

PROPOSED REFURBISHMENT OF HVAC SYSTEM IN PRESIDENT BOX – 2, A.C. ENCLOSURE AND LIFT WORKS AND OTHER AREAS AT WANKHEDE STADIUM FOR MUMBAI CRICKET ASSOCIATION

BILL OF QUANTITIES - HVAC WORKS

SR. NO.	DESCRIPTION OF ITEM	QUANTITY	UNIT	RATE	AMOUNT
VRV SECTION					
OUTDOOR UNIT					
1	Supplying, erecting, testing and commissioning of 20HP, VRF/VRV air conditioning system outdoor unit (ODU) complies type-IV OEM standards working on HFC refrigerant R410A or other required/suitable green equivalent refrigerant, for minimum cooling capacity as delivering 100% capacity at 47° C, non stop cooling even at 56° C and coefficient of performance (COP) 3.00 to 4.00, modular type vertical hot air discharge suitable for longer piping range upto 1000 metre operation in cooling mode with inverter/digital VRF/VRV technology microprocessor based control compressor starter/control panel with scroll compressor, air cooled copper condenser coil of suitable shape for increasing maximum heat transfer area, rain protection cover, built in oil separator, accumulator and oil receiver, copper tube aluminium fin air cooled condenser, condenser fan with motor suitable for 415V±10%, 50 Hz, 3 phase power supply (all suitable for high ambient conditions), internal copper refrigerant piping, internal wiring and refrigerant, etc. all housed in powder coated weather proof cabinet complete.	2.00	Each		
2	Supplying, erecting & commissioning 4 pole RCCB 63A, electromagnetic type with 30/100/300 mA sensitivity with earth leakage trip indication With IP 65 In closer complete as per specification no. SW-RCCB/RCCB	2.00	Each		
3	Supplying, erecting & commissioning 4 pole RCCB 25A, electromagnetic type with 30/100/300 mA sensitivity with earth leakage trip indication With IP 65 In closer complete as per specification no. SW-RCCB/RCCB	3.00	Each		
INDOOR UNIT					
4	Supply, installation, testing and commissioning of VRF/VRV based ceiling suspended 4 Way cassette room/indoor unit standard size of nominal cooling capacity 4.15TR having EER as per BEE standards and specifications, suitable as per site requirement with swing louvers and adjustable blades from sides. IDU with drainage arrangements, fan, refrigerant liquid and refrigerant piping, cordless remote control, and fresh air port etc. IDU shall have anti corrosive coating suitable for coastal area in all respects suitable to operate on 1-phase, 230V, 50Hz, AC supply complete. The unit consisting with any additional refrigerant and oil charge as per requirement during installation.	4.00	Each		
5	Supply, installation, testing and commissioning of VRF/VRV based ceiling suspended 4 Way cassette room/indoor unit IDU-compact of nominal cooling capacity 1.66TR having EER as per BEE standards and specifications, suitable as per site requirement with swing louvers and adjustable blades from sides. IDU with drainage arrangements, fan, refrigerant liquid and refrigerant piping, cordless remote control, and fresh air port etc. IDU shall have anti corrosive coating suitable for coastal area in all respects suitable to operate on 1-phase, 230V, 50Hz, AC supply complete. The unit consisting with any additional refrigerant and oil charge as per requirement during installation.	2.00	Each		
6	Supply, installation, testing and commissioning of VRF/VRV based ceiling suspended 1 way cassette room/indoor unit (IDU-compact / standard size) of nominal cooling capacity 2.08TR having EER as per BEE standards and specifications, suitable as per site requirement with swing louvers and adjustable blades from sides. IDU with drainage arrangements, fan, refrigerant liquid and refrigerant piping, cordless remote control, and fresh air port etc. IDU shall have anti corrosive coating suitable for coastal area in all respects suitable to operate on 1-phase, 230V, 50Hz, AC supply complete. The unit consisting with any additional refrigerant and oil charge as per requirement during installation complete.	4.00	Each		
7	Supply, installation, testing and commissioning of high pressure grade required size copper connection Y or T- Joints/refnet complete erected on wall/ceiling with supports/raceways, Nitrile rubber insulation, painting etc. with brazing and testing for leakages confirming the normal operation of the VRV/VRF air conditioning system.	10.00	Each		
8	Supplying, erecting, testing and commissioning centralised programmable remote control panel (HMI) touch manager controls minimum 16 system of 64 ODU's can be controlled and up to 992 IDU's can be individually mounted and controlled indoor units having colour min 200mm size LCD touch panel, yearly schedule, power proportional distribution function, temperature limitation, history function complete erected on wall integrated with provided fire alarm system.	1.00	Each		
9	Providing vacuumising the airconditioner system to 200 micron and charging with R410 refrigerant for AC unit.	180.00	KG		
REFREGRENT PIPE					
10	Supplying, laying / fixing, testing and commissioning of appropriate nominal refrigerant copper pipe of 6.4 mm dia (OD) for liquid line / suction line supply and return piping of suitable gauge (hard drawn copper pipe for liquid main line and for refrigerant) With 7 mill black colour glass cloth along with necessary supports, hangers, clamps, vibration isolators and fittings such as bends, tees, valves, gauges, strainers with insulation of 19 mm thick elastomeric nitrile rubber along with application of multicoating suitable for use with VRV / VRF piping for protection against mechanical damages, fungal growth, flame spread, water permeance and ultra violet radiations complete with OEM standards of VRV / VRF air conditioning system.	65.00	Rmt		

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SR. NO.	DESCRIPTION OF ITEM	QUANTITY	UNIT	RATE	AMOUNT
11	Supplying, laying / fixing, testing and commissioning of appropriate nominal refrigerant copper pipe of 9.5 mm dia (OD) for liquid line / suction line supply and return piping of suitable gauge (hard drawn copper pipe for liquid main line and for refrigerant) With 7 mill black colour glass cloth along with necessary supports, hangers, clamps, vibration isolators and fittings such as bends, tees, valves, gauges, strainers with insulation of 19 mm thick elastomeric nitrile rubber along with application of multicoating suitable for use with VRV / VRF piping for protection against mechanical damages, fungal growth, flame spread, water permeance and ultra violet radiations complete with OEM standards of VRV / VRF air conditioning system.	215.00	Rmt		
12	Supplying, laying / fixing, testing and commissioning of appropriate nominal refrigerant copper pipe of 12.7 mm dia (OD) for liquid line / suction line supply and return piping of suitable gauge (hard drawn copper pipe for liquid main line and for refrigerant) With 7 mill black colour glass cloth along with necessary supports, hangers, clamps, vibration isolators and fittings such as bends, tees, valves, gauges, strainers with insulation of 19 mm thick elastomeric nitrile rubber along with application of multicoating suitable for use with VRV / VRF piping for protection against mechanical damages, fungal growth, flame spread, water permeance and ultra violet radiations complete with OEM standards of VRV / VRF air conditioning system.	125.00	Rmt		
13	Supplying, laying / fixing, testing and commissioning of appropriate nominal refrigerant copper pipe of 15.9 mm dia (OD) for liquid line / suction line supply and return piping of suitable gauge (hard drawn copper pipe for liquid main line and for refrigerant) With 7 mill black colour glass cloth along with necessary supports, hangers, clamