INVITATION TO QUOTE
ITQ REF NO: NKF/PL/2022/003
DATE: 7 January 2022

ITQ FOR REPLACEMENT OF AIRCON SYSTEM AT NKF CENTRE LEVEL 1 AND LEVEL 2

1. Introduction

1.1. The National Kidney Foundation ("NKF") wishes to invite vendor (the "Vendor") to quote for the replacement of aircon at NKF Centre level 1 and level 2.

1.2. This Invitation To Quote incorporates the following documents:

- Scope of Work (Annex A)
- Breakdown of Cost (Annex B)
- Schedule of Unit Rates For Variation (M&E) (Annex C)
- Schedule of Technical Data (Annex D)
- Deviations From the Specifications (Annex E)
- Drawings (Annex F)
- Schedule of Rates for Maintenance (Annex G)
- Variable Refrigerant Volume (VRV) Units (Annex H)
- Information About Vendor (Annex I)
- Conditions of Contract
- Agreement to Terms and Conditions

2. Scope of Service

2.1 The Vendor shall perform the Services according to the requirements specified in **Annex A- Scope of Work**, as according to their submission of bid(s).

3. Compulsory Briefing

3.1 A briefing will be conducted at the date, time and place (1 venue) specified below. All vendors attending the briefing must be fully vaccinate.

Date: 11 January 2022, Tuesday
Time: 10:00 am
Venue: NKF Centre (Level 1)
81 Kim Keat Road
Singapore 328836
Contact: 9725-9136 Mr. Jerome Chan

3.2 Interested Vendors must attend the briefing session. ITQ bids would not be considered for non-attendance of the briefing session.

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4. Submission of ITQ

4.1 The quotation submitted by the Vendor shall be as in "**Breakdown of Cost**" – **Annex A**. Full set of quotation must be submitted with Vendor's stamp on all pages stipulated in the ITQ. The quotation must be submitted in a sealed envelope and endorsed with the words "**Invitation to Quote Ref No: NKF/PL/2022/003 ITQ for Replacement of Aircon at NKF Centre Level 1 and Level 2"**. All submissions must be delivered by **21 January 2022, Friday, before 3.00pm** (the "**Closing Date**") to the following address by Hand:

Deposit to: ITQ Box A
Security Counter
National Kidney Foundation
81 Kim Keat Road
Singapore 328836
Attn: Ms. Pauline Leong

4.2 The submitted quotation shall be irrevocable and open for acceptance by NKF for **90 days** from the Closing Date.

4.3 The Vendor, at the point of submission of its bids, is required to provide the following information and/or documents to NKF:

(a) Annexes A to I;
(b) Conditions of Contract
(c) Agreement to Terms and Conditions
(d) Project reference of more than $150K
(e) Extract of company/business registration from the Accounting & Corporate Regulatory Authority (ACRA), showing a full list of directors/partners of the Vendor (ACRA should not be more than 3 months from the point of submission);
(f) Latest audited financial report or published accounts
(g) Any other documents relevant to the ITQ of service

4.4 If you have any inquiries relating to this invitation to quote, please contact Ms. Pauline Leong at telephone no 6506 2104 or email to pauline.leong@nkfs.org.

5. Terms and Conditions

5.1 The terms and conditions set out in the **Conditions of Contract** shall form part of the binding contract between the successful Contractor and the NKF.

5.2 The NKF is not obliged to accept and reserves the right to reject the lowest or any quotation bid, or part or all of any quotation bid or assign any reason for rejecting any quotation bid.

5.3 Where any of the Terms and Conditions of this Scope of Service is in conflict or at variance with the Conditions of Contract, the Terms and Conditions of this Scope of Service shall prevail.

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5.4 The NKF reserved the rights to award the contract in whole or in part.

6 Price Quotations

6.1 All prices quoted by the Vendor shall be in the lawful currency of the Republic of Singapore and exclusive of GST.

6.2 All prices quoted by the Vendor shall represent the total cost to NKF.

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Annex A

PROPOSED REPLACEMENT OF EXISTING VRV SYSTEM TO NEW VRV SYSTEM INCLUDING NEW REFRIGERANT PIPEWORKS AT NKF CENTER AT 81 KIM KEAT ROAD SINGAPORE 328836

ANNEX A - SCOPE OF WORKS

The brief replacement of existing VRV system to new VRV system works shall be as follow and it shall include all other Aircon replacement and Builder works not mentioned but indicated on the tender drawings and in the lump sum breakdown cost.

The scope of the replacement of existing VRV system works shall include but not limited to:

PRELIMINARIES, GENERAL & BUILDER'S WORKS

1. The Contractor is advised that it shall be deemed to be his sole responsibility to ascertain for himself the nature and extent of the works that is required of him for due and faithful completion of each and every aspect of the works contained in this part of the Contract.

2. The Contractor shall generally obtain his own information on all matters affecting the execution of the whole of the works involved in this part of the Contract to the entire satisfaction of the Employer's Representative. No claim for extras in consequences of any alleged ignorance in any respect will be entertained by the Employer's Representative.

