

Standard Bidding Document

CEMB AUGUST 2026 NP 01
(Works)

National

Single Stage-Two Envelope



August 18, 2026

*The Centre of Excellence in Molecular Biology (CEMB) (The Centre of Excellence in Molecular Biology (CEMB)), Head Admin
87 West Canal Road, Thokar Niaz Baig, Model Town, Lahore (District), Lahore Division (Division), Punjab (Province).
Phone: +92-301-309-1327, Email: admin@cemb.edu.pk*

Table of Contents

REQUEST FOR BIDS	1
Instructions to Bidders	1
Bid Data Sheet	1
Bids Data Sheet (BDS)	1
Eligibility Criteria	1
Evaluation Criteria	2
Jobs/Lots	2
Related Services :	8
Work Specifications and Market Rates	9
Scope of Work	43
Price Schedule	44
General Conditions of Contract	46
Special Conditions of Contract	56
Bid Securing Declaration	62
Contract Form	64
Integrity Pact	67
Performance Guarantee Form	69
Annexure	72
SPECIFICATION	73
Procurement Forms	74
Additional Forms and Documents	77

Eligibility Criteria

Bidder's Type	Required Registration
Individual / Individual Consultant Sole Proprietorship Partnership Firm Company (Private Limited)	FBR (NTN) FBR (GSTN) Punjab (PRA)

Eligibility Criteria	Document
Note: Detailed technical specifications, quantities, materials, equipment details, and complete scope of work are available in the detailed on CEMB website (https://www.cemb.edu.pk/?page_id=3924). Bidders are requested to submit their quotations lot-wise, in accordance with the e-PADS BOQ format.	Yes

Evaluation Criteria

Least Cost Based Selection (LCBS)

Weightage

Technical Evaluation Weightage	
100	
Technical Marks	65
Passing Marks	42
Technical Evaluation Criteria	
Least Cost Quality Based (Qualitative)(Doc Required)	65

Jobs/Lots

Lot Title : LOT 1 (HVAC System and Associated Works)

Bid Security : 624000 PKR

Job	Delivery Schedule	Quantity
-----	-------------------	----------

HVAC SYSTEMS FOR BIOTECH / CLEAN ROOMS, PRODUCTION LINE 1 & 2, GROUND FLOOR	Address: 87 West Canal Road, Thokar Niaz Baig, Model Town, Lahore (District), Lahore Division (Division), Punjab (Province). Schedule: 90 Days Quantity: 1/job	1/job
Installation & SUPPLY of D'X Packaged TYPE PHARMA GRADE HYGENIC AIR HANDLING UNITS With Condensing Units mentioned in schedule of equipment including shifting and fixing of equipment on foundations, complete in all respect as specified	Address: 87 West Canal Road, Thokar Niaz Baig, Model Town, Lahore (District), Lahore Division (Division), Punjab (Province). Schedule: 90 Days Quantity: 1/job	1/job

Lot Title : LOT 2 (Clean Room Panels and Associated Work)

Bid Security : 110000 PKR

Job	Delivery Schedule	Quantity
Supply, Installation & Finishing of Clean Room Ceiling/Roof Systems, including Epoxy Flooring and Associated Works	Address: 87 West Canal Road, Thokar Niaz Baig, Model Town, Lahore (District), Lahore Division (Division), Punjab (Province). Schedule: 90 Days Quantity: 1/job	1/job

Job	Delivery Schedule	Quantity
Supply & Installation of Clean Room Wall/Partition Panels, Insulated Doors and Associated Accessories/Works	Address: 87 West Canal Road, Thokar Niaz Baig, Model Town, Lahore (District), Lahore Division (Division), Punjab (Province). Schedule: 090 Days Quantity: 1/job	1/job

Lot Title : LOT 3 (Electrical Works)

Bid Security : 58000 PKR

Job	Delivery Schedule	Quantity
Supply, Installation, Testing & Commissioning of Electrical Wiring, Power & Lighting Systems, Switches, Sockets, Light Fixtures and Associated Accessories	Address: 87 West Canal Road, Thokar Niaz Baig, Model Town, Lahore (District), Lahore Division (Division), Punjab (Province). Schedule: 90 Days Quantity: 1/job	1/job
Supply, Installation, Testing & Commissioning of Distribution Boards, Main Power Cables, Earthing/CPC, Cable Trays and Associated Electrical Infrastructure, including Shop/As-Built Drawings	Address: 87 West Canal Road, Thokar Niaz Baig, Model Town, Lahore (District), Lahore Division (Division), Punjab (Province). Schedule: 90 Days Quantity: 1/job	1/job

Lot Title : LOT 4 (Fire Alaram System)

Bid Security : 16000 PKR

Job	Delivery Schedule	Quantity
Supply, Installation, Testing & Commissioning of Addressable Fire Alarm System, including Fire Alarm Control Panel, Smoke Detectors, Manual Call Points, Alarm Sounders/Bells and Associated Devices	Address: 87 West Canal Road, Thokar Niaz Baig, Model Town, Lahore (District), Lahore Division (Division), Punjab (Province). Schedule: 90 Days Quantity: 1/job	1/job
Supply, Installation, Testing & Commissioning of Fire Alarm Wiring, Fire-Resistant Cables, Fire Alarm Junction Boxes (FAJB), Conduits and Associated Accessories	Address: 87 West Canal Road, Thokar Niaz Baig, Model Town, Lahore (District), Lahore Division (Division), Punjab (Province). Schedule: 90 Days Quantity: 1/job	1/job

Lot Title : LOT 5 (Process / Utilities Works)

Bid Security : 266000 PKR

Job	Delivery Schedule	Quantity
Installation, Testing & Commissioning of Process & Clean Utilities Equipment and Systems, including Compressed Air, WFI, RO/Purified Water, Vacuum, CO ₂ Gas and Associated Equipment	Address: 87 West Canal Road, Thokar Niaz Baig, Model Town, Lahore (District), Lahore Division (Division), Punjab (Province). Schedule: 90 Days Quantity: 1/job	1/job

Job	Delivery Schedule	Quantity
Supply, Installation, Testing & Commissioning of Process Utility Piping, Valves, Fittings, Pressure Gauges, Air Vents and Associated Accessories for WFI, RO/Purified Water, Compressed Air, CO ₂ , Vacuum and Tap Water Systems	Address: 87 West Canal Road, Thokar Niaz Baig, Model Town, Lahore (District), Lahore Division (Division), Punjab (Province). Schedule: 90 Days Quantity: 1/job	1/job

Lot Title : LOT 6 (Civil & Plumbing Works)

Bid Security : 36000 PKR

Job	Delivery Schedule	Quantity
Supply, Installation & Construction of External Sewerage, Internal Drainage, Waste & Vent Systems, Floor Drains, Cleanouts, uPVC/HDPE Piping, Traps, Gullies and Septic Tank Works	Address: 87 West Canal Road, Thokar Niaz Baig, Model Town, Lahore (District), Lahore Division (Division), Punjab (Province). Schedule: 90 Days Quantity: 1/job	1/job
Civil & Associated Works, including Fabrication and Installation of Fiber Glass Shed with MS Powder-Coated Structure, Supports, Grouting and Complete Finishing Works	Address: 87 West Canal Road, Thokar Niaz Baig, Model Town, Lahore (District), Lahore Division (Division), Punjab (Province). Schedule: 90 Days Quantity: 1/job	1/job

Lot Title : LOT 7 (FURNITURE & MECHANICAL WORKS)

Bid Security : 90000 PKR

Job	Delivery Schedule	Quantity
SS304 Stainless Steel Furniture Supply, fabrication and installation of SS304 cross-over benches, lockers, cabinets and mirrors, complete as per specifications.	Address: 87 West Canal Road, Thokar Niaz Baig, Model Town, Lahore (District), Lahore Division (Division), Punjab (Province). Schedule: 90 Days Quantity: 1/job	1/job
Supply and installation of laminar flow cabinet and SS304 static/dynamic pass-through boxes with interlocking doors, complete as specified.	Address: 87 West Canal Road, Thokar Niaz Baig, Model Town, Lahore (District), Lahore Division (Division), Punjab (Province). Schedule: 90 Days Quantity: 1/job	1/job

Related Services :

No



Work Specifications and Market Rates

Lot Title: LOT 1 (HVAC System and Associated Works)

Specifications / Requirements:

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
1	A	HVAC SYSTEMS FOR BIOTECH / CLEAN ROOMS, PRODUCTION LINE 1 & 2, GROUND FLOOR			31200000	thirty-one point two million	31200000
2	1	Installation & SUPPLY of D'X Packaged TYPE PHARMA GRADE HYGENIC AIR HANDLING UNITS With Condensing Units mentioned in schedule of equipment including shifting and fixing of equipment on foundations, complete in all respect as specified in the specifications and as directed by the Consultant/Engineer Incharge.					

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
3	1.1	AHU No-1 (Production Rm-1,Gowing, DeGowning, Air Lock, Exit-1, G.Floor) 2810 CFM	NO	1			
4	1.2	AHU No-2 (Production Corridor, Production Rm-2, DeGowning, Air Lock,-5, G.Floor) 3345 CFM	NO	1			
5	1.3	AHU No-3 (Autoclave, Quarantine, QC Lab, Buffer, Utility Corridor, G.Floor) 1890 CFM	NO	1			
6	1.4	AHU No-4 (Microbiology Lab, Gowning, DeGowning, Air Lock, G.Floor) 1280 CFM	NO	1			
7	1.5	AHU No-5 (Raw Material Store, Material Quarantine Rejection,Approved Material, Change Room, G.Floor) 1290 CFM	NO	1			
8	2	Exhaust Air Inline Fans with louvers, Exhaust Air Louver-1 (2810 CFM)	NO	1			
9	3	Exhaust Air Louver-2 (3345 CFM)	NO	1			

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
10	4	Installation of H-13, 99.97% efficiency @0.3 microns, HEPA filters, make Trox, UplaTech, MGT, Sagicofim, American Air Filters or approved equal as directed by the consultant/Engineer and as per schedule of equipment and materials					
11	4.1	24"x24"x12"	NOS	6			
12	4.2	18"x18"x6"	NOS	4			
13	4.3	12"x12"x12"	NOS	5			
14	4.4	12"x12"x6"	NOS	6			
15	5	G4, 55%-2" Thick & 99.97% HEPA Filters For E.A. Filter Plenums					
16	5.1	24"x24"x12" & 24"x24"x6"	EACH	4			
17	5.2	G4, 55% EFF. Filters, 24"x24"x2"	EACH	4			

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
18	6	Supply and installation of WET SCRUBBER UNITS (CAP., 2810 CFM & 3345 CFM), with centrifugal fan, 3 HP Pump motor(EACH) with water collection, tank, tower packing/filling, complete in all respect as per schedule, specifications, and drawings.	NO	2			
19	7	Supply, fabrication and installation of G.I. Sheet metal ducting using prime quality sheets including all elbows, bends, reducers, splitter dampers, guide vanes, service doors, bracing, hangers, flanged joints above 24 gauge and supports etc., complete in all respect as specified in the specifications, shown on the drawings and as directed by the consultant/engineer incharge in following thickness and quantities:-					
20	7.1	26 guage.	SFT	195			
21	7.2	24 guage.	SFT	6810			
22	7.3	22 guage.	SFT	4145			

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
23	8	Providing and fixing 16 kg/m3 density blanket type glass wool insulation 1" thick with aluminium foil vapour barrier, adhesive tape on all joints and 8 Oz canvas cloth wrapping complete as specified in the specifications and directed by the consultant / Engineer incharge.	SFT	9400			
24	9	Providing and fixing 32 kg/m3 density blanket type glass wool insulation 2" thick with aluminium foil vapour barrier, adhesive tape on all joints and 8 Oz canvas cloth wrapping complete as specified in the specifications and directed by the consultant / engineer incharge.	SFT	3000			
25	10	26 Gauge Cladding on exposed ducts on all joints and complete as specified in the specifications and directed by the consultant / engineer incharge.	SFT	3200			

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
26	11	Providing and fixing air control/regulating devices in supply and return air ducts complete in all respect as specified in the specifications, shown on the drawings and as directed by the consultant/engineer incharge in following quantities; Perforated supply Air grilles, SS304					
27	11.1	27"x27"	NOS	7			
28	11.2	21"x21"	NOS	4			
29	11.3	15"x15"	NOS	11			
30	12	Supply & Installation of HEPA FILTER HOUSINGS (18g G.I. Sheet/MS. Sheet) Powder Coated					
31	12.1	26 1/2" x26 1/2" x16"	NOS	7			
32	12.2	20 1/2" x20 1/2" x10"	NOS	4			
33	12.3	14 1/2" x14 1/2" x16"	NOS	5			
34	12.4	14 1/2" x14 1/2" x10"	NOS	6			
35	13	Aluminium S.A.D having powder coating finish:					
36	13.1	21"x21"	NOS	1			

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
37	13.2	15"x15"	NOS	5			
38	13.3	12"x12"	NOS	5			
39	13.4	9"x9"	NOS	1			
40	14	R.A.Registers with fixed horizontal bars and powder coating finish:SS304,					
41	14.1	8"x12"	NOS	8			
42	14.2	8"x10"	NOS	4			
43	14.3	10"x12"	NO	1			
44	14.4	10"x16"	NOS	2			
45	14.5	12"x18"	NO	1			
46	15	E.A.Registers with movable horizontal bars: SS304					
47	15.1	8"x12"	NOS	11			
48	15.2	10"x14"	NO	1			
49	15.3	12"x22"	NOS	5			
50	16	VOLUME CONTROL DAMPERS (VCD), 18 gauge GI Sheet with 3% maximum leakage factors.					

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
51	16.1	18"x12"	NO	3			
52	16.2	18"x10"	NOS	1			
53	16.3	18"x8"	NO	3			
54	16.4	14"x10"	NO	1			
55	16.5	12"x12"	NO	2			
56	16.6	12"x10"	NOS	1			
57	16.7	12"x8"	NOS	1			
58	16.8	12"x6"	NO	6			
59	16.9	10"x10"	NOS	2			
60	16.10.	10"x8"	NO	1			
61	16.11	8"x8"	NO	1			
62	16.12	8"x6"	NO	2			
63	17	Aluminium powder coated fresh Air Intake Louvers with fixed horizontal bars, VCDS & 2" Thick Washable Filters.					
64	17.1	34"x16"	NO	1			
65	17.2	30"x16"	NO	1			
66	17.3	10"x8"	NOS	3			

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
67	18	Fusible link type FIRE DAMPERS (FD), 18 gauge GI Sheet with linkage arrangement @ 60 deg CDB Temperature					
68	18.1	34"x16"	NO	1			
69	18.2	30"x16"	NO	1			
70	18.3	24"x14"	NO	1			
71	18.4	18"x14"	NOS	2			
72	19	HEPA, G4 Filter Plenums (20g G.I Sheet with 2" thick insulation and 26 gauge G.I.Sheet cladding) for exhaust air systems with inlet/outlet flanges, complete in all respect. 50"x26"x26"(LxWxH)	NOS	2			
73	20	Flexible Connectors					
74	20.1	34"x16"	NOS	2			
75	20.2	30"x16"	NOS	2			
76	20.3	24"x14"	NO	1			
77	20.4	22"x12"	NO	1			
78	20.5	18"x14"	NOS	2			

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
79	20.6	18"x12"	NO	1			
80	20.7	16"x14"	NO	1			
81	21	Motor control centers with circuit breakers, MCCBs, MCBs, Fuses, Motor, Switches, Instruments, Indicating lights, etc. for all equipments as per specification.					
82	21.1	MCC-1 (AHU-1 TO 5, Exhaust air fans, air curtains, Wet Scrubber Units, etc.), at Ground floor & roof top (160 KW, 320 Amps, TPN with two earthing points),	NO	1			
83	22	Power cabling including compression glands from local control panel to AHUS, Fans, Air Curtains, etc.					
84	22.1	150 sqmm, 4 Core	RFT	40			
85	22.2	70 sqmm, 4 Core	RFT	180			
86	22.3	16 sqmm, 4 Core	RFT	80			
87	22.4	10 sqmm, 3 Core	RFT	60			
88	22.5	4 & 2.5 sqmm, 2 Core	RFT	120			

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
89		Control cabling including compression glands for thermostates, sensors & controllers including 20mm PVC conduit					
90	23	Condensate Drain PPRC / Piping (G.I. medium pressure / UPVC Class-C)	RFT	300			
91	24	Installation of U-tube manometers / megnaelical gauges across filter sections. i) 1", 1.25" & 2" dia	RFT	150			
92	25	Megnaelicals, Range 0~60 Pa / 0~2.4" of water guage with 4 NOS no SS 304 Display Panel Box complete with nozzles and flexible tubing, complete in all respect. (Dawyers, USA).	NO	22			
93	26	Manometers, Range 0~1250 Pa/ 0~5" of water guage, Dawyers, USA	NO	15			
94	27	Control panel unit, including return air thermostat, manually or by remote control device, 3 speed slector, rated power shall be at the middle speed only.	NO	5			

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
95	28	Upvc sleeves through which drain pipes plumbing services, and electrical services passés, of at least 25mm to 100mm diameters,	JOB	1			
96	29	Supply & Installation of Heavy duty type air curtains with mounting frames. (6'-X 7'), Make: AeroTech/SASA Metal / Air Control Or Imported	NO	4			
97	30	Special tools and instruments for maintenance.	L.S.	1			
98	31	Tags.	L.S.	1			
99	32	Glass frame Mounted Charts.	Sets	1			
100	33	Charts, Transparencies and 2 Sets.	L.S.	1			
101	34	Printed technical mannuals in English.	JOB	1			

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
102	35	Third Party Validation of all systems as per ISO 14644-3 with HVAC qualification documents DQ / IQ / OQ / PQ / OQ as per international norms. Temperature, Humidity, Differential air pressure, Airborne Particle count, Air Changes, Air Flow pattern. Installed Filter system leakage test (For Hepa filter only) HVAC documentation must include below attached minimum requirements .	L.S.	1			
103	36	Performing one month each summer and winter test run during maintenance period and setting the equipment and plant to deliver the design conditions and maintaining the log book during test run.	L.S.	1			
104	37	Preparing and providing 03 sets of shop drawings before start of work and 04 sets of as built drawings after completion of work for entire HVAC system including ducting, piping, electrical and controls wiring diagrams.	L.S.	1			

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
						GRAND TOTAL:	Rs31,200,000.00

Lot Title: LOT 2 (Clean Room Panels and Associated Work)

Specifications / Requirements:

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
1	B	CLEAN ROOMS PANELS			5500000	five million five hundred thousand	5500000
2	38	3 MM THICK EPOXY PAINTS ON ENTIRE FLOOR with COVING	SFT	1700			
3	39	Supply and installation of 25 MM THICK GI SHEET, PU FALSE CEILING/Roof Panels FILLED WITH PU/ ROCKWOOL INSULATION, Density of 35~42 Kg/CUM	SFT	800			

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
4	40	Supply and installation of 50 MM THICK SANDWICH WALL/PARTITION PANELS WITH PU / ROCKWOOL INSULATION, Density of 35~42 Kg/CUM COVING, ALUMINUM PROFILES, ETC.	SFT	1250			
5	41	Supply and installation of Single Door Size: 3' x 7',PU Density 40 to 42 Kg/ m ³ Panels Skin Both sides Covered by Pre-Painted G.I sheets,thickness 0.45mm	SFT	105			
						GRAND TOTAL:	Rs5,500,000.00

Lot Title: LOT 3 (Electrical Works)

Specifications / Requirements:

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
--------	----------	-------------	------	-----	------	-----------------	--------

1	C	ELECTRICAL WORKS			2900000	two million, nine hundred thousand.	2900000
2	42	CIRCUIT POINT WIRING: Supply and wiring of point to point with 1.5mm2 single core insulated 300/500 volt grade cables and 1.5mm2 cable as protective conductor (PC) in & including PVC conduit installed recessed in walls / R.C.C. Slab, installed on ceiling or as required as per site conditions. complete in all respects as per specifications and drawings.	RFT	800			
3	43	Supply and wiring of light circuit from DB to switchboard with 2.5mm2 single core insulated 300/500 volt grade cables and 2.5mm2 cable as protective conductor (PC) in & including PVC conduit installed recessed in walls / R.C.C. Slab, installed on ceiling or as required as per site conditions. Complete with all conduit accessories junction boxes, pull boxes as required complete in all respects as per specifications and drawings.	RFT	1400			

4	44	POWER SOCKET WIRING, Wiring and fixing of 1-3 pin 6amp to 20 Amps combined switch socket away from switch board and wired with 3 x 1 core 4 mm sq. P+N+CPC, Cu/PVC wires 300/500 Volt grade, in and including cost of 25mm dia. heavy duty PVC conduit, make as specified in Annexure "A", recessed in walls, floor, above false ceiling or as required as per site conditions, all PVC conduit accessories, pull boxes, steel pull wires, M.S. box shall be made of 16 SWG sheet steel with earth terminal having 2 coats of antirust paint , M.S. box shall be of the same size as that of 1-15 Amps switch socket, INCLUDING cost of 15 Amps 3 pin combined switch socket with porcelain base and plug, make CLIPSAL, LEGRAND, ABB or as specified in Annexure "A", complete in all respect. Wiring shall be done directly from the MCB installed in the respective DB without any claim of circuit.					
5	44.1	4mm2 single core pvc cable shall be use for all German Sockets wiring	Rft	380			
6	44.2	CPC/eathing & Neutral cables	Rft	1050			

