities on and adjacent to the site, which are to remain upon completion of the work,

- all other enabling tasks, associated and subsidiary components and items of ancillary work, which are indicated or reasonably inferred from the Specifications and/or Drawings, and which are necessary to perform and complete the work described,

- demobilising the Site upon completion of the Works, including but not limited to: removing from Site all Contractor's Equipment and temporary works materials, clearing and removing from the Site all Contractor's rubbish, debris and surplus materials, and reinstating and restoring the Site to its' original condition,

- establishment costs, overhead charges, profit and risk.

* Coordination with other associated trades, designers, third party supplier and specialists, at the time preparing shop drawings and during the works progress.



MECHANICAL PREAMBLE

SPECIFICATIONS:

Mechanical equipment has been measured in complete items unless otherwise stated in the specification and bill item. The rates for all items shall include for supplying all materials, fixing, terminating and connecting all accessories and components for a complete and functional item.

The Contractor shall consult the relevant sections of the specification when query or doubt arise.

The Contractor shall consult with, and employ specialist sub-contractors for specific items of work as identified in the specification. All costs associated with such works shall be included in the tender. Specialist sub-contractors will be of recognized expertise, acceptable to the engineer.

All items of mechanical plant shall be connected to the control and power systems by wiring out from the mechanical control centres. All wiring shall be carried out by competent and qualified electricians under the mechanical scope of works.

Rates and prices entered against the items shall include for all costs in connection with the followings :

* Connection items of plant and equipment as necessary to the control and power systems.
* Provision of starter's, protective devices, automatic change over/load shedding facilities, remote and local isolation/emergency shut off as appropriate, control functions and alarms to achieve the intent outlined in the Control Section of the Specification.

All motors to be of the 'Low Energy' type as outlined in the Specification.

* Off loading, storing, connecting up, protecting as necessary, testing,cleaning, balancing, commissioning individual items of plant as well as complete systems installations all as specified and directed by the Engineer.
* Supports, brackets and fixings of every description required to complete the works.
* Cutting or forming all holes, mortises, chases and the like in the structure to facilitate the various works and making good in all trades as necessary;
* Coordination with other associated trades, designers, third party supplier and specialists, at the time preparing shop drawings and during the works progress.
* The Contractor shall conduct a site inspection to validate existing equipment, openings, and the number and capacities of existing AC units prior to commencement of works.
* The Contractor shall verify the design calculations and obtain the Engineer's/Consultant's approval prior to execution.
* The Contractor shall prepare and submit shop drawings for approval prior to commencement of the relevant works.
* The Contractor shall prepare and submit as-built drawings upon completion of the works.
* The Contractor shall dismantle ten (10) of the existing fans, relocate and sell them, and deduct the estimated selling price from the total cost of works.

Warranty Period: The Contractor shall provide a warranty period of one (1) year for all system components, commencing from the date of Substantial Completion or from the date of final approval of the Testing and Commissioning, whichever occurs later.



ELECTRICAL PREAMBLE

SPECIFICATIONS:

Rates for all items of equipment and materials shall be inclusive of all labor, electric power during installation and testing oxygen, acetylene, water, transport, rigging, temorary works, stores, offices, instruments insurance, customs, duties, overhead, profit certificates, samples, tests, supply of all information and data, supply of catalogues, charts, curves, submittals, certified drawings and all other information and services called for in the specification, all fully connected up and good working order. Rates shall also include for:

a. All builders work in connection with fixing of supports brackets, clips as required
b. Cutting or forming allopenings, mortises, chases, etc., infloors, walls and ceiling required for the installation and making good after.

c. Repair, repaint and generally make good and leave in perfect condition all the work executed by him under the contract.
d. All other work in connection with the installation that is not measured separately.

e. Electrical equipment is enumerated unless otherwise stated and the rates shall include for supplying all materials labour, plant, fixing, terminating and connecting accessories, etc.
f. All the feeder cables (PVC/PVC) are measured in line armeters from the boards to the boards to the equipment or from the distribution board to Submain or from board etc.The rates shall include for the supply of materials, laying, terminating, trenching, cable trays, ducting, etc.
g. Disconnecting / Isolating switches are enumerated and the rates shall include all necessary wires, conduits, boxes etc. If the switches are fed by cables, then the cables are measured separately.

h. Warranty Period: The Contractor shall provide a warranty period of one (1) year for all system components, commencing from the date of Substantial Completion or from the date of final approval of the Testing and Commissioning, whichever occurs later.

* Coordination with other associated trades, designers, third party supplier and specialists, at the time preparing shop drawings and during the works progress.



Item No.	Description	Unit	Qty	Unit Price US.$.	Total Price US.$.
PART 3	**MECHANICAL ENGINEERING SERVICES**				
1	**General Technical Requirements** The Contractor should revise the Mechanical drawings and make sure that they can be executed properly in the building. The Contractor should prepare completely shop drawings for all mechanical works and these shop drawings should be approved by the Engineer before executing. Contractor shall provide all necessary Mechanical works, maintenance, cleaning, relocation or removing, testing & commissioning for the existing mechanical system to ensure properly working system. The contractor shall inspect all the existing system and site condition prior to pricing. Cost of the above shall be included in the cost of items.				
2	**Ventilation System**				
2.1	**Fans**				
2.1.1	**High-Temperature Centrifugal Exhaust Fan** Supply backward-curved / airfoil centrifugal fan, AMCA-certified for air and sound, rated 12,100 CFM (≈ 20,560 m³/h) at ≈ 350 Pa external static pressure, suitable for continuous operation in air ≥ 60 °C; galvanised / corrosion-resistant casing with inspection door and drain plug; fixed-speed (no VFD); motor ≈ 4 kW, 400 V / 3-phase / 50 Hz, IE3, IP55, Class F, S1 duty, with DOL / soft-starter and staggered-start provision; Fan width/depth should not exceed 800mm in order to transport the fan inside the building.	No.	11.00		
2.1.2	**Installation of Exhaust Fans** deliver, install, connect, test, balance and commission the above mentioned exhaust fans, complete with flexible connector, anti-vibration mounts, matching flanges, mounting base/frame, local isolator and control wiring, supports and all accessories.	No.	11.00		
2.1.3	**Re-commissioning of Existing Fans** Four of the existing axial fresh-air supply fans (8,000 CFM each) shall be retained, cleaned, relocated as per drawings and re-commissioned as powered make-up fresh air fans, 3 of them as duty and 1 as standby.	No.	4.00		



Item No.	Description	Unit	Qty	Unit Price US.$.	Total Price US.$.
2.2	**Duct System**				
2.2.1	**Duct Work** Supply, fabricate, deliver and install galvanized steel (hot-dip galvanized iron with zinc coating) sheet ductwork for heat extraction system, complete with all fittings, bends, elbows, tees, reducers, transitions, offsets, splitter vanes, access doors, turning vanes, flanged joints, sealant, gaskets, reinforcing angles and stiffeners, support channels, threaded rods, hangers, anchors, flexible connections to equipment, vibration isolators where required, fixing accessories, cutting, testing, balancing provisions and all incidentals necessary for a complete installation, in accordance with the project specifications, SMACNA HVAC Duct Construction Standards and approved shop drawings. The ductwork shall be manufactured from galvanized steel sheets of the specified thickness as per specifications section 2.4, complete with all reinforcements and supports suitable for the operating pressure, air velocity and service conditions. The item rate shall include all fabrication waste, transportation, lifting, installation and commissioning, complete in all respects.	m2	900.00		
2.2.2	**Plenum Box** Supply, fabricate and install galvanized steel heat-extraction plenum box, fabricated from minimum 1.2 mm thick hot-dip galvanized steel, Z275 coating, complete with folded joints, reinforced corners, necessary internal stiffeners, 500 × 400 mm flanged branch connection, galvanized steel supports and brackets, sealant, gaskets, fasteners, anchorage, zinc-rich repair coating to damaged galvanized surfaces, transportation, lifting, installation, alignment, testing and all accessories necessary for a complete installation. The plenum box shall be suitable for continuous operation with exhaust-air temperatures up to 60°C and shall withstand the operating airflow and pressure without excessive vibration, deformation or noise. Wire-mesh panel, volume control damper and connecting ductwork shall be measured separately.	No.	50.00		
2.3	**Wire Mesh** Supply, fabricate and install removable galvanized welded wire mesh panel, size 1,500 × 1,200 mm (or as needed as per site condition), comprising 20 × 20 mm clear mesh opening with 2.0 mm diameter galvanized steel wire, complete with 25 × 25 × 2 mm galvanized steel angle perimeter frame, one central stiffener, galvanized or stainless-steel fixing bolts/screws with wide washers, high-temperature EPDM or silicone gasket rated not less than 100°C, cutting, welding, zinc-rich repair coating to all cut and welded surfaces, supports, accessories and installation to heat-extraction plenum box, suitable for approximately 2,600 CFM airflow and continuous air temperature up to 60°C, complete in all respects.	No.	50.00		



Item No.	Description	Unit	Qty	Unit Price US.$.	Total Price US.$.
2.4	**Volume Control Damper (VCD)** Supply, fabricate and install galvanized steel manual single-blade volume control damper, complete with galvanized steel frame and blade, galvanized shaft, bronze or nylon bearings, manual locking quadrant, operating handle, fixing accessories and all necessary hardware, suitable for exhaust air systems operating up to 80°C. Sizes as follows:				
2.4.1	300x600mm	No.	2.0		
2.4.2	500x400mm	No.	19.0		
2.4.3	500x500mm	No.	13.0		
2.4.4	600x450mm	No.	16.0		
2.4.5	600x600mm	No.	2.0		
3	**Testing, Adjusting, Balancing (TAB) and Commissioning** Of the Complete Heat Extraction Ventilation System, including but not limited to inspection, functional testing, start-up, adjustment and balancing of all extraction fans, ductwork, plenum boxes, volume control dampers and associated accessories; measurement and recording of airflow, air velocity, static pressure, total pressure, fan rotational speed, motor voltage, current and power consumption; adjustment of manual volume control dampers to achieve the specified design airflow; verification of fan rotation, vibration levels, noise levels, duct leakage, and proper operation of all equipment; correction of deficiencies identified during testing; submission of complete TAB and commissioning reports, including calibrated instrument certificates; demonstration of satisfactory system operation to the Engineer; and all labour, equipment, instruments, temporary connections, consumables and accessories required to complete the works in accordance with the project specifications, SMACNA, AMCA and ASHRAE requirements.	Item	1.0		
4	**Dismantling of Exsiting Fans, Ducts, Louvers and accessories** This item should have a negative value: Dismantle, relocate & sell ten (10) No. of the existing ventilation fans complete with associated ducts, louvers, fixings and accessories. Credit for estimated resale value of the dismantled items referred above, to be deducted from the total value of works (Provisional).	Item	1.0		
	MECHANICAL ENGINEERING SERVICES **TOTAL CARRIED TO PRICE SUMMARY**				



Item No.	Description	Unit	Qty	Unit Price US.$.	Total Price US.$.
PART 4	**ELECTRICAL ENGINEERING SERVICES**				
1	**General** The Contractor should revise all the drawings and compare them with the site conditions and redo all the design works with the necessary calculations for all the electrical installations and works. Moreover, the Contractor should submit shop drawings and as-built drawings for the maintenance use in the future. The contractor should provide all the necessary maintenance works for all Electrical systems related to the building to ensure its proper works.				
2	**LV Wires and Cables**				
2.1	**Low Voltage Distribution Cables (Cu/PVC/PVC, CU/XLPE/PVC or CU/XLPE/LSZH)** Supply, install, test and commission low-voltage power cables from the respective feeder panel to the exhaust fan isolating switch, complete with cable pulling, routing, supports, conduits/trays where required, glands, lugs, terminations, identification tags, fixing accessories, and all associated materials and works, complete in accordance with the drawings and specifications. **(Cable sizes to be verified by the contractor based on voltage drop calculation. Lengths to be verified as per site condition)**				
2.1.1	**Main Feeder Cables (Cu/XLPE/PVC) For Exhaust Air Fans**				
2.1.1.1	4 x 4 mm² + E =4 mm² (Only additions)	Lm	200.0		
3	**Isolating switches and Control Box**				
3.1	**Isolating Switches** Supply, install and connect the following disconnector switch complete including cabling/conduit works back to respective panelboards, with all related accessories as shown on drawings and as specified.				
3.1.1	Isolating switch rated 16A TPN IP 65, for Exhaust Air Fans (Cable not included)	No.	11.0		



Item No.	Description	Unit	Qty	Unit Price US.$.	Total Price US.$.
3.2	**Fan Control Panel and Current Relay Sensor** Supply, install, test and commission a local IP65 Fan Control Panel for automatic exhaust fan operation, complete with AC-3 rated contactor, interposing relays, control MCB/fuses, terminal blocks, internal wiring and all associated control components. The scope shall include all control wiring and interconnections between the Fan Control Panel and the current sensing relays (CSRs) installed on the associated compressors, including control cables, wires, conduits, cable glands, lugs, supports, terminations, identification, testing, commissioning, and all related accessories required for a complete and fully operational system.				
3.2.1	IP65 polycarbonate control enclosure	No.	11.0		
3.2.2	AC-3 magnetic contactor (9–18 A,coil to suit control voltage)	No.	11.0		
3.2.3	Interposing relay with socket	No.	49.0		
3.2.4	Control MCB (2–6 A) or fuse holder with fuse	No.	11.0		
3.2.5	HOA selector switch (Hand-Off-Auto)	No.	11.0		
3.2.6	Pilot lights (Power / Run)	No.	22.0		
3.2.7	Terminal blocks, DIN rail, wiring duct, labels	No.	11.0		
3.2.8	Internal control wiring, glands, lugs and accessories	No.	11.0		
3.2.8	Control cable from CSRs to Fan Control Panel	No.	11.0		
3.2.8	Conduits, fittings and supports	No.	11.0		
3.2.8	Installation, wiring, testing & commissioning	No.	11.0		
3.2.8	Current sensing relays (CSR)	No.	49.0		
	ELECTRICAL ENGINEERING SERVICES TOTAL CARRIED TO PRICE SUMMARY				



Item No.	Description	Unit	Qty	Unit Price US.$.	Total Price US.$.
PART 4A	**ELECTRICAL ENGINEERING SERVICES (Optional)**				
5	**Main Feeder Cables CU/XLPE/LSZH) For Fresh Air Fans (Optional)**				
5.1	4 x 4 mm² + E =4 mm² (New)	Lm	140.0		
6	**Cable tray (Optional)** Supply, install the following cable tray, hot dip galvanized complete including the galvanized brackets for fixing the trays to the walls or ceilings, the galvanized bolts and the accessories for connection of different elements, the angle elements, the fixing rigidly to the walls and ceilings and all necessary connections and accessories. as shown on the drawings and as specification.				
6.1	Power Cable tray (300x50mm)	Lm	200.0		
	ELECTRICAL ENGINEERING SERVICES (Optional) TOTAL CARRIED TO PRICE SUMMARY				

