TEM NO.	DESCRIPTION	SPEC REF.	UNIT	QTY	Unit Price Total
	Bill 1: Preliminary and General				
1,1	Technical Submissions		sum	1	·
1,2	Workshop Drawings		sum	1	
1,3	Transport		sum	1	
1,4	Rigging		sum	1	
1,5	Compliance With Health and Safety Regulations		sum	1	
1,6	Attendance		sum	1	
1,7	Training		sum	1	
1,8	Operating & Maintenance Manuals and As Built			1	
	Drawings		sum	1	
1,9	Testing and Commissioning c/w Pressure Testing		sum	1	
1,10	P & G'S		sum	1	
	TOTAL CARRIED FORWARD				-

TOTAL BROUGHT FROM PREVIOUS PAGE MODULAR CLEAN / STERILITY ROOM . Design, supply and fix modular clean room system to the Strillty Room to meet World Health Organization Standards, The design must also include the clean room forms to includence, Anne RATING, VENTLATION, AIR CONDITIONING (HVAC) INSTALLATIONS . 2 HEATING, VENTLATION, AIR CONDITIONING (HVAC) INSTALLATIONS . 2.1 The provision of HVAC fistures/ fittings should include MicroSound Fan Filter Units: - fan- powerd HEPA Niter module is 99.99% efficient 8 0.3 microsi with add states peed control and RPI suppression, a statey switch and process with add states peed control and RPI suppression, a statey switch and process with add states peed dictions for sening of particles, velocity and pressurization per WHO clean room. Externally insulated ductors will no in form the unit to the variant (SPK efficient EU 09) and HEPA. Fressure sensors will be installed by GPM efficient EU 09) and HEPA. Fressure sensors will be air conditioned by Reins and SPM theat room for pressure and state in the during of particles, velocity and pressure. No 1 R AHU401 (Horizontal) double skin DX Spit air handling unit 827/W that cooling capacity with 55°C46°FT betting coll, supply air in 55°C46°FT betting Con Micros (SSW Meeting capacity coll VSD 55°C1°1°C cooling coll with 24°C11.2°C orief coil. SSW Meeting capacity with 55°C46°FT betting coil, supply air in 55°C46°FT betting continue duptation of the unit before the cooling coll, supply air in 55°C46°FT betting continue with an average arrestation of 25%, secondary litter with an average arrestation of 25%, secondary litter with an average arrestation of 25%. Secondary litter with an average arrestation of 55% of the string conduce	ITEM NO.	DESCRIPTION	SPEC REF.	UNIT	QTY		
Design, supply and fix modular clean room system to the Strilliy Room to meet World Incubators, And Room, Microbiology laboratory and Microbiology Examination room. The modular clean room system includes but not limited Image: Comparison of C		TOTAL BROUGHT FROM PREVIOUS PAGE				R	-
Health Organization Standards. The design must also include the clean room doors to includers, Andre Boom, Microbiology Idsorbardy and Microbiology Examination room. The modular clean room system includes but not limited Image: Comparison of the Charter of Infining a broud include Microbound Fam Filter Units: - fan- modular clean room system includes but not limited 2.1 The provision of HVAC Instructed fittings abrouble include Microbound Fam Filter Units: - fan- control and RB suppression, a stefpt switch and juncich hor mounded to the pre-filter frame, lowered pre-filter grilles complete with OBD for pressure control and Certification Testing of particles, velocity and pressurization per WHO clean room guidelines Image: Certification Testing of particles, velocity and pressurization per WHO clean room guidelines The clean rooms will be air conditioned by means of DX Split Air Handling Units (BY General HVAC Contractor). The DX Split Air Handling Units (BY General HVAC Contractor). The DX Split Air Handling Units (BY General HVAC Contractor). The DX Split Air Handling Units (BY General HVAC Contractor). The DX Split Air Handling Units (BY General HVAC Contractor). The DX Split Air Handling Units (BY General HVAC Contractor). The DX Split Air Handling Units (BY