7	45	Power Switch Sockets, Wiring and fixing of 1-3 pin 6amp to 20 Amps combined switch socket away from switch board and wired with 3 x 1 core 4 mm sq. P+N+CPC, Cu/PVC wires 300/500 Volt grade, in and including cost of 25mm dia. heavy duty PVC conduit, make as specified in Annexure "A", recessed in walls, floor, above false ceiling or as required as per site conditions, all PVC conduit accessories, pull boxes, steel pull wires, M.S. box shall be made of 16 SWG sheet steel with earth terminal having 2 coats of antirust paint , M.S. box shall be of the same size as that of 1-15 Amps switch socket, INCLUDING cost of 15 Amps 3 pin combined switch socket with porcelain base and plug, make CLIPSAL, LEGRAND, ABB or as specified in Annexure "A", complete in all respect. Wiring shall be done directly from the MCB installed in the respective DB without any claim of circuit.					
8	45.1	6A German Swicth Socket	Nos.	12			
9	45.2	10A German Swicth Socket	Nos.	3			
10	45.3	20A German Swicth Socket	Nos.	3			

11	45.4	32A 3 PHASE SOCKET	No.	1			
12	45.5	4Cx10mm ² PVC cable with 16mm single CPC for 32A 3 phase socket	Rft	150			
13	46	LIGHT FIXTURES					
14	46.1	LED Light size 24"x24" - (4 Tube-24 W, Each)	Nos.	26			
15	46.2	Down light (18 W, Each)	Nos.	33			
16	46.3	Emergency Light	Nos.	4			
17	47	Swich Board Supply consisting of one point controlled by one switch with 1.5mm ² PVC insulated 300/500 volt grade wire in and including PVC conduits recessed in walls/R.C.C. slab, or installed on ceilings including all conduit accessories junction boxes, pull boxes, pull wire, 2.5mm ² cable as PC. complete with 10 Amp. Single way switch make CLIPSAL / MK installed on & including 16 SWG sheet steel boards recessed in wall/column complete in all respects as per drawing & specifications.					
18	47.1	One Gang Way switch	Nos.	30			
19	47.2	Two Way switch	Nos.	3			

20	48	DISTRIBUTION BOARDS (DB), Installation, testing and commissioning at site of following Distribution board (DB)/Light/Power ,complete in all respect up to the satisfaction of Engineer. Sizes of the body of all DB shall be of identical dimensions irrespective the quantity of outgoing MCBs.(See Attched Power Layout)				
21	48.1	6-Way 3 phase distribution Board for Light. Total Lighting Load 2.5KW Incoming Breaker MCCB size 40ATP and Outgoing 10Ampare MCB-18 Nos (Single Pole) including BUS BAR for Neutral alongwith DB Panel, Phase indication Light., Digital Volt meter, Ampare Meter Complete in all respect	No.	1		
22	48.2	6-Way 3 phase distribution Board for Power Total Power Load 86 KW Incoming Breaker MCCB size 200ATP and Outgoing 20Ampare MCB-18 Nos (Single Pole) including BUS BAR for Neutral alongwith DB Panel, Phase indication Light., Digital Volt meter, Ampare Meter Complete in all respect. 32 Ampare 3 Phase Breaker for Production Room-1	No.	1		
23	49	DISTRIBUTION BOARDs Main Power Cables				

24	49.1	Distribution Board-Light, Main Incoming cable 4C x 16mm ² and 10mm single core (Earthing) for Distributuion Board - Light to Main Power Panel.	Rft	200			
25	49.2	Distribution Board-Power, 4C x 70mm ² and 35mm single core (Earthing) for Distributuion Board - Power to Main Power Panel	Rft	200			
26	50	CABLE TRAYSS: upply and installation of GI or MS or pvc cable trays of following sizes duly powder coated in approved colour. The gauge of sheet will not be less than 16, including the cost of installation of hangers and other necessary arrangements.					
27	50.1	6"x3" for power cable trays	Rft	200			
28	50.2	4"x3" for Communication	Rft	200			
29	50.3	Shop Drawing / Asbuilt Drawing and Submittal	SETS	3			
						GRAND TOTAL:	Rs2,900,000.00

Lot Title: LOT 4 (Fire Alaram System)

Specifications / Requirements:

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
1	D	FIRE ALARM SYSTEM			800000	eight hundred thousand	800000
2	51	Supply Installation Testing and commissioning of wiring of Fire Alarm System					
3	51.1	Smoke Detector	Nos.	30			
4	51.2	Supply Installation Testing and commissioning of wiring of smoke sensors /bells sounder and manual call station with 2 core fire resistant cable in one inch heavy duty pvc conduit or flexible. Complete in all respect.	Rft	400			
5	51.3	Supply, installation, testing and commissioning of microprocessor based 02 loop Control Panel Intelligent (Addressable) Fire Alarm Panel of Approved MAKE with built-in power supply unit and NICAD battery backup, supervisory buzzer, alarm cancelling device, complete in all respects, as per the specifications and drawings and to the satisfaction of the Engineer.	Nos.	1			

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
6	51.4	Alarm Sounder	Nos.	2			
7	51.5	FAJB	No.	1			
8	51.6	Smoke Detector control Panel	No.	1			
						GRAND TOTAL:	Rs800,000.00

Lot Title: LOT 5 (Process / Utilities Works)

Specifications / Requirements:

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
1	E	PROCESS / UTILITIES WORKS			13300000	thirteen million three hundred thousand	13300000

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
2	52	INSTALLATION, COMMISSIONING & TESTING OF FOLLOWING OWNER SUPPLIED EQUIPMENTS FROM CLEAN UTILITY ROOM TO THE PRODUCTION FACILITIES (GROUND FLOOR & ROOF TOP INCLUDING LOADING, UPLIFTING, PLACEMENT & SHIFTING AT RESPECTIVE FOUNDATIONS COMPLETE IN ALL RESPECTS.					
3	52.1	AIR COMPRESSER (WITH DRYER & STORAGE TANK), SS-316L	100 CFM/ 3 CM/MIN	1			
4	52.2	R.O WATER / PURIFIED WATER STORAGE TANKS, SS-316L	Each	2			
5	52.3	VACUUM CONVEY (100L Storage bin to Production areas) & (Production Areas to Storage bin 700L), SS-304L	1000 L	1			
6	52.4	WATER FOR INJECTION SYSTEM (WFI) FOR PRODUCTION AREAS, SS-316L	100 L	1			
7	52.5	CORBONDIOXIDE GAS (CO2) CYLINDER, SS-304L	50 KG/H	1			

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
8	52.6	HAND SANITIZERS (500 ML), PVC BOTTLES	ML	4			
9	52.7	WALL MOUNTED EYE WASHERS STATIONS COMPLETE WITH WATER CONNECTIONS/FITTINGS, ETC, MS POWDER COATED	Each	2			
10	53	COMPRESSED AIR PIPING SYSTEM, SS-316L, Ø 1"	Each	70			
11	54	GATE VALVE, Ø 1"	Each	1			
12	55	TAP WATER (PPRC /UPVC), Supply and delivery of Polypropylene Random Pipe and (DIN 8077 / DIN 8078 PN. 20) with Turkish Standards (TS-9937-11451-11755), or approved equivalent, for Cold / hot Water Piping System, including the cost of all fittings such as elbows, tees, unions, adopters, etc., complete in all respects as described in specifications, drawing and approval of the Consultants: PIPES					
13	55.1	Ø 1"	Rft	35			

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
14	55.2	Ø 1-1/4"	Rft	100			
15	56	GATE VALVE					
16	56.1	1 " Ø	Each	2			
17	56.2	1 1/4" Ø	Each	1			
18	57	PRESSURE GAUGES: Supply and delivery of Pressure gauge 3½" (90mm) dia including the gauge cocks, connecting line as per drawing(s) and specifications and / or as directed and approved by the Engineer complete in all respects: 0 to 4.5 Kg / Cm2	Each	2			
19	58	Supply and delivery of Automatic Air Vent Valve, Size: ½ " dia (15mm), AUTOMATIC AIR VENT VALVE:	Each	4			
20	59	WATER FOR INJECTION (WFI), SS-316L, Stainless steel Tube with ss flanges joints, clamps, orbital welding complete in all respect.					
21	59.1	1 " Ø	Rft	144			
22	59.2	Ø 1 1/4"	Rft	124			

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
23	59.3	Ø 1 1/2"	Rft	96			
24	60	GATE VALVES, Ø 1"	Each	10			
25	61	RO/PURIFIED WATER, SS-316L, PIPES					
26	61.1	1" Ø	Rft	36			
27	61.2	3/4" Ø	Rft	50			
28	61.3	1 -1/4" Ø	Rft	35			
29	61.4	1- 1/2" Ø	Rft	20			
30	62	GATE VALVES, 3/4" Ø	Each	5			
31	63	CORBON DI OXIDE GAS (CO2), SS-304L, PIPE, 3/16" Ø x 3/8" Ø	Rft	85			
32	64	GATE VALVE, Ø 3/16" x 3/8" Ø	Each	1			
33	65	VACUUMED SYSTEM, SS-304L , PIPES					
34	65.1	Ø 1 1/4"	Rft	120			
35	65.2	Ø 1 1/2"	Rft	36			
36	66	GATE VALVES, 1 1/4" Ø	Each	4			

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
37	67	Completlon of all above accessories, Installation, testing and commissioning of compressed Air, WFI, RO Water/Purified Water, CO2, Tap Water, etc complete in all respect.	JOB	1			
						GRAND TOTAL:	Rs13,300,000.00

Lot Title: LOT 6 (Civil & Plumbing Works)

Specifications / Requirements:

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
1	F	CIVIL AND PLUMBING WORKS			1800000	one million eight hundred thousand	1800000

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
2	68	EXTERNAL SEWERAGE SYSTEM: Supply and delivery of R.C.C Pipes ASTM-C 76 BS 5911 as manufactured by Pakistan Pipe & Construction Co. (Pvt) Ltd. Or approved equivalent including collars, cement mortar for joints, excavation & back -filling, compacting, and testing and / or as directed and approved by the Engineer complete in all respects. R.C.C / HDPE					
3	68.1	Size dia 4"	Rft	200			
4	68.2	Size dia 6"	Rft	10			
5	69	INTERNAL DRAINAGE WASTE AND VENT SYSTEM: Supply and delivery of of brass Cleanout Plugs, as shown on drawings, and specification and/or as directed by Consultants-Engineer complete in all respects: Size dia 4"	Each	20			
6	70	FLOOR DRAINS: Providing of GMP SS Floor Drains as shown on drawings, as directed by Consultants-Engineer complete in all respects: SS304, Size 4" dia	Each	9			

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
7	71	Providing and fixing of brass screw downs type clean-out plug with C.I adapter piece etc. equivalent to ZURN CO. BRASS/PPRC, Size dia 4"	Each	9			
8	72	Supply and delivery of uPVC Pipes as Manufactured by Cosmoplast or equivalent 6 bars (BSEN 1329) for Soil, Waste Water & Vent Piping, including the cost of all fittings, specialties and pushfit/rubber rings, as per drawing and specification and/or directed by Consultants-/Engineer complete in all respects, Size dia 4" (Internal dia)	Rft	160			
9	73	Providing and making waste water jointing assembly for wash basin and sink (bottle trap) including cost of PVC molded wall socket, C.I. hub etc. Complete as per Drawing and instruction of Engineer Incharge . UPVC/HDPE, For Wash basin/Sink	Each	4			
10	74	Providing and making Gulley Traps Chamber with all accessories including cost of C.I. gulley trap, C.I. grating 300mm x 300mm. (15" x 15") C.I. covers.	Each	1			

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
11	75	Septick Tank (two or three chambers) with Cast Iron covers and frame fixed with 6" thick RCC 1:2:4 lintal, 1:3:6 CC bed, 2" thick 1:2:4 RCC flooring, 6" thick 1:3:6 RCC block masonry walls set in 1:6 cement mortar and with ½" thick cement plaster, Complete in all respect. Size 4'-0"x2'-6" depth 4' to 5'-0".	Each	1			
12	76	Fabrication of 3mm Thick Fiber Glass Shed, MS powder coated stand/frame, angle iron Strips, red oxide paint, grouting, etc., @ 12' height From F.F.L. (3000 SFT, Approx.).	JOB	1			
						GRAND TOTAL:	Rs1,800,000.00

Lot Title: LOT 7 (FURNITURE & MECHANICAL WORKS)

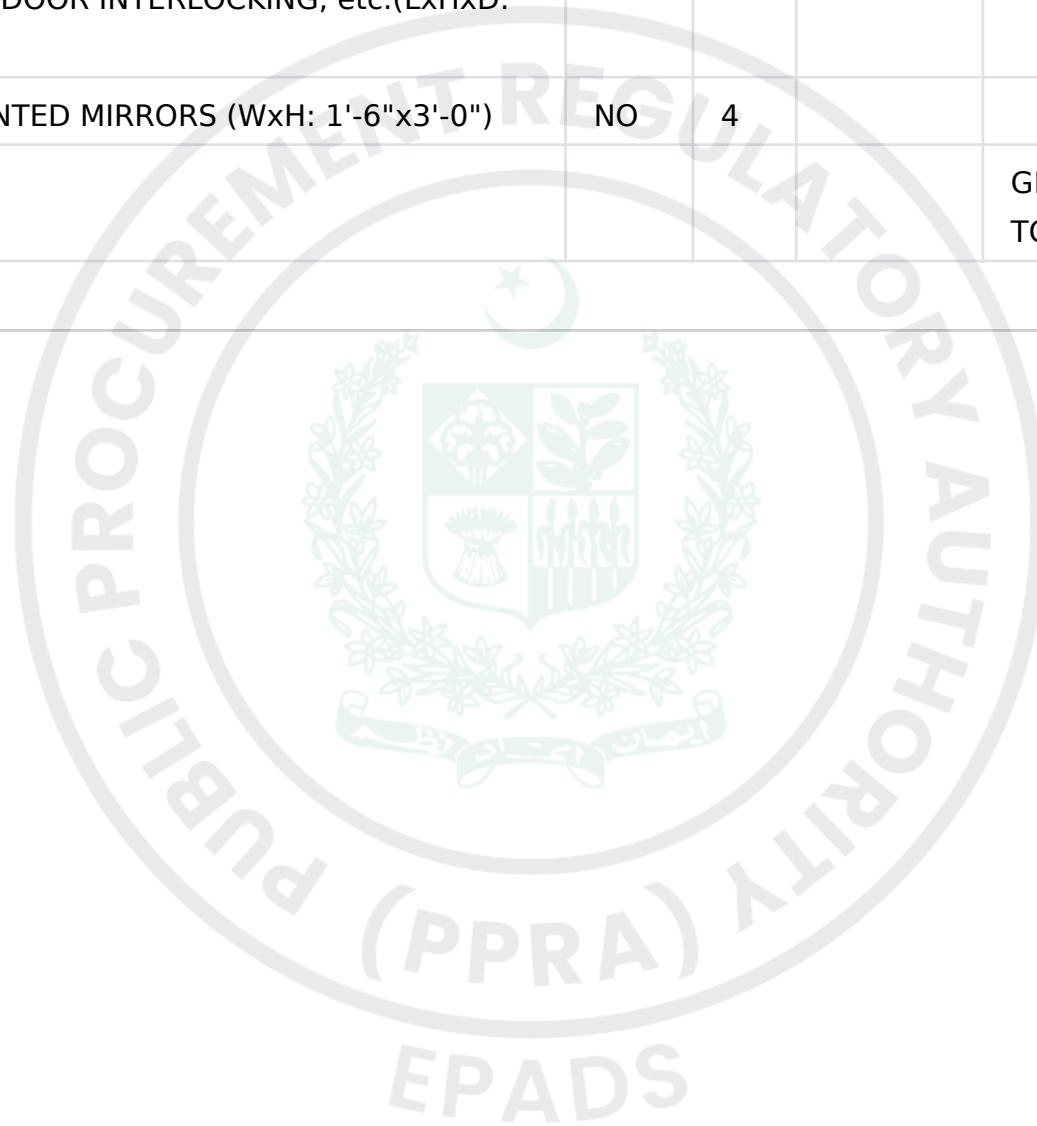
Specifications / Requirements:

Sr. No	Ref. No.	Description	Unit	Qty	Rate	Amount in Words	Amount
--------	----------	-------------	------	-----	------	-----------------	--------

1	G	FURNITURE AND MECHANICAL WORKS			4500000	four million five hundred thousand	4500000
2	77	CROSS OVER BENCHES					
3	77.1	SS304, 20 GAUGE CROSS OVER BENCHES (SIZE: 4'X12"X18")	Each	3			
4	77.2	SS304, 20 GAUGE CROSS OVER BENCHES (LxWxH: 3'x0'-9"x12"),	Each	4			
5	77.3	SS304, 20 GAUGE LOCKERS FOR GOWNING/DEGOWNING (LxDxH): 2'-6"x0'- 9"x5'-0", MINIMUM 3 PARTITIONS)	Each	4			
6	78	Fabrication of Shoe Lockers in dull finish 304 stainless Steel, 8 partitions with 8 no. doors. Each door will be Equipped with Chinese lock. Door on front side and Stainless steel net on rear side. Complete fabrication In 16 gauge stainless steel.					
7	78.1	a. Size: 40" x 20" x 36"	Each	1			
8	78.2	b. Size: 30 x 20" x 36	Each	2			

9	79	Fabrication of Executive Cabinet with 4 shelves and 4 doors in Dull 304 stainless Steel finishes. Thickness 1.5 mm (16 gauge). Each door shall be equipped with Chinese Lock. Size: 42" x 20" x 72"	Each	1			
10	80	LAMINAR FLOW CABINET WITH BENCH (OPTION-1), Size: 2 ft x 4 ft x 7.0 ft (L X W x H) (Vertical flow, downward direction through HEPA) With 24" X 48" x 3", 99.9995% efficiency @ 0.12 microns H14-HEPA filter (AAF, Sagicofim, MGT KLC, or approved equal), SS 304 side walls, fan with 1/3 HP imported fan Motor, single phase explosion proof, 220V, 50 Hz (DWDI), 55% efficiency pre filter or 30% efficiency 2" thick Pre-filters, with UV and fluorescent lights, blower to maintain Velocity @ 0.45m/s +/- 20%, variable speed drive control, Megnehelic pressure gauge, air flow pattern shall be 100% Discharge, etc.	Each	2			
11	81	SUPPLY & INSTALLATION OF SS304, 18 Gauge STATIC PASS THRU BOXES, DOOR INTERLOCKING, ETC (LxHxD: 2'x2'x1'-6")	NO	4			

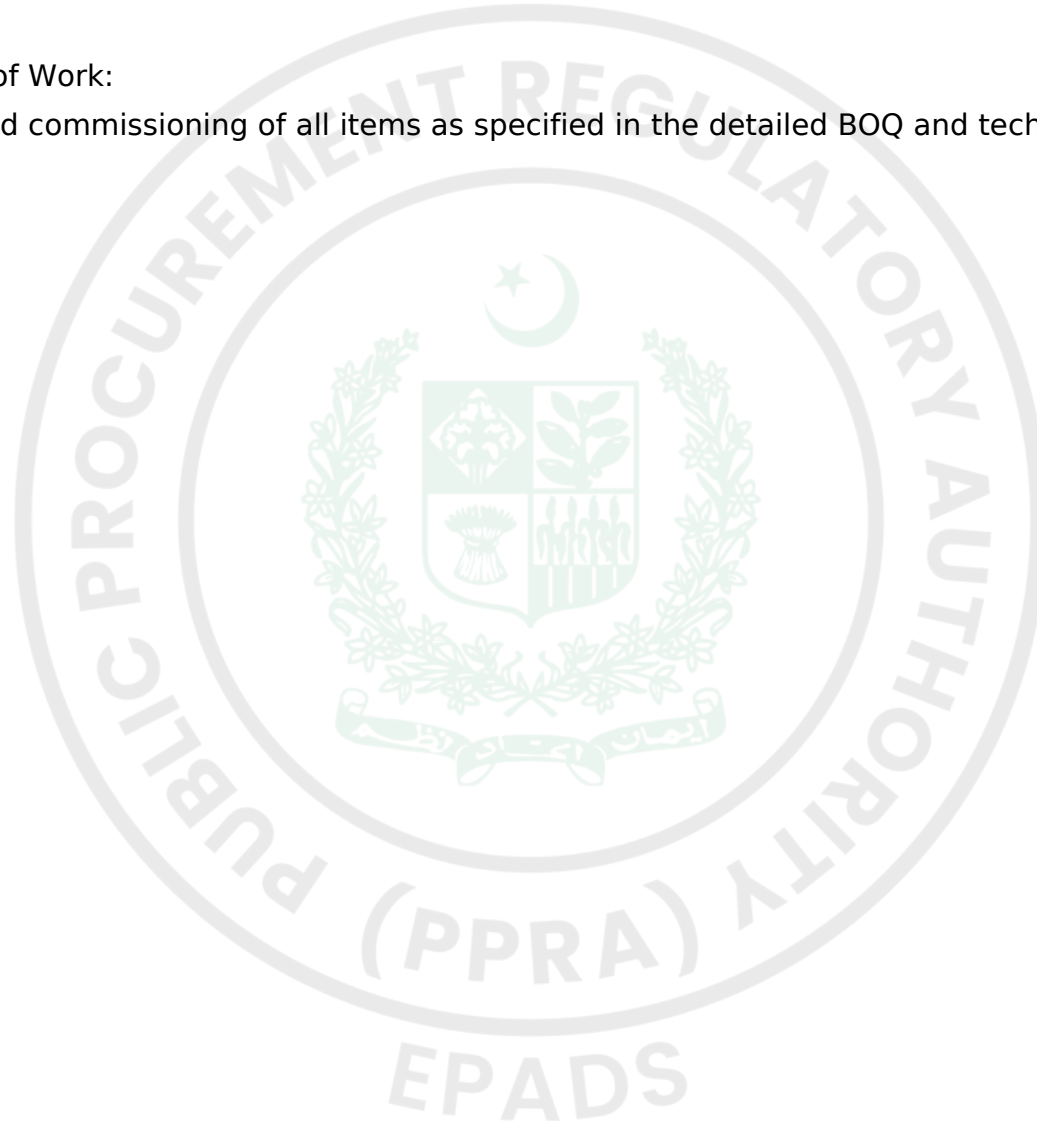
12	82	SUPPLY & INSTALLATION OF SS304, 18 Gauge, DYNAMIC PASS THRU BOXES, DOORS, WINDOWS, DOOR INTERLOCKING, etc.(LxHxD: 2'x2'x1'-6")	NO	4			
13	83	WALL MOUNTED MIRRORS (WxH: 1'-6"x3'-0")	NO	4			
						GRAND TOTAL:	Rs4,500,000.00



Scope of Work

Required Services and Scope of Work:

Supply, installation, testing and commissioning of all items as specified in the detailed BOQ and technical specifications available on the CEMB website.



Price Schedule

For Individual Jobs

#	Job Title	Quantity	Unit Price (PKR)	Total Price (PKR)	Delivery Location	Delivery Period / Year	Country of Origin
1							
2							

For Lots

#	Lot Title	Total Lot Price (PKR)	Country of Origin
1	[Lot 1 Title]		





General Conditions of Contract

A. General

1. Definitions

1.1. Unless the context otherwise requires, the following terms whenever used in this Contract shall have the same meaning and shall be interpreted as indicated

1.1.1. "Applicable Law" means the laws and any other instruments having the force of law in the Government's Country, or in such other country as may be specified in the Special Conditions of the Contract (SC), as they may be issued and in force from time to time;

1.1.2. "The Contract" means an agreement enforceable by law;

1.1.3. "The Contract Price" means the price payable to the Contractor under the Contract for the full and proper performance of its contractual obligations;

1.1.4. "The Services" means the work to be performed by the Contractor pursuant to this Contract and as prescribed in the Specifications and Schedule of Activities included in the Contractor's Bid;

1.1.5. "Ancillary Services" means those services ancillary to the provision of Services, such as transportation and insurance, and any other incidental services, such as installation, commissioning, provision of technical assistance, training, and other such obligations of the Contractor covered under the Contract;

1.1.6. "GCC" means the General Conditions of Contract contained in this section;

1.1.7. "SCC" means the Special Conditions of Contract by which the GCC may be amended or supplemented;

1.1.8. "Day" means calendar day unless indicated otherwise;

1.1.9. "Effective Date" means the date on which this Contract comes into force and effect;

1.1.10. "The Contractor" means the individual or corporate body whose Bids to provide the Services has been accepted by the Procuring Agency;

1.1.11. "The Project Site," where applicable, means the place or places named in Bid Data Sheet and technical Specifications;

1.1.12. "Government" means the Government of Pakistan;

1.1.13. "Local Currency" means the currency of Pakistan;

1.1.14. "In Writing" means communicated in written form with proof of receipt;

1.1.15. "Completion Date" means the date of completion of the Services by the Contractor as certified by the Procuring Agency;

1.1.16. "Foreign Currency" means any currency other than the currency of the country of the Procuring Agency;

1.1.17. "Party" means the Procuring Agency or the Contractor, as the case may be, and "Parties" means both of them;

1.1.18. "Service" means any object of procurement other than goods or works;

1.1.19. "Subcontractor" means any entity to which the Bidder subcontracts any part of the Services.

2. Applicable Law

2.1. The contract shall be governed and interpreted in accordance with the laws of Pakistan, unless otherwise specified in SCC.

3. Language

3.1. The Contract as well as all correspondence and documents relating to the Contract exchanged between the Contractor and the Procuring Agency, shall be written in the **English language** unless otherwise stated in the SCC. Supporting documents and printed literature that are part of the Contract may be in another language provided these are accompanied by an accurate translation of the relevant passages in English, in which case, for purposes of interpretation of the Contract, this translation shall govern.

4. Notices

4.1. Any notice, request, or consent made pursuant to this Contract shall be in writing and shall be deemed to have been made when delivered in person to an authorized representative of the Party to whom the communication is addressed, or when sent by registered mail, telex, telegram, or facsimile to such Party at the address specified in the SCC.

5. Location

5.1. The Services shall be performed at such locations as the Procuring Agency may approve and as specified in SCC.

5.2. A {DOCUMENTS}

6. Authorized Representatives / Authority of Member in charge

6.1. Any action required or permitted to be taken, and any document required or permitted to be executed, under this Contract by the Procuring Agency or the Contractor may be taken or executed by the officials specified in the SCC.

B. Commencement, Completion, Modification, and Termination of Contract

7. Effectiveness of Contract

7.1. This Contract shall come into effect on the date the Contract is signed by both parties and such other later date as may be stated in the SCC.

8. Commencement of Services

8.1. The Contractor shall confirm availability of Key Experts and begin carrying out the Services not later than the number of days after the Effective Date specified in the SCC.

9. Program schedule

9.1. Before commencement of the Services, the Contractor shall submit to the Procuring Agency for approval a Program showing the general methods, arrangements, order and timing for all activities. The Services shall be carried out in accordance with the approved Program as updated.

10. Starting Date/Expiration Date

10.1. The Contractor shall start carrying out the Services Five (05) days after the date the Contract becomes effective, or at such other date as may be specified in the SCC.

10.2. Unless terminated earlier pursuant to Clause **GCC 14** hereof, this Contract shall expire at the end of such time period after the Effective Date as specified in the SCC.

11. Entire Agreement

11.1. This Contract contains all covenants, stipulations and provisions agreed by the Parties. No agent or representative of either Party has authority to make, and the Parties shall not be bound by or be liable for, any statement, representation, promise or agreement not set forth herein.

12. Modification

12.1. Any modification or variation of the terms and conditions of this Contract, including any modification or variation of the scope of the Services, may only be made by written agreement between the Parties. However, each Party shall give due consideration to any modification(s) or variation(s) made by the other Party.

12.2. In cases of any modification(s) or variation(s), the prior written consent of the Procuring Agency is required.

13. Force Majeure

13.1. Definition

For the purposes of this Contract, "Force Majeure" means an event which is beyond the reasonable control of a Contractor and which makes a Contractor's performance of its obligations under the Contract impossible or so impractical as to be considered impossible under the circumstances.

13.2. No Breach of Contract

The failure of a Party to fulfill any of its obligations under the contract shall not be considered to be a breach of, or default under, this Contract in so far as such inability arises from an event of Force Majeure, provided that the Party affected by such an event (a) has taken all reasonable precautions, due care and reasonable alternative

measures in order to carry out the terms and conditions of this Contract, and (b) has informed the other Party as soon as possible about the occurrence of such an event.

13.3. Extension of Time

Any period within which a Contractor shall, pursuant to this Contract, complete any action or task, shall be extended for a period equal to the time during which such Party was unable to perform such action as a result of Force Majeure.

13.4. Payments

During the period of their inability to perform the Services as a result of an event of Force Majeure, the Contractor shall be entitled to continue to be paid under the terms of this Contract, as well as to be reimbursed for additional costs reasonably and necessarily incurred by them during such period for the purposes of the Services and in reactivating the Service after the end of such period.

14. Termination

14.1. By the Procuring Agency

The Procuring Agency may terminate this Contract in case of the occurrence of any of the events specified in paragraphs (a) through (e) of this Clause. In such an occurrence the Procuring Agency shall give at least thirty (30) calendar days' written notice of termination to the Contractor in case of the events referred to in (a) through (d); at least sixty (60) calendar days' written notice in case of the event referred to in (e);

14.1.1. If the Contractor fails to remedy a failure in the performance of its obligations hereunder, as specified in a notice of suspension;

14.1.2. If the Contractor becomes (or, if the Contractor consists of more than one entity, if any of its members becomes) insolvent or bankrupt or enter into any agreements with their creditors for relief of debt or take advantage of any law for the benefit of debtors or go into liquidation or receivership whether compulsory or voluntary;

14.1.3. If the Contractor fails to comply with any final decision reached as a result of arbitration proceedings;

14.1.4. If, as the result of Force Majeure, the Contractor is unable to perform a material portion of the Services for a period of not less than sixty (60) calendar days;

14.1.5. If the Procuring Agency, in its sole discretion and for any reason whatsoever, decides to terminate this Contract;

14.2. By the Contractor

The Contractor may terminate this Contract, by not less than thirty (30) calendar days' written notice to the Procuring Agency, in case of the occurrence of any of the events specified in paragraphs (a) through (d) of this Clause.

14.2.1. If the Procuring Agency fails to pay any money due to the Contractor pursuant to this Contract and not subject to dispute within forty-five (45) calendar days after receiving written notice from the Contractor that such payment is overdue;

14.2.2. If, as the result of Force Majeure, the Contractor is unable to perform a material portion of the Services for a period of not less than sixty (60) calendar days;

14.2.3. If the Procuring Agency fails to comply with any final decision reached as a result of arbitration;

14.2.4. If the Procuring Agency is in material breach of its obligations pursuant to this Contract and has not remedied the same within forty-five (45) days (or such longer period as the Bidder may have subsequently approved in writing) following the receipt by the Procuring Agency of the Contractor's notice specifying such breach.

C. Obligations of the Contractor

15. General

15.1. Standard of Performance

15.1.1. The Contractor shall perform the Services and carry out the Services with all due diligence, efficiency and economy, in accordance with generally accepted professional standards and practices, and shall observe sound management practices, and employ appropriate technology and safe and effective equipment, machinery, materials and methods. The Contractor shall always act, in respect of any matter relating to this Contract or to the Services, as a faithful adviser to the Procuring Agency, and shall at all times support and safeguard the Procuring Agency's legitimate interests in any dealings with the third parties;

15.1.2. The Contractor shall employ and provide such qualified and experienced Experts and Sub-Contractors as are required to carry out the Services.

15.2. Law Applicable to Services

The Contractor shall perform the Services in accordance with the Contract and in accordance with the Law of Pakistan and shall take all practicable steps to ensure that any of its Experts and Sub-Bidders, comply with the Applicable Law.

16. Conflict of Interests

16.1. Contractor Not to Benefit from Commissions and Discounts

The remuneration of the Contractor shall constitute the Contractor's sole remuneration in connection with this Contract or the Services, and the Contractor shall not accept for their own benefit any trade commission, discount, or similar payment in connection with activities pursuant to this Contract or to the Services or in the discharge of their obligations under the Contract, and the Contractor shall use their best efforts to ensure that the Personnel, any Subcontractors, and agents of either of them similarly shall not receive any such additional remuneration.

16.2. Contractor and Affiliates Not to be Otherwise Interested in Project

The Contractor agree that, during the term of this Contract and after its termination, the Contractor and its affiliates, as well as any Subcontractor and any of its affiliates, shall be disqualified from providing Services (other than the Services and any continuation thereof) for any project resulting from or closely related to the Services.

16.3. Prohibition of Conflicting Activities

Neither the Bidder nor its Subcontractors nor the Personnel shall engage, either directly or indirectly, in any of the following activities:

16.3.1. during the term of this Contract, any business or professional activities in the Government's country which would conflict with the activities assigned to them under this Contract;

16.3.2. during the term of this Contract, neither the Contractor nor their Subcontractors shall hire public employees in active duty or on any type of leave, to perform any activity under this Contract;

16.3.3. after the termination of this Contract, such other activities as may be specified in the SCC.

17. Insurance to be Taken Out by the Contractor

17.1. The Contractor(a) shall take out and maintain, and shall cause any Subcontractors to take out and maintain, at its (or the Sub-contractors', as the case may be) own cost but on terms and conditions approved by the Procuring Agency, insurance against the risks, and for the coverage, as shall be specified in the SCC; and (b) at the Procuring Agency's request, shall provide evidence to the Procuring Agency showing that such insurance has been taken out and maintained and that the current premiums have been paid.

18. Contractor's Actions Requiring Procuring Agency's Prior Approval

18.1. The Contractor shall obtain the Procuring Agency's prior approval in writing before taking any of the following actions:

18.1.1. appointing such members of the Personnel not provided by the Contractor;

18.1.2. changing the Program of activities; and

18.1.3. any other action that may be specified in the SCC.

19. Reporting Obligations

19.1. The Contractor shall submit to the Procuring Agency the reports and documents in the numbers, and within the periods as prescribed by the Procuring Agency.

20. Liquidated Damages

20.1. Payments of Liquidated Damages

The Contractor shall pay liquidated damages to the Procuring Agency at the rate per day stated in the SCC for each day that the Completion Date is later than the Intended Completion Date. The total amount of liquidated damages shall not exceed the amount defined in the SCC. The Procuring Agency may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor's liabilities.

20.2. Correction for Over-payment

If the Intended Completion Date is extended after liquidated damages have been paid, the Procuring Agency shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate. The

Contractor shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rates specified in SCC.

20.3. Lack of performance penalty

If the Contractor has not corrected a Defect within the time specified in the Procuring Agency's notice, a penalty for Lack of performance will be paid by the Contractor. The amount to be paid will be calculated as a percentage of the cost of having the Defect corrected, assessed as specified in the Contractor

21. Performance Guarantee

21.1. Within the time stipulated in the acceptance letter from the Procuring Agency, the successful Bidder shall furnish the Performance Guarantee in shape and amount **specified in SCC.**

21.2. The proceeds of the Performance Guarantee shall be payable to the Procuring agency as compensation for any loss resulting from the Supplier's failure to complete its obligations under the Contract.

21.3. The Performance Guarantee shall be denominated in the currency of the Contract, or in a freely convertible currency acceptable to the Procuring agency and shall be in the acceptable form as specified in SCC.

21.4. The Performance Guarantee will be discharged by the Procuring agency and returned to the Supplier not later than thirty (30) days following the date of completion of the Supplier's performance obligations under the Contract, including any warranty obligations, unless otherwise **specified in SCC.**

22. Sustainable Procurement

22.1. The Contractor shall conform to the sustainable procurement contractual provisions, if and as specified in the SCC.

D. Contractor's Personnel

23. Description of Personnel

23.1. The titles, agreed job descriptions, minimum qualifications, and estimated periods of engagement in the carrying out of the Services of the Contractor's Key Personnel. The Key Personnel listed by title as well as by name are hereby approved by the Procuring Agency.

24. Removal and / or Replacement of Personnel

24.1. Except as the Procuring Agency may otherwise agree, no changes shall be made in the Key Personnel. If, for any reason beyond the reasonable control of the Contractor, it becomes necessary to replace any of the Key Personnel, the Contractor shall provide as a replacement a person of equivalent or better qualifications.

24.2. If the Procuring Agency finds that any of the Personnel have (i) committed serious misconduct or have been charged with having committed a criminal action, or (ii) have reasonable cause to be dissatisfied with the performance of any of the Personnel, then the Contractor shall, at the Procuring Agency's written request specifying the grounds thereof, provide as a replacement a person with qualifications and experience acceptable to the Procuring Agency.

24.3. The Contractor shall have no claim for additional costs arising out of or incidental to any removal and/or replacement of Personnel.

E. Obligations of the Procuring Agency

25. Change in the Applicable Law

25.1. If, after the date of this Contract, there is any change in the Applicable Law with respect to taxes and duties which increases or decreases the cost of the Services rendered by the Contractor, then the remuneration and reimbursable expenses otherwise payable to the Contractor under this Contract shall be increased or decreased accordingly by agreement between the Parties, and corresponding adjustments shall be made to the amounts referred in the SCC.

26. Services and Facilities

26.1. The Procuring Agency shall make available to the Contractor and the Experts, for the purposes of the Services and free of any charge, the services, facilities and property described in the Terms of Reference, at the times and in the manner specified in the Terms of Reference.

26.2. In case that such services, facilities and property shall not be made available to the Contractor, the Parties shall agree on (i) any time extension that it may be appropriate to grant to the Contractor for the performance of the Services, (ii) the manner in which the Contractor shall procure any such services, facilities and property from other sources, and (iii) the additional payments, if any, to be made to the Contractor as a result thereof.

F. Payments to the Contractor

27. Contract Price

27.1. The price payable shall be in Pakistani Rupees unless otherwise specified in the SCC.

28. Terms and Conditions of Payment

28.1. Payments will be made to the Contractor according to the payment schedule stated in the SCC and as per actual invoice submitted by the Contractor.

28.2. Unless otherwise stated in the SCC, the advance payment shall be made against the provision by the Contractor of a bank guarantee for the same amount, and shall be valid for the period stated in the SCC. Any other payment shall be made after the conditions listed in the SCC for such payment have been met, and the Contractor have submitted an invoice to the Procuring Agency specifying the amount due.

29. Quality Control Identifying Defects

29.1. The principle and modalities of Inspection of the Services by the Procuring Agency shall be as indicated in the SCC. The Procuring Agency shall check the Contractor's performance and notify him of any Defects that are

found. Such checking shall not affect the Contractor's responsibilities. The Procuring Agency may instruct the Contractor to search for a Defect and to uncover and test any service that the Procuring Agency considers may have a Defect. Defect Liability Period is as defined in the SCC.

29.2. A {INSPECTION}

30. Correction of Defects, and Lack of Performance Penalty

30.1. The Procuring Agency shall give notice to the contractor of any Defects before the end of the Contract. The Defects liability period shall be extended for as long as Defects remain to be corrected.

30.2. Every time notice a Defect is given; the contractor shall correct the notified Defect within the length of time specified by the Procuring Agency's notice.

30.3. If the contractor has not corrected a Defect within the time specified in the Procuring Agency's notice, the Procuring Agency will assess the cost of having the Defect corrected, the contractor will pay this amount, and a Penalty for Lack of Performance.

31. Settlement of Disputes Amicable Settlement

31.1. The Parties shall use their best efforts to settle amicably all disputes arising out of or in connection with this Contract or its interpretation.

32. Dispute Settlement

32.1. Arbitration

If any dispute of any kind whatsoever shall arise between the procuring agency and the contractor in connection with or arising out of the Contract, including without prejudice to the generality of the foregoing, any question regarding its existence, validity or termination, or the execution of the contract, the parties shall seek to resolve any such dispute or difference by mutual consultation. If the parties fail to resolve such a dispute or difference even after negotiations or mediation, then the dispute shall be referred within fourteen (14) days in writing by either party to the Arbitrator, with a copy to the other party.

Any dispute in respect of which a notice of intention to commence arbitration has been given, in accordance with **GCC sub-clause 32.1**, shall be finally settled by arbitration. Arbitration may be commenced prior to or after completion of the Contract. Arbitration proceedings shall be conducted in accordance with Arbitration Act 1940. Notwithstanding any reference to arbitration herein, the parties shall continue to perform their respective obligations under the Contract unless otherwise agreed. The Procuring Agency shall continue to pay the Contractor any undisputed amounts due under the Contract during the resolution of any dispute.



Special Conditions of Contract

SECTION VIII. SPECIAL CONDITIONS OF CONTRACT

The following Special Conditions of Contract shall supplement the General Conditions of Contract. Whenever there is a conflict, the provisions herein shall prevail over those in the Conditions of Contract. The corresponding clause number of the GCC is indicated in parentheses.

Number of GC Clause

Amendments of, and Supplements to, Clauses in the General Conditions of Contract

Number of GC Clause 1

Definitions

The Procuring Agency is: The Centre of Excellence in Molecular Biology (CEMB) (The Centre of Excellence in Molecular Biology (CEMB)), Head Admin 87 West Canal Road, Thokar Niaz Baig, Model Town, Lahore (District), Lahore Division (Division), Punjab (Province).

The Supplier is:

The title of the subject procurement is: CEMB AUGUST 2026 NP 01

Number of GC Clause 2

Applicable/Governing Law:

The Contract shall be interpreted in accordance with the laws of Islamic Republic of Pakistan

Number of GC Clause 3

Language:

The language of the Contract, all correspondence and communications to be given, and all other documentation to be prepared and supplied under the Contract shall be in **English**.