3. The Contractor is advised to strictly and carefully follow NKF house rules and renovation guide for carrying out the fitting out works in the premises. The Contractor is advised that the work schedule be submitted ahead of time and NKF's prior approval need to be obtained before works are carried out.

4. Adequate advance notice (2~3 days) shall be provided to NKF Operations Department prior to commencement of works so that there is adequate time to inform end-users and insurancecompanies.

5. The Contractor is advised to read carefully the notes in the tender drawings for important information and guidelines for carrying out the fitting out works.

6. The Contractor shall submit samples, specifications and technical data of the cables, fittings, equipment and materials for the consulting engineer's approval prior to commencement of work.

7. The Contractor shall submit shop drawings, coordination drawings and schedules for the consulting engineer's approval.

8. The Contractor shall be responsible for making all necessary arrangements and

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coordinating

with all relevant authorities, facilities team, consultants, engineers, direct contractors, in- house contractors, vendors, suppliers, specialists, subcontractor, building maintenance, building term contractors, safety officers etc to ensure satisfactory completion of the Contract.

9. The Contractor shall note that there will be no disruption to the existing operation of the building during the construction period and shall allow for any temporary or permanent diversion and relocation of any existing services that would affect the operations of other areas throughout the construction period.

10. The Contractor shall carry out site inspection and report for any existing damages, malfunctions and faulty equipment/materials/fitting/etc within 2 weeks after receiving the award before execution of works. For any unreported cases, it shall be under the Contractor's responsibility to repair/ replace without any variation cost.

11. The Contractor shall carry out the necessary tracing works on the existing VRV condensing units and Fan Coil Units serving 1st & 2nd storey. and the Electrical power that are interfaced to the system

12. The Contractor is advised that the works shall include the dismantling, reinstatement and making good of all ceiling work, building work and other services (whether indicated or otherwise) affected by the dismantling of existing services or the installation of new services.

13. The Contractor shall double-check and ensure before commencement of any removal of existing FCUs, cable cutting / wall penetration works etc . The Contractor shall be fully liable for any impact to the center operations resulting from cutting any wrong cables and/or interruption of any existing services. All associated costs for the necessary rectification shall be borne by the Contractor.

14. For each incident of non-compliance, disruption of services or interruption to center operations, an administrative penalty charge of S$500.00 shall be imposable on the Contractor. This administrative penalty charge shall be deducted from the next payment and recorded in the Payment Certificate accordingly.

15. The Contractor shall be responsible to remove and make good all existing services.

16. For avoidance of doubt, the Contractor shall take photographs before commencement of all works and after reinstatement.

17. The Contractor shall be responsible to provide painting and reinstatement to affected areasto the consultant/client's satisfaction.

18. Site reinstatement, including painting and making good of existing wall and floor penetration at 4th storey where VRV condensing unit servicing the 2nd storey Auditorium and other floors are deemed included in the tender.

19. The Contractor shall be responsible for any hoarding and other protection works necessary where there are dusty and hacking/ceiling cutting works.

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20. The Contractor shall be responsible for site housekeeping and ensure that the staff safety (e.g. no tripping hazard from uncovered wiring) is not compromised throughout the project duration.

21. All the existing and new openings through fire compartments shall be sealed by approved materials. Fire stop shall be provided wherever applicable.

22. The Contractor shall engage a Structural Professional Engineer to verify and certify any wall or floor penetrations and any hangars, supports and brackets required.

23. The Contractor shall liaise with the NKF/consulting engineer to identify the services to be removed and modified before proceeding with the works.

24. The Contractor shall allow for out of normal working hours for new and existing works as necessary. The Contractor is advised to allow for night work and shutdowns at night. The Contractor is advised to plan and ensure the works are carried out accordingly. A work programme shall be submitted for approval.

25. The Contractor shall allow out of normal working hours works for modification and interfacing works to existing. Method statement shall be produced for each event and submitted for approval by the client and consulting engineer.

26. The Contractor shall be responsible to coordinate all the exact locations of all related outlets, panels, wall and ceiling mounted equipment and fixtures on site with other trades.

27. The Contractor shall be responsible to coordinate for new equipment power supplies and their locations.

28. The Contractor shall be responsible to verify the existing power supply available and highlightto consulting engineer, if inadequate.

29. The Contractor shall keep on site at all times an experienced, qualified and efficient full time foreman or supervisor for daily supervision, coordination, planning and execution of the works. The supervisor shall be empowered to receive and carry out instructions from NKF and be contactable at all times when works are on-going.

30. The Contractor shall, if necessary, be responsible to provide an on-site safety officer to ensure safe work procedures and environmental control measures are implemented at the work site.

31. The Contractor shall be responsible for coordinating with the current in-house fire contractors for the fire alarm system isolation and final interfacing back to the existing systems. Where necessary.

32. The Contractor shall be responsible to coordinate with the in-house contractors for correct interfacing, testing and commissioning, and ensuring that all affected M&E systems are reinstated properly.

33. Where there are no in-house contractors for the particular M&E system, the Contractor shall be responsible to coordinate with the NKF Facilities and Maintenance team for interfacing, testing and commissioning witnessed by the FM team.