General HVAC Contractor). The DX Split Air Handling Units (BY General HVAC Contractor). The DX Split Air Handling Units (BY General HVAC Contractor). The DX Split Air Handling Units (BY General HVAC Contractor). The DX Split Air Handling Units (BY General HVAC Contractor). The DX Split Air Handling Units (BY General HVAC Contractor). The DX Split Air Handling Units (BY HVAC DY HVAC HVAC UNIT Contractor). The DX Split Air Handling Units (BY HVAC DY HVAC HVAC UNIT). The HTM HTM (BY Air SYOL) was not main the SPC HVAC heating conl, supply air 6 SPONE. Imad Rooper Air SPN (BN Contractor). <td></td> <td>MODULAR CLEAN / STERILITY ROOM</td> <td></td> <td></td> <td></td> <td></td> <td></td>		MODULAR CLEAN / STERILITY ROOM					
2.1 The provision of HVAC fixturear fittings should include MicroSound Fan Filter Units: - fan-powered HEPA filter module is 99.99% efficient 80.3 microns with solid state speed control and RF suppression, a safety switch and juncition box mounted to the pre-filter frame, lowered pre-filter gitting complete with DBD for pressure control and Certification Testing of particles, velocity and pressurgurations per WHO clearnoom guidelines. The Icean rooms will be air conditioned by means of DX Split Air Handling Unit will be located on fourth floor complete with primary and secondery fluites (95% efficient EU 09) to achieve 40-520%, relative humidity and 20 – 24 C temperature in the clean room. Externally insulated ductive/werk WII can from the unit to the various room and terminating with the supply air diffusers complete with HEPA filters (96.97% EU12). The extract air duct will have low level mounted griles and acconserv filtes (95% efficient EU 09) and hitPA. Pressure sensors will be installed to in all rooms to monitor pressure. 2.1.1 filter instantiating thing is evel connecting to the extract ductwork complete with primary and secondery filters (95% efficient EU 09) and hitPA. Pressure sensors will be installed to in all rooms to monitor pressure. No 1 R 2.1.1 filter with a average anestance of 92%, secondary filter with an average anestance of 82%, secondary filter with an average and extract ductwork complete with primary and secondery filter (95% efficient 51% 50000 with SGC/45% heating cognition with SGC/45% heating cognition with sGC/45% filters (950% efficient (95.6% MI total cooling capacity of with SGC/45% heating cognition with an average anestance of 82%. secondary filter with an average and extract ductwork complete with primary and secondery filter (95.6% effice 75.6% 150000 with motorised freeh air damper, stai		Health Organization Standards. The design must also include the clean room doors to Incubators, Ante Room, Microbiology laboratory and Microbiology Examination room. The					
2.1.1 Bit Part Res module is 99.99% Reficient @ 0.3 microns with solid state speed control and RF suppression, a safety switch and junction box mounded to the pre-filter frame, louvered pre - filter gilles complete with DBD for pressure control and Certification Testing of particles, webcity and pressurization per WHO cleanroom guidelines Image: Control of Control of Control of Control of Control of Certification Testing of particles, webcity and pressurization per WHO cleanroom guidelines Image: Control of Contr	!	HEATING, VENTILATION, AIR CONDITIONING (HVAC) INSTALLATIONS					