Number of GC Clause 4

Notices:

The addresses for the notices are:

Procuring Agency:

The Centre of Excellence in Molecular Biology (CEMB) (The Centre of Excellence in Molecular Biology (CEMB)), Head Admin
87 West Canal Road, Thokar Niaz Baig, Model Town, Lahore (District), Lahore Division (Division), Punjab (Province).
+92-301-309-1327
admin@cemb.edu.pk

Contractor/ Bidder:

[Name, address and telephone number]

The Contractor/ Bidder's Representative(s)

[Name, address, telephone number and e-mail address]

Number of GC Clause 6.1

The Authorized Representatives are:

For the Procuring Agency:

The Centre of Excellence in Molecular Biology (CEMB) (The Centre of Excellence in Molecular Biology (CEMB)), Head Admin
87 West Canal Road, Thokar Niaz Baig, Model Town, Lahore (District), Lahore Division (Division), Punjab (Province).
+92-301-309-1327
admin@cemb.edu.pk

For the Bidder:

Name:

Designation:

Address:

Number of GC Clause 7

Effectiveness of the contract

The Contractor/Bidder shall be effective within days from the date of signature of the Contract by both parties

Number of GC Clause 8

Commencement of Contract:

The Contractor/Bidder shall provide Non-Consultancy Services from the effective date of contract.

Number of GC Clause 10.2

Expiration of Contract:

The time period shall be

Number of GC Clause 14

Termination

In the event of termination of the contract due to any reason as already defined in the General Conditions of Contract, the Bidder shall be responsible for providing to the Authority the Goods till the time of alternate arrangements.

Number of GC Clause 16

Conflict of Interest:

The Procuring Agency reserves the right to determine on a case-by-case basis whether the Bidder should be disqualified from providing goods or services due to a conflict of a nature described in Clause GCC 17.

Number of GC Clause 20

Liquidated Damages

If the Bidder fails to provide services as required under the contract or in case of any data loss/data breach or any incident compromising the data security or other such failures related to any services, the Bidder shall pay to the Procuring Agency as Liquidated Damages at a rate of **2.00%** to **5.00%** of the Contract value, in accordance with the extent of performance failure & the cost of investigating such incidents as judged by the Authority.

Number of GC Clause 21

Performance Guarantee:

The amount of performance guarantee shall be **10.00%** of the contract price in acceptable form of **Pay Order, Call at Deposit, Demand Draft**

Number of GC Clause 27

Currency of Payment:

All the payment to be released to the contractor/Bidder shall be in Pakistani Rupees.

Number of GC Clause 28

Payment terms:

Payment will be made to the Bidder against the procured Goods and services according to the actual invoice or running bills submitted by the Bidder against the services provided within the time given in the conditions of the contract.

Number of GC Clause 29

Identifying Defects:

The Authority reserves the right at any time to inspect the premises of the provider to inspect the goods and monitor the goods being provided.

Inspections & Tests Requirements

For being Brand New, bearing relevant reference numbers of the equipment (Certificate from supplier)

For Physical Fitness having No Damages (Certificate from supplier)

For the Country of Origin as quoted by the Supplier (Certificate from manufacturer)

For conformance to specifications and performance parameters, through Prior to delivery inspection (Inspection Report by Procurement Committee / Inspection Team)

For successful operation at site after complete installation, testing and commissioning of the equipment (Installation, Testing and Commissioning Report by Procurement Committee / Inspection Team)

Required Services and Scope of Work: Supply, installation, testing and commissioning of all items as specified in the detailed BOQ and technical specifications available on the CEMB website.

Delivery & Documents

Copies of the Supplier's invoice showing Goods' description, quantity, unit price, and total amount;

Original and two copies of the usual transport document (for example, a negotiable bill of lading, a non-negotiable sea waybill, an inland waterway document, an air waybill, a railway consignment note, a road consignment note, or a multimodal transport document) which the buyer may require to take the goods;

Copies of the packing list identifying contents of each package;

Insurance Certificate;

Manufacturer's or Supplier's Valid Warranty Certificate;

Inspection Certificate issued by the Nominated Inspection Agency (if any), and the Supplier's Factory Inspection Report;

Certificate of Origin.

The above documents would be required even if the equipment has already been imported and is available with the supplier ex-stock

Required Services and Scope of Work: Supply, installation, testing and commissioning of all items as specified in the detailed BOQ and technical specifications available on the CEMB website.

Number of GC Clause 31

Following is the guidance for Dispute Resolution

- i. If any dispute of any kind whatsoever shall arise between the Authority and the Bidder in connection with or arising out of the Contract... (full clause unchanged)
- ii. At future of negotiation the dispute shall be resolved through mediation...
- iii. At failure of mediation, arbitration under Arbitration Act 1940...
- iv. Cost sharing equally...
- v. Proceedings may commence before/after completion...

Notwithstanding any reference to the arbitration herein, the parties shall continue to perform their respective obligations under the Contract.

Rules of procedure for arbitration proceedings:

Any dispute between the Authority and a Bidder shall be referred to arbitration under the laws of Pakistan including Arbitration Act 1940.

Place of Arbitration and Award:

The arbitration shall be conducted in English language and place shall be Islamabad. The award shall be final and binding.





Bid Securing Declaration

Form 9: Bid Securing Declaration

Date: *[insert date (as day, month and year)]*

Bid No.: **P91675**

To: **The Centre of Excellence in Molecular Biology (CEMB) (The Centre of Excellence in Molecular Biology (CEMB)), Head Admin 87 West Canal Road, Thokar Niaz Baig, Model Town, Lahore (District), Lahore Division (Division), Punjab (Province).**

We, the undersigned, declare that:

We understand that, according to your conditions, Bids must be supported by a Bid Securing Declaration.

We accept that we will be blacklisted and henceforth cross debarred for participating in respective category of public procurement proceedings for a period of (not more than) six months, if fail to abide with a bid securing declaration, however without indulging in corrupt and fraudulent practices, if we are in breach of our obligation(s) under the Bid conditions, because we:

1. have withdrawn or modified our Bid during the period of Bid Validity specified in the Form of Bid;
2. Disagreement to arithmetical correction made to the Bid price; or
3. having been notified of the acceptance of our Bid by the Procuring Agency during the period of Bid Validity, (i) failure to sign the contract if required by Procuring Agency to do so or (ii) fail or refuse to furnish the Performance Security or to comply with any other condition precedent to signing the contract specified in the Bidding Documents.

We understand this Bid Securing Declaration shall expire if we are not the successful

Bidder, upon the earlier of (i) our receipt of your notification to us of the name of the successful Bidder; or (ii) twenty-eight (28) days after the expiration of our Bid.



Contract Form

SECTION IX: CONTRACT FORMS

THIS AGREEMENT made the ____ day of _____ 20____ between **The Centre of Excellence in Molecular Biology (CEMB) (The Centre of Excellence in Molecular Biology (CEMB)), Head Admin 87 West Canal Road, Thokar Niaz Baig, Model Town, Lahore (District), Lahore Division (Division), Punjab (Province).**

(hereinafter called “the Procuring Agency”) of the one part and [name of Bidder] of [city and country of Bidder] (hereinafter called “the Bidder”) of the other part:

WHEREAS the Procuring Agency invited Bids for provision of goods, viz., **CEMB AUGUST 2026 NP 01 (P91675)** and has accepted a Bids by the Bidder for the provision of Goods in the sum of [contract price in words and figures] (hereinafter called “the Contract Price”).

NOW THIS CONTRACT WITNESSETH AS FOLLOWS:

1. In this Contract words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.

2. The following documents shall be deemed to form and be read and construed as part of this Contract, In the event of any ambiguity or conflict between the Contract Documents listed below, the order of precedence shall be the order in which the Contract Documents are listed below:-

1. This form of Contract;
2. the Form of Bids and the Price Schedule submitted by the Bidder;
3. the Schedule of Requirements;
4. the Technical Specifications;
5. the Special Conditions of Contract;
6. the General Conditions of the Contract;
7. the Procuring Agency’s Letter of Acceptance; and
8. [add here: any other documents]

3. In consideration of the payments to be made by the Procuring Agency to the Bidder as hereinafter mentioned, the Bidder hereby covenants with the Procuring Agency to provide the Goods related services and to remedy defects therein in conformity in all respects with the provisions of the Contract.

4. The Procuring Agency hereby covenants to pay the Bidder in consideration of the provision of Goods and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the contract at the times and in the manner prescribed by the contract.

IN WITNESS whereof the parties hereto have caused this Contract to be executed in accordance with their respective laws the day and year first above written.

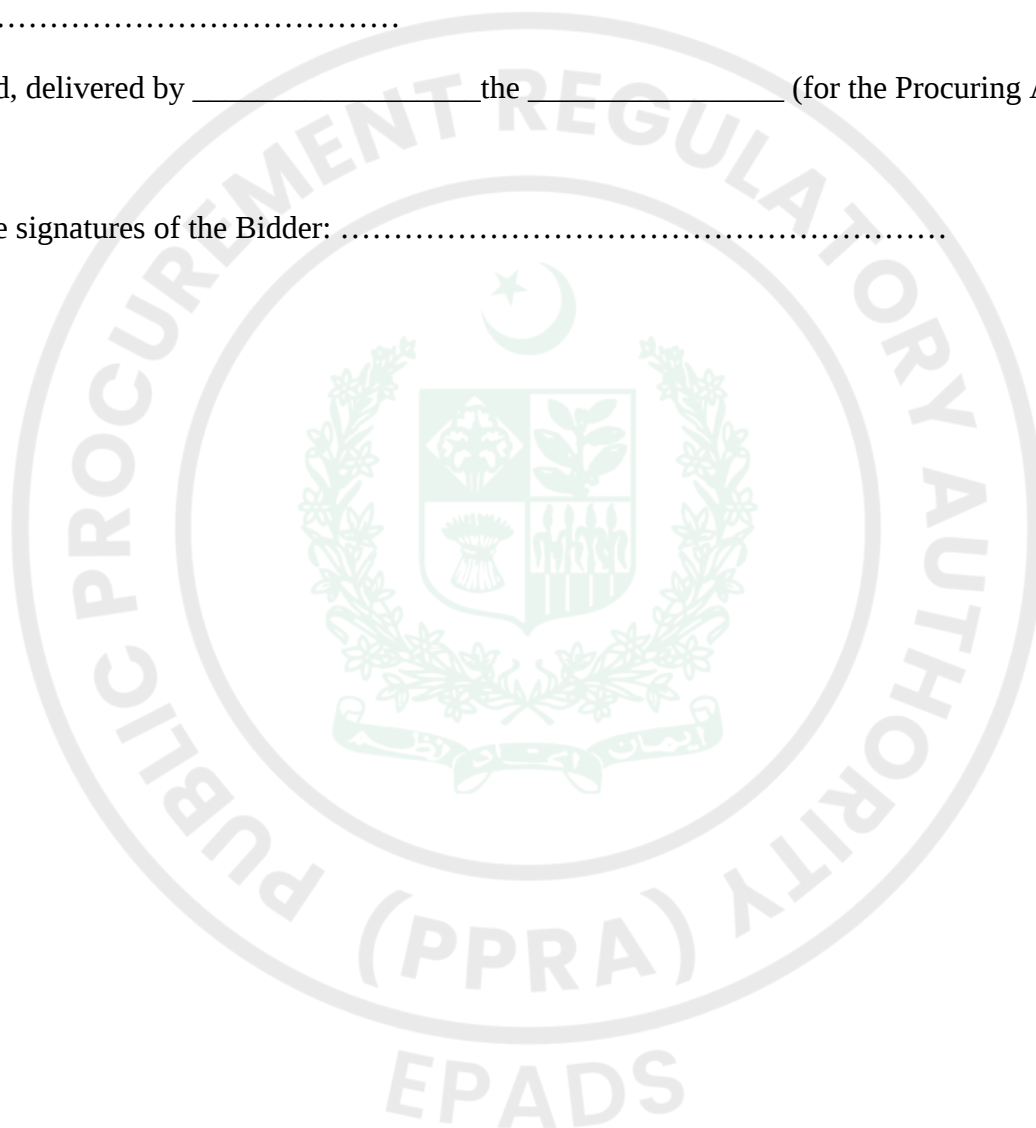
Signed, sealed, delivered by _____ the _____ (for the Procuring Agency)

Witness to the signatures of the Procuring Agency:

.....

Signed, sealed, delivered by _____ the _____ (for the Procuring Agency)

Witness to the signatures of the Bidder:





Integrity Pact

Integrity Pact

DECLARATION OF FEES, COMMISSION AND BROKERAGE ETC. PAYABLE BY THE SUPPLIERS OF GOODS, SERVICES & WORKS IN CONTRACTS WORTH RS.10.00 MILLION OR MORE

Contract

Number: Contract

Value: Contract Title:

Dated:

[Name of Supplier] hereby declares that it has not obtained or induced the procurement of any contract, right, interest, privilege or other obligation or benefit from Government of Pakistan or any administrative subdivision or agency thereof or any other entity owned or controlled by it (GoP) through any corrupt business practice.

Without limiting the generality of the foregoing [Name of Supplier] represents and warrants that it has fully declared the brokerage, commission, fee etc. paid or payable to anyone and not given or agreed to give and shall not give or agree to give to anyone within or outside Pakistan either directly or indirectly through any natural or juridical person, including its affiliate, agent, associate, broker, consultant, director, promoter, shareholder, sponsor or subsidiary, any commission, gratification, bribe, finder's fee or kickback, whether described as consultations fee or otherwise, with the object of obtaining or inducing the procurement of a contract, right, interest, privilege or other obligation or benefit in whatsoever form from GoP, except that which has been expressly declared pursuant hereto.

[Name of Supplier] certifies that it has made and will make full disclosure of all agreements and arrangements with all persons in respect of or related to the transaction with GoP and has not taken any action or will not take any action to circumvent the above declaration, representative or warranty.

[Name of Supplier] accepts full responsibility and strict liability for making and false declaration, not making full disclosure, misrepresenting fact or taking any action likely to defeat the purpose of this declaration, representation and warranty. It agrees that any contract, right interest, privilege or other obligation or benefit obtained or procured as aforesaid shall, without prejudice to any other right and remedies available to GoP under any law, contract or other instrument, be voidable at the option of GoP.

Notwithstanding any rights and remedies exercised by GoP in this regard, [Name of Supplier] agrees to indemnify GoP for any loss or damage incurred by it on account of its corrupt business practices and further pay compensation to GoP in an amount equivalent to ten times the sum of any commission, gratification, bribe, finder's fee or kickback given by [Name of Supplier] as aforesaid for the purpose of obtaining or inducing the procurement of any contract, right, interest, privilege or other obligation or benefit in whatsoever form from GoP.



Performance Guarantee Form

Performance Guarantee Form

To: **The Centre of Excellence in Molecular Biology (CEMB) (The Centre of Excellence in Molecular Biology (CEMB)), Head Admin 87 West Canal Road, Thokar Niaz Baig, Model Town, Lahore (District), Lahore Division (Division), Punjab (Province).**

WHEREAS *[name of Bidder]* (hereinafter called “the Bidder”) has undertaken, in pursuance of Contract No. *[reference number of the contract]* dated *[insert date]* for provision of Goods (hereinafter called “the Contract”).

AND WHEREAS it has been stipulated by you in the said Contract that the Bidder shall furnish you with a Bank Guarantee by a reputable bank for the sum specified therein as security for compliance with the Bidder’s performance obligations in accordance with the Contract.

AND WHEREAS we have agreed to give the Bidders guarantee:

THEREFORE, WE hereby affirm that we are Guarantors and responsible to you, on behalf of the Bidder, up to a total of *[amount of the guarantee in words and figures]*, and we undertake to pay you, upon your first written demand declaring the Bidder to be in default under the Contract and without cavil or argument, any sum or sums within the limits of *[amount of guarantee]* as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This guarantee is valid until the: *[insert date]*

Signature and seal of the Guarantors

[name of bank or financial institution]

[address]

[date]





Annexure

SPECIFICATION

Information (Read-Only)

See Form Under Additional Forms and Documents: **SPECIFICATION** (page number: 78)





Procurement Forms







Additional Forms and Documents



**CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore**

**Tender Notice No: AO/14080
Date: 10-08-2026**

**TENDER DOCUMENT
FOR
CONSTRUCTION OF CLEAN ROOM/BIOTECH LABORATORY**



AUGUST 2026

Page **1** of **39**



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

TENDER NOTICE

Tenders under rule 36 (b) of PPRA rules (2004) through e-procurement (EPADS) are invited from interested Civil, Mechanical, Contractors/bidder for " CONSTRUCTION OF CLEAN ROOM/BIOTECH LABORATORY " as mentioned vide Lot-1, 2 , 3, 4, 5, 6 & 7 respectively as follow.

Lot 1	HVAC SYSTEMS FOR BIOTECH / CLEAN ROOMS, PRODUCTION LINE 1 & 2, GROUND FLOOR	Estimated price: Rs 31.20 Million Bid security: 2% of above Estimated price (to be attached with technical bid)
Lot 2	CLEAN ROOMS PANELS	Estimated price: Rs 5.5 Million Bid security: 2% of above Estimated price (to be attached with technical bid)
Lot 3	ELECTRICAL WORKS	Estimated price: Rs 2.90Million Bid security: 2% of above Estimated price (to be attached with technical bid)
Lot 4	FIRE FIGHTING WORKS	Estimated price: Rs 0.80 Million Bid security: 2% of above Estimated price (to be attached with technical bid)
Lot 5	PROCESS / UTILITIES WORKS	Estimated price: Rs 13.3 Million Bid security: 2% of above Estimated price (to be attached with technical bid)
Lot 6	CIVIL, PLUMBING WORKS	Estimated price: Rs 1.80 Million Bid security: 2% of above Estimated price (to be attached with technical bid)
Lot 7	FURNITURE AND MECHANICAL WORKS	Estimated price: Rs 4.50 Million Bid security: 2% of above Estimated price (to be attached with technical bid)

Interested bidders can submit bids for all Lots (1–7) as a single package, for any single Lot, or for multiple Lots. All bids must be accompanied by a Bid Security (2% package wise as specified or 2% of total amount in case of single package) in the amount stated above in the shape of CDR in the Name of “Director, Centre of Excellence in Molecular Biology (CEMB)” and must be delivered at Purchase Section CEMB, on or before **10.09.2026** at 10:00 AM in sealed envelopes. Technical Bids will be opened at 10:30 AM on the same day in the presence of bidder’s representatives who choose to attend at the same address. **All the technical and financial bids must be uploaded on e-procurement portal (EPADS).**

The Director CEMB reserves the right to reject any or all tenders. Tender documents will be also available on centre website (www.cemb.edu.pk). If there is a public holiday announced by the Government on the tender opening date, then the tender will be opened on the next working day. It is to be noted that technical tender documents may please upload in the same sequence as demanded in the tender document.

HEAD (Admin), CEMB
Email: admin@cemb.edu.pk
Phone: +92 (42) 35293145,
Cell: 0300-4525194



TERMS AND CONDITIONS OF TENDER:-

- 1) Sealed tenders should be submitted by **filling in the rate** and amount in the BOQ given in the tender document along with the total tender cost. Each page of the tender should be signed & stamped by the contractor. Incomplete, part or conditional tenders will not be accepted.
- 2) **Earnest money** at the rate of 2% of the total tender cost in the shape of deposit at call in the name of Director CEMB, Lahore must accompany the tender, failing which the tender will be rejected.
- 3) Bid validity period after opening of the bid is **90 Days**.
- 4) **Time of Commencement:** Within 07 days from the date of receipt of the letter of acceptance.
- 5) **Time of Completion:** 90 days after commencement of the work.
- 6) Amount of **liquidated damages** at the rate of 0.1% of contract Price Per Day maximum deduction 10% of the contract price in case of delay in the completion of the project.
- 7) **Defect Liability Period:** 6 months from the date of Completion certificate
- 8) Percentage of **retention money:** 10% of gross value of Work done.
- 9) Only **registered Contractors**, who are on active tax payers list (ATC) of FBR are eligible to participate in tender competition.
- 10) The values of amount should not be filled **handwritten** in the tender documents, it must be filled be filled through typing.
- 11) Income **Tax**/Punjab Sales Tax: Taxes will be deducted as per Government Rules.