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REPLACEMENT OF ECISTING VRV SYSTEM TO NEW INCLUDING NEW REFRIGERANTPIPEWORS

i) Removal of Existing VRV condenser and Fan Coil Units servicing 1st and 2nd storey.

ii) Supply and install new VRV system complete with wired control face plate and all necessary accessories including thermostat and steel frame support. DX Fan Coil Units (FCUs) shall be connected to new condensing unit as per tender drawing for 1st and 2nd storey.

iii) Supply labour to take delivery of 2 nos of existing Fan coil unit from 1st storey store room to replace with the FCU1-1B & FCU 1-1B as shown in the tender drawing

iv) Supply and install new refrigerant pipes, condensate pipe complete with class “O” insulations as per tender drawings for 1st and 2nd storey.

v) Contractor require to confirm the power requirement of the offered VRV system and upgrade the power supply when required

vi) Engagement of a Structural Professional Engineer to verify and certify any penetration if required and VRV condenser mounting

vii) Testing and Commissioning of complete ACMV system.

viii) Monthly servicing maintenance (to be carried out on Sunday only), warranty and replacementof parts (new equipment only) during the 12 months Defect Liability Period.

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Annex B

ANNEX B – BREAKDOWN OF COST

The itemized Breakdown of the Lump Sum Tender Price as listed below shall form only as an indication of the breakdown value for this contract works. The tenderer shall price the contract works in accordance with the Tender Drawings and Documents. No claim for extra or otherwise shall be considered for any trade/items/works as specified and shown in the Tender Drawings and Specifications but not described hereunder**.**

	Work Description	Qty	Unit Price SGD (excl GST)
A) Preliminaries and General			
1	Insurances	1 lot	
2	Site Supervision, Safety Supervision & Coordination	1 lot	
3	Tracing Works	1 lot	
4	Protection Works	1 lot	
5	Temporary Diversion Works	1 lot	
6	Shop Drawings, As-built Drawings & OMM	1 lot	
7	Engagement of Structural PE for Penetrations and Hanging Supports	1 lot	
8	Servicing and Maintenance during 12-month DLP	1 lot	
9	Any Other Works. Pls Specify:	1 lot	
		Sub-total (A)	

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B) Proposed New VRV System And Refrigerant pipes			**Qty**	**Unit Price SGD (excl GST)**
1	Removal of Existing VRV condenser and Fan Coil Units servicing :		1 lot	
	a)	1st Storey	1 lot	
	b)	2nd Storey		
2	Supply and install new VRV system complete with wired control face plate and all necessary accessories including thermostat and steel frame support. DX Fan Coil Units (FCUs) shall be connected to new condensing unit as per tender drawing for		1 lot	
	a)	1st Storey	1 lot	
	b)	2nd Storey	1 lot	
3	Supply and install new high performance MERV 8 pre-filter For all the FCUs		1 lot	
	a)	1st Storey	1 lot	
	b)	2nd Storey	1 lot	
4	Supply labour to take delivery of 2 nos of existing Fan coil unit from 1st storey store room to replace with the FCU1-1B & FCU 1-1B as shown in the tender drawing		1 lot	
5	Supply and install new refrigerant pipes, condensate pipe complete with class “O” insulations as per tender drawings for			
	a)	1st Storey		
	b)	2nd Storey		
6	Supply and install new outdoor isolators for all level 1 & level 2 VCUs (replaced existing to new). Contractor to check the condition of the wiring from AC control panel to VCU, replace with new wirings when required.		1 lot	
7	Engagement of a Structural Professional Engineer to verify and certify any penetration if required and VRV condenser mounting			
8	Testing and Commissioning of complete ACMV system.			
9	Monthly servicing maintenance (to be carried out on Sunday only), warranty and replacement of parts (new equipment only) during the 12 months Defect Liability Period.			

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B) Proposed New VRV System And Refrigerant pipes		**Qty**	**Unit Price SGD (excl GST)**
10	Any other items not mentioned above but necessary to complete the works in accordance with drawings, specifications, preliminaries and condition of contract. Tenderer to specify: (ii) _____ (iii) _____		
		Sub-total (B)	

C) Builder's Works			
1	Hacking, Removal, Coring of Floors, Walls and Ceiling	1 lot	
2	Make Good and Installation of Ceiling Board	1 lot	
3	Fire Stopping of Penetrations	1 lot	
4	Painting and Other Reinstatements	1 lot	
5	Any Other Works. Pls Specify:	1 lot	
		Sub-total (C)	
		Grand Total	

Accepted By:

Authorized Signature: _____ Date: _____

Signatory Name: _____ Signatory Title: _____

Telephone Number: _____ Vendor's Name: _____

Email Address: _____ Vendor's Stamp: _____

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Annex C

ANNEX C - SCHEDULE OF UNIT RATES FOR VARIATION (M&E)

Rates are inclusive of all overheads (including on and off-site supervisory staff, allowances, consumables, etc.) and shall remain valid until the end of the Defects Liability Period.