VSD 5.5°C/11°C cooling coll with 24°C/11.2°C on/off coll, 55KW heating capacity with 55°C/45° heating coll, supply air is 7500/k, primary filter with an average arresstance of 95%, and HEPA filters. F/A is 7500/s with motorised fresh air damper, stainless steel drain pan, heating coll mounted upstream of the unit before the cooling coll, light. Serving Labs 1-7. 520% RH, 650Pa. No 1 R AHU-02 (Horizontal) double skin DX Split air handling unit 95.6kW total cooling coality of the cooling coality of the cooling capacity with 55°C/45° heating coal, supply air is 8500/s, primary filter with an average arresstance of 82%, secondary filter with an average arresstance of 85%, and HEPA filters. F/A is 5500/s with motorised fresh ari damper, stainless steel drain pan, heating coil mounted upstream of the unit before the cooling coil, light. Serving Labs 8-13. 520% RH, 650Pa. No 1 R 2.1.2 filter with an average arresstance of 95%, and HEPA filters. F/A is 5500/s with motorised fresh ari damper, stainless steel drain pan, heating coil mounted upstream of the unit before the cooling coil, light. Serving Labs 8-13. 520% RH, 650Pa. No 1 R 2.1.3 Supply and install the following plants and equipment. Tenderer is expected to be familiar with the specified manufacturers and is to submit appropriate brochures of the specified filters (or an equivalent product of another acceptable manufacturer as shall be agreed with the Client and Consultants. No 1 R 2.1.3 Supply and install the following plants and equipment as shall be agreed with the Client and Consultants. No 1 R	,1	powered HEPA filter module is 99.99% efficient @ 0.3 microns with solid state speed control and RFI suppression, a safety switch and junction box mounted to the pre-filter frame, louvered pre - filter grilles complete with OBD for pressure control and Certification Testing of particles, velocity and pressurization per WHO cleanroom guidelines The clean rooms will be air conditioned by means of DX Split Air Handling Units (By General HVAC Contractor). The DX Split Air Handling Unit will be located on fourth floor complete with primary and secondery filters (95% efficent EU 09) to achieve 40-620% relative humidity and 20 – 24 oC temperature in the clean room. Externally insulated ductwork will run from the unit to the various room and terminating with the supply air diffusers complete with HEPA filters (99.97% EU12). The extract air duct will have low level mounted grilles in all rooms with area classification Class 100. The extract fan will be mounted outside the building at high level connecting to the extract ductwork complete with primary and secondery filters (95% efficent EU 09) and HEPA. Pressure					
Install No 1 R AHU-02 (Horizontal) double skin DX Split air handling unit 95.6kW total cooling capacity c/w VSD 5.5°C/11°C cooling coil with 24°C/11.2°C on/off coil, 45W heating capacity with 55°C/45° heating coil, supply air is 8500/s, primary filter with an average arresstance of 82%, secondary air damper, stainless steel drain pan, heating coil mounted upstream of the unit before the cooling coil, light. Serving Labs 8-13. 520% RH, 650Pa. No 1 R 2.1.2 Supply and install the following plants and equipment. Tenderer is expected to be familiar with the specified manufacturers and is to submit appropriate brochures of the specified items (or an equivalent product of another acceptable manufacturer as shall be agreed with the Client and Consultants. No 1 R 2.1.3 Supply and install the following plants and equipment. Tenderer is expected to be familiar with the specified manufacturers and is to submit appropriate brochures of the specified items (or an equivalent product of another acceptable manufacturer as shall be agreed with the Client and Consultants. No 1 R 2.1.3 Gutdoor air-cooled VRF condensing units, capable of multiple indoor units and zone, with extended range refrigerant piping. Operating outdoor temperature is 40°C . High COP. Refrigerant shall be R410A. E.g. Mitsubishi, LG, or approved equal. Note that the capacities stated below are for the combined floor load and are not additions of the individual capacities of the indoor units. Install Install Install Install Install 2.1.4 ODU-01 (serving A	2.1.1	VSD 5.5°C/11°C cooling coil with 24°C/11.2°C on/off coil, 55kW heating capacity with 55°C/45° heating coil, supply air is 7500/s, primary filter with an average arresstance of 82%, secondary filter with an average arresstance of 95%, and HEPA filters. F/A is 7500//s with motorised fresh air damper, stainless steel drain pan, heating coil mounted upstream of the unit before the					