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

Evaluation Criteria of Bidders

Sr. No.	Parameters	Detail	Maximum Marks	Remarks															
1	Past Performance (Within previous 3 years)	(a) Major Institutions Served (Form A1): (15 marks) <table><tr><th colspan="3">No. of institutions served</th></tr><tr><td>i</td><td>1 to 3</td><td>5</td></tr><tr><td>ii</td><td>4 to 6</td><td>10</td></tr><tr><td>iii</td><td>7 & Above</td><td>15</td></tr></table>	No. of institutions served			i	1 to 3	5	ii	4 to 6	10	iii	7 & Above	15	15	Institutions mean government institutions / Public Sector organizations / Public Sector Universities / Government Agencies / Autonomous Bodies etc. Copies of relevant work orders / completion certificate must be attached.			
No. of institutions served																			
i	1 to 3	5																	
ii	4 to 6	10																	
iii	7 & Above	15																	
2	Relevant Experience	<table><tr><th colspan="3">General Experience</th></tr><tr><td>i</td><td>1 year</td><td>2</td></tr><tr><td>ii</td><td>2 years</td><td>4</td></tr><tr><td>iii</td><td>Above 2 years</td><td>5</td></tr></table>	General Experience			i	1 year	2	ii	2 years	4	iii	Above 2 years	5	5	Contractor has completed at least 3 projects of similar nature in last five years			
General Experience																			
i	1 year	2																	
ii	2 years	4																	
iii	Above 2 years	5																	
3	Enlistment record with Government Organizations & other agencies	1 Mark for each enlistment up to maximum of five enlistments	5	Enlistment Certificate															
4	Financial Status	<table><tr><th colspan="3">Financial Status</th></tr><tr><td>i</td><td>Tax Returns (Last 3 years). (1 marks each year)</td><td>3</td></tr><tr><td>ii</td><td>Bank Certificate*</td><td>2</td></tr><tr><td>iii</td><td>Bank Statement (Previous 12 months)</td><td>2</td></tr><tr><td>iv</td><td>Balance above the amount of quoted items.</td><td>3</td></tr></table>	Financial Status			i	Tax Returns (Last 3 years). (1 marks each year)	3	ii	Bank Certificate*	2	iii	Bank Statement (Previous 12 months)	2	iv	Balance above the amount of quoted items.	3	10	All provided documents can be verified by the Department.
Financial Status																			
i	Tax Returns (Last 3 years). (1 marks each year)	3																	
ii	Bank Certificate*	2																	
iii	Bank Statement (Previous 12 months)	2																	
iv	Balance above the amount of quoted items.	3																	



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

5	Technical Staff (Overall) (Form B1)	(Form-B) <table><tr><td colspan="3">Technical Staff</td></tr><tr><td>i</td><td>Less than 2 persons</td><td>0</td></tr><tr><td>ii</td><td>3 -5 persons and above</td><td>02</td></tr><tr><td>iii</td><td>6 persons and above</td><td>04</td></tr></table>	Technical Staff			i	Less than 2 persons	0	ii	3 -5 persons and above	02	iii	6 persons and above	04	4	Qualification marks will be awarded on the final degree. Complete supporting documents be attached.			
Technical Staff																			
i	Less than 2 persons	0																	
ii	3 -5 persons and above	02																	
iii	6 persons and above	04																	
6	Good Reputation Certificate from any Govt. Institution / Private Sector in Connection with Services	<table><tr><td colspan="3">Good Reputation Certificate</td></tr><tr><td>i</td><td>No certificate provided</td><td>0</td></tr><tr><td>ii</td><td>1 to 2</td><td>1</td></tr><tr><td>iii</td><td>3 to 5</td><td>3</td></tr><tr><td>iv</td><td>6 and above</td><td>5</td></tr></table> Appreciation Certificates / Satisfactory letters etc. must be attached.	Good Reputation Certificate			i	No certificate provided	0	ii	1 to 2	1	iii	3 to 5	3	iv	6 and above	5	5	Institutions mean government institutions / Public Sector organizations / Public Sector Universities / Government Agencies / Autonomous Bodies Private Institute etc.
Good Reputation Certificate																			
i	No certificate provided	0																	
ii	1 to 2	1																	
iii	3 to 5	3																	
iv	6 and above	5																	
7	Blacklisting from any agency	In case the firm is blacklisted, no Marks will be given and 15 points will be added in case affidavit by the company that it has not been black listed is attached.	15																
8	Litigation History in which Decision has been given against the firm(s)	In case the firm is involved in any litigation, no marks will be given and 10 points will be added in case affidavit of no litigation is attached.	10																
9	End User Satisfaction	<table><tr><td colspan="3">End User Satisfaction</td></tr><tr><td>i</td><td>Excellent</td><td>10</td></tr><tr><td>ii</td><td>Good</td><td>07</td></tr><tr><td>iii</td><td>Satisfactory</td><td>03</td></tr></table>	End User Satisfaction			i	Excellent	10	ii	Good	07	iii	Satisfactory	03	10				
End User Satisfaction																			
i	Excellent	10																	
ii	Good	07																	
iii	Satisfactory	03																	
10	Registration with income tax department	No points will be given if income tax certificate is not attached and 6 points will be added in case of valid certificate	6																



**CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore**

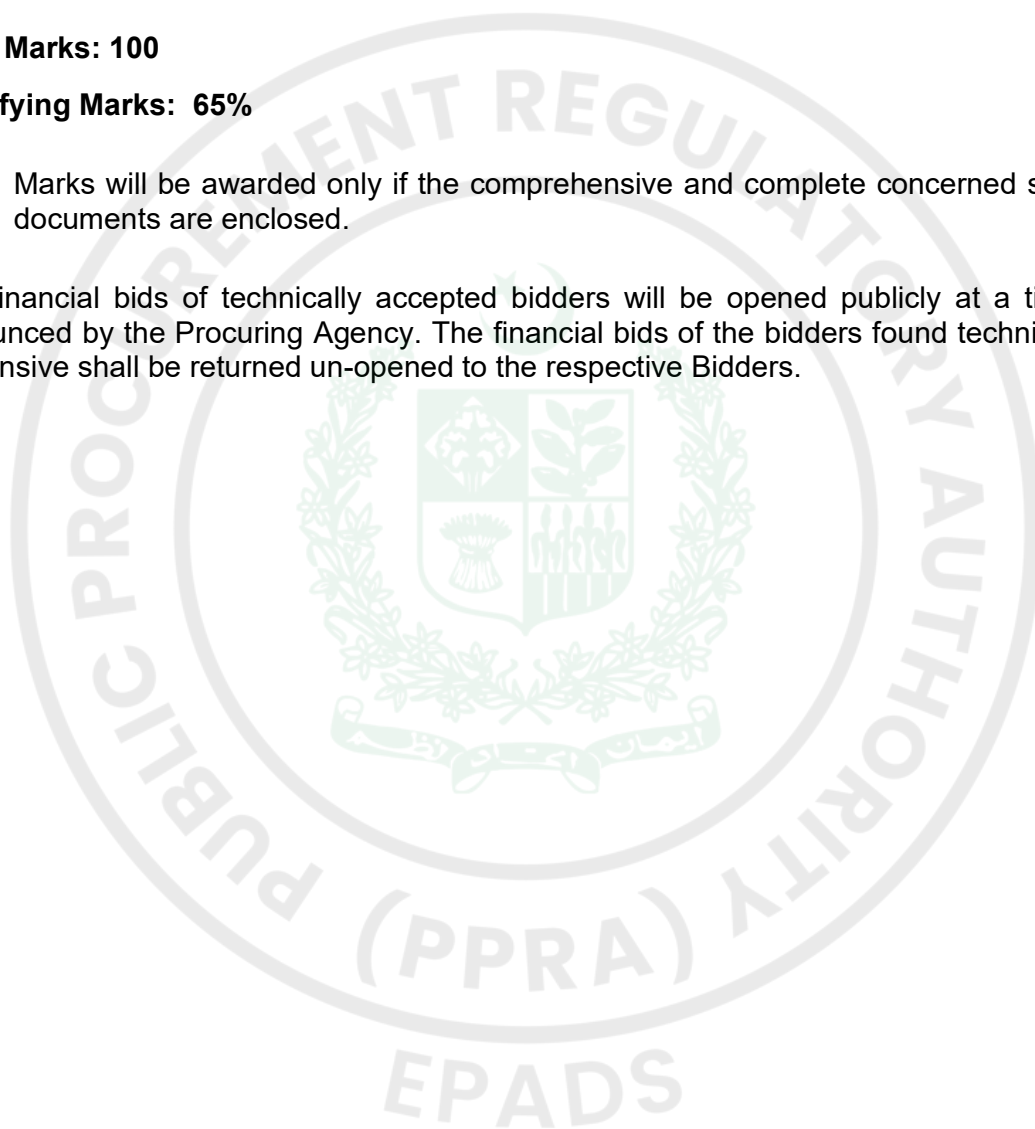
11	Project Schedule	Project Work Plan and Completion Schedule	15	
----	------------------	---	----	--

Total Marks: 100

Qualifying Marks: 65%

Note: Marks will be awarded only if the comprehensive and complete concerned supporting documents are enclosed.

The financial bids of technically accepted bidders will be opened publicly at a time to be announced by the Procuring Agency. The financial bids of the bidders found technically non-responsive shall be returned un-opened to the respective Bidders.





**CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore**

**HVAC SYSTEMS FOR BIOTECH / CLEAN ROOMS,
PRODUCTION LINE 1 & 2, GROUND FLOOR**

**“PHARMA GRAD HYGIENIC AIR HANDLING UNIT
AIR FILTRATION, CONTROLS, GAUGES, MONITORING
DISPLAY SYSTEM”**

**SUPPLY & COMMISSIONING OF
MODULAR TYPE DOUBLE SKIN**

AIR HANDLING UNITS

**WITH VFD BASED PLUG FANS, D’X & ELECTRIC REHEAT
TYPE COILS, WITH HIGH QUALITY FILTER SECTIONS**



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

DETAIL SPECIFICATION OF D'X COIL & ELECTRIC REHEAT BASED AIRHANDLING UNITS (Hygienic type)													
BIOTECH / CLEAN ROOM FACILITY (CLASS 1,000 TO 100, 000)-GROUND FLOOR													
Sr. No.	AHU No.	Service	D'X COOLING COIL CONDITIONS							ELECTRIC REHEAT COIL DATA			
			COIL EAT		COIL LAT		Coil Total Capacity (TH)	Coil Sensible Capacity (SH)	SCREW/SCROLL TYPE COMPRESSORS	Capacity	NO. OF STAGES	COIL EAT	COIL LAT
			DB	WB	DB	WB							
			°F	°F	°F	°F	MBTUH	MBTUH	HP	KW	NO.	°FDB	°FDB
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	1	DX COIL-1	115.0	83.0	51.2	49.8	225.0	191.3	2x12	8.0	2	51.2	53.8
2	2	DX COIL-2	115.0	83.0	51.2	49.8	270.0	229.5	2x14	9.0	2	51.2	54.2
3	3	DX COIL-3	85.5	65.5	52.5	50.1	66.0	56.0	1x7.5	5.0	2	52.5	55.5
4	4	DX COIL-4	74.5	62.3	53.5	51.4	48.0	41.0	1x6	4.0	1	53.5	54.8
5	5	DX COIL-5	75.8	63.0	54.5	51.9	48.0	40.0	1x6	4.0	1	54.5	55.4
LEGENDS:			NOTES										
TH = COIL TOTAL HEAT			1. ELECTRIC REHEAT COIL SHALL BE OPERATE WITH CLEAN ROOM HUMIDITY SENSOR TO MAINTAINED RH UPTO 60%.										
SH = COIL SENSIBLE LOAD			2. THE COIL & DRAIN PAN SHALL BE READILY REVERSIBLE AS PER SITE CONDITIONS.										
EDB = COIL ENTERING DRY BULB			3. FOR "MAKE" AND "COUNTRY OF MANUFACTURE" SEE SCHEDULE-I TO BID										
EWB = COIL ENTERING WET BULB			"LIST OF APPROVED MANUFACTURERS FOR ITEMS / MATERIALS / EQUIPMENTS										
EAT = ENTERING AIR TEMPERATURE			OF HVAC WORKS"										
LAT = LEAVING AIR TEMPERATURE													
EWT = ENTERING WATER TEMPERATURE													
LWT = LEAVING WATER TEMPERATURE													
AMBIENT OUTDOOR CONDITION:													
INDOOR DESIGN CONDITIONS:													
AHU-1, 2 & 4			22±2 °CDB & NMT 50% RH										
AHU-3 & 5			23±2 °CDB & NMT 50% RH										



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

UNITS IDENTIFICATIONS (SCHEDULE OF FANS)																		
CENTRIFUGAL & CABINET TYPE DUCTED INLINE FANS																		
CODE	TYPES	SERVICES	QTY	AREA/SERVICES	REFERENCE		AIR FLOW CFM	EXTERNAL SP	MAX. OV PPM	FAN DRIVE	MOTOR			AMCA DESIGNATION		FILTER TYPES		
					LOCATION	MODEL					MAX. FAN MOTOR RPM	FAN MOTOR V/PHZ	FAN MOTOR PHASE KW	APPROX. DIA INCH	DISCH ARREANGEMENT	FAN		PRE FILTER, HEPA H13, 99.97% EFF.
1	CENTRIFUGAL F.C. DUCTED INLINE (SMS)	EXHAUST AIR	1	PRODUCTION RM-1 & CHANGE ROOMS	ROOF TOP	..	2840	3.0	2000	BELT	1440	420V/3P/50HZ	4.5	18	FRONT	TOP	2" THICK	
2	CENTRIFUGAL F.C. DUCTED INLINE (SMS)	EXHAUST AIR	1	PRODUCTION RM-2 & CHANGE ROOMS	ROOF TOP	..	3345	3.4	2000	BELT	1440	420V/3P/50HZ	5	24	FRONT	TOP	2" THICK	24"X24"X12" & 24"X24"X6"
For the fan motors below 1 HP, manufacturer should provide fans with three speed controller, while above 1 HP the fan manufacturer should provide the fans with VFD.																		
NOTES:-																		
1. FOR "MAKE" AND "COUNTRY OF MANUFACTURE" SEE SCHEDULE-1 TO BID																		
"LIST OF APPROVED MANUFACTURERS FOR ITEMS / MATERIALS / EQUIPMENTS OF HVAC WORKS"																		
2. Centrifugal fans shall be Cabinet type with mounting/hanging arrangements																		
3. FC Fan G.I Impeller for low pressure																		
4. IP-55, Class-F imported or Siemens/ABB Motor.																		
5. 220V/Ph/50Hz in 1Hp or less.																		
6. 380-400V/3Ph/50Hz in 1Hp and above.																		
7. G.I construction with PU (25mm Thick) sheet in Double skin.																		
8. Hi quality standard external aluminum profile																		
9. Greasing, acid bath phosphating with non-ferrous coating and finally electrostatic paint at 180°C.																		
10. Exhaust Air Back Draft Shutter/Lower should be provided at discharge side.																		
11. Sound power level of all fans at discharge shall not exceed 85 db.																		



TECHNICAL SPECIFICATION

General: Air handling units as shown on the drawings, low velocity (low pressure or high pressure single zone draw - thru or multi zone blow-thru) type shall be provided for various areas of the Building and shall be of capacities under the specified conditions of operation as given in the Schedule of Equipment. All components to be heavy duty type and suitable for continuous operation.

The Units installed outdoors to have weatherproof construction.

The unit shall be complete with cooling/heating coil(s), fan(s), fan motor(s), Motorized dampers (VCDs) as specified, internal face and bypass dampers for single zone Units if specified in the Schedule, multi-zone units to have segmented zone face and bypass dampers, perforated plate in the heating or bypass section to balance air resistance across the cooling coil, filter sections(s) suitable for filters specified elsewhere, access plenum sections for high efficiency filters, eliminators SS 304, mixing box with VCDs as show in drawings, drain pan and all other components and accessories to complete the unit.

The casing shall be modular type, panels of best quality not less than 1.2mm thick sheet steel, Properly reinforced and braced for maximum rigidity, with smooth internal and external surfaces and to have removable panels and access doors for easy access to all internal parts.

The casing and access doors to be insulated with at least 50mm thick min. 74kg / cum density fiberglass or 100-120kg / cum density mineral wool rigid board type or equivalent insulation, with face coating to resist erosion with air velocities up to 20 m / sec., properly fastened to the panels.

The integrity of the insulation shall be maintained at the unit panel joints to avoid sweating at the joints.

The unit sections thru which air at ambient temperature only is flowing may not be insulated.

Double Skin Construction (DSC) Unit. Where specified, units of double skin construction shall be Supplied. DS units shall have insulation sandwiched between two steel sheets, internal to be min. 0.6mm thick and external 1.2mm thick. The casing panels and access doors to be formed by sheets folded together at edges with smooth internal and external surfaces. The panels to be supported between sturdy aluminum corners/frame work or equivalent arrangement. Internal/external sheets may be of material other than steel as specified in the Schedule.

Thermal barrier shall be provided between internal and external metal surfaces to prevent sweating. Units of up to 2 cum/sec (4000cfm) capacity may have 40 mm thick panels, larger capacity units with 50mm thick panels. The insulation may be min. 75kg/cum density rigid board type or foamed in place polyurethane, 40 & 50mm.



**CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore**

Unit sections thru which air at ambient temperature only is flowing may not be insulated and be of single skin construction.

The type and thickness of insulation to ensure that the panels and casing joints do not sweat with ambient dew point up to 28 oC.

To provide easy access to all internal parts, the casing shall have access doors or inspection panels of same construction, with inner surface flush and smooth with adjoining surfaces, tightly sealed with sealing gasket and easy to open or close, provided with handles may have removable type panels/doors with hand grip bolts and larger size with hinged type access doors.

The casing panel sheets and supporting frame work to be corrosion protected, boundaries and powder paint coated or baked enamel finished, or as specified in the Schedule of Equipment.

Multi leaf opposed blade type air volume control dampers (VCDs) shall be provided in the mixing box and other sections as specified in the Schedule or shown in the drawings. Damper bearing (preferably of nylon construction) and linkages to be of construction and design to be easily movable with minimum force and suitable for operation by automatic damper actuators. Open to close position indicators to be provided. The damper blades to be interlinked with gear wheels at one end to ensure simultaneous smooth movement of all blades. Damper blades fitting within the frame to allow minimum air leakage from sides. The blades to interlock on closure for effective air seal.

The unit section requiring draining (coils, humidifiers) shall be installed on a common base frame to act as a drain pan with drain outlet connection on both sides. The construction shall be SS 304 OR sandwich type completely insulated with at least 15mm thick foamed in place insulation with out any joint.

The different components of each unit section to be fixed through the casing to two external base channels so that the unit is not in contact with floor.

The design of the unit should make site assembly work quick and easy. The assembly will be only with nuts and bolts and clamps. The assembled panels shall form a strong and rigid casing.

The casing shall be tested to be air tight against negative or positive pressure of 200mm WG (2000 Pascal) or higher if specified

The unit to be mounted on rubber in shear or similar approved vibration isolators to isolate it from the Building structure.



**CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore**

CENTRIFUGAL BACKWARD OR PLUG TYPE FAN

General: The Contractor shall supply fans of the type specified below, the Contractor shall be responsible for the proper selection of the fans so that the specified operating conditions are obtained. Motors shall conform to specification under MOTOR and shall be sized to provide the required BHP for meeting the specified conditions without overloading.

Centrifugal Fans: Shall be single width, single inlet or double width double inlet, class I, II or III as required or indicated.

Fan Housing: Housings shall be of heavy gauge steel, continuously welded construction with rigid reinforcement. In class I & II construction size 12 inches through 27 inches shall have 12 gauge sides and 14 gauge scrolls, while sizes 30 inch through 66 inches shall have 10 gauge sides and 12 gauge scrolls. All fan housings shall be equipped with flanged discharge and removable spun inlet cones designed for smooth airflow. Single-inlet, single-width fans shall be provided with extended inlet collars for slip-on type duct connections. Inlet collars shall be of heavy gauge round design.

Fan Wheels: shall be rigidly constructed, accurately balanced both statically and dynamically on precision electronic balancers, and shall be free from objectionable noise and vibration. Each wheel shall be designed for critical speed of at least 1.25 times the maximum class speed. Up to 27 inches fan blades may be forward curved, backward curved or airfoil design. Fan blades over 27 inches shall have backward curved or airfoil design, unless otherwise specified under EQUIPMENT & MATERIAL SCHEDULE. Forward or backward curved wheel shall be of steel plate, while aerofoil wheels shall be of cast-aluminum, or formed steel with cavity filled.

Bearing: Fans shall have heavy duty, grease lubricated, precision anti-friction ball or roller, self-aligning, pillow block type bearings, selected for minimum average bearing life of 125,000 hours when operating at maximum catalogued class conditions. Bearings shall be provided with suitable arrangements for re-lubrication.

Mounting & Drive: The fan and motor drive shall be mounted on heavy steel framing. Motor shall be mounted on slide rails. Drive arrangement shall be as specified, or as recommended by AMCA for the condition of operation. Drive shall be selected for minimum 1.2 BHP. Fans up to & including 50 HP shall be with variable pulley & suitable for adjustment within + 10% of specified RPM. Provide complete belt guard on fan and motor pulley, constructed of heavy steel framing and expanded metal mesh screening.

Painting & Coating: Each fan component shall be thoroughly degreased, phosphatized and provided with two coats of special anti-rust primer and two coats of stove enameled paint.



**CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore**

Installation: Fans shall be rigidly secured so that they operate without vibration and transmission of vibration to structure shall be isolated. Connection to ducting shall be through flexible connectors. Ducting connection to fan shall ensure lowest turbulence and smooth transition of sides. All supporting arrangement of the fans shall be drawn up by this contractor and submitted to the consultant for approval. Floor mounted fan shall be installed as a 100mm high concrete foundation with edges provided with 25x 25 x 3 mm angle iron.

Commissioning and Testing: The fans shall be commissioned and tested by this contractor. Test forms, supplied by the consultants shall be filled in and the consultant's approval obtained.

The fans to be double inlet type and statically and dynamically balanced and tested in the factory. The fan bearings must be quiet in operation, self-aligning type and to prevent leakage of oil grease, preferably permanently sealed and prefabricated otherwise to require infrequent lubrication and oil grease cups must be provided in external accessible positions for easy lubrication.

Fan to be selected for quiet operation, max. 2000-rpm, fan outlet velocity not to exceed 10 m / s (2000 fpm) or as specified, fan outlet connected to the casing with short flexible collar of heavy duty air tight canvas properly sewn and clamped, max. 1400-rpm electric motor, direct drive, fan speed +5-10% of the design selected speed to balance the air systems after commissioning of the unit. The fan motor shall be equipped with VF DRIVE of protection Class IP54 or IP55 and selected so as not to be loaded more than 90% of net rated hp under specified operating conditions. The fan motor to be mounted on a sturdy adjustable base. The fan motor may be located inside or outside the unit casing. If located inside, both fan and motor shall be installed on a common sturdy base mounted on rubber in shear or similar vibration isolators and isolated from the unit casing.