AIR-CONDITIONING & MECHANICAL VENTILATION						
Item	**Description**		**Rate S$**			**Total**
			Unit	**Material**	**Labour/ Overheads/ Profits**	
1	Labour Rates					
	a)	Sheetmetal worker	per hr			
	b)	Pipe fitter	per hr			
	c)	Electrician	per hr			
	d)	Welder	per hr			
	e)	Supervisor	per hr			
	f)	Labourer	per hr			
	g)	Others (please specify)	per hr			
		i)	per hr			
		ii)	per hr			
		iii)	per hr			
2	Condensate drain pipe, including fittings, supports, painting; installed (but less insulation, excavation and backfilling)					
	a)	Copper pipes (BS2871:Part 1 Table X) with brazed joints, installed, of diameter	per m			
		i) 28mm	per m			
		ii) 35mm	per m			
		iii) 42mm	per m			
		iv) 54mm	per m			
	b)	Heavy duty UPVC	per m			
		v) 28mm	per m			
		vi) 35mm	per m			
		vii) 42mm	per m			
		viii) 54mm	per m			

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3	Add Class O close cell insulation to above			per m²			
	a)	Galvanised steel ductwork, of gauge;					
		i)	26 Ga.	per m²			
		ii)	24 Ga.	per m²			
		iii)	22 Ga.	per m²			
		iv)	20 Ga.	per m²			
		v)	18 Ga.	per m²			
		vi)	16 Ga.	per m²			
4	Addition to .5 for ductwork insulation,						
	a)	External insulation, 32 kg/m³ fibreglass including vapour barrier, of insulation thickness,					
		i)	25mm	per m²			
		ii)	50mm	per m²			
	b)	External insulation, 50mm thick polyurethane including vapour barrier, chicken wire mesh, 12mm thick cement plaster and weather resistant paint		per m²			
	c)	Internal insulation; 60 kg/m³ semi-rigid rockwool mat including 22 gauge perforated aluminium sheet lining of insulation thickness					
		i)	25mm	per m²			
		ii)	50mm	per m²			
5	Addition to .5 for painting (1 coat primer paint, 1 under coat and 1 finishing coat)			per m²			

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PLUMBING & SANITARY							
Item	**Description**			**Rate S$**			**Total**
				Unit	**Material**	**Labour/ Overheads/ Profits**	
1	Labourers – labour			per hr			
2	Plumbers – labour			per hr			
3	Supervisor/Engineer			per hr			
4	Certified Welders			per hr			
5	Licensed Plumber			per hr			
6	Cold water pipework including fittings and supports installed (but less excavation and backfilling):						
	a)	Copper pipes installed complete with capillary fittings of nominal size:					
		i)	15mm dia.	per m			
		ii)	22mm dia.	per m			
		iii)	28mm dia.	per m			
		iv)	35mm dia.	per m			
		v)	42mm dia.	per m			
		vi)	54mm dia.	per m			
	b)	Additional to 6a for using compression fittings of nominal size:					
		i)	15mm dia.	per m			
		ii)	22mm dia.	per m			
		iii)	28mm dia.	per m			
		iv)	35mm dia.	per m			
		v)	42mm dia.	per m			
		vi)	54mm dia.	per m			
	c)	Copper pipes installed underground complete with capillary fittings of nominal size:					
		i)	15mm dia.	per m			
		ii)	22mm dia.	per m			
		iii)	28mm dia.	per m			
		iv)	35mm dia.	per m			
		v)	42mm dia.	per m			
		vi)	54mm dia.	per m			
		ix)	108mm dia.	per m			

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7	Hot water piping including fittings, insulation and supports installed:						
	a)	Pipework - rates are to be the same as for items .6(a)					
	b)	Insulation - 25mm thick for the following nominal pipe size:					
		i)	15mm dia.	per m			
		ii)	22mm dia.	per m			
		iii)	28mm dia.	per m			
8	Cold water valves installed,						
	a)	Stop Valves of nominal size,					
		i)	15mm dia.	each			
		ii)	22mm dia.	each			
		iii)	25mm dia.	each			
		iv)	32mm dia.	each			
		v)	40mm dia.	each			
		vi)	50mm dia.	each			
	b)	Sluice Valves/Gate Valves of nominal size,					
		i)	15mm dia.	each			
		ii)	22mm dia.	each			
		iii)	25mm dia.	each			
		iv)	32mm dia.	each			
		v)	40mm dia.	each			
		vi)	50mm dia.	each			
	c)	Check Valves installed of nominal size,					
		i)	15mm dia.	each			
		ii)	22mm dia.	each			
		iii)	25mm dia.	each			
		iv)	32mm dia.	each			
		v)	40mm dia.	each			
		vi)	50mm dia.	each			

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9	Sanitary pipework including fittings and supports installed (but less excavation and backfilling):						
	a)	Hubless cast iron pipes, installed, of nominal size,					
		i)	80mm dia.	per m			
		ii)	100mm dia.	per m			
		iii)	150mm dia.	per m			
	b)	Ductile iron pipes for belowground use, installed, for nominal size,					
		i)	80mm dia.	per m			
		ii)	100mm dia.	per m			
		iii)	150mm dia.	per m			
	c)	uPVC pipes for aboveground use, installed, for nominal size,					
		i)	32mm dia.	per m			
		ii)	40mm dia.	per m			
		iii)	50mm dia.	per m			
		iv)	80mm dia.	per m			
		v)	100mm dia.	per m			
		vi)	150mm dia.	per m			
	d)	uPVC pipes for underground use, installed, for nominal size,					
		i)	100mm dia.	per m			
		ii)	150mm dia.	per m			
	e)	Vitrified clay (stoneware) pipes for belowground use, installed, for nominal size,					
		i)	150mm dia.	per m			
		ii)	225mm dia.	per m			
10	Inspection Chamber/Manhole to Sewerage Department Drawing No. PUB/SEW/STD/002), without cover, of depth (to invert level),						
	a)	0.75m		each			
	b)	1.0m		each			
	c)	1.5m		each			
	d)	2.0m		each			
	e)	2.5m		each			

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11	Inspection chamber covers, additional to item .12					
	a)	Medium duty cast iron double seal flat type cover with frame including bedding and painting of size 600mm x 450mm	each			
	b)	Heavy duty cast iron double seal flat type cover with frame including bedding and painting of size 600mm x 600mm	each			
	c)	Heavy duty recessed cover with frame including bedding of size 600mm x 450mm (tiling by others)	each			
12	Taking delivery and installation of sanitary appliances (including final connections from roughed-in pipes)					
	a)	Squatting WC	each			
	b)	Pedestal WC	each			
	c)	Wash hand basin with taps	each			
	d)	Slab urinal	each			
	e)	Bowl urinal	each			
	f)	Bowl urinal devices	each			
	h)	Double bowl sink with taps (for kitchen)	each			
	i)	Bidet	each			
13	Floor waste trap installed, (excludes grating)		each			
	a)	uPVC, of nominal size				
		i) 100mm x 100mm	each			
		ii) 100mm x 80mm	each			
	b)	Cast iron, of nominal size				
		i) 100mm x 100mm	each			
		ii) 100mm x 80mm	each			
	c)	Floor drain (heavy duty) for car park area,:				
		i) 100mm x 100mm	each			
		ii) 80mm dia.	each			
14	Grating (hinged type) for .20 above, installed,					
	a)	Stainless steel, of nominal size,				
		i) 100mm x 100mm	each			
		ii) 80mm dia.	each			
	b)	uPVC, of nominal size				
		i) 100mm x 100mm	each			
		ii) 80mm dia.	each			

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FIRE PROTECTION						
Item	**Description**		**Rate S$**			**Total**
			Unit	**Material**	**Labour/ Overheads/ Profits**	
1	Supervisors /Engineers		per hr			
2	Pipe fitters		per hr			
3	Pipe welders		per hr			
4	Alarm system electricians		per hr			
5	Hosereel Pipework - BS1387 medium grade galvanised steel (inclusive of fittings, supports, painting and installation)					
	a)	25mm dia.	per m			
	b)	32mm dia.	per m			
	c)	40mm dia.	per m			
	d)	50mm dia.	per m			
6	Stop Valves (inclusive of supports and installation)					
	<u>Bronze Gate Valves</u>					
	a)	20mm dia.	per no.			
	b)	25mm dia.	per no.			
	c)	32mm dia.	per no.			
	d)	40mm dia.	per no.			
	e)	50mm dia.	per no.			
7	Check Valves (inclusive of supports and installation)					
	<u>Bronze Swing Check Valves</u>					
	a)	32mm dia.	per no.			
	b)	40mm dia.	per no.			
	c)	50mm dia.	per no.			
8	Flexible Pipeline Connectors					
	a)	32mm dia.	per no.			
	b)	40mm dia.	per no.			
	c)	50mm dia.	per no.			
9	Fire hose reel (inclusive of 30m x 25mm rubber hose, reel, installation but less cabinet)		per set			
10	Fire hosereel cabinet extinguisher (steel type)		per no.			
11	Fire extinguishers c/w mounting bracket (w/o cabinet)					

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	a)	1.15 kg CO2	per no.			
	b)	2.3 kg CO2	per no.			
	c)	4.5 kg CO2	per no.			
	d)	4.5 kg CO2 Dry Chemical	per no.			
	e)	9 kg CO2 Dry Chemical	per no.			
	f)	3 kg ABC Dry Power	per no			
12	Fire extinguisher cabinet (steel type)		per no.			
13	Fire alarm detectors and accessories					
	a)	Breakglass call point	per no.			
	b)	150mm alarm bell	per no.			
	c)	Siren	per no.			
	d)	Flashing beacon light	per no.			
	e)	Rate-of-rise and fixed temperature heat detector, addressable type	per no.			
	f)	Ionization, smoke detector, addressable type	per no.			
	g)	Photo-electric smoke detector, addressable type	per no.			
	h)	Linear smoke detector (receiver and transmitter)	per no.			
	i)	Strobe Light	per no			
14	Supply and installation of PVC insulated cables (copper conductor) in surface conduit (excluding conduit) UL Class A wiring					
	a)	1.0mm2/1C	per m			
	b)	1.5mm2/1C	per m			
	c)	2.5mm2/1C	per m			
	d)	4.0mm2/1C	per m			
	e)	6.0mm2/1C	per m			
	f)	10.0mm2/1C	per m			

Accepted By:

Authorized Signature: _____ Date: _____

Signatory Name: _____ Signatory Title: _____

Telephone Number: _____ Vendor's Name: _____

Email Address: _____ Vendor's Stamp: _____

Company's Stamp & Signature:

ANNEX D - SCHEDULE OF TECHNICAL DATA

The Tenderer must enclose with the Tender, copies of manufacturer Technical Specifications, brochures, charts, etc. necessary for the assessment of the Tender and shall complete the schedule of data tabled below.

It is to be understood that the requirements of the Specifications are the minimum requirements that will be accepted in this Contract.

However, it is agreed that should any material or equipment described in these Schedules of Technical Data be superior in anyway to the requirements of the Tender Specifications and/or Drawings, the Subcontractor will not be permitted to revert to materials or equipment of a lower standard even if such material or equipment are ableto meet the requirements set out in the Specification and/or Drawings.

AIR-CONDITIONING INSTALLATION		
ITEM	**DESCRIPTION**	
1.0	**VRV AIR-COOLED AIR-CONDITIONING UNIT**	
	Make	
	Country of Origin	
	Type	
	Model No.	
	Total Cooling Capacity kW	
	Power Input	
	Running Amp	
	Elect. Characteristics (V/Ph/Hz)	
	Indoor Unit Fan Coil Unit	
	Type	
	Total Cooling Capacity for each FCU (kW)	
	Sound Pressure Level (dBA)	
	Air Flow (CMH) High	
	Air Flow (CMH) Medium	
	Air Flow (CMH) Low	
	Filter Type	
	Outdoor Condensing Unit	
	Dimensions	
	Weight	

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	Sound pressure Level (dBA)	

ITEM	DESCRIPTION	
2.0	**REFRIGRANT PIPEWORK**	
	Manufacturer	
	Country of Origin	
	Type of Pipe	
	Duty/Class	
	Pipe Fitting Make	
	Pipe Fitting Standard	
3.0	**CONDENSATE PIPEWORK**	
	Manufacturer	
	Country of Origin	
	Type of Pipe	
	Duty/Class	
	Pipe Fitting Make	
	Pipe Fitting Standard	
4.0	**PIPEWORK INSULATION**	
	Insulation Material	
	Manufacturer	
	Country of Manufacture	
	Thermal Capacity	
	W/m 0K	
	Vapour Seal Material	
	Sheet Material	

Accepted By:

Authorized Signature: _____ Date: _____

Signatory Name: _____ Signatory Title: _____

Telephone Number: _____ Vendor's Name: _____

Email Address: _____ Vendor's Stamp: _____

Company's Stamp & Signature:

Company's Stamp & Signature:

Annex E

ANNEX E - DEVIATIONS FROM THE SPECIFICATION

The tenderer is to set out below a tabulated statement showing clearly, and in order of the relevant clauses, any deviations from the specification. No other departures will be accepted during the course of the contract unless otherwise approved by the Engineer in writing.

Page No.	Clause/Details

Accepted By:

Authorized Signature: _____ Date: _____

Signatory Name: _____ Signatory Title: _____

Telephone Number: _____ Vendor's Name: _____

Email Address: _____ Vendor's Stamp: _____

Company's Stamp & Signature:

Annex F

ANNEX F - SCHEDULE OF DRAWING

SCHEDULE OF DRAWING	
IEM-21278-AC-001	NOTES AND LEGEND 1ST AND 2ND STOREY AIR-CONDITIONING EQUIPMENTSCHEDULE
IEM-21278-AC-201	1ST STOREY AIR-CONDITIONING LAYOUT PLAN
IEM-21278-AC-202	PART OF 2ND STOREY AIR-CONDITIONING LAYOUT PLAN
IEM-21278-AC-203	PART OF 2ND STOREY AIR-CONDITIONING LAYOUT PLAN
IEM-21278-AC-204	PART OF 3RD STOREY AIR-CONDITIONING LAYOUT PLAN
IEM-21278-AC-205	PART OF 4TH STOREY CU LOCATION PLANDETAIL A

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ANNEX G – SCHEDULE OF RATES FOR MAINTENANCE

The Contractor shall submit with his tender, his rates for the servicing and maintenance of the whole installation after expiry of the maintenance period. The maintenance of the installations in this service shall generally comply with the standard terms and conditions stated below:

Terms and Conditions for Comprehensive Maintenance:

i) The Contractor shall send skilled staff periodically to clean, check, inspect and adjust all the equipment, and will exercise all responsible care to maintain the equipment in proper and safe operating condition. The Contractor shall record all inspection and maintenance works carried out and a copy of the report shall be submitted to the Employer or Employer's Representative.

ii) The Contractor shall supply all the necessary oil, grease, cotton waste, refrigerant and similar consumables, and all other replacement parts and to maintain the installation inproper working condition at all times.

iii) In the event of a breakdown, the Contractor shall send skilled staff immediately to rectify the breakdown at the Employer or Employer's Representative request.

iv) The Contractor shall examine and test periodically all machinery and equipment including all safety and control equipment so as to ensure that the installation is in safe operatingcondition at all times.

v) The Contractor shall provide 24-hour emergency call-back service for adjustment and repairto the equipment. The response time for emergency call shall not exceed 1/2 hour.

vi) It is the Contractor's obligation to repair and supply spare parts necessitated by ordinarywear and tear without extra charge.

vii) The Contractor shall be paid monthly for the maintenance service rendered at the agreed maintenance rates. The agreement shall commence after the expiry of the MaintenancePeriod.

viii) The Contractor shall exercise reasonable care and take all protective/preventive measures during the course of rectification works so as to prevent unnecessary loss, damage, delay orinjury of any nature whatsoever which may occur.

ix) The Contractor shall attend all necessary testing and inspections required by the Building Authorities during the term of Service and Maintenance Contract.

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Rates:

Rates for every year for the first five years after the expiry of the initial maintenance period.

The employer reserves the right to accept or decline the maintenance offer on an annual basis. Confirmation will be issued by the Employer to the Contractor at least two weeks prior to the commencement of each year's maintenance.

System		COMPREHENSIVE MAINTENANCE (Rate Per Month)				
		Year 1	Year 2	Year 3	Year 4	Year 5
a)	VRV FCU					
b)	VRV CU					

Accepted By:

Authorized Signature: _____ Date: _____

Signatory Name: _____ Signatory Title: _____

Telephone Number: _____ Vendor's Name: _____

Email Address: _____ Vendor's Stamp: _____

Company's Stamp & Signature:

Annex H

ANNEX H – VARIABLE REFRIGERANT VOLUME (VRV) UNITS

1 General

1.1 The unit shall be air-cooled, split type multi system air conditioner consisting of one outdoor unit and multiple indoor units, each having capability to cool independently of requirements ofthe rooms.

1.2 The compressor shall be equipped with inverter controller, enable it to reduce minimum loaddown to 10%.

1.3 The unit shall be suitable for mix-match connection for cassette-type, ducted type, ceiling suspended type, wall mounted type, floor mounted type indoor units.

1.4 The refrigerant piping shall be extended up to 100m with 50m level difference without any oiltraps.

1.5 Both indoor unit and outdoor unit be assembled, tested and charged with refrigerant R22 atthe factory.

1.6 All fan coil units within the same condensing unit shall be independent in control, and all otherfan coil units shall remain operational in the event of any failure on one of its fan coil unit.

2 Air-Cooled Condensing Unit

2.1 The air-cooled condensing unit shall be a factory assembled unit housed in a sturdy weatherproof casing constructed from rust-proof mild steel panels coated with a baked enamelfinish. The condensing unit shall be designed to operate safely when connected to multiplefan coil units which have a combined operating nominal capacity varying from 10% to 30% ofnominal compressors capacity. The noise level shall not be more than 55dBA measured horizontally 1m away and 1.5m aboveground.

a. Compressor

The single compressor shall be of only highly efficient scroll or rotary compressor andfully equipped with inverter control capable of changing the speed linearly inaccordance to the room load requirement. It shall be able to vary form 10% to 130%of its nominal capacity. It shall be linear in capacity control to meet load fluctuationand indoor unit individual control.

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b. Condenser Assembly

The air-cooled condenser shall be constructed with copper tubes mechanically bonded to aluminium fins to form a cross fin coil. The condenser shall have a largeface area to minimise noise and give a higher for heat transfer. Condenser should be of waffle louvre fins its copper tubing of internal groove lining design for high efficiency for heat rejection.

c. Condenser Fan and Motor

The condenser fan shall be of multi-blade low speed low noise type made form non-metallic material and dynamically and statically balanced for minimum noise and vibration. The condenser fan shall be directly coupled to a induction motor. The condenser fan and motor shall be able to correspond to the heat load changes by stepping up or down according to the load requirement.

d. Refrigerant Circuit

The refrigerant circuit shall include an accumulator, liquid and gas shut off valves and necessary safety devices should be provided to ensure the safety operation of the system.

e. Accumulator

The cylindrical accumulator shall be constructed from mild steel plates pressed into shaped. The accumulator shall have sufficient capacity to prevent any liquid refrigerant from flowing back into the compressor suction.

f. Safety Devices

The following devices shall be part of the condensing unit

1. High Pressure Switch,
2. Discharge Gas Temperature Control,
3. Inrush Current of not more than 5 ampere with inverter soft starter at 5Hz,
4. Fuse,

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5. Crankcase Heater,

6. Fusible Plug,

7. Over current relay for the Compressor,

8. Thermal Protectors for Compressor and Fan Motor,

9. Re-cycling Guard Timer,

10. Open-Phase Protector,

11. Current Safe Control,

12. Power Transistor Overheat Protection.

g. Pressure Testing

The complete refrigerant circuit should be subjected to a pressure test of 28.0kg/cm2for 24 hours without any drop in pressure.

h. Pipe Material

The refrigerant pipe shall be of de-oxidised phosphorous seamless copper pipe conform to JIS H300 - C1220T.

i. Oil Recovery System

Unit shall be equipped with an oil recovery system operating at every 10 hours of operation to ensure stable operation with long refrigerant pipings (system installing with oil traps is not acceptable).

j. Starter

All condensing units must be inverter control starter at 5Hz and starting current not exceeding 5 ampere.