Install No 1 R AHU-02 (Horizontal) double skin DX Split air handling unit 95.6kW total cooling capacity c/w VSD 5.5°C/11°C cooling coil with 24°C/11.2°C on/off coil, 45W heating capacity with 55°C/45° heating coil, supply air is 8500/s, primary filter with an average arresstance of 82%, secondary air damper, stainless steel drain pan, heating coil mounted upstream of the unit before the cooling coil, light. Serving Labs 8-13. 520% RH, 650Pa. No 1 R 2.1.2 Supply and install the following plants and equipment. Tenderer is expected to be familiar with the specified manufacturers and is to submit appropriate brochures of the specified items (or an equivalent product of another acceptable manufacturer as shall be agreed with the Client and Consultants. No 1 R 2.1.3 Supply and install the following plants and equipment. Tenderer is expected to be familiar with the specified manufacturers and is to submit appropriate brochures of the specified items (or an equivalent product of another acceptable manufacturer as shall be agreed with the Client and Consultants. No 1 R 2.1.3 Gutdoor air-cooled VRF condensing units, capable of multiple indoor units and zone, with extended range refrigerant piping. Operating outdoor temperature is 40°C . High COP. Refrigerant shall be R410A. E.g. Mitsubishi, LG, or approved equal. Note that the capacities stated below are for the combined floor load and are not additions of the individual capacities of the indoor units. Install Install Install Install Install 2.1.4 ODU-01 (serving A		Supply		No	1	р	
2.1.2 AHU-02 (Horizontal) double skin DX Split air handling unit 95.6kW total cooling capacity c/w VSD 5.5°C/11°C cooling coil with 24°C/11.2°C on/off coil, 45kW heating capacity with 55°C/45° heating coil, supply air is 8500l/s, primary filter with an average arresstance of 82%, secondary filter with an average arresstance of 95%, and HEPA filters. F/A is 8500l/s with motorised fresh air damper, stainless steel drain pan, heating coil mounted upstream of the unit before the cooling coil, light. Serving Labs 8-13. 520% RH, 650Pa. No 1 R 2.1.2 Supply and install the following plants and equipment. Tenderer is expected to be familiar with the specified manufacturers and is to submit appropriate brochures of the specified items (or an equivalent product of another acceptable manufacturer as shall be agreed with the Client and Consultants. Outdoor air-cooled VRF condensing units, capable of multiple indoor units and zone, with extended range refrigerant piping. Operating outdoor temperature is 40°C. High COP. Refrigerant shall be R410A. E.g. Mitsubishi, LG, or approved equal. Note that the capacities stated below are for the combined floor load and are not additions of the individual capacities of the indoor units. ODU-01 (serving AHU-01) cap: 132.7kW Heat Pump inverter type Outdoor Unit Complete with all accessories including unit fixings (Mitsubishi or Equal approved). No 1 R							-
Supply Install No 1 R 2.1.3 Supply and install the following plants and equipment. Tenderer is expected to be familiar with the specified manufacturers and is to submit appropriate brochures of the specified items (or an equivalent product of another acceptable manufacturer as shall be agreed with the Client and Consultants. No 1 R 0utdoor air-cooled VRF condensing units, capable of multiple indoor units and zone, with extended range refrigerant piping. Operating outdoor temperature is 40°C. High COP. Refrigerant shall be R410A. E.g. Mitsubishi, L.G., or approved equal. Note that the capacities stated below are for the combined floor load and are not additions of the individual capacities of the indoor units. ODU-01 (serving AHU-01) cap: 132.7kW Heat Pump inverter type Outdoor Unit Complete with all accessories including unit fixings (Mitsubishi or Equal approved).	2.1.2	AHU-02 (Horizontal) double skin DX Split air handling unit 95.6kW total cooling capacity c/w VSD 5.5°C/11°C cooling coil with 24°C/11.2°C on/off coil, 45kW heating capacity with 55°C/45° heating coil, supply air is 8500/s, primary filter with an average arresstance of 82%, secondary filter with an average arresstance of 95%, and HEPA filters. F/A is 8500/s with motorised fresh air damper, stainless steel drain pan, heating coil mounted upstream of the unit before the				ĸ	-
Supply Install No 1 R 2.1.3 Supply and install the following plants and equipment. Tenderer is expected to be familiar with the specified manufacturers and is to submit appropriate brochures of the specified items (or an equivalent product of another acceptable manufacturer as shall be agreed with the Client and Consultants. No 1 R 0utdoor air-cooled VRF condensing units, capable of multiple indoor units and zone, with extended range refrigerant piping. Operating outdoor temperature is 40°C. High COP. Refrigerant shall be R410A. E.g. Mitsubishi, L.G., or approved equal. Note that the capacities stated below are for the combined floor load and are not additions of the individual capacities of the indoor units. ODU-01 (serving AHU-01) cap: 132.7kW Heat Pump inverter type Outdoor Unit Complete with all accessories including unit fixings (Mitsubishi or Equal approved).				No	1	р	
 Supply and install the following plants and equipment. Tenderer is expected to be familiar with the specified manufacturers and is to submit appropriate brochures of the specified items (or an equivalent product of another acceptable manufacturer as shall be agreed with the Client and Consultants. Outdoor air-cooled VRF condensing units, capable of multiple indoor units and zone, with extended range refrigerant piping. Operating outdoor temperature is 40°C. High COP. Refrigerant shall be R410A. E.g. Mitsubishi, LG, or approved equal. Note that the capacities stated below are for the combined floor load and are not additions of the individual capacities of the indoor units. ODU-01 (serving AHU-01) cap: 132.7kW Heat Pump inverter type Outdoor Unit Complete with all accessories including unit fixings (Mitsubishi or Equal approved). 		Supply		NO		К	-
extended range refrigerant piping. Operating outdoor temperature is 40°C. High COP. Refrigerant shall be R410A. E.g. Mitsubishi, LG, or approved equal. Note that the capacities stated below are for the combined floor load and are not additions of the individual capacities of the indoor units. ODU-01 (serving AHU-01) cap: 132.7kW Heat Pump inverter type Outdoor Unit Complete with all accessories including unit fixings (Mitsubishi or Equal approved).	2.1.3	Supply and install the following plants and equipment. Tenderer is expected to be familiar with the specified manufacturers and is to submit appropriate brochures of the specified items (or an equivalent product of another acceptable manufacturer as shall be agreed with the Client and		No	1	R	-
2.1.4 all accessories including unit fixings (Mitsubishi or Equal approved).		Outdoor air-cooled VRF condensing units, capable of multiple indoor units and zone, with extended range refrigerant piping. Operating outdoor temperature is 40°C. High COP. Refrigerant shall be R410A. E.g. Mitsubishi, LG, or approved equal. Note that the capacities stated below are for the combined floor load and are not additions of the individual capacities of					
Supply No. 4 D	2.1.4	all accessories including unit fixings (Mitsubishi or Equal approved).					
		Supply		No	1	R	-
Install No 1 R TOTAL CARRIED FORWARD R				No	1		-

ITEM NO.	DESCRIPTION	SPEC REF.	UNIT	QTY		
	TOTAL BROUGHT FROM PREVIOUS PAGE				R	-
2.1.5	ODU-02 (serving AHU-02) cap: 95.6 kW Heat Pump inverter type Outdoor Unit Complete with		No	1	D	
	Supply		No		R	-
0.4.5	Install		No	1	R	-
2.1.5 2.1.6	Diameter 28mm copper pipe Diameter 32mm copper pipe		m m	15 15	R R	-
						-
2.1.7 2.1.8	Header for connection of indoor units Y branch pipe for connection of outdoor units		Item Item	3 5	R R	-
2.1.9	Y branch pipe for connection of indoor units		Item	2	R	-
	Pipe Insulation					
2.1.10	Diameter 28mm copper pipe		m	15	R	-
2.1.11	Diameter 32mm copper pipe		m	15	R	-
	VENTILATION EXTRACTION					
	EF-01 Extract Air Fan with a volume flow rate 'of 6.47 m³/s at a pressue of 400 Pa c/w two(2) x sound attenuators, Hepa filters, Pressure controllers and all necessary fittings					
	Supply		No	1	R	-
	Install		No	1	R	-
2.1.12	EF-02 Extract Air Fan with a volume flow rate 'of 8.5 m³/s at a pressue of 400 Pa c/w two(2) x sound attenuators, Hepa filters, Pressure controllers and all necessary fittings					
	Supply		No	1	R	-
	Install EF1 Extract Fan. Diameter 400mm with a volume flow rate 'of 0.45 m ³ /s at a pressue of 250 Pa c/w two(2) x sound attenuators and all necessary fittings and controllers		No	1	R	-
	Supply		No	1	R	-
	Install		No	1	R	-
	Supply, Deliver & Install Heat Recovery Ventilator c/w with all neccesary fittings, accessories & Supply		No	0		
	Install		No	0		
2.2	AIR FLOW CONTROLS					
2.2.1	Flow control / Balancing Dampers single or multi leaf. E.g GDL, Trox or approved equivalent Allow for the provision of balancing dampers as indicated on drawing and/or specification and/or schedules					
	Supply		No	30	R	-
	Install		No	30	R	-
2.3 2.3.1	VENTILATION DUCTS (EXTERNALLY INSULATED) Installation of Ducts shall included all fixing to complete the installation					
	Supply Air Ducts		2	200	-	
	Category 1 Category 2		m2 m2	280 0	R	-
	Category 3		m² m2	120	R	-
	Category 4		 m2	45	R	-
	Category 5		_m 2	65	R	-
	SA Fittings					
	Category 1		ea	35	R	-
	Category 2		ea	0		
	Category 3		ea	25	R	-
	Category 4		ea	15	R	-
	Category 5		ea	24	R	-
	TOTAL CARRIED FORWARD			1	R	-

ITEM NO.	DESCRIPTION	SPEC REF.	UNIT	QTY		
NU.	TOTAL BROUGHT FROM PREVIOUS PAGE	KEF.			R	_
	TOTAL BROUGHT FROM PREVIOUS PAGE				K	
	Extraction Air Ducts (Uninsulated)					
	Category 1		_m 2	35	R	-
	Category 2		2	0		
	Category 3		_m 2	150	R	-
	Category 4		_m 2	45	R	-
	Category 5		_m 2	5	R	-
	Fittings					
	Category 1		ea	35	R	-
	Category 2		ea	0		
	Category 3		ea	25	R	-
	Category 4		ea	15	R	-
	Category 5		ea	24	R	-
	AIR TERMINALS					
	Install and connect with all necessary fittings and accessories. All Clean Room Supply Diffusers to be installed c/w Hepa Filters					
	Extract air disc valves with neck diameter 150mm		No	6	R	-
	Extract Air Louves 850x600 c/w Hepa Filters		No	2	R	-
	Supply Air diffusers (Swirl type) c/w Plenum Boxes 600x600 with neck diameter 300mm		No	30	R	-
	Extract Air Grilles 500x300 c/w Humidity sensors		No	30	R	-
	Humidifiers c/w duct sensors		No	13	R	-
	Door grills 300x300		No	4	R	-
	Allow for installation of 5 Fume Cupboards c/w Ventilation fittings and controls		No	10	R	-
	Electrical Installation		Item	1	R	-
					K	
	TOTAL FOR RESOURCE CENTRE CARRIED TO SUMMARY PAGE				R	-
	Excluding VAT					

Excluding VAT