TENDER REF. NO.: KK/133/2026/JPK(TC)

MINISTRY OF HEALTH
NEGARA BRUNEI DARUSSALAM

THE PROVISION OF COMPREHENSIVE MAINTENANCE SERVICES FOR REFRIGERATED AIRCONDITIONING AND VENTILATION AT SERIA HEALTH CENTRE, SUNGAI LIANG HEALTH CENTRE AND LABI HEALTH CENTRE FOR A PERIOD OF THREE (3) YEARS

TENDER FEE : $30.00

RECEIPT NO. :

CLOSING DATE : ON TUESDAY, 04th August 2026

TIME : 2.00 PM

FOA :

THE CHAIRMAN
MINI TENDER BOARD, TENDER BOX
GROUND FLOOR, MINISTRY OF HEALTH
COMMONWEALTH DRIVE
BANDAR SERI BEGAWAN BB3910
NEGARA BRUNEI DARUSSALAM

[CLUSTERING]

SECTION 2

INVITATION TO TENDER
THE PROVISION OF COMPREHENSIVE MAINTENANCE SERVICES FOR REFRIGERATED AIRCONDITIONING AND VENTILATION AT SERIA HEALTH CENTRE, SUNGAI LIANG HEALTH CENTRE AND LABI HEALTH CENTRE FOR A PERIOD OF THREE (3) YEARS

SPECIFICATIONS

1. GENERAL

Tenderers are sought from suitably qualified contractors who wish to be considered for the provision of comprehensive maintenance services (hereinafter referred to as "Maintenance Services") for Refrigeration Air Conditioning and Ventilation (hereinafter referred to as "the System") at sites located at Schedule I.

The duration of the Services is for **three (3) years**

To enable the proper evaluation of the Tender, Tenderers must complete the list of registered personnel with full details of their qualifications and experiences for Mechanical and Electrical engineering works as set out in **Section 3** in the Invitation To Tender.

2. SCOPE OF WORK

The Contractor shall provide Maintenance Services for refrigerated airconditioning and ventilation as listed out in **Schedule I**, inclusive of all necessary spare parts, replacement parts and materials to keep the system in good working condition and order.

The Ministry of Health (hereinafter referred to as "the Ministry") reserves the right to amend the schedule of equipment, either by addition or deletion, as the equipment becomes liable for the maintenance under this tender, or is taken out of service.

The Maintenance Services are as follows:

- Preventive Maintenance
- Corrective Maintenance

The Contractor is also required to carry out "special service calls" (service calls between regular scheduled preventive maintenance service calls) at no extra charge to the Ministry, when requested and found by the Superintending Officer (hereinafter referred to as "S.O.") to be necessary to keep the system in good working condition and order.

The Contractor shall also provide standby site attendance of two (2) qualified personnel, whenever requested by the S.O. during special events at no extra charge. Such personnel must be present at the specified site at least **two (2) hours** before the event, to carry out testing of the system.

The Contractor shall provide emergency minor adjustment service on a 24-hour basis for airconditioning breakdowns, as soon as such breakdowns are reported.

2.1 Preventive Maintenance

The Contractor shall carry out scheduled or routine preventive maintenance as set out in **Schedule II**.

Preventive maintenance shall be carried out during Government working hours: 07.45 am – 12.15 pm & 01.30 pm – 04.30 pm

The Contractor shall prepare and submit a quarterly work schedule covering the preventive maintenance and major overhaul **two (2) weeks** in advance for approval.

Preventive Maintenance shall be planned and carried out so as to cause minimum inconvenience and disruption to the operation of the airconditioning system.

The Contractor shall ensure that the downtime of any of the equipment within the system is kept to a minimum of one (1) day. A penalty of **B$100.00 per day** shall be imposed on the Contractor if the said period if exceeded and that, it is in the opinion of the S.O., the equipment ought reasonably to have been put back to service.

All materials specified to be used on the routine preventive maintenance visits such as grease, oil, distilled water and cleaning materials shall be included in the cost of the service.

A minimum of two (2) persons are required to be stationed at Estate Maintenance, Daerah Belait respectively during Government working hours when preventive maintenance is being carried out.

Within fourteen (14) days of being awarded the Tender, the Contractor shall submit a work schedule for three (3) years duration to S.O.

This work schedule must clearly show the actual working time, day/date. month, names of each service teams and type of maintenance ("W" indicates two weeks; "M" indicates monthly; "Q" indicates quarterly; "H" indicates every six month or biannually; "A" indicates annually) for each routine preventive maintenance to be carried out.

The Contractor shall ensure that his personnel comply with the work schedule while carrying out the routine preventive maintenance.

Where necessary, the S.O. reserves the right to shift the schedule maintenance date to alternative date/s, in conjunction with a VIP visit to any the sites with or without prior notice.

2.2 Corrective Maintenance

The Contractor shall also perform corrective maintenance on the system.

This service shall be provided free of charge with unlimited breakdown calls per year.

Corrective Maintenance shall be performed **AT ANY TIME (inclusive of public holidays)** upon notification by the S.O. or his representative.

The Contractor shall dispatch his service engineer to a site specified by the S.O. or his representative within **one (1) hour** after being notified in writing or telephone that the system is inoperative. A penalty of **B$100.00 per hour** shall be imposed for every hour or part thereof of the response time is exceeded.

After responding to the response time, the contractor and/or his personnel shall produce and submit a report of the fault or breakdown to the S.O. prior to proceeding with rectifying the fault or breakdown.

The service engineer shall complete any repair or replacement of parts within **three (3) days** from the time the service engineer arrives at the specified site. A penalty of **$100.00 per day** shall be imposed if the said downtime is exceeded and that, it is in the opinion of the S.O., the system ought reasonably to been put back to service.

To ensure immediate response by the Contractor and/or his personnel, the Contractor shall submit contact numbers of his personnel to enable the S.O. or his representative for reporting faults and breakdowns.

3. SHUT DOWN OF AIRCONDITIONING SERVICES

Where it is necessary to shut down airconditioning services for preventive maintenance, this shall be in done in liaison with the S.O. of the site affected. This will take the form of shutting down the airconditioning services during the normal working day at a time when it will cause least disturbance to the staff and patient.

In some cases it may be practical to shut down the airconditioning services only before or after working hours, in which case special arrangements for access and security must be made at the Ministry's expense.

4. INSTALLATION NOT OPERATIONAL

In the event of a fault being found which requires the system to be switched off immediately, whether for immediate repair or to prevent the fault developing into a dangerous condition or becoming more expensive to repair, the Contractor shall immediately inform the S.O. of the site affected.

If the fault has developed into a breakdown where the major spare part has be repaired or replaced, the Contractor shall provide an estimated time for the repair or replacement to be carried out.

5. DEFECTS DURING MAINTENANCE SERVICES

When any defects in any of the system performance is identified by the Contractor during the maintenance services, the Contractor shall be responsible for making good such defects.

The Contractor shall give due importance to safety at all times. Appropriate notices shall be posted at all times whenever service/repair/safety test are being carried out.

6. CANCELLATIONS

For all cancelled or postponed maintenance services, the Contractor is required to give in writing the reasons for not carrying out such works on the scheduled date/s.

The Ministry reserves the right to arrange alternative dates/times to perform the outstanding maintenance services or make deductions from the charges/invoices submitted for payment.

7. CONTRACT PRICE AND PAYMENTS

The proposed Contract Sum shall be deemed to cover all costs involved in performing the Maintenance Services including all costs, charges and expenses for labour, spare parts, materials, consumables, tools, equipment, transport, documentation, insurance, taxes, duties, overheads and any other necessary items. This proposed Contract Sum shall remain fixed and firm for the five (5) year duration.

The Contractor shall submit invoices (in 3 copies) of the previous month **on the first week of the next month** for each site. The claim shall be addressed accordingly to the following:

Head Of Section
Estate Management Section
Suri Seri Begawan Hospital
Negara Brunei Darussalam

Payment will only be made after submission of the invoice and other related documents such as the certified original and duplicate service reports by the S.O. and monthly breakdown/maintenance report.

If only one maintenance services is performed in a month instead of two (2), then the Contractor shall invoice only fifty percent (50%) of the maintenance costs.

8. REPLACEMENT PARTS, SPARE PARTS, MATERIALS etc

The Contractor shall supply all replacement parts, spare parts and consumables necessary for the proper operation, preventive maintenance and breakdown repairs of the system.

The Contractor shall ensure that these are genuine parts approved by the manufacturer/s, and here new parts or materials are to be used shall be sought in advanced.

The Contractor shall not be liable to replace parts, materials and consumables.

The Contractor is required to keep all spare parts in stock at all times. Major items which are of high cost such as compressor, chilled water pump motor, etc and unlikely to be required within one year need not be stocked.

9. DESPATCH OF ITEMS OF EQUIPMENT FOR OVERHAUL OR REPAIR

The Contractor shall bear all costs in the dispatch of any parts or module of the system/s for overhaul, repair or reprogrammed, including the costs for packing, carriage and insurance.

10. USE OF SITE

The Contractor shall not use any of the sites for any purpose other than that of carrying out Maintenance Services stipulated in these Specifications.
The Contractor shall, at all times, keep the sites clear and free from all surplus materials, rubbish, debris arising from the execution of the works and keep the sites in clean conditions.

11. HEALTH AND SAFETY PRECAUTIONS AGAINST CONTROL

The Contractor shall provide all necessary measures to comply with all health and safety regulations and rules currently in place. The Contractor shall also comply with all orders and instructions given to him from time to time by the S.O. with regards to health and safety of persons in the vicinity of any site, site regulations and the work in general.

The Contractor shall take all reasonable precautions to prevent loss or damage by fire, comply with existing fire regulations and all instructions given to him by the S.O. with regards to fire precautions and prevention.

12. SUPERVISION AND PERSONNEL

To ensure the proper and efficient execution of the Maintenance Services, the Contractor shall provide and employ **three (3) qualified and competent workers** to perform the Maintenance Services on a full-time basis.

The Contractor shall ensure that such personnel are properly trained, registered with the Electrical Services Department, Brunei Darussalam and employed by the Contractor throughout the duration of this Tender.

The Contractor is required to submit a list of names, addresses, qualifications, experiences and other relevant information that the S.O. may require, of all persons that shall be employed for the performance of the Maintenance Services. Any amendments made to the list shall be submitted in writing within five (5) days upon knowledge that any person has been added or deleted from the list during the period of the contract.

The S.O. reserves the right to remove, reject or replace any persons employed by the Contractor, who in the opinion of the S.O. is not competent to execute the Maintenance Services, and shall direct the Contractor to replace such person/s.

Within fourteen (14) days of being awarded of this Tender, the Contractor is required to submit the following information relating to stand-by mechanics to facilitate the Ministry to make contact in case of any emergency:

- Names
- Contact Address
- Telephone / Facsimile Number(s)

The Contractor shall nominate supervisor/s for the purpose of administrative and on-site supervision. Such nominated persons may be called for interviews prior to the ward of the Tender.

The Contractor shall ensure that his workers possess the necessary employment passes if they are employed outside Brunei Darussalam.

All personnel employed by the Contractor shall be neatly and properly attired in uniforms.

13. INSURANCES

The Contractor shall warrant that he will maintain at his own expense, comprehensive general liability, errors and omissions, workers' compensation, public liability, property damage and automobile liability insurance. Upon request by the Ministry, the Contractor shall furnish certificates showing that such insurance is in effect and will not be cancelled or changed in the absence of a prior 30-days' written notice to the Ministry.

14. INSPECTION

The S.O. has the authority to inspect and test any part or the whole of the system at any time but not to open-up, disconnect, adjust or alter any setting, component of control, except to operate the external switches and controls.

The S.O. reserves the right to ask the Contractor or his representative during a routine maintenance visit or by giving seven (7) days written notice to carry out a supervised installation test.

Any defects found during the test which would affect the installation's performance, safety or life shall be corrected without delay. If the defect can reasonably be attributed to negligence or incompetence on the part of the contractor's expense, the cost of correcting the defect shall be borne by the Contractor and at no extra charge to the Ministry.

15. LOG BOOKS AND REPORTS

A record of the work done on each maintenance visit shall be noted in a maintenance log book by the Contractor.

The log book must show the date, time and duration of work performed; a description of work performed and the name of the contractor's personnel responsible for performing the work.

Completion of the maintenance visit shall be affixed via the technician's signature and shall be confirmed in writing by the Superintending Officer or his representative.

The log book must be available for inspection by the S.O. at any time.

The Contractor shall also submit Maintenance Service Reports in format acceptable to the Government and shall include the following information:

- Reference number of any equipment of the system;
- the job number;
- the date the job was completed;

- date, time and total time any equipment of the system is made unavailable to the Government;
- name of contractor's technician/personnel responsible for carrying out the job; and
- the comments of the person requesting the Maintenance Service.

16. EQUIPMENT AND TOOLS

To enable the mechanics/engineers to carry out their work efficiently, safely, accurately and without any risk of causing excessive wear to the system being serviced, all mechanics/engineers employed by the Contractor must be equipped with an adequate tool kit.

To carry out installation and testing works, the Contractor must be in possession of the following measurement instruments:-

- Megger – insulation resistance
- Multitester – AC & DC voltage; DC current & resistance
- Tong Tester – AC current
- Test pin
- Fuse
- General Tool kit

The Contractor must also be in possession of other maintenance tools, grease gun, hand-held blowers, vacuum cleaners etc.

17. SECURITY

Where maintenance services is to be carried out within a secure area, the Contractor shall provide to the Superintending Officer full details of all his personnel and vehicles requiring access to the site, not less than seven (7) days before entry is required. Details shall include the following particulars:

- Name
- Address
- Identity card number / passport number
- Gender
- Citizenship
- Expiry date of work pass (for foreign workers)

Where security passes are issued to the Contractor's personnel, the Contractor is responsible for the proper use of the passes.

The Contractor shall ensure that the passes are immediately returned to the authorities when they are no longer required due to the employee not being engaged to work at the secured area, or if the employee has left the Contractor's employment.

18. OFFICE AND WORKSHOP

The Contractor is required to maintain an office in Brunei Darussalam at his own expense where he can easily be notified by telephone of any maintenance or breakdowns relating to the airconditioning system.

The Contractor shall maintain an equipped workshop to carry out inspection, small repairs and testing of electrical and/or mechanical spare parts.

The S.O. reserves the right to enter and inspect the workshop at any time during the Contractor's working hours. Where such entry into the Contractor's premises would create conflict with confidential information or work for the Contractor, a twenty-four (24) hour written notice will be given to the Contractor. The Contractor will ensure that a member of his staff will accompany the S.O. at all times during the visit.

SCHEDULE A – TENDER FORM

To:

TENDER REFERENCE NO.: KK/133/2026/JPK(TC)

THE PROVISION OF COMPREHENSIVE MAINTENANCE SERVICES FOR REFRIGERATED AIRCONDITIONING AND VENTILATION AT SERIA HEALTH CENTRE, SUNGAI LIANG HEALTH CENTRE AND LABI HEALTH CENTRE FOR A PERIOD OF THREE (3) YEARS

TENDER OF (*name of tenderer*)

Company/Business Registration No_____

Tender Closing Date:_____

ITEM NO.	DESCRIPTION	LOCATION	QUANTITY	RATE	PRICE/MONTH B$
1	Preliminaries				
1.2	Allow sum of preliminaries to comply with condition of contract, mobilization, specification and other requirements. The contractor shall undertake to execute everything that is deemed necessary prior to the commencement of works. Mobilization and demobilization of all tool and equipment and platforms and everything else as required and necessary for the execution and completion of the works.				
1.3	Insurances policies. Allow for the expenses incurred for providing policies and other insurances as may be necessary to protect the Contractor's and Government's interest and shall valid **until the end of the defect liability (maintenance) period:-**				
1.4	Workmen's Compensation's Policy in the joint names of the Government and the Contractor.				
1.5	Public liability Policy in the joint names of the Government and the Contractor.				
1.6	Fire policy in the joint names of the Government and the Contractor.				
1.7	Banker's guarantee of amount **5% of the contract sum** in the joint names of Government and the Contractor.				
1.8	Total cost of Preventive Maintenance Service charge plus Unlimited Breakdown calls per annum				
1.9	Total Cost for three (3) years				
2	Air Cooled Scrolled Chiller c/w AHU and Control Panel (Complete Set) (Primary Filter Washable)	Pusat Kesihatan Seria	3		
3	Split Units Complete Set	Pusat Kesihatan Seria	42		
4	Variable Refrigerant Volume (VRV) Air-Conditioning – Condensing Units	Pusat Kesihatan Seria	2		
5	Variable Refrigerant Volume (VRV) Air-Conditioning – Fan Coil Units	Pusat Kesihatan Seria	13		

ITEM NO.	DESCRIPTION	LOCATION	QUANTITY	RATE	PRICE/MONTH B$
6	Split Units Complete Set	Pusat Kesihatan Sungai Liang	72		
7	Split Units Complete Set	Pusat Kesihatan Labi	17		
TOTAL COST OF PREVENTIVE MAINTENANCE SERVICE CHARGE PLUS UNLIMITED BREAKDOWN CALLS PER ANNUM					
TOTAL COST FOR THREE (3) YEARS					

1. We offer and undertake on your acceptance of our Tender to provide the above mentioned services in accordance with your Invitation To Tender.

2. Our Tender is fully consistent with and does not contradict or derogate from anything in your Invitation To Tender. We have not qualified or changed any of the provisions of your Invitation To Tender.

3. We shall execute a formal agreement in the appropriate form set out in Section 4 – Contract of the Invitation to Tender together with such further terms and conditions, if any, agreed between the Government and us.

4. OUR OFFER IS VALID FOR **SIX (6)** CALENDER MONTHS FROM THE TENDER CLOSING DATE.

5. When requested by you, we shall extend the validity of this offer.

6. We further undertake to give you any further information which you may require.

Dated this day of 2026.

Tenderer's official stamp:

_____

Signature of authorised officer of Tenderer
Name:
Designation:

SCHEDULE B – INFORMATION SUMMARY

2.1 Tenderers shall provide in this Schedule the following information:

a. Management summary

b. Company profile (including Contractor and sub-contractor(s), if any)

c. Years of experience (as of the Tender Closing Date) of the Contractor and sub-contractor(s) in the:

- *Provision of maintenance services for refrigerated airconditioning and ventilation*

d. Other information which is considered relevant

SCHEDULE C – SUB-CONTRACTS

3.1 Tenderers shall complete Table 3.1 with information about all the companies involved in the provision of the services and items specified in this tender. This shall include details about the Contractor and each sub-contractor involved, as well as their respective responsibilities.

3.2 Tenderers shall also indicate in Table 3.1 any alliance relationship established with each sub-contractor. An alliance is defined as a formal and binding business relationship between the allied parties.

Table 3.1 Responsibility Table

Company Name	**Responsibility Description**	**Alliance Relationship between Contractor and Sub-contractor(s)**		
		Alliance Exists? (Y/N)	**Date Established**	**Alliance Description**
Contractor				
		Not Applicable	Not Applicable	Not Applicable
Sub-contractor(s)				

SCHEDULE D – COMPANY'S BACKGROUND

4.1 Each of the companies involved in this tender, including Contractor and sub-contractor(s) (if any), shall provide information on the company's background, scope of operations, financial standing and certified copy of its Certificate of Incorporation or Certificate of Registration (as the case may be).

SCHEDULE E – REFERENCES

5.1 Tenderers shall submit a list of customers in Table 5.1 to whom the Contractor has provided similar services and items as specified in this tender in the recent 5 years as of the Tender Closing Date.

Table 5.1 References of previous customers

Customer Name and Address	Customer Type (Govt or Quasi Govt)*	Contact Person	Title	Contact Number, Fax Number and E-mail Address

***Note: Tenderers shall indicate whether the customer is a Government or Quasi Government organisation. A Quasi Government is defined as an organisation which (1) is managed and controlled by the Government; or (2) has at least 50% shares being held by the Government. Please leave the column blank if the customer is neither a Government or Quasi Government organisation.**

5.2 The Ministry of Health shall treat all the information submitted under this schedule in strict confidence.

5.3 The Ministry of Health reserves the right to contact the references for tender assessment purposes.

SCHEDULE F – DECLARATION

PENGAKUAN PENENDER
TENDERER'S DECLARATION

SCHEDULE I

LIST OF EQUIPMENTS

Item No	Plant/Equipment	Location	SERVICE PRICE					
			Monthly	2 Monthly	Quarterly	Annual	Quantity	Total
1.	Air Cooled Scroll Chiller c/w AHU and Control Panel (Complete Set) (Primary Filter Washable)	Pusat Kesihatan Seria	-	$ x 5	-	$ x 1	$ x 03	$
2.	Split Unit Complete Set	Pusat Kesihatan Seria	-	$ x 5	-	$ x 1	$ x 42	$
3.	Variable Refrigerant Volume (VRV) Air-Conditioning – Fan Coil Unit	Pusat Kesihatan Seria	-	$ x 5	-	$ x 1	$ x 13	$
4.	Variable Refrigerant Volume (VRV) Air-Conditioning – Condensing Unit	Pusat Kesihatan Seria	-	$ x 5	-	$ x 1	$ x 2	$
5.	Split Unit Complete Set	Pusat Kesihatan Sungai Liang	-	$ x 5	-	$ x 1	$ x 72	$
6.	Split Unit Complete Set	Pusat Kesihatan Labi	-	$ x 5	-	$ x 1	$ x 17	$
							TOTAL	**$**

GRAND TOTAL CARRIED TO TENDER FORM (SCHEDULE A)	**PER YEAR**	**x 3 YEARS**	

SCHEDULE II

PLANT PREVENTIVE MAINTENANCE SCHEDULE

PREVENTIVE MAINTENANCE
SCHEDULES / CHECKLISTS

Equipment	Maintenance	2M/AHU
AHU & FCU	2-Monthly Service	

1. Switch off plant. Remove and clean filters by washing. If disposable – replace as necessary.
2. Check cooling coil for dust and algae. Clean by using approved cleaner, soft brush (and pressure spray pump for AHU's). Straighten damaged fins with fin comb.
3. Check condensate line, pan and trays for damage, blockage. Clean as necessary with chemical and test for easy water flow. Replace approved condensate pan treatment tablets for FCU's (consumable).
4. Check and service controls and devices for correct operation i.e. Motorized valves and dampers, step controllers, thermostat, humidistats, smoke detectors, duct heaters, air flow switch, high temperature cutout etc. report/repair if faulty.
5. Check and record temperature/humidity and settings i.e. SA and RA temperature, chilled water in and out temperature, humidity etc.
6. Check V-belts for correct tension and wear. Replace worm belts from stock (consumable). Readjust tension where necessary. As a guide V-belt tension should be ¾" to 1¼" deflection or see manufacturers information.
7. Pulley drives to be checked for secure fixing, if loose to be tightened. Alignment of pulleys to be checked and adjusted as necessary using straight-edge or string line.
   Note: Recheck tension of v-belts after adjustment.
8. Check motor and Fan Bearings for wear, noise and lubrication Lubricate. Failed bearing are over lubricated will be replaced at the contractors expense.
   Noise and wear to be investigated and reported. If found to be too severe, unit should be left switched off and reported immediately. Shaft couplings, if fitted, to be checked for wear and secure fitting.
9. Fans and fan housing to be checked for secure fitting & cleaned by brush and vacuum. Fan blades to be inspected for any signs of damage, looseness and reported if found.
10. Check electrical connections for damage or looseness; repair or tighten as required. Clean any dust build up on motors and electrical panels and clean. Check for noisy contractors, timers, change-over relays-service.
    Check carbon brushes and replace if necessary (consumable)
    Check and record running amps. Replace any defective indicator lights, fuses etc.
11. Check, fix back or report internal and external duct insulation if loose or damaged.
12. Check AHU panels for secure fixing. Replace any missing screws (consumable). Check panel seals and repair/replace if leaking.
13. Check AHU panels for rust/corrosion, wire brush and repaint affected area with anti-rust paint. Report any damage.
14. Clean AHU panels and the plant room and leave it tidy. (AHU room is not to be used as a "store").
15. Replace plant room lighting as necessary.

Equipment	Maintenance	A/AHU
AHU & FCU	Annual Services	

1. Carry out 2-monthly service.
2. Change all V-belts.
3. Dry base of unit and paint internally with anti-rust paint.
4. Paint external surface, including fresh air intake grille, with quick drying glossy paint of similar colour to original.
5. Test smoke damper manually; report if defective.
6. Meg the AHU/FCU motor and record.
7. Re-surfacing of slip ring and changing of shaft bearing, (both front and back). Carry out insulation testing (> 1 meg).

8. Replace carbon brush for all slip ring motor. (to be replaced in complete sets)

NOTE: Where cooling coils are very dirty and clogged up special cleaning procedure shall be carried out: discharge air duct shall be disconnected (if possible) or a temporary bypass shall be provided between the supply and return air side; the coil shall be sprayed (with the blower running) with approved concentrated cooling coil cleaning chemical and washed down repeated until the coil is clean;

Equipment	Maintenance	2M/D
Ductwork AHU, FCU & Ventilation Fan	2-Montlhy Services	

1. This service is to be done together with the AHU, FCU & Ventilation fan service at no additional cost.
2. Visually inspect for air leaks, condensation; repair or report.
   Visually inspect internal and external duct installation and vapour barrier for damage repair or report. Check flexible connections for secure fixing and damage.
3. Clean diffusers and grilles by soft brush and vacuum.

Equipment	Maintenance	2M/D
Ductwork	2-Montlhy Services	

1. This service is to be done together with the AHU, FCU & Ventilation fan service at no additional cost.
2. Carry out 2-monthly service.
3. Lightly brush and vacuum clean internally where possible (including volume dampers, control sensors air heaters etc in duct).
4. Wash all return and supply grilles and diffusers with mild non-abrasive cleaner, do not dirty walls or ceiling whilst cleaning grilles and diffusers.

Equipment	Maintenance	2M/EP
Electrical Control Panels/Switch Board	2-Montlhy Services	

1. This service is to be done together with the Plant (AHU, Pumps etc.) service at no additional cost.
2. Check electrical connections for looseness and damage, retighten as necessary or report. Inspect indicator lights and fuses; replace any defective.
3. Check proper operation of controls and safety devices, noisy contactors, timers, change-over relays, etc. and record settings.
4. Check contractors for burnt or dirty contacts, service or report. Spray clean contacts with contact cleaners if still usable; otherwise replace.
5. Clean out dust, cobwebs etc.

Equipment	Maintenance	2M/EP
Electrical Control Panels/Switch Board	2-Montlhy Services	

1. This service is to be done together with the Plant (AHU, Pumps etc.) service at no additional cost.
2. Carry out 2 monthly service.
3. Prepare external surface (including conduits and trunking) and repaint with quick drying glossy paint of similar colour to original.

Equipment	Maintenance	D/DXACCU
DX Air Cooled Condensing Unit (more than 25TR)	Daily Service	

1. Daily check and record operating conditions i.e. Temperature, pressures, amps, oil level, suction and discharge temperature/pressure, air on/off temperatures etc., Oil level in sight-glass should be ½ to 2/3 full. If low-top up as necessary and record amount used.

Check operation of crankcase heaters. Inspect sight glass for moisture and bubbles and report. Check and record suction superheat.

Equipment	Maintenance	M/DXACCU
DX Air Cooled Condensing Unit (more than 4TR)	Monthly Service	

1. Carry out 1D Maintenance (unit more than 25TR only).
2. Check condensing coil for dust/dirt build up. Clean by using approved cleaner, soft brush and pressure spray pump. Straighten damaged fins with fin comb.
3. Check Condensing unit for vibration and damage; test pipework for leaks with leaks with leak detector.
4. Check operating and safety controls and record settings. Check electrical connections for damage or looseness, repair or tighten as required. Clean any dust build up on motors and electrical panels.
   Check for noisy contractors, timers, change-over relays.
   Check and record running amps. Replace any defective indicator lights, fuses etc.
5. Check V-belts for correct tension and wear. Replace worn belts from stock (consumable). Readjust tension where necessary as a guide V-belts tension should be ¾" to 1¼" deflection or see manufacturers information.
6. Pulley drives to be checked for secure fixing, if loose to be tightened. Alignment of pulleys to be checked and adjusted as necessary using straight-edge or string line.
   Note: Recheck tension of V-belts after adjustment.
7. Check motor and Fan Bearings for wear, noise and lubrication Lubricate. Failed bearing are over lubricated will be replaced at the contractors expense.
   Noise and wear to be investigated and reported. If found to be too severe, unit should be left switched off and reported immediately. Shaft couplings, if fitted, to be checked for wear and secure fitting.
8. Fans and fan housing to be checked for secure fitting & cleaned by brush and vacuum. Fan blades to be inspected for any signs of damage, looseness and reported if found.
9. Check condensing unit for secure fixing, replace missing screws/fasteners.
10. Clean condensing unit panels and area.

Equipment	Maintenance	A/DXACC
DX Air Cooled Condensing Unit (more than 4TR)	Annual Service	

1. Carry out Monthly Maintenance.
2. Meg compressor windings and fan motors.
3. Check and clean electrical contractor all electrical connections, check and replace any defective fuse-holder and service electrical components.
4. Check compressor oil by chemical analysis.
   Change compressor oil and refrigerant filter; Test run and trim refrigerant charge.
5. Prepare external surface (including conduits and trunking) and repaint with quick drying glossy paint of similar colour to original.

Equipment	Maintenance	2M/ACSU
DX Air Cooled Split Unit	2-Monthly Services	

1. Switch off plant. Remove and clean filters by washing. If disposable-replace as necessary.
2. Check cooling coil and condensing coil for dust and algae. Clean by using approved cleaner, soft brush and pressure jet pump. Straighten damaged fins with fin comb.
3. Check condensate line, pan and trays for damage, blockage. Clean as necessary with chemical and test for easy water flow. Replace approved condensate pan treatment tablets (consumable).
4. Check and service controls and devices for correct operation i.e. Motorized valves and dampers, step controllers, thermostat, humidistats, smoke detectors, duct heaters, air flow switch, high temperature cutout etc. report/repair if faulty.
5. Check and record supply/return air temperature and room humidity and settings.

6. Check V-belts for correct tension and wear. Replace worn belts (consumable). Readjust tension where necessary as a guide V-belts tension should be ¾" to 1¼" deflection or see manufacturers information.
7. Pulley drives to be checked for secure fixing, if loose to be tightened. Alignment of pulleys to be checked and adjusted as necessary using straight-edge or string line.
   Note: Recheck tension of V-belts after adjustment.
8. Check motor and Fan Bearings for wear, noise and lubrication Lubricate. Failed bearing are over lubricated will be replaced at the contractors expense.
   Noise and wear to be investigated and reported. If found to be too severe, unit should be left switched off and reported immediately. Shaft couplings, if fitted, to be checked for wear and secure fitting.
9. Fans and fan housing to be checked for secure fitting & cleaned by brush and vacuum. Fan blades to be inspected for any signs of damage, looseness and reported if found.
10. Check electrical connections for damage or looseness; repair or tighten as required. Clean any dust build up on motors and electrical panels. Check for noisy contractors, timers, change-over relays. Check and record running amps. Replace any defective indicator lights, fuses etc.
11. Check panels for secure fixing. Replace any missing screws. Check panel seals and repair/replace if leaking.
12. Check panels for rust/corrosion, wire brush and repaint affected area with anti-rust paint. Report any damage.

Equipment	Maintenance	A/ACSU
DX Air Cooled Split Units	Annual Service	

1. Carry out 2-monthly service.
   Note: For wall, floor, ceiling, cassette type split unit the refrigerant should be pump-down and the FCU must be brought down for general servicing. Prior to the completion the FCU must be reinstalled with adequate Freon charge any additional Freon will be included in annual servicing price.
2. Change all V-belts.
3. Dry base of unit and paint internally with anti-rust paint where applicable.
4. Paint external surface with quick drying glossy paint of similar colour to original (including conduits and trunking).
5. Test smoke damper manually; report if defective.
6. Meg compressor windings and fan motor.

Equipment	Maintenance	M/WP
Water pumps	Monthly Service	

1. Check shaft seal glands for excessive water leaks. For packing type gland adjust/replace so as to allow a steady drip of water. For mechanical seal report for replacement.
2. Check coupling, pulleys, anti-vibration connection, insulation and mountings, insulation etc. for secure fixing and wear, rectify and/or report for repair. Check pump and motor bearings and signs of wear.
3. Check and record suction and discharge pressure running amps, direction of rotation.
4. Check electrical connections for damage or looseness; repair or tighten as required. Clean any dust build up on motors and electrical panels. Check for noisy contractors, timers, change-over relays. Check and record running amps. Replace any defective indicator lights, fuses etc.
5. Clean motor vents, slip ring, inspect and replace carbon brush holder, carbon brushes as necessary (consumable). Check and tighten electrical connections.
6. Valve glands to be checked for leaks, packing to be tightened or replaced as necessary.
7. Change over to standby pump as schedule.

Equipment	Maintenance	Q/WP
Water pumps	Quarterly Service	

1. Carry out monthly service.
2. Clean water pump strainers.

3. Lubricate pump and motor bearings sparingly.
4. Wire brush rust/corrosion and repaint with red oxide/anti rust paint.
5. Check operation of non-return water valves.

Equipment	Maintenance	A/WP
Water pumps	Annual Services	

1. Carry out quarterly service.
2. Meg pump motor and record.
3. Prepare and repaint outer surface with similar colour paint to original.
4. Re-surfacing of slip ring and changing of shaft bearing, (both front and back). Carry out insulation testing (> 1 meg).
5. Replace carbon brush for all slip ring motor (to be replaced in complete sets).

Equipment	Maintenance	2M/MP
Condenser/Chilled Water Pipe work/Expansion Tank	2-Monthly Service	

1. This service is to be done together with the pumps, cooling towers, water chiller plants etc. service at no additional cost.
2. Check correct level of extension tank and make up water (1/3 height of tank).
3. Check pipe work, flexible joints, brackets, supports etc. for secure fixing and vibration; make good/report as necessary.
4. Inspect and rectify or report water leaks, damaged pipe insulation.
5. Inspect all valves for gland packing leaks; replace or tighten gland packing as necessary.
6. Check correct operation of flow-switch, air vent, flow meters, water pressure gauges etc.

Equipment	Maintenance	A/P
Condenser/Chilled Water Pipe work/Expansion Tank	Annual Service	

1. This service is to be done together with the pumps, cooling towers, water chiller plants etc. service at no additional cost.
2. Carry out 2-monthly service.
3. Drain and clean out make up tank and expansion tank; treat with anti-rust paint. Test valve operation, examine and report any leakage.
4. Operate all valves and record number of turns on valve spindle and return to original setting.
5. Open all air-vents and bleed system; report/service any defective automatic air-vents.
6. Prepare and repaint outer surface with similar colour paint to original.

Equipment	Maintenance	2M/VF
Ventilation Fans	2 Monthly Service	

1. Clean inlet/outlet grilles and fan blades, fan housing etc. clean air filter or replace as necessary.
2. Check V-belts for correct tension and wear. Replace worn belts as necessary (consumable). Readjust tension where necessary as a guide V-belts tension should be ¾" to 1¼" deflection or see manufacturers information.
3. Pulley drives to be checked for secure fixing, if loose to be tightened. Alignment of pulleys to be checked and adjusted as necessary using straight-edge or string line.
   Note: Recheck tension of V-belts after adjustment.
4. Check motor and Fan Bearings for wear, noise and lubrication Lubricate. Failed bearing are over lubricated will be replaced at the contractors expense.
   Noise and wear to be investigated and reported. If found to be too severe, unit should be left switched off and reported immediately. Shaft couplings, if fitted, to be checked for wear and secure fitting.
5. Check electrical connections for damage tighten as required. Carry-out as per service/4.
6. Clean the plant room and leave it tidy (Plant room not to be used as a 'Store').
7. Replace plant room lighting as necessary.

Equipment	Maintenance	A/VF
Ventilation Fans	Annual Service	

NOTE: Not required for window mounted exhaust fans (small)

1. Carry out quarterly service.
2. Lubricate bearings sparingly.
3. Change all V-belts.
4. Prepare and repaint outer surface with similar colour paint to original.
5. Check and record running amps. Meg fan motors and record.

Equipment	Maintenance	2M/CR
Cold Room	2 Monthly Services	

1. Inspect indicating lights and cold room lights; replace as necessary.
2. Check defrost heaters, door heater, drain pipe heaters etc. check and record running amps of the compressor condenser fans, evaporator fans and heaters.
3. Inspect fan and motor bearings.
4. Check and record store temperature gauge reading.
5. Inspect store insulation, doors, floor etc for damage and report.
6. Clean the condensing unit, comb straight dented fins. Check system for leaks, noise and vibration. Check oil level and top up as necessary.
7. Carry-out as Service/4.

Equipment	Maintenance	A/CR
Cold Room	Annual Services	

1. Carry out 2-monthly service.
2. Clean condensing coil and evaporate with approved chemical if necessary.
3. Meg compressor windings and fan motor.
4. Prepare and repaint outer surface with similar colour paint to original.

Equipment	Maintenance	2M/RAC
Room Air Conditioners	2-Monthly	

1. Wash the air filter or replace if necessary.
2. Brush and vacuum clean the cooling coil and comb straight fins if found dented.
3. Check for noise and vibration. Correct any loose fasteners, mounting etc.
4. Check any coil freezing during operation.
5. Clean condensate drain pan, drain pipe of sludge and slime etc.
6. Check and record running current of the compressor and fan motor.
7. Inspect and service controls and safety components.

Equipment	Maintenance	A/RAC
Room Air Conditioners	Annual Service	

1. Remove from installed site to workshop, replace with service unit if required and carry out 2-monthly service.
2. Meg compressor windings and fan motors.
3. Chemically clean condenser and cooling coil.
4. Prepare and repaint outer surface with similar colour paint to original.

Equipment	Maintenance	2M/SMP
Monitoring Panel	2-Monthly Service	

1. Inspect indicator bulbs, replace defective.
2. Check for noisy contractors.
3. Clean out dust within panels.
4. Inspect and tighten electrical and control wire connection etc.

5. Check condition and operation of fuses, overloads, timers, earth fault relays, circuit breakers, smoke detector, transformers, metering devices etc. and replace or report any defective.
6. Check for correct sequence of operation of the controls.

Equipment	Maintenance	A/SMP
Monitoring Panel	Annual Service	

1. Carry out 2-monthly service.
2. Prepare and repaint outer surface with similar colour paint to original.

Equipment	Maintenance	D/ACLC
Air cooled Liquid Chillers	Daily Service	

1. Daily Record system operating conditions. Report any trend or adverse conditions for example:
   Oil, suction and discharge pressure. Entering and leaving water temperature and pressure, check compressor oil level oil pressure should be 20 to 30 PSI above suction pressure. Record chiller running amps and compressor running amps.

2. Inspect indicator lights, gauges etc. and replace any found defective. Check system for leaks, noise, vibration etc.
   Carry out area cleaning.

Equipment	Maintenance	M/ACLC
Air cooled Liquid Chillers	Monthly Service	

1. Carry out daily maintenance.
2. Check panels for secure fixing. Replace any missing screws. Check panel seals and repair/replace if leaking.
3. Clean condensing coil; comb fin straight if found dented. Clean the Plant room area.

Equipment	Maintenance	A/ACLC
Air cooled Liquid Chillers	Annual Service	

1. Carry out monthly service.
2. Meg compressor windings and fan motors.
3. Tighten all electrical connections, check and clean contactors. Check all fuse clips and replace defective fuse holder, inspect and service all electrical safety components.
4. Perform chemical analysis of oil.
5. Inspect cooler tubes and clean if necessary.
6. Change compressor oil and refrigerant filter.
7. Test run and trim the refrigerant charge.
8. Prepare and repaint outer surface with similar colour paint to original.

Note: Manufacturer’s instructions for maintenance shall be followed in conjunction with these guides

SCHEDULE III

SPARE PARTS LIST

ALL PRICES ARE FOR SINGLE UNIT – 1 No, OR 1 M, OR 1 M2 etc.				
Ref. No.	**PARTS DESCRIPTION (As described below or approval equivalent)**	**RATE PARTS ONLY**	**RATE LABOUR TO INSTALL**	**NETT PRICE TO SUPPLY & INSTALL**
1.	Oil Heater Thermometer for R134A/R410A Chiller			
2.	Chiller Oil Pump			
3.	3-Way Valve Motor (only) Honeywell 24V, 1-2			
4.	3-Way Valve Motor (only) Honeywell 24V, 1-2 c/w valve linkage			
5.	FCU Motor Control 240V, 5-6 Rpm (Any Brand)			
6.	3-Way bypass valve suitable for any brand FCU complete set 1ph, 240V, 50Hz			
7.	AHU Smoke Detector (Any Brand) 220V-240V			
8.	Motor for AHU 2-5 Hp			
9.	Magnetic Contactor			
a.	15 – 35amps			
b.	36 – 55amps			
c.	56 – 75amps			
d.	76 – 95amps			
e.	96 – 115amps			
f.	116 – 135amps			
10.	Coil Voltage 220V			
a.	15 – 35amps			
b.	36 – 55amps			
c.	56 – 75amps			

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Ref. No.	**PARTS DESCRIPTION (As described below or approval equivalent)**	**RATE PARTS ONLY**	**RATE LABOUR TO INSTALL**	**NETT PRICE TO SUPPLY & INSTALL**
d.	76 – 95amps			
e.	96 – 115amps			
f.	116 – 135amps			
11.	To rewind Motors c/w resurfacing, new Bearings, Mounting, Rotor & Stator any Rpm & 1Ph 240/415V 50Hz with 6 months warranty			
a.	5 – 7.5hp			
b.	10 – 15hp			
c.	16 – 29hp			
d.	30 – 40hp			
e.	41 – 50hp			
f.	51 – 60hp			
g.	61 – 75hp			
12.	Refrigerant Gas, etc..			
a.	Refrigerant R134a, 407, 404, R410A /Kg			
b.	Nitrogen /Kg			
13.	Compressor Oil (CARRIER/UNI-AIRE) suitable for Refrigerant Systems R407, R410A& R134A /liter			
14.	Moisture & Liquid Indicator (Sight Glass)			
a.	⅜" - ½"			
b.	5/8 – 1⅛"			
15.	Re-insulation of Ducting with 2"/2ibs. Fiber glass & aluminum foil			
16.	To fabricate, supply & install Ducting c/w 2"/2ibs. Fiber glass & aluminum foil			
17.	To fabricate, supply & install Ducting aeroflex			

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Ref. No.	**PARTS DESCRIPTION (As described below or approval equivalent)**	**RATE PARTS ONLY**	**RATE LABOUR TO INSTALL**	**NETT PRICE TO SUPPLY & INSTALL**
18.	Re-insulation of AHU panel with 1" thick Aeroflex or Superlon			
19.	Re-insulation of AHU panel with 2" thick Aeroflex or Superlon			
20.	Re-insulation of suction line and drain line with Aeroflex /Superton c/w denso tape			
21.	Re-insulation of Chilled water pipe or either approved pipe insulation c/w 22G Aluminium sheet cladding & painting wall thickness 3" density 2ibs / m^2			
a.	Pipe size 3 – 5" dia			
b.	Pipe size 6 – 9" dia			
c.	Pipe size 10 – 12" dia			
d.	Pipe size below 3" dia. (with approved insulation for indoor use, 1½ - 2" thick c/w vapour barrier). Aeroflex/Superlon /m^2			
22.	Re-insulation of Chilled water pipe c/w pre-formed polystyrene foam pipe insulation with steel wire mesh and hard setting cement for pipe greater than 3"/m^2			
23.	Liquid line solenoid valve c/w solenoid coil (24/110/240V 50Hz) any size			
24.	Hand valves for Refrigerant line size less than 2"/m^2			
25.	PVC drain pipe c/w fittings (bends, elbows, traps, tees etc.)			
a.	Pipe size below 1½" dia.			
b.	Pipe size below 1⅝" – 2" dia.			
c.	Pipe size below 1¼" – 4" dia.			
26.	G.I drain pipe c/w fittings (bends, elbows, traps, tees etc.)			
27.	Hi pressure cut out switch 0-400 psig auto /manual reset			
28.	Lo pressure cut out switch 0-400 psig auto /manual reset			
29.	Oil pressure control switch auto/manual reset			

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Ref. No.	**PARTS DESCRIPTION (As described below or approval equivalent)**	**RATE PARTS ONLY**	**RATE LABOUR TO INSTALL**	**NETT PRICE TO SUPPLY & INSTALL**
30.	Dial pressure gauge 3 – 4” dia. 0-60 psig			
31.	Compressor unloader solenoid coil 120/240 VAC 50Hz Carrier or equivalent			
32.	Refrigerant suction line filter drier			
a.	¼” - ⅝” OFT			
b.	¾” - ⅞” OFT			
c.	⅛” - ⅝” OFT			
33.	Replaceable core type filter drier shell only			
a.	C485 ⅝” OFT			
b.	C487 ⅞” OFT			
c.	C489 1⅛” OFT			
d.	C9611G 1⅜” ODF			
e.	C9613G 1⅝” OFT			
f.	C19217 2⅛” OFT			
34.	Gate Valve			
a.	3” dia.			
b.	4” dia.			
c.	5” dia.			
d.	8” dia.			
e.	10” dia.			
f.	12” dia.			
g.	14” dia.			

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Ref. No.	**PARTS DESCRIPTION (As described below or approval equivalent)**	**RATE PARTS ONLY**	**RATE LABOUR TO INSTALL**	**NETT PRICE TO SUPPLY & INSTALL**
35.	Strainer whole assembly			
a.	Strainer ½”			
b.	Strainer ⅝”			
c.	Strainer 2”			
d.	Strainer 3”			
e.	Strainer 4”			
36.	Bearing over 4” including holes (pillow, block flange and others)			
37.	Resurfacing of shaft for AHU motors			
38.	Resurfacing of shaft for pumps motors			
39.	Materials for repairing leaks. To provide all the required materials to repair all leaks, install new compressor c/w oil & gas or overhaul to working order as instructed by designated officer, labour charge are no chargeable.			
114.	Transducer-sensor			
115.	By pass contactor			
116.	Starter management module			
117.	Chiller visual control (CVC)			
118.	P.S.I.O 19XR04006001			
119.	Fining card			
120.	Impeller			
121.	Thrust bearing (whole Assembly)			
122.	Actuator motor			
123.	Oil pump			

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Ref. No.	**PARTS DESCRIPTION (As described below or approval equivalent)**	**RATE PARTS ONLY**	**RATE LABOUR TO INSTALL**	**NETT PRICE TO SUPPLY & INSTALL**
124.	Oil filter			
125.	Oil heater			
126.	02XTransformer 115/24V or 115/12V			
127.	Oil pressure switch			
128.	Local interface device			
129.	S.C.R			
130.	Thermostatic expansion valve			
a.	5 – 10 TR			
b.	11 – 30 TR			
c.	31 – 50 TR			
d.	51 – 75 TR			
e.	76 – 96 TR			
131.	Electronic expansion valve (Carrier Chiller/Uni-Aire)			
132.	Thermistor			
133.	Microprocessor board			
134.	C.P.C sensor			
135.	Relay board			
136.	Compressor service valve			
a.	½ - ¾”			
b.	⅞ - 1⅛”			
c.	1⅜ - 2⅛”			

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Ref. No.	**PARTS DESCRIPTION (As described below or approval equivalent)**	**RATE PARTS ONLY**	**RATE LABOUR TO INSTALL**	**NETT PRICE TO SUPPLY & INSTALL**
137.	Semi hermetic compressor (Carrier)			
138.	Capacitor running/starter 370-440VAC, 50Hz any brand			
a.	2 – 5 MFD			
b.	6 – 15 MFD			
c.	16 – 29 MFD			
d.	30 – 50 MFD			
e.	51 – 70 MFD			
139.	RAC starter 220/440 coil single or three phase c/w overhead			
a.	Suitable for ¾ - 1½ hp (4 – 10 Amp)			
b.	Suitable for 2 - 1½ hp (11 – 25 Amp)			
c.	Filter drier sporlan ¼" - ½"			
d.	Filter drier sporlan ⅝" - ⅞"			
140.	To supply & install exhaust fan c/w making opening either through glass or concrete, mounting plate, bracket as required and to provide power supply c/w on/off switch from nearest the DB			
a.	6"			
b.	8"			
c.	10"			
d.	12"			
e.	15"			
f.	18"			
g.	24"			

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Ref. No.	**PARTS DESCRIPTION (As described below or approval equivalent)**	**RATE PARTS ONLY**	**RATE LABOUR TO INSTALL**	**NETT PRICE TO SUPPLY & INSTALL**
141.	To service glass/wall mounted exhaust fan			
a.	6 – 12”	----------	± $3	
b.	15 – 24”	----------	± $4	
142.	To rewind motors c/w resurfacing, new bearings, rotors, stators & mounting any rpm 1ph or 3Ph, 240/415V, 50Hz with 9 months warranty			
a.	1/3 - ½ Hp			
b.	¾ - 1 Hp			
c.	2 – 4 Hp			
d.	5 – 5.7 Hp			
143.	Thermal overload relay for fully hermetic compressor for RAC & split unit			
a.	¾ - 1 Hp			
b.	1½ - 2 Hp			
c.	2½ - 3 Hp			
144.	Liquid line solenoid valve c/w solenoid coil (24/110/240V, 50Hz) any brand & size less than 2”			
145.	Change bush to bearing fan motor, FCU, RAC etc			
146.	G.I drain pipe c/w fittings (bends, elbows, traps, tees etc. including welding & brazing) below 1½”			
147.	Refrigerant suction line filter Drier			
a.	½ - ⅝ ODF			
b.	¾ - ⅞ ODF			
c.	1⅛ - 1⅝ ODF			
148.	RAC filter roll ½” x 16” x 50’ (or offer)			
149.	Thermostat including sensor as required			

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Ref. No.	**PARTS DESCRIPTION (As described below or approval equivalent)**	**RATE PARTS ONLY**	**RATE LABOUR TO INSTALL**	**NETT PRICE TO SUPPLY & INSTALL**
150.	Air filter, soft foam/sponge type			
151.	Air filter, hard PVC mesh frame type			
152.	Air blower, evaporator fan			
153.	Over load relay, for compressor			
154.	Fan motor bush			
155.	Fan motor bearing			
156.	Filter drier			
157.	Remote control for split unit			
158.	High pressure switch			
159.	Low pressure switch			
160.	Service valve			
161.	Refrigerant piping connector coupling			
162.	Front cover			
163.	Flexible hose, ½" Ø/m			
164.	Remove to wire type including necessary parts			
165.	Fully hermetic compressor for split unit R134a or R410A any make c/w service valve, motor protector, crankcase heater, capacitor + 9 months warranty including testing & commissioning			
a.	8,000 Btu/hr – 12,000 Btu/Hr			
b.	12,500 Btu/hr – 16,000 Btu/Hr			
c.	16,500 Btu/hr – 24,000 Btu/Hr			
d.	24,500 Btu/hr – 30,000 Btu/Hr			

ALL PRICES ARE FOR SINGLE UNIT – 1 No, OR 1 M, OR 1 M2 etc.				
Ref. No.	**PARTS DESCRIPTION (As described below or approval equivalent)**	**RATE PARTS ONLY**	**RATE LABOUR TO INSTALL**	**NETT PRICE TO SUPPLY & INSTALL**
e.	30,500 Btu/hr – 38,000 Btu/Hr			
f.	38,500 Btu/hr – 48,000 Btu/Hr			
166.	Fan blade for condenser, split unit any make			
a.	8,000 Btu/hr – 12,000 Btu/Hr			
b.	12,500 Btu/hr – 16,000 Btu/Hr			
c.	16,500 Btu/hr – 24,000 Btu/Hr			
d.	24,500 Btu/hr – 30,000 Btu/Hr			
e.	30,500 Btu/hr – 38,000 Btu/Hr			
f.	38,500 Btu/hr – 48,000 Btu/Hr			
g.	48,500 Btu/hr – 60,000 Btu/Hr			
h.	65,500 Btu/hr – 72,000 Btu/Hr			
167.	Micro-computer control for split unit any make			
a.	8,000 Btu/hr – 10,000 Btu/Hr			
b.	10,500 Btu/hr – 13,000 Btu/Hr			
c.	13,500 Btu/hr – 18,000 Btu/Hr			
d.	18,500 Btu/hr – 28,000 Btu/Hr			
e.	28,500 Btu/hr – 38,000 Btu/Hr			
f.	38,500 Btu/hr – 48,000 Btu/Hr			
168.	Electrical printed circuit boards for split unit any make			
a.	8,000 Btu/hr – 10,000 Btu/Hr			
b.	10,500 Btu/hr – 13,000 Btu/Hr			

ALL PRICES ARE FOR SINGLE UNIT – 1 No, OR 1 M, OR 1 M2 etc.				
Ref. No.	**PARTS DESCRIPTION (As described below or approval equivalent)**	**RATE PARTS ONLY**	**RATE LABOUR TO INSTALL**	**NETT PRICE TO SUPPLY & INSTALL**
c.	13,500 Btu/hr – 18,000 Btu/Hr			
d.	18,500 Btu/hr – 28,000 Btu/Hr			
e.	28,500 Btu/hr – 38,000 Btu/Hr			
f.	38,500 Btu/hr – 48,000 Btu/Hr			
169.	FCU fan scroll for split unit any make			
a.	8,000 Btu/hr – 10,000 Btu/Hr			
b.	10,500 Btu/hr – 13,000 Btu/Hr			
c.	13,500 Btu/hr – 18,000 Btu/Hr			
d.	18,500 Btu/hr – 28,000 Btu/Hr			
e.	28,500 Btu/hr – 38,000 Btu/Hr			
f.	38,500 Btu/hr – 48,000 Btu/Hr			
170.	New condenser fan motor for split unit any make			
a.	8,000 Btu/hr – 10,000 Btu/Hr			
b.	10,500 Btu/hr – 13,000 Btu/Hr			
c.	13,500 Btu/hr – 18,000 Btu/Hr			
d.	18,500 Btu/hr – 28,000 Btu/Hr			
e.	28,500 Btu/hr – 38,000 Btu/Hr			
f.	38,500 Btu/hr – 48,000 Btu/Hr			
171.	New fan motor for RAC any make			
a.	7,000 Btu/hr – 11,000 Btu/Hr			
b.	12,000 Btu/hr – 17,000 Btu/Hr			

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Ref. No.	**PARTS DESCRIPTION (As described below or approval equivalent)**	**RATE PARTS ONLY**	**RATE LABOUR TO INSTALL**	**NETT PRICE TO SUPPLY & INSTALL**
c.	18,000 Btu/hr – 24,000 Btu/Hr			
172.	New evaporator fan motor for split unit any make			
a.	8,000 Btu/hr – 10,000 Btu/Hr			
b.	10,500 Btu/hr – 13,000 Btu/Hr			
c.	13,500 Btu/hr – 18,000 Btu/Hr			
d.	18,500 Btu/hr – 28,000 Btu/Hr			
e.	28,500 Btu/hr – 38,000 Btu/Hr			
f.	38,500 Btu/hr – 48,000 Btu/Hr			
173.	To rewind fan motor for split unit any make c/w bearings			
a.	8,000 Btu/hr – 13,000 Btu/Hr			
b.	13,500 Btu/hr – 18,000 Btu/Hr			
c.	18,500 Btu/hr – 28,000 Btu/Hr			
d.	28,500 Btu/hr – 38,000 Btu/Hr			
e.	38,500 Btu/hr – 48,000 Btu/Hr			
174.	To rewind fan motor for RAC any make c/w bearings			
a.	7,000 Btu/hr – 11,000 Btu/Hr			
b.	12,000 Btu/hr – 17,000 Btu/Hr			
c.	18,000 Btu/hr – 24,000 Btu/Hr			
175.	To fabricate, supply & install Drip tray for RAC			
176.	Plug top MK or approved equivalent (to supply only)			
a.	13 amps			

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Ref. No.	**PARTS DESCRIPTION (As described below or approval equivalent)**	**RATE PARTS ONLY**	**RATE LABOUR TO INSTALL**	**NETT PRICE TO SUPPLY & INSTALL**
b.	15 amps			
177.	3-core flexible cable suitable for the following rating			
a.	15 amps			
b.	20 amps			
c.	30 amps			
178.	Refrigerant piping for split unit c/w Armaflex insulation and Denso tape			
a.	Below 1”			
b.	1⅛” – 2”			
179.	Replace refrigerant piping insulation using Armaflex for split unit			
a.	Below 1”			
b.	1⅛” – 2”			
180.	Metal trunking			
a.	2” x 2” x 6”			
b.	2” x 3” x 6”			
c.	2” x 4” x 6”			
181.	PVC trunking			
a.	2” x 2” x 6”			
b.	2” x 3” x 6”			
c.	2” x 4” x 6”			
182.	New receiver for			
a.	RAC’s			

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Ref. No.	**PARTS DESCRIPTION (As described below or approval equivalent)**	**RATE PARTS ONLY**	**RATE LABOUR TO INSTALL**	**NETT PRICE TO SUPPLY & INSTALL**
b.	Split units			
183.	Flare nuts any size for split unit and RAC			
184.	Flare union any size for split unit and RAC			
185.	Flare elbow any size for split unit and RAC			
186.	Flare tee any size for split unit and RAC			
187.	Air curtains any makes			
a.	Air flow 2” x throw			
b.	Air flow 3” x throw			
c.	Air flow 4” x throw			
188.	Alteration of an opening as requested by the Department			
189.	Banking off an opening using ½ thick painted plywood, properly fixed to cover the opening fully			
190.	To supply and install metal support brackets for RAC and split type air conditioning where the brackets shall be rigidly fixed and painted to match the external wall of the building (for ducting & condensing unit various size)			
191.	To construct an opening where it should be rigid and correctly size at a location as requested by the designated officer of the department. The type of walls are as follows:			
a.	On timber/wooden wall			
b.	Within louvers/NACO window frame			
c.	On brick or concrete wall less than 6” thick			
d.	On brick or concrete wall 6 to 12” thick			
e.	On fixed glass window frame or on window with frame			
192.	To supply, install, excavate and making good etc ……. Of concealed drain pipe as follows:			

ALL PRICES ARE FOR SINGLE UNIT – 1 No, OR 1 M, OR 1 M2 etc.				
Ref. No.	**PARTS DESCRIPTION (As described below or approval equivalent)**	**RATE PARTS ONLY**	**RATE LABOUR TO INSTALL**	**NETT PRICE TO SUPPLY & INSTALL**
a.	On concrete floor only			
b.	On concrete floor with mosaic tiles			
193.	Supply and installation of new RAC (Carrier or equivalent) units on to a location as requested by designated officer of the department, where the wall are either already available or done by others. The prices should include all materials such as wiring, starter, plug top etc and works related, testing/commissioning and 5 years warranty for compressor			
a.	7,000 Btu/hr – 11,000 Btu/Hr			
b.	12,000 Btu/hr – 17,000 Btu/Hr			
c.	18,000 Btu/hr – 24,000 Btu/Hr			
194.	To supply & install external security grills for RAC c/w accessories etc.			
195.	To replace a compressor with another working compressor salvaged from a written-off unit, including all necessary related works. The works shall also include testing of the unit repainting of the unit using two coats of red lead oxide paint and a final coat to match the original colour. The price should only be chargeable as labour charge.			
196.	Supply and installation of new split unit A/C approved by MOD using R134a refrigerant with varied capacity and size on to a location as requested by designated officer of the department, where the wall are either already available or done by others. The prices should include all materials such as wiring, starter, plug top etc and works related, testing/commissioning and 5 years warranty for compressor			
a.	8,000 Btu/hr – 10,000 Btu/hr			
b.	10,500 Btu/hr – 13,000 Btu/hr			
c.	13,500 Btu/hr – 18,000 Btu/hr			
d.	18,500 Btu/hr – 28,000 Btu/hr			
e.	28,500 Btu/hr – 38,000 Btu/hr			

ALL PRICES ARE FOR SINGLE UNIT – 1 No, OR 1 M, OR 1 M2 etc.				
Ref. No.	**PARTS DESCRIPTION (As described below or approval equivalent)**	**RATE PARTS ONLY**	**RATE LABOUR TO INSTALL**	**NETT PRICE TO SUPPLY & INSTALL**
f.	38,500 Btu/hr – 48,000 Btu/hr			
197.	To supply & install plywood			
a.	3/6” x 4’ x 8’			
b.	¼” x 4’ x 8’			
c.	½” x 4’ x 8’			
198.	To supply and deliver glass mounted exhaust fan			
a.	6”			
b.	8”			
199.	To supply and deliver wall mounted exhaust fan			
a.	6”			
b.	8”			
200.	**Chilled Water Pump** Supply and install standalone horizontal single stage end suction centrifugal pump c/w TEFC motor IP55. Pump performance shall meet the requirements as below. Contractor shall be responsible to verify the pump head to deliver the required amount of water flow to the new chiller and existing AHU.			
a.	Water flow rate not less than 4.8 l/s			
b.	Water flow rate not less than 3.3 l/s			
GRAND TOTAL				**$**

SCHEDULE IV

LIST OF TOOLS

LIST OF TOOLS AND INSTRUMENTS TO BE USED THROUGH OUT THE CONTRACT PERIODS

Items No.	Names of Tools/Instrument	Size/Range	Quantity	Y/N
1.	Vacuum Pump	For Commercials/ Domestic Plant	2 nos	
2	Screw Driver	Various Sizes	4 Sets	
3.	Philip Screw Driver	Various Sizes	4 Sets	
4.	Alan Key	Various Sizes	4 Sets	
5.	Ratchet	$^1/_4$ " - $^3/_8$ "	4 Sets	
6.	Socket Set (metric)	Various Sizes	4 Sets	
7.	Open End /Ring Spanner	Various Sizes	4 Sets	
8.	Adjustable Spanner	6" 8" 10" & 12"	4 nos each	
9.	Torque Wrench	80-250lbs	1set	
10.	Manifold Gauge for R12 & R134 Machines	-	2 set each	
11.	Pipe Wrench	12" & 24"	2 nos each	
12.	Oxygen & Acetylene Set (small cylinder)		1 set	
13.	Pressure Pump (Complete Set)	800-1200 watts	2 sets	
14.	Ladder	8 steps & 12 steps	2 nos each	
15.	Flaring Set	Various Sizes	1 set	
16.	Torch Light		4 nos	
17.	Extension Light		2 nos	
18.	Extension Wire complete (3 core)	10m & 30m (long)	2 set each	
19.	Long nose Plier, Side cutter Plier & Plier		4nos each	
20.	Portable Arc Welding (complete)		1 set	

Items No.	Names of Tools/Instrument	Size/Range	Quantity	Y/N
21.	Hose	20- 30m (long)	4 nos	
22.	Wet and Dry Vacuum Cleaner		2 nos	
23.	Vernier Clipper		2 nos	
24.	Hack saw		2 nos	
25.	Junior Hacksaw		2 nos	
26.	Bearing Puller	3-12kg	2 nos	
27	Ball Hammer and Mallet		2 nos each	
28	Water Flow Meter		1 no	
29.	Air Velocity Meter		1 no	
30	Sling Physcrometer		2 nos	
31	Multi Meter Tester		4 nos	
32	Amps Meter		2 nos	
33	Megger Meter		2 nos	
34	Safety Shoes		19 nos	
35	Overall/Uniform with clear logo/name of the company		38 nos	
36	Hand Gloves		19 nos	
37	Eye protection (glass/plastic)		8 nos	
38	Ear Muff/ Protector		8 nos	
39	Safety Helmet		8 nos	
40	First Aid Kit (Complete)		2 sets	
41	Fire extinguisher	BFC 2.5Kg)	2 sets	
42	Halide Detector		2 nos	

Items No.	Names of Tools/Instrument	Size/Range	Quantity	Y/N
43	Electric Drill & Rechargeable Battery Drill		2 nos each	
44	Drill bit	Various size for Concrete, Metal and wood	2 sets	
45	Push Car/ trolley		2 nos	
46.	Grease Gun		2 nos	
47.	Thermo-hydrograph		4 nos	
48.	Roto jet Machine Complete Set (Chillers Annual Servicing)		1 no	

Note:-

List of item (1- 48) are require through out the contract and must be available within 14days of commencing works/contract starts. Any items are not listed, may be useful and require, Tenders are required to fill in the blank form provided.

SCHEDULE V

CONSUMABLES ITEMS

LIST OF CONSUMABLES ITEMS

Consumables items to be paid within the contract conditions including labour, supervision, testing and commissioning. To be used at any time when required throughout the contract period.

1. Belting of all types and various sizes
   a. Air Handling Units
   b. Fan coil Units
   c. Central Exhaust Fan
   d. Cooling Towers
   e. All Refrigeration, Air conditioning and Ventilation Plant

2, Bearing/ Bush of All Refrigeration, Air conditioning and Ventilation Plant (Any types and sizes)

3. Painting and Cleaning material to all Refrigeration, Air conditioning and Ventilation Plant electrical grade contact spray for switch board , Control Panel and etc.

4. Motor terminal & compressor thermal overload i.e. klixon, etc

5. Any type of air filters.

6. Rubber mounting for compressor, motor etc

7. Flare nut, Flare Union, crews, fastener, nuts and bolts (any types and sizes)

8. Approved chemicals for cleaning coil (in any amount) when ever required.

9. Service valves or charging port for compressor.

10. Fuses, Cables lugs, Connector and etc (any types and amps)

11 13A and 15A Plug Top

12. Repair leaks c/w recharge refrigerant to full running capacity (The item shall be used when ever the unit not cooling/undercharge due to leak in the system) for R11, R12, R134A, R407 and etc.

13, Nitrogen at any amount when required

14. Denso/Duct and Refrigerant Pipes insulation Tape (to repair damage of All Refrigeration, Air conditioning and Ventilation Plant)

15. Roll Filter for AHU, FCU etc

16. Indicator bulbs for all type of switch board, indicator panel etc.