3 Fan Coil Units

3.1 Each fan coil unit shall be of the ceiling mounted cassette type as shown on the drawings.

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3.2 Each fan coil units shall be equipped with a self-diagnosis remote controller and having the features of setting of the room temperature (with digital indicator of room temperature), timer, air discharge direction (for cassette units), 3 fan speed selection, self-diagnosis circuit with malfunction code display. The ceiling recessed type of fan coil units must be equipped with condensate drain pumps.

3.3 The unit shall have adequate external static pressure for connection to ductwork as shown onthe drawings. Each ducted type of fan-coil units shall have ducting flanges for connecting flexible ducting.

a. Cross Fins Evaporator

The cross fin evaporator coil shall be constructed from strong clean copper tubes bonded to aluminum fins suitably spaced to ensure maximum heat transfer. The inletof the coil shall be factory brazed to an electronic control valve. The face velocity ofthe coil shall be exceptionally low to ensure quiet operation.

The cross fin coil shall be of waffle louvre fins and inner grooved lining tube design toensure highly efficient performance. Fin pitch shall not be less than 2.0mm.

b. Electronic Control Valve

An electronic expansion valves shall be factory brazed to the inlet of the coil. It shalladjust the refrigerant volume continuously in respond to load variations of the room byfuzzy logic control to maintain a precise constant temperature of +/- 0.50C.

c. Evaporator Fan

The evaporator fan shall be of the dual suction multi blade type with its length designed to match the coil width. The fan shall be statically and dynamically balanced to ensure low noise and vibration free operations. It shall be directly driven by a 3 speed induction motor. For ceiling ducted unit, the fan shall be able to cater for thestatic pressure of the system as shown in the drawing. The motor shall operate on 220V/1□/50Hz.

d. Control

Computerised control shall be used to maintain a correct room temperature with minimum power consumption. Unit shall equipped with 3 speed fan controller, timer on/off control, temperature setting as well as actual room temperature display in LED indicators.

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e. Network Control

A network controller will be connectable to operate and control all the fan coil units according to designed address of the fan coil units.

f. Air Filter

Long-life type air filter shall be provided for each fan coil unit. The air filter shall have a minimum effective life of 2500 hours.

4 Vibration and Noise Control

4.1 All fan coil units with capacity less than 2500 CMH may be suspended in the ceiling space with selected neoprene hangers. All units above 2500 CMH shall each be suspended with minimum 4 numbers spring-neoprene hangers.

4.2 All pipes connected to fan coil units shall be isolated with isolation rubber sleeves.

4.3 Discharge ducts (and return air ducts if any) shall be installed with flexible connectors similarto that of AHU. Noise leakage via the connectors must be insignificant; otherwise special lagging will be required.

4.4 For selected fan coil units the maximum allowable sound power level is specified in the equipment schedules. For all other fan coil units the sound power levels shall not exceed thefollowing:-

Frequency Hz	SWL, dB re 10-12 Watts, at Octave Bands							
	63	125	250	500	1K	2K	4K	8K
NC 35	62	55	48	42	39	37	36	35
NC 40	66	59	53	47	43	42	41	40
NC 45	69	62	56	51	49	47	46	45
NC 50	73	66	61	56	54	52	51	50

4.5 All fan coil units with a sound power level greater than 65dBA located within a space of criteriaNC 40 or less shall be supplied with specially constructed fan coil unit casings to prevent break out noise entering the space.

4.6 The subcontractor is to submit the manufacturer's sound power level data of fan coil units selected for review.

4.7 Where any doubt arises, the subcontractor shall arrange for at least two units of each modelselected to be tested by a recognised testing authority to substantiate the manufacturer's sound power rating at the subcontractor's own expenses.

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Annex I

INFORMATION ABOUT VENDOR

ITQ REF NO. _____

ITQ FOR _____

1. Vendor's name: _____
2. Company/Business registration no.: _____
3. Registered address: _____

   _____
4. GST registration no. (if applicable): _____
5. Type of business (please select)

   ( ) Sole proprietorship ( ) Private company (limited by shares)

   ( ) Partnership ( ) Public company (limited by shares)

   ( ) Others (please specify): _____

   _____
6. Contact person

   Name: _____

   Title: _____

   Tel No.: _____

   Fax No.: _____

   Email: _____

7. **I declare that I/the Contractor is not related[1] to any person in NKF who is involved in this ITQ howsoever and whatsoever.**
8. The above named Contractor certifies and declares that all information, documents and materials provided in connection with its quotation bid are true and accurate to the best of its knowledge.

Authorised Signature: _____

Signatory's name: _____ Signatory's title: _____

Contractor's name: _____ Contractor's stamp: _____

[1]Related refers to the following: Spouse, domestic partner, child, mother, father, brother or sister or close associates; any corporation, business or non-profit organization of which you are serving as staff, officer, board member, partner, participate in management or are employed by; any trust or other estate in which you have a substantial interest or as to which you serve as a trustee or in a similar capacity.

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