5. Coil (s) Section:

The water-cooling or heating coil(s) shall be of heavy gauge seamless copper tubes with mechanically bonded aluminum fins, tested with at least 20 bar air pressure in a water tank. Unless otherwise specified the cooling and heating coils shall have not more than fins/cm (10 fins/inch) and face velocity not to exceed 2.6 m/s (500 fpm) and heating coils to have not more than 5 fins/cm (12 fins/inch) and face velocity not to exceed 5.1m/s (100 fpm). The air flow to be uniform across the coil face.

The steam / electrical heating coil(s) where specified shall be of copper tubes with mechanically bonded aluminum fins, tested for twice the operating pressure but for at least 3.5 bar and having the steam supply and condensate return connections on the same end. The coil shall have accurately sized steam distribution header and tubes with evenly spaced orifices to discharge steam in the direction of condensate flow to ensure even distribution of steam over the full length of each tube and to provide uniform supply air temperature with full load or any degree of steam modulation.



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

Where the steam coil is installed in an air duct, the casing shall be of at least 1.6mm thick sheet forming and supports and top and bottom channels with holes for fastening to duct work. Unless otherwise specified, the coil shall not have more than 5 fins/cm (12 /inch) and face velocity not to exceed 2.1m / s (550 fpm).

If specified, the coils to have protective coating for corrosion protection against sea air. The tendered to furnish details of the protective coating. Each coil to have automatic air vent at highest point and drain valve with plug at the lowest point.

Units for the areas requiring humidification shall be equipped with humidifiers of the type as specified in the Schedule. For water spray type humidifier, water supply point shall be arranged by the Employer from the Building water supply system. Pumps, automatic controls, valves, heat exchangers, pipe and fittings, etc. required to complete the humidifier system shall be provided by the Contractor unless specified otherwise.

The steam grid humidifiers where specified, shall be suitable for the steam supply Pressure and to ensure uniform air humidification.

The conditions of operation for the units, coil capacities, water pressure drop through the coil, steam supply pressure, etc. shall be as given in the Schedule Equipment. Coil capacity ratings shall be ARI certified for units of USA origin.

6. Filters:

Provide filter section (s) with filters. Each AHU shall be provided with out Filters as indicated in CONDITION OF OPERATIONS. Filters sections shall confirm to specifications and sizes given under SELECTION DATA OF AHUS

7. Mixing Box:

Mixing box shall be furnished for all air handling units where indicated in Schedule of EQUIPMENT & MATERIALS or shown on drawings. Damper arrangement at top & side, or bottom & side, shall be parallel type and set up for merging of air streams inside the box. Damper blade rods shall rotate on rustproof bushings and shall be air tight. Each box shall be equipped with duct connection flanges and necessary fastener holes. Mixing box shall be the manufacturer s standard product. Access doors shall be hinged & removable type. Dampers shall be low leak airfoil type with a leakage rate of less than 2%. In selecting the units, the Supplier shall carefully check and confirm that the units can be installed and conveniently serviced and maintained within the respective spaces indicated on the drawings for unit installation.



8. FAN MOTORS

Motors shall be of the type and sizes as specified for all air-conditioning equipment and shall comply with rules of electrical machines as stated in VDE 0530/59 and BS 2613. Adjustment in motor HP or speed shall be allowed to meet the system requirements, and site conditions. Generally, all motors shall be constant speed, 3 phase, squirrel-cage induction type unless otherwise specifically noted.

The motors offered shall be of the 400V, 3-phase, 50 Hz AC system type and shall be suitable for operation at 400V + 10%.

The motors shall be suitable and able to give required output under site conditions i.e. maximum ambient temperature of 120°F. (50°C) and altitude 1700 feet (518 meters).

The motors where specified to be single phase should be suitable for operation at 230 + 10% volts, 50 Hertz, AC System.

The motors shall be tropicalized, Class insulated and fungus proof, unless otherwise specified. The motors shall have a totally enclosed fan-cooled (TEFC) construction. All motors should be arranged for quiet operation and guaranteed to give the required output and fulfill the requirements of the machineries without producing any sound outside the machine room.

Motors rated 25HP and above shall be fitted with thermostats in the three phase windings, along with a suitable relay in the MCC to trip the starter if the motor overheats.

Motors being started with Variable Frequency Drives (VFD) shall be confirmed by the manufacturer not to deviate or otherwise be adversely affected on being operated through a VFD.

Magnehalic Gages: At Filters: Each bank of high efficiency filter and HEPA filter shall be provided with an appropriate station to determine pressure drop, consisting of Magnehalic gage, probes, flexible tubes and mounting arrangement.

The tendered to supply the following information:

Unit construction details.

The overall unit dimensions and operating weight.

Coil(s) constructions, face area, number of fins per cm (or inch), face air velocity, air resistance, water pressure drop.

Type of fan, fan rpm, air velocity at fan outlet, unit noise level rating in dB, fan HP requirement, fan motor HP & rpm, cum/ hour (or cfm) air flow capacity and total static pressure at which the fan selected.

Manufacturer s performance guarantees certificate and technical bulletins including coil capacity tables and fan performance curves. Type and construction of D X & Reheat Coils (As mentioned)



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

The unit shall have a collar for fixing supply air duct or grille. Ceiling suspend units shall have suspension brackets and floor mounted units bottom supports. In either case the unit shall have not transmit vibrations to the building structure.

All units shall have one thick viscous oil permanent cleanable type air filter of aluminum media.

Refrigerant should be providing by the supplier at their factory premises or at the time of commissioning of all units including F.A. D X Units (If required).

SPARE PARTS

The supplier / contractor shall include the price of complete set of spare parts for all items Required for one-year operation for the specified operating hours. Amongst other spare parts, the supplier / tenderer shall include the Following with limitation:

One set each of fan-motors of same capacity, minimum one motor should be quoted as spare.

(1 20HP)

Silicon Sealant & rubber gasket should be providing, so sufficient for one unit as spare.

Similarly, one set of all type of FILTERS should be providing, so sufficient for one-year application as spare.



SPECIFICATIONS HVAC VALVES, RUBBER JOINTS, GAUGES, THERMOMETERS

GATE VALVES: DN65 & ABOVE:

Handwheel Operation: Rising Stem OS&Y or Non-Rising Stem (NRS), (as specified in design)
Flange to Flange: EN558-1(3) comply to EN1171, API 600
Body & Bonnet Material: Cast Iron ENGJL250, Bolted Bonnet
Seats & Stems Material: Bronze & must be renewable
End Connection: Flange Type
Flange Holes Drilling: PN16 EN 1092
Painting: Epoxy or Polyurethane Paint, minimum 100 microns thickness
Pressure Rating: Minimum PN16 (232 Psi)

GATE VALVES: DN15 TO DN50:

End to End: EN 12288-1, BS 5154 or equal
Body & Bonnet Material: Bronze
End Connection: Threaded Type
Pressure Rating: Minimum PN20 (290 Psi)

GLOBE VALVES: DN65 & ABOVE:

Body & Bonnet Material: Cast Iron ENGJL250, Bolted Bonnet Bolted Bonnet
Handwheel Operation: Rising, (as specified in design)
Flange to Flange: EN558-1(1) comply to EN13789
Seats & Stems Material: Bronze & must be renewable
End Connection: Flange Type
Flange Holes Drilling: PN16 EN 1092
Painting: Epoxy or Polyurethane Paint, minimum 100 microns thickness
Pressure Rating: Minimum PN16 (232 Psi)

GLOBE VALVES: DN50 & BELOW:

Body & Bonnet Material: Bronze
End to End: BS 5154 or equal
End Connection: Threaded Type
Pressure Rating: Minimum PN20 equal to (290 Psi)

NON-RETURN OR CHECK VALVES: SWING TYPE, DN65 & ABOVE:

Body & Bonnet Material: Cast Iron ENGJL250, Bolted Bonnet
Flange to Flange: EN558-1(10) comply to EN12334, ANSI 16.10
Disc Seat Rings Material: Bronze & must be renewable
End Connection: Flange Type
Flange Holes Drilling: PN16 EN 1092
Painting: Epoxy or Polyurethane Paint, minimum 100 microns thickness
Pressure Rating: Minimum PN16 (232 Psi)



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

NON-RETURN OR CHECK VALVES: SWING TYPE, DN50 & BELOW:

End to End: BS 5154 or equal
Body & Bonnet Material: Bronze
End Connection: Threaded Type
Pressure Rating: Minimum PN20 (290 Psi)

STRAINERS Y-TYPE: DN65 & ABOVE

Body & Bonnet Material: Cast Iron ENGJL250, Bolted Bonnet
Flange to Flange: EN558-1(1) comply to EN13789
Perforated Mesh: Stainless Steel 304 - Stainless Steel 316
End Connection: Flange Type
Flange Holes Drilling: PN16 EN 1092
Painting: Epoxy or Polyurethane Paint, minimum 100 microns thickness
Pressure Rating: Minimum PN16 (232 Psi)

STRAINERS Y-TYPE: DN50 & BELOW

Body & Bonnet Material: Bronze
End to End: BS 5154 or equal
Perforated Mesh: Stainless Steel 304 - Stainless Steel 316
End Connection: Threaded Type
Pressure Rating: Minimum PN20 (290 Psi)

BALL VALVES / DRAIN COCKS: DN50 & BELOW Used for all type of drains
WATER & DOMESTIC GAS APPLICATION

Body & Bonnet Material: Bronze or DZR Forged Brass (Dezincification Resistant Brass)
Thread Standard: BS21
End Connection: Threaded Type
Ball: 304 stainless steel / Copper
Lever: Aluminum
Seat: Reinforced Teflon
Pressure Rating: Minimum PN20 equal to (290 Psi) & maximum Class PN32 equal to (460 Psi)

RUBBER EXPANSION JOINTS / RUBBER BELLOWS: DN65 & ABOVE

Body: EPDM / Neoprene Rubber
Sphere: Single
Fabric: Nylon
Flanges: Mild Steel Galvanized
Wire: Steel Wire – Galvanized
End Connection: Flange Type
Flange Holes Drilling: PN16 EN 1092
Pressure Rating: Minimum PN16 232 Psi)



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

RUBBER EXPANSION JOINTS / RUBBER BELLOWS: DN50 & BELOW:

Body: EPDM / Neoprene Rubber
Sphere: Single
Fabric: Nylon
End Connection: Threaded Type
Pressure Rating: Minimum PN10 (150 Psi) Maximum PN16 (232 PSI)

STAINLESS STEEL FLEXIBLE HOSES (FOR USER POINT) DN50 & BELOW

Body: Stainless Steel 304
Length: 1200mm (4 Feet Long)
Braided: Yes
Pressure Rating: Minimum PN16 232 Psi)
End Connection: Female Threaded

BALANCING VALVES OR CIRCUIT SETTERS: DN65 & ABOVE:

Body & Bonnet Material: Cast Iron ENGJL250, Bolted Bonnet
Flange to Flange: EN558-1(1) comply to EN13789
Disc & Disc Rings: Ductile Iron Disc, PTFE Disc Rings, or EPDM Coated
O Ring: EPDM or PTFE Teflon
Indicator: ABS
Bushing: Bronze
End Connection & Drill: Flange Type, PN16 EN 1092
Painting: Epoxy or Polyurethane Paint, minimum 100 microns thickness
Pressure Rating: Minimum PN16 equal to (232 Psi)

BALANCING VALVES OR CIRCUIT SETTERS: DN50 & BELOW:

Body & Bonnet Material: Bronze
Pressure Rating: Minimum PN25 equal to (360 Psi)
Indicator: ABS / PVC
End Connection: Threaded Type
Pressure Rating: Minimum PN25 equal to (360 Psi)

FCU TERMINAL KIT / BY PASS ASSEMBLY: DN50 & BELOW

Built In Ball Valves, Strainers, PICV with Modulating Actuator, Complete with Insulation Box.

For Higher GPM in PICV, without Insulation is acceptable.

Static Pressure: 2500 kPa / 360 ps
Media Temperature: -20°C to +120°C / -4°F to +248°F
Housing & Cover: Forged brass DZR ASTM CuZn36Pb2As (CW602N)
O-rings: EPDM
By-Pass ball valves: Chemically Nickel-Plated Brass
By Pass Handle: Painted Aluminum
Strainer Mesh: 420μ (=40 mesh) stainless steel
Drain Valve: Brass DZR ASTM CuZn36Pb2As (CW602N)
Drain Ball Valve: Chemically Nickel-Plated Brass
Insulation: EPP



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

End Connection: Female ISO
Housing Tags: 1/4" ISO

ACTUATOR SPECS

Supply Voltage: 24V AC/DC $\pm 10\%$, 50/60 Hz
Type: Electrical, bi-directional synchronous motor
Power Consumption: AC: 2.5VA operating (4.7VA max) DC: 1.2W operating (2.2W max)
Control Signal: Analog 0(2)-10V DC, $<0.5\text{mA}$
Feedback: Yes
FailSafe Feature: No (otherwise as required)
Auto Stroke: Yes
Operating Time: Maximum 22 Seconds
Humidity Rating: 0..85% rH, no condensation
Protection: IP54 including upside-down, class III, indoor use only
Closing Adjustment: In operation, actuator will self-adjust according to the closing point of the valve

PRESSURE INDEPENDENT CONTROL VALVE: 15MM to 40MM:

Static Pressure 2500 kPa / 360 psi
Ambient Temperature: $+1^{\circ}\text{C}$ to $+50^{\circ}\text{C}$ / $+34^{\circ}\text{F}$ to $+122^{\circ}\text{F}$
Media Temperature -20°C to $+120^{\circ}\text{C}$ / -4°F to $+248^{\circ}\text{F}$
Material
Insert Glass-reinforced PSU/POM/PPS
Diaphragm Insert 20mm: EPDM
Insert 40mm: Hydrogenated acrylonitrile-butadiene-rubber
Internal Metal Components Stainless steel
O-Rings EPDM
Cone PPS
Maximum Close off Pressure 600 kPaD / 87 psid
Maximum Operational ΔP : 400 kPaD / 58 psid
Shut-off leakage: ANSI / FCI 70-2 2006 / IEC 60534-4 - Class IV
Flow rate range: Insert 20mm: 0.0103-0.308 l/sec / 0.163-4.89 GPM
insert 40mm: 0.240-1.29 l/sec / 3.81-20.4 GPM

VALVE MATERIAL:

Body: Forged brass ASTM CuZn40Pb2 / DZR brass CW602N
Ball valve: End connections ABV: Chemically nickel-plated brass ball
End Connection Female Threaded

PRESSURE INDEPENDENT CONTROL VALVE: 40MM to 50MM

Static Pressure 2500 kPa / 360 psi
Ambient Temperature: $+1^{\circ}\text{C}$ to $+50^{\circ}\text{C}$ / $+34^{\circ}\text{F}$ to $+122^{\circ}\text{F}$
Media Temperature -20°C to $+120^{\circ}\text{C}$ / -4°F to $+248^{\circ}\text{F}$
Material
Flow Regulation Unit Internal: Glass-reinforced PSU/POM/PPS
Internal Metal Components Stainless steel
Diaphragm Hydrogenated acrylonitrile-butadiene-rubber
Housing & Covers Forged brass ASTM CuZn40Pb2 / DZR brass CW602N



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

End Connection	Female Threaded
Maximum Close off Pressure	600 kPaD / 87 psid
Maximum Operational ΔP :	400 kPaD / 58 psid
Shut-off leakage:	ANSI / FCI 70-2 2006 / IEC 60534-4 - Class IV
Flow rate range:	0.528-3.79 l/sec / 8.36-60.0 GPM

PRESSURE INDEPENDENT CONTROL VALVE: 50MM to 250MM

Static Pressure	4000 kPa / 580 psi
Ambient Temperature:	-20°C to +120°C / -4°F to +248°F
Media Temperature	-10°C to +50°C / +14°F to +122°F
Material	
Diaphragm	Hydrogenated acrylonitrile-butadiene-rubber
Body	Ductile iron ASTM A395 Grade 60-40-18
O-Rings	EPDM
Internal Metal Components	Stainless steel
End Connection	Universal flange connections which can be used with both
ISO and ANSI	
Bosy Tappings:	1/4" ISO
Maximum Close off Pressure	700 kPaD / 100 psid
Maximum Operational ΔP :	600 kPaD / 87 psid
Shut-off leakage:	ANSI / FCI 70-2 2006 / IEC 60534-4 - Class IV
Flow rate range:	1.48-76.8 l/sec / 23.4-1220 GPM

PRESSURE GAUGE WITH SIPHON & GAUGE COCK:

Body:	Stainless Steel 304
Dial Size:	4" or 4.5"
Window:	Plastic
Rating:	0-160 (11 Bar) or 0-230 PSI (16 Bar)
Connection:	1/2" BSP Threaded
Internals	Copper
Filling	Glycerine Filled or Fillable
IP Code	IP65 or Above
Siphon Type:	Ring Type
Siphon Material	Black Steel
Gauge Cock	Known as Ball Valve

THERMOMETER WITH THERMOWELL:

Case Material:	Polypropylene or Painted Aluminum
Pocket Material:	Brass
Case Size:	200mm minimum
Window:	Plastic
Rating:	0-120C
Filling:	Blue / Red Spirit
Connection:	1/2" BSP Threaded
Thermowell Material	Forged Brass (from Forged Brass Rod, Not Casted)
Thermowell Length:	1/2"



SPEICFICATIONS FOR VALVES, STEAM / DIESEL / GAS / OIL APPLICATION

GATE VALVES: DN50 & ABOVE

Handwheel Operation: Rising Stem OS&Y, (as specified in design)
Flange to Flange: API 600
Body & Bonnet Material: Cast Steel A216 WCB, Bolted Bonnet
Seats & Stems Material: Stainless Steel Cr13%
End Connection: Flange Type, Raised Face
Flange Holes Drilling: ANSI 16.5 Class 150 (as specified in design)
Painting: Temperature Resistant, Corrosion Resistant Paint
Working Parameters: 150 LBS at 350 Celsius degrees

GATE VALVES: DN50 & BELOW

End to End: API 602 / BS EN ISO 15761:2002
Body & Bonnet Material: Forged Steel ASTM A105
End Connection: Threaded / Socket / Butt Weld Type (as specified in design)
Working Parameters: 300 LBS at 350 Celsius degrees
DN50 in Forged Steel: Only to use where high pressure or temperature is required, otherwise to follow as in A216 WCB

GLOBE VALVES: DN65 & ABOVE

Handwheel Operation: Rising Stem OS&Y, (as specified in design)
Flange to Flange: ANSI 16.34 / ANSI 16.10
Body & Bonnet Material: Cast Steel A216 WCB, Bolted Bonnet
Seats & Stems Material: Stainless Steel Cr13%
End Connection: Flange Type, Raised Face
Flange Holes Drilling: ANSI 16.5 Class 150 (as specified in design)
Painting: Temperature Resistant, Corrosion Resistant Paint
Working Parameters: 150 LBS at 350 Celsius degrees

GLOBE VALVES: DN50 & BELOW

Body & Bonnet Material: Forged Steel ASTM A105
End Connection: Threaded / Socket / Butt Weld Type (as specified in design)
Working Parameters: 300 LBS at 350 Celsius degrees

DN50 in Forged Steel: Only to use where high pressure or temperature is required, otherwise to follow as in A216 WCB

NON-RETURN OR CHECK VALVES (SWING TYPE): DN65 & ABOVE

Body & Bonnet Material: Cast Steel A216 WCB, Bolted Bonnet
Flange to Flange: ASME 16.34 / ANSI 16.10
Disc Seat Rings Material: Stainless Steel C13%
End Connection: Flange Type, Raised Face
Flange Holes Drilling: ANSI 16.5 Class 150 (as specified in design)
Painting: Temperature Resistant, Corrosion Resistant Paint
Working Parameters: 150 LBS at 350 Celsius degrees

NON-RETURN OR CHECK VALVES (SWING TYPE): DN50 & BELOW



**CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore**

End to End: ASME 16.34 / BS EN ISO 15761:2002
End Connection: Threaded / Socket / Butt Weld Type (as specified in design)
Working Parameters: 300 LBS at 350 Celsius degrees
DN50 in Forged Steel: Only to use where high pressure or temperature is required,
otherwise to follow as in A216 WCB

STRAINER, Y-TYPE: DN65 & ABOVE

Body Material: Cast Steel A216 WCB, Bolted Bonnet
Flange to Flange: BS 5152 / Y Type / Basket Type / Manufacturer Standard
Mesh Material: 304 stainless Steel
End Connection: Flange Type, Raised Face
Working Parameters: 300 LBS at 350 Celsius degrees
DN50 in Forged Steel: Only to use where high pressure or temperature is required,
otherwise, to follow as in A216 WCB

STRAINER, Y-TYPE: DN50 & BELOW

Body: Stainless Steel 304 / Forged Steel A105
Mesh Material: 304 stainless Steel
End Connection: Threaded / Socket / Butt Weld Type (as specified in design)
Working Parameters: 300 LBS at 350 Celsius degrees
DN50 in Forged Steel: Only to use where high pressure or temperature is required,
otherwise, to follow as in A216 WCB

BALL VALVES: DN65 & ABOVE

FOR COMMERCIAL GAS / OIL / DIESEL (AS SPECIFIED)

Body Material: Cast Steel ASTM A216 WCB / Stainless Steel 304
Flange to Flange: API 608 / ANSI 16.10
Body Style: Two-Piece full Port
Ball: 304 Stainless Steel
Lever: Steel / Aluminum
End Connection: Flange Type, Raised Face
Flange Holes Drilling: ANSI 16.5 Class 150 (as specified in design)
Pressure Rating: Minimum Class 150 for Flange Type
Painting: Not Painted if Stainless Steel
Working Parameters: 150 LBS at 350 Celsius degrees

BALL VALVES: DN50 & BELOW

FOR DOMESTIC GAS APPLICATION (AS SPECIFIED)

Body: DZR Forged Brass (Dezincification Resistant Brass)
Body Style: Two-piece full port
Ball: 304 Stainless Steel / Copper
Lever: Steel / Aluminum
Seat: Reinforced Teflon
End Connection: Threaded Type
Pressure Rating: Minimum PN20 equal to (290 Psi) & maximum Class PN32
equal to (460 Psi)
Working Parameters: 150 PSI at 120 Celsius degrees

BALL VALVES: DN65 & ABOVE

FOR OXYGEN / NITROGEN NITROUS OXIDE / CARBON DI OXIDE



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

Body Material:	Stainless Steel 316
Flange to Flange:	API 608 / ANSI 16.10
Body Style:	Two-Piece full Port
Ball:	316 Stainless Steel
Lever:	Steel/Aluminum
End Connection:	Flange Type, Raised Face
Flange Holes Drilling:	ANSI 16.5 Class 150 (as specified in design)
Pressure Rating:	Minimum Class 150 for Flange Type
Working Parameters:	150 LBS at 350 Celsius degrees

BALL VALVES: DN50 & BELOW
FOR OXYGEN / NITROGEN / NITROUS OXIDE / CARBON DI OXIDE

Body:	Stainless Steel 316
Body Style:	Single Piece or Two-piece full port
Ball:	316 Stainless Steels
Lever:	Steel /Aluminum
Seat:	Reinforced Teflon
End Connection:	Threaded Type
Pressure Rating:	1000 PSI
Working Parameters:	300 LBS at 350 Celsius degrees

BALL VALVES: DN65 & ABOVE DRY STEAM / WET SETAM / VACCUM /
CONDENSATE DRAIN
COMPRESSED & MOIST COMPRESSED AIR / NATURAL GAS

Flange to Flange:	API 608 / ANSI 16.10
Body Material:	Stainless Steel 304
Body Style:	Two-Piece full Port
Ball:	304 Stainless Steel
Lever:	Steel/Aluminum
End Connection:	Flange Type, Raised Face
Flange Holes Drilling:	ANSI 16.5 Class 150 (as specified in design)
Pressure Rating:	Minimum Class 150 for Flange Type
Working Parameters:	150 LBS at 350 Celsius degrees

BALL VALVES: DN50 & BELOW
DRY STEAM / WET SETAM / VACCUM / CONDENSATE DRAIN
COMPRESSED & MOIST COMPRESSED AIR / NATURAL GAS

Body:	Stainless Steel 304
Body Style:	Single Piece or Two-piece full port
Ball:	304 Stainless Steels
Lever:	Steel /Aluminum
Seat:	Reinforced Teflon
End Connection:	Threaded Type
Pressure Rating:	1000 PSI
Working Parameters:	300 LBS at 350 Celsius degrees



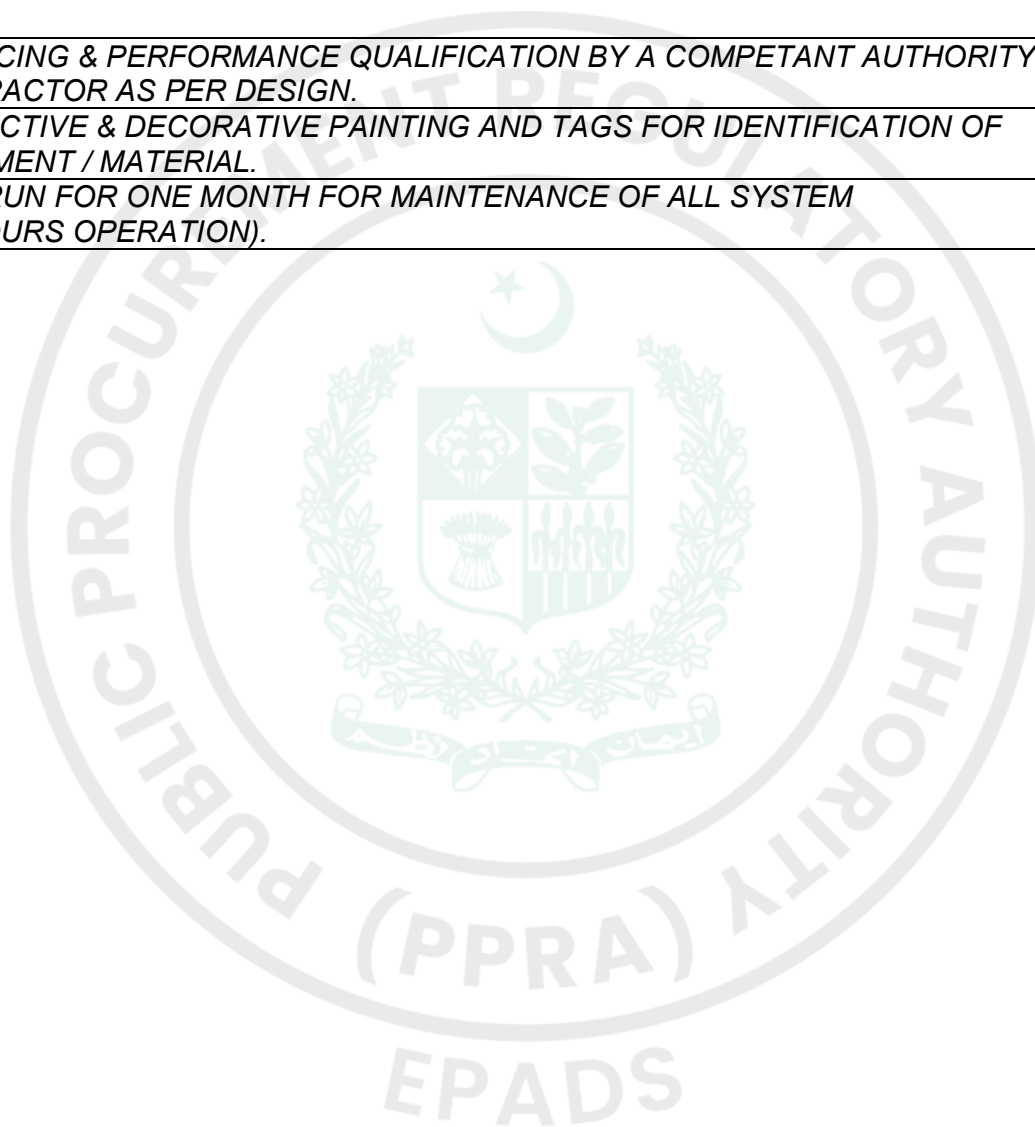
**CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore**

"TESTING, COMMISSIONING & HANDING OVER"

BALANCING & PERFORMANCE QUALIFICATION BY A COMPETANT AUTHORITY OR CONTRACTOR AS PER DESIGN.

PROTECTIVE & DECORATIVE PAINTING AND TAGS FOR IDENTIFICATION OF EQUIPMENT / MATERIAL.

*TEST RUN FOR ONE MONTH FOR MAINTENANCE OF ALL SYSTEM
(16 HOURS OPERATION).*





CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

LIST OF APPROVED MANUFACTURERS FOR HVAC & MECHANICAL WORKS

IMPORTANT NOTICE TO TENDERERS:

Equipment & Material shall be supplied only from the approved sources noted below. However, in all cases the Contractor shall submit complete technical details of the equipment, material and obtain Consultant's approval prior to delivery on site. Where option of Approved Equivalent is indicated, it shall be at the discretion of the Consultant to accept the alternate proposal submitted by the Contractor.

#	Equipment & Material	Approved Manufacturers	Country of Origin
1	Air Handling Units (Local Brands)	Mecair, Swift air, Eco star, SitalKlima, Coolmax, Eco Air, Lancer.	Pakistan
2	Air Handling Units (Imported Brands)	Carrier, Tecka King Air, York, System Air, Untes, Dunham-Bush, EuorKlima.	West Europe, Turkey, Malaysia, China
3	Terminal Hepa Filter	FCR, Ulpatech, Camfil, MGT, AAF	West Europe, Turkey, Malaysia
4	Electric Heaters	IME, Pak Premier, Shan Industries, Grand Impex	Pakistan
5	Ventilation Fans (Imported Brands)	Sisteven, , Kayites, Casals, Deton, Venco, Kruger, Green heck	Turkey, Malaysia, China, KSA, UAE.
6	Automatic & Temperature Controls	Johnson Controls, Schneider, Honeywell, Alteck	USA, Canada, Australia
7	Closed Cell Polyolefin Type Duct & Pipe Insulation	Inco flex, Aroflex, Armacell, Gulf-O-Flex or Thermobreak	UAE, Malaysia, Thailand, China
8	GI Sheets (Hot Dip Galvanized)	ISL, ASL or Imported	Pakistan
9	Paint	ICI / Berger	Pakistan
10	Thermometers, Pressure Gauges	Terice, Weksler.	USA or Approved Equal



**CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore**

11	Supports & Anchors	Noble, Hilti, Fischer / Fabricate as per approved sample	Pakistan/Europe / Pakistan
12	Concrete Fasteners	Rawl plug Co., Hilti	UK, Germany
13	Motors	Siemens, ABB, Casals, Deton, Nicotra, Krugar or approved equal	Germany/Pakistan / China / USA, Europe, Japan
14	Air Filters	AAF / Camfil / Trox / Ulpatech / MGT / FCR or approved equal	Germany/ Pakistan / Korea / China / Italy / Taiwan
15	Chemicals	Drew Ameroid / Maxon or approved equal	USA / Singapore
16	Condenser Water Treatment Equipment (Large)	Drew Ameroid / Maxon or approved equal	USA / Singapore
17	Duct Flexible Connection	InfoTech Flow Duct, Duct mate or ALS.	USA, Turkey, UAE
18	Chilled & Steam Piping	See Piping Schedule	
19	PVC Condensate Pipe & Fittings (Class-D)	Dadex, Popular, Beta or equal	Pakistan
20	Hot & potable water Piping	See Piping Schedule	
21	Air Vents	Spirax Sarco / Venn	UK / USA / Japan / Approved equivalent Imported
22	Steam Traps & Specialties	TLV / Spirax Sarco	Japan / UK
23	Compressed Air Piping	See Piping Schedule	
24	PVC round Ducting / Piping	See Piping Schedule	
25	Demineralized Water Piping	See Piping Schedule	Local work through Specialized fabricator



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

26	Centrifugal Sediment Separator	Bell & Gosset or approved equal	USA / Pakistan
27	Wet Scrubber	Steam Master, Chan Controls	Local Work Through Specialized Fabricator
28	Electrical Panels, ACP s, DB	Electrech, South Asian,, Bilal Switch Gear, Capital Electro or Approved Equal	Pakistan
29	Fiberglass Pipe Insulation	Afico / Kimco / Knauff	Saudi Arabia/Kuwait / UAE
30	Vapor barrier coating	Foster Approved equivalent	Imported
31	White Glue	Hoechst	Germany / Pakistan
32	Closed Cell Foam Insulation	Armaflex Aero flex	Thailand
33	Duct Insulation	Afico or	Saudi Arabia
34	Canvas Jacket	Approved equal	Pakistan
35	White Glue	Hoechst	Pakistan
36	Sheet Metal	Pakistan Steel	Pakistan / Imported Japan / As approved
37	Structural Steel	Prime quality as approved	Pakistan
38	Duct Sealant	Dow Corning/Zahbia	
39	Volume Dampers	Air Guide, Steel craft or Approved Equal / Air control, Mehran Engr.	Pakistan/China / Pakistan
40	Air Devices	Steel Craft, Pak Premier, EAP, Shan Industries, Air Carrier / FCR, Air control, Air Guide or Approved Equal	Pakistan



Bill of Quantities (BOQ)

CONSTRUCTION OF CLEAN ROOM/BIOTECH LABORATORY **AT CEMB**

Sr. No	DESCRIPTION OF ITEMS	QTY	UNIT	RATE PER UNIT	Total Amount (Rs.)
A	HVAC SYSTEMS FOR BIOTECH / CLEAN ROOMS, PRODUCTION LINE 1 & 2, GROUND FLOOR				
1	Installation & SUPPLY of D'X Packaged TYPE PHARMA GRADE HYGENIC AIR HANDLING UNITS With Condensing Units mentioned in schedule of equipment including shifting and fixing of equipment on foundations, complete in all respect as specified in the specifications and as directed by the Consultant/Engineer Incharge.				
1.1	AHU No-1 (Production Rm-1,Gowing, DeGowning, Air Lock, Exit-1,G.Floor) 2810 CFM.	1	NO		
1.2	AHU No-2 (Production Corridor, Production Rm-2, DeGowning, Air Lock,-5, G.Floor) 3345 CFM	1	NO		
1.3	AHU No-3 (Autoclave, Quarantine, QC Lab, Buffer, Utility Corridor,G.Floor), 1890 CFM	1	NO		
1.4	AHU No-4 (Microbiology Lab, Gowning, DeGowning, Air Lock, G.Floor) 1280 CFM	1	NO		
1.5	AHU No-5 (Raw Material Store, Material Quarantine Rejection,Approved Material, Change Room, G.Floor) 1290 CFM	1	NO		
2	Exhaust Air Inline Fans with louvers, Exhaust Air Louver-1 (2810 CFM)	1	NO		
3	Exhaust Air Louver-2 (3345 CFM)	1	NO		
4	Installation of H-13, 99.97% efficiency @0.3 microns, HEPA filters , make Trox, UplaTech, MGT, Sagicofim, American Air Filters or approved equal as directed by the consultant/Engineer and as per schedule of equipment and materials				
4.1	24"x24"x12"	6	NOS		
4.2	18"x18"x6"	4	NOS		
4.3	12"x12"x12"	5	NOS		
4.4	12"x12"x6"	6	NOS		
5	G4, 55%-2" Thick & 99.97% HEPA Filters For E.A. Filter Plenums				
5.1	24"x24"x12" & 24"x24"x6"	4	EACH		
5.2	G4, 55% EFF. Filters, 24"x24"x2"	4	EACH		
6	Supply and installation of WET SCRUBBER UNITS (CAP., 2810 CFM & 3345 CFM), with centrifugal fan, 3 HP Pump motor(EACH) with water collection, tank, tower packing/filling, complete in all respect as per schedule, specifications, and drawings.	2	NO		
7	Supply, fabrication and installation of G.I. Sheet metal ducting using prime quality sheets including all elbows, bends, reducers, splitter dampers, guide vanes, service doors, bracing, hangers, flanged joints above 24 gauge and supports etc.,				



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

	complete in all respect as specified in the specifications, shown on the drawings and as directed by the consultant/engineer incharge in following thickness and quantities:-				
7.1	26 guage.	195	SFT		
7.2	24 guage.	6,810	SFT		
7.3	22 guage.	4,145	SFT		
8	Providing and fixing 16 kg/m ³ density blanket type glass wool insulation 1" thick with aluminium foil vapour barrier, adhesive tape on all joints and 8 Oz canvas cloth wrapping complete as specified in the specifications and directed by the consultant / Engineer incharge.	9,400	SFT		
9	Providing and fixing 32 kg/m ³ density blanket type glass wool insulation 2" thick with aluminium foil vapour barrier, adhesive tape on all joints and 8 Oz canvas cloth wrapping complete as specified in the specifications and directed by the consultant / Engineer incharge.	3,000	SFT		
10	26 Gauge Cladding on exposed ducts on all joints and complete as specified in the specifications and directed by the consultant / engineer incharge.	3,200	SFT		
11	Providing and fixing air control/regulating devices in supply and return air ducts complete in all respect as specified in the specifications, shown on the drawings and as directed by the consultant/engineer incharge in following quantities:, Perforated supply Air grilles, SS304				
11.1	27"x27"	7	NOS		
11.2	21"x21"	4	NOS		
11.3	15"x15"	11	NOS		
12	Supply & Installation of HEPA FILTER HOUSINGS (18g G.I. Sheet/MS. Sheet) Powder Coated				
12.1	26 1/2" x26 1/2" x16"	7	NOS		
12.2	20 1/2" x20 1/2" x10"	4	NOS		
12.3	14 1/2" x14 1/2" x16"	5	NOS		
12.4	14 1/2" x14 1/2" x10"	6	NOS		
13	Aluminium S.A.D having powder coating finish:				
13.1	21"x21"	1	NOS		
13.2	15"x15"	5	NOS		
13.3	12"x12"	5	NOS		
13.4	9"x9"	1	NOS		
14	R.A.Registers with fixed horizontal bars and powder coating finish:SS304,				
14.1	8"x12"	8	NOS		
14.2	8"x10"	4	NOS		
14.3	10"x12"	1	NO		
14.4	10"x16"	2	NOS		
14.5	12"x18"	1	NO		
15	E.A.Registers with movable horizontal bars: SS304				
15.1	8"x12"	11	NOS		
15.2	10"x14"	1	NO		
15.3	12"x22"	5	NOS		
16	VOLUME CONTROL DAMPERS (VCD), 18 gauge GI Sheet with 3% maximum leakage factors.				
16.1	18"x12"	3	NO		
16.2	18"x10"	1	NOS		



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

16.3	18"x8"	3	NO		
16.4	14"x10"	1	NO		
16.5	12"x12"	2	NO		
16.6	12"x10"	1	NOS		
16.7	12"x8"	1	NOS		
16.8	12"x6"	6	NO		
16.9	10"x10"	2	NOS		
16.10.	10"x8"	1	NO		
16.11	8"x8"	1	NO		
16.12	8"x6"	2	NO		
17	Aluminium powder coated fresh air intake louvers with fixed horizontal bars, VCDS & 2" Thick Washable Filters.				
17.1	34"x16"	1	NO		
17.2	30"x16"	1	NO		
17.3	10"x8"	3	NOS		
18	Fusible link type FIRE DAMPERS (FD), 18 gauge GI Sheet with linkage arrangement @ 60 deg CDB Temperature				
18.1	34"x16"	1	NO		
18.2	30"x16"	1	NO		
18.3	24"x14"	1	NO		
18.4	18"x14"	2	NOS		
19	HEPA, G4 Filter Plenums (20g G.I Sheet with 2" thick insulation and 26 gauge G.I.Sheet cladding) for exhaust air systems with inlet/outlet flanges, complete in all respect. 50"x26"x26"(LxWxH)	2	NOS		
20	Flexible Connectors				
20.1	34"x16"	2	NOS		
20.2	30"x16"	2	NOS		
20.3	24"x14"	1	NO		
20.4	22"x12"	1	NO		
20.5	18"x14"	2	NOS		
20.6	18"x12"	1	NO		
20.7	16"x14"	1	NO		
21	Motor control centers with circuit breakers , MCCBs, MCBs, Fuses, Motor, Switches, Instruments, Indicating lights, etc. for all equipments as per specification.				
21.1	MCC-1 (AHU-1 TO 5, Exhaust air fans, air curtains, Wet Scrubber Units, etc.), at Ground floor & roof top (160 KW, 320 Amps, TPN with two earthing points),	1	NO		
22	Power cabling including compression glands from local control panel to AHUS, Fans, Air Curtains, etc.				
22.1	150 sqmm, 4 Core	40	RFT		
22.2	70 sqmm, 4 Core	180	RFT		
22.3	16 sqmm, 4 Core	80	RFT		
22.4	10 sqmm, 3 Core	60	RFT		
22.5	4 & 2.5 sqmm, 2 Core	120	RFT		
	Control cabling including compression glands for thermostates , sensors & controllers including 20mm PVC conduit				
23	Condensate Drain PPRC / Piping (G.I. medium pressure / UPVC Class-C)	300	RFT		
24	Installation of U-tube manometers / megnaheical gauges across filter sections. i) 1", 1.25" & 2" dia	150	RFT		



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

25	Megnahelicals , Range 0~60 Pa / 0~2.4" of water guage with 4 NOS no SS 304 Display Panel Box complete with nozzles and flexible tubing, complete in all respect. (Dawyers, USA).	22	NO		
26	Manometers , Range 0~1250 Pa/ 0~5" of water guage, Dawyers, USA	15	NO		
27	Control panel unit , including return air thermostat, manually or by remote control device, 3 speed slector, rated power shall be at the middle speed only.	5	NO		
28	Upvc sleeves through which drain pipes plumbing services, and electrical services passés, of at least 25mm to 100mm diameters,	1	JOB		
29	Supply & Installation of Heavy duty type air curtains with mounting frames. (6'-X 7'), Make: AeroTech/SASA Metal / Air Control Or Imported	4	NO		
30	Special tools and instruments for maintenance.	1	L.S.		
31	Tags.	1	L.S.		
32	Glass frame Mounted Charts.	1	Sets		
33	Charts, Transparencies and 2 Sets.	1	L.S.		
34	Printed technical mannuals in English.	1	JOB		
35	Third Party Validation of all systems as per ISO 14644-3 with HVAC qualification documents DQ / IQ / OQ / PQ / OQ as per international norms. Temperature, Humidity, Differential air pressure, Airborne Particle count, Air Changes, Air Flow pattern. Installed Filter system leakage test (For Hepa filter only) HVAC documentation must include below attached minimum requirements .	1	L.S.		
36	Performing one month each summer and winter test run during maintenance period and setting the equipment and plant to deliver the design conditions and maintaining the log book during test run.	1	L.S.		
37	Preparing and providing 03 sets of shop drawings before start of work and 04 sets of as built drawings after completion of work for entire HVAC system including ducting, piping, electrical and controls wiring diagrams.	1	L.S.		
SUB TOTAL ITEM 1 TO 37			A		
B	CLEAN ROOMS PANELS				
38	3 MM THICK EPOXY PAINTS ON ENTIRE FLOOR with COVING	1700	SFT		
39	Supply and installation of 25 MM THICK GI SHEET, PU FALSE CEILING/Roof Panels FILLED WITH PU/ ROCKWOOL INSULATION, Density of 35~42 Kg/CUM	800	SFT		
40	Supply and installation of 50 MM THICK SANDWICH WALL/ PARTITION PANELS WITH PU / ROCKWOOL INSULATION, Density of 35~42 Kg/CUM COVING, ALUMINUM PROFILES, ETC.	1250	SFT		
41	Supply and installation of Single Door Size: 3' x 7',PU Density 40 to 42 Kg/ m³ Panels Skin Both sides Covered by Pre-Painted G.I sheets,thickness 0.45mm	105	SFT		
SUB TOTAL ITEM 38 TO 41			B		
C	ELECTRICAL WORKS				
42	CIRCUIT POINT WIRING: Supply and wiring of point to point with 1.5mm2 single core insulated 300/500 volt grade cables and 1.5mm2 cable as protective conductor (PC) in & including	800	RFT		



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

	PVC conduit installed recessed in walls / R.C.C. Slab, installed on ceiling or as required as per site conditions. complete in all respects as per specifications and drawings.				
43	Supply and wiring of light circuit from DB to switchboard with 2.5mm ² single core insulated 300/500 volt grade cables and 2.5mm ² cable as protective conductor (PC) in & including PVC conduit installed recessed in walls / R.C.C. Slab, installed on ceiling or as required as per site conditions. Complete with all conduit accessories junction boxes, pull boxes as required complete in all respects as per specifications and drawings.	1400	RFT		
44	POWER SOCKET WIRING , Wiring and fixing of 1-3 pin 6amp to 20 Amps combined switch socket away from switch board and wired with 3 x 1 core 4 mm sq. P+N+CPC, Cu/PVC wires 300/500 Volt grade, in and including cost of 25mm dia. heavy duty PVC conduit, make as specified in Annexure "A", recessed in walls, floor, above false ceiling or as required as per site conditions, all PVC conduit accessories, pull boxes, steel pull wires, M.S. box shall be made of 16 SWG sheet steel with earth terminal having 2 coats of antirust paint, M.S. box shall be of the same size as that of 1-15 Amps switch socket, INCLUDING cost of 15 Amps 3 pin combined switch socket with porcelain base and plug, make CLIPSAL, LEGRAND, ABB or as specified in Annexure "A", complete in all respect. Wiring shall be done directly from the MCB installed in the respective DB without any claim of circuit.				
44.1	4mm ² single core pvc cable shall be use for all German Sockets wiring	380	Rft		
44.2	CPC/earthng & Neutral cables	1050	Rft		
45	Power Switch Sockets , Wiring and fixing of 1-3 pin 6amp to 20 Amps combined switch socket away from switch board and wired with 3 x 1 core 4 mm sq. P+N+CPC, Cu/PVC wires 300/500 Volt grade, in and including cost of 25mm dia. heavy duty PVC conduit, make as specified in Annexure "A", recessed in walls, floor, above false ceiling or as required as per site conditions, all PVC conduit accessories, pull boxes, steel pull wires, M.S. box shall be made of 16 SWG sheet steel with earth terminal having 2 coats of antirust paint, M.S. box shall be of the same size as that of 1-15 Amps switch socket, INCLUDING cost of 15 Amps 3 pin combined switch socket with porcelain base and plug, make CLIPSAL, LEGRAND, ABB or as specified in Annexure "A", complete in all respect. Wiring shall be done directly from the MCB installed in the respective DB without any claim of circuit.				
45.1	6A German Swicth Socket	12	Nos.		
45.2	10A German Swicth Socket	3	Nos.		
45.3	20A German Swicth Socket	3	Nos.		
45.4	32A 3 PHASE SOCKET	1	No.		
45.5	4Cx10mm ² PVC cable with 16mm single CPC for 32A 3 phase socket	150	Rft		
46	LIGHT FIXTURES				
46.1	LED Light size 24"x24" - (4 Tube-24 W, Each)	26	Nos.		
46.2	Down light (18 W, Each)	33	Nos.		
46.3	Emergency Light	4	Nos.		



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

47	Swich Board Supply consisting of one point controlled by one switch with 1.5mm ² PVC insulated 300/500 volt grade wire in and including PVC conduits recessed in walls/R.C.C. slab, or installed on ceilings including all conduit accessories junction boxes, pull boxes, pull wire, 2.5mm ² cable as PC. complete with 10 Amp. Single way switch make CLIPSAL / MK installed on & including 16 SWG sheet steel boards recessed in wall/column complete in all respects as per drawing & specifications.				
47.1	One Gang Way switch	30	Nos.		
47.2	Two Way switch	3	Nos.		
48	DISTRIBUTION BOARDS (DB) , Installation, testing and commissioning at site of following Distribution board (DB)/Light/Power ,complete in all respect up to the satisfaction of Engineer. Sizes of the body of all DB shall be of identical dimensions irrespective the quantity of outgoing MCBs.(See Attched Power Layout)				
48.1	6-Way 3 phase distribution Board for Light. Total Lighting Load 2.5KW Incoming Breaker MCCB size 40ATP and Outgoing 10Ampare MCB-18 Nos (Single Pole) including BUS BAR for Neutral alongwith DB Panel, Phase indication Light., Digital Volt meter, Ampare Meter Complete in all respect.	1	No.		
48.2	6-Way 3 phase distribution Board for Power Total Power Load 86 KW Incoming Breaker MCCB size 200ATP and Outgoing 20Ampare MCB-18 Nos (Single Pole) including BUS BAR for Neutral alongwith DB Panel, Phase indication Light., Digital Volt meter, Ampare Meter Complete in all respect. 32 Ampare 3 Phase Breaker for Production Room-1	1	No.		
49	DISTRIBUTION BOARDS Main Power Cables				
49.1	Distribution Board-Light , Main Incoming cable 4C x 16mm ² and 10mm single core (Earthing) for Distributuion Board - Light to Main Power Panel.	200	Rft		
49.2	Distribution Board-Power , 4C x 70mm ² and 35mm single core (Earthing) for Distributuion Board - Power to Main Power Panel	200	Rft		
50	CABLE TRAYSS : upply and installation of GI or MS or pvc cable trays of following sizes duly powder coated in approved colour. The gauge of sheet will not be less than 16, including the cost of installation of hangers and other necessary arrangements.				
50.1	6"x3" for power cable trays	200	Rft		
50.2	4"x3" for Communication	200	Rft		
50.3	Shop Drawing / Asbuilt Drawing and Submittal	3	SETS		
	SUB TOTAL ITEMS 42 TO 50.3			C	
D	FIRE ALARM SYSTEM				
51	Supply Installation Testing and commissioning of wiring of Fire Alarm System				
51.1	Smoke Detector	30	Nos.		
51.2	Supply Installation Testing and commissioning of wiring of smoke sensors /bells sounder and manual call station with 2 core fire resistant cable in one inch heavy duty pvc condit or felxible. Complete in all respect.	400	Rft		



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

51.3	Supply, installation, testing and commissioning of microprocessor based 02 loop Control Panel Intelligent (Addressable) Fire Alarm Panel of Approved MAKE with built-in power supply unit and NICAD battery backup, supervisory buzzer, alarm cancelling device, complete in all respects, as per the specifications and drawings and to the satisfaction of the Engineer.	1	Nos.		
51.4	Alarm Sounder	2	Nos.		
51.5	FAJB	1	No.		
51.6	Smoke Detector control Panel	1	No.		
	SUB TOTAL ITEMS 51.1 TO 51.6			D	
E	PROCESS / UTILITIES WORKS				
52	INSTALLATION, COMMISSIONING & TESTING OF FOLLOWING OWNER SUPPLIED EQUIPMENTS FROM CLEAN UTILITY ROOM TO THE PRODUCTION FACILITIES (GROUND FLOOR & ROOF TOP INCLUDING LOADING, UPLIFTING, PLACEMENT & SHIFTING AT RESPECTIVE FOUNDATIONS COMPLETE IN ALL RESPECTS.				
52.1	AIR COMPRESSOR (WITH DRYER & STORAGE TANK), SS-316L	1	100 CFM/ 3 CM /MIN		
52.2	R.O WATER / PURIFIED WATER STORAGE TANKS , SS-316L	2	Each		
52.3	VACUUM CONVEY (100L Storage bin to Production areas) & (Production Areas to Storage bin 700L), SS-304L	1	1000 L		
52.4	WATER FOR INJECTION SYSTEM (WFI) FOR PRODUCTION AREAS, SS-316L	1	100 L		
52.5	CORBONDIOXIDE GAS (CO ₂) CYLINDER, SS-304L	1	50 KG/H		
52.6	HAND SANITIZERS (500 ML), PVC BOTTLES	4	ML		
52.7	WALL MOUNTED EYE WASHERS STATIONS COMPLETE WITH WATER CONNECTIONS/FITTINGS, ETC, MS POWDER COATED	2	Each		
53	COMPRESSED AIR PIPING SYSTEM, SS-316L, Ø 1"	70	Each		
54	GATE VALVE, Ø 1"	1	Each		
55	TAP WATER (PPRC /UPVC) , Supply and delivery of Polypropylene Random Pipe and (DIN 8077 / DIN 8078 PN. 20) with Turkish Standards (TS-9937-11451-11755), or approved equivalent, for Cold / hot Water Piping System, including the cost of all fittings such as elbows, tees, unions, adopters, etc., complete in all respects as described in specifications, drawing and approval of the Consultants: PIPES				
55.1	Ø 1"	35	Rft		
55.2	Ø 1-1/4"	100	Rft		
56	GATE VALVE				
56.1	1 " Ø	2	Each		
56.2	1 1/4" Ø	1	Each		
57	PRESSURE GAUGES: Supply and delivery of Pressure gauge 3½" (90mm) dia including the gauge cocks, connecting line as per drawing(s) and specifications and / or as directed and approved by the Engineer complete in all respects: 0 to 4.5 Kg / Cm ²	2	Each		



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

58	Supply and delivery of Automatic Air Vent Valve , Size: ½ " dia (15mm), AUTOMATIC AIR VENT VALVE:	4	Each		
59	WATER FOR INJECTION (WFI), SS-316L , Stainless steel Tube with ss flanges joints, clamps, orbital welding complete in all respect.				
59.1	1 " Ø	144	Rft		
59.2	Ø 1 1/4"	124	Rft		
59.3	Ø 1 1/2"	96	Rft		
60	GATE VALVES, Ø 1"	10	Each		
61	RO/PURIFIED WATER, SS-316L, PIPES				
61.1	1" Ø	36	Rft		
61.2	3/4" Ø	50	Rft		
61.3	1 -1/4" Ø	35	Rft		
61.4	1- 1/2" Ø	20	Rft		
62	GATE VALVES, 3/4" Ø	5	Each		
63	CORBON DI OXIDE GAS (CO ₂), SS-304L, PIPE, 3/16" Ø x 3/8" Ø	85	Rft		
64	GATE VALVE, Ø 3/16" x 3/8" Ø	1	Each		
65	VACUUMED SYSTEM, SS-304L , PIPES				
65.1	Ø 1 1/4"	120	Rft		
65.2	Ø 1 1/2"	36	Rft		
66	GATE VALVES, 1 1/4" Ø	4	Each		
67	Completon of all above accessories, Installation, testing and commissioning of compressed Air, WFI, RO Water/Purified Water, CO ₂ , Tap Water, etc complete in all respect.	1	JOB		
	SUB TOTAL ITEMS 52 TO 67			E	
F	CIVIL AND PLUMBING WORKS				
68	EXTERNAL SEWERAGE SYSTEM: Supply and delivery of R.C.C Pipes ASTM-C 76 BS 5911 as manufactured by Pakistan Pipe & Construction Co. (Pvt) Ltd. Or approved equivalent including collars, cement mortar for joints, excavation & back –filling, compacting, and testing and / or as directed and approved by the Engineer complete in all respects. R.C.C / HDPE				
68.1	Size dia 4"	200	Rft		
68.2	Size dia 6"	10	Rft		
69	INTERNAL DRAINAGE WASTE AND VENT SYSTEM: Supply and delivery of of brass Cleanout Plugs, as shown on drawings, and specification and/or as directed by Consultants-Engineer complete in all respects: Size dia 4"	20	Each		
70	FLOOR DRAINS: Providing of GMP SS Floor Drains as shown on drawings, as directed by Consultants-Engineer complete in all respects: SS304, Size 4" dia	9	Each		
71	Providing and fixing of brass screw downs type clean-out plug with C.I adapter piece etc. equivalent to ZURN CO. BRASS/PPRC, Size dia 4"	9	Each		
72	Supply and delivery of uPVC Pipes as Manufactured by Cosmoplast or equivalent 6 bars (BSEN 1329) for Soil, Waste Water & Vent Piping, including the cost of all fittings, specialties and pushfit/rubber rings, as per drawing and specification and/or directed by Consultants-/Engineer complete in all respects, Size dia 4" (Internal dia)	160	Rft		
73	Providing and making waste water jointing assembly for wash basin and sink (bottle trap) including cost of PVC molded wall	4	Each		



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

	socket, C.I. hub etc. Complete as per Drawing and instruction of Engineer Incharge . UPVC/HDPE, For Wash basin/Sink				
74	Providing and making Gulley Traps Chamber with all accessories including cost of C.I. gulley trap, C.I. grating 300mm x 300mm. (15" x 15") C.I. covers.	1	Each		
75	Septick Tank (two or three chambers) with Cast Iron covers and frame fixed with 6" thick RCC 1:2:4 lintal, 1:3:6 CC bed, 2" thick 1:2:4 RCC flooring, 6" thick 1:3:6 RCC block masonry walls set in 1:6 cement mortar and with ½" thick cement plaster, Complete in all respect. Size 4'-0"x2'-6" depth 4' to 5'-0".	1	Each		
76	Fabrication of 3mm Thick Fiber Glass Shed , MS powder coated stand/frame, angle iron Strips, red oxide paint, grouting, etc., @ 12' height From F.F.L. (3000 SFT, Approx.).	1	JOB		
	SUB TOTAL ITEMS 68 TO 76			F	
G	FURNITURE AND MECHANICAL WORKS				
77	CROSS OVER BENCHES				
77.1	SS304, 20 GAUGE CROSS OVER BENCHES (SIZE: 4'X12"X18")	3	Each		
77.2	SS304, 20 GAUGE CROSS OVER BENCHES (LxWxH: 3'x0'-9"x12"),	4	Each		
77.3	SS304, 20 GAUGE LOCKERS FOR GOWNING/DEGOWNING (LxDxH): 2'-6"x0'-9"x5'-0", MINIMUM 3 PARTITIONS)	4	Each		
78	Fabrication of Shoe Lockers in dull finish 304 stainless Steel, 8 partitions with 8 no. doors. Each door will be Equipped with Chinese lock. Door on front side and Stainless steel net on rear side. Complete fabrication In 16 gauge stainless steel.				
78.1	a. Size: 40" x 20" x 36"	1	Each		
78.2	b. Size: 30 x 20" x 36"	2	Each		
79	Fabrication of Executive Cabinet with 4 shelves and 4 doors in Dull 304 stainless Steel finishes. Thickness 1.5 mm (16 gauge). Each door shall be equipped with Chinese Lock. Size: 42" x 20" x 72"	1	Each		
80	LAMINAR FLOW CABINET WITH BENCH (OPTION-1) ,Size: 2 ft x 4 ft x 7.0 ft (L X W x H) (Vertical flow, downward direction through HEPA) With 24" X 48" x 3", 99.9995% efficiency @ 0.12 microns H14-HEPA filter (AAF, Sagicofim, MGT KLC, or approved equal), SS 304 side walls, fan with 1/3 HP imported fan Motor, single phase explosion proof, 220V, 50 Hz (DWDI), 55% efficiency pre filter or 30% efficiency 2" thick Pre-filters, with UV and fluorescent lights, blower to maintain Velocity @ 0.45m/s +/- 20%, variable speed drive control, Megnehelic pressure gauge, air flow pattern shall be 100% Discharge, etc.	2	Each		
81	SUPPLY & INSTALLATION OF SS304, 18 Gauge STATIC PASS THRU BOXES , DOOR INTERLOCKING, ETC (LxHxD: 2'x2'x1'-6")	4	NO		
82	SUPPLY & INSTALLATION OF SS304, 18 Gauge, DYNAMIC PASS THRU BOXES , DOORS, WINDOWS, DOOR INTERLOCKING, etc.(LxHxD: 2'x2'x1'-6")	4	NO		
83	WALL MOUNTED MIRRORS (WxH: 1'-6"x3'-0")	4	NO		
	SUB TOTAL ITEMS 77 TO 83			G	



CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore

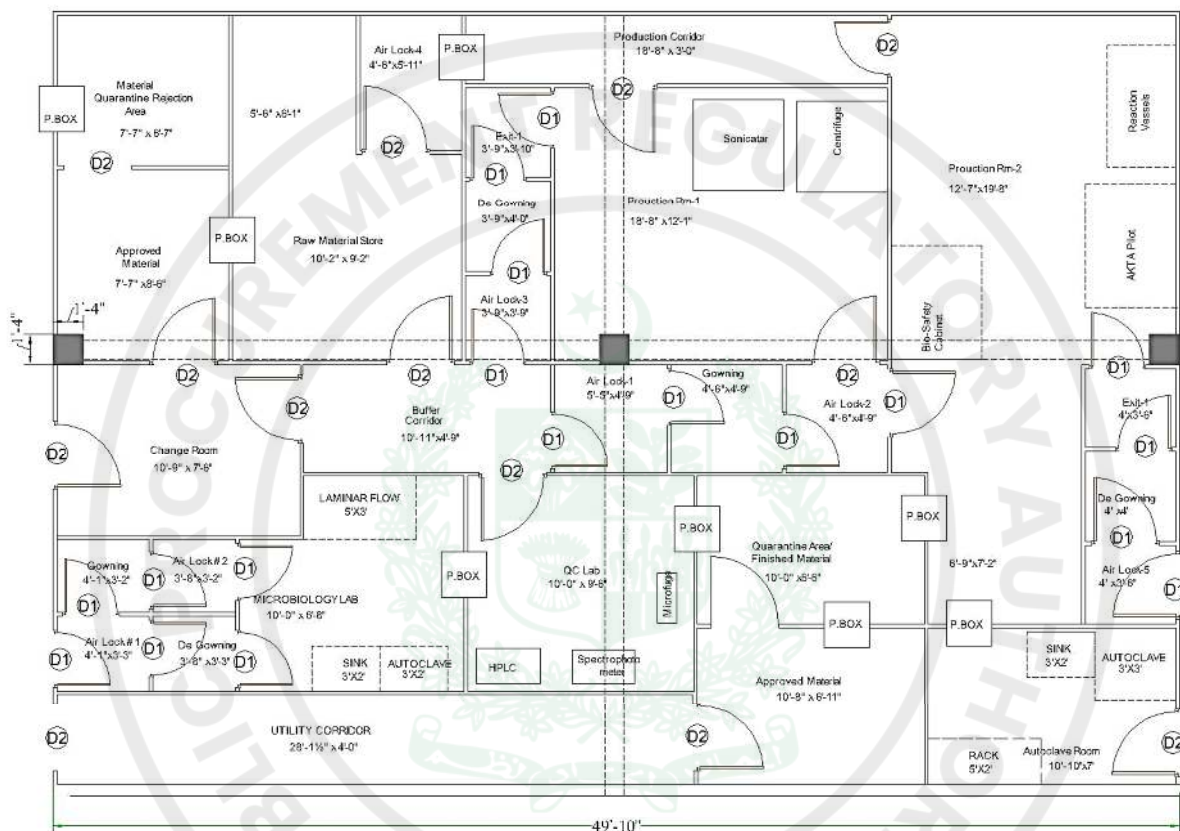
	SUB TOTAL (A TO G)	
	PST @ 5%	
	GRAND TOTAL	





**CENTRE OF EXCELLENCE IN MOLECULAR BIOLOGY (CEMB),
CEMB-87-West Canal Bank Road,
Thokar Niaz Baig, Lahore**

DRWAINGS



**GROUND FLOOR
LAYOUT OF CIVIL PLAN**

Note:

Other Complete Drawings for each discipline, including HVAC, Civil, Electrical, and others, are organized in separate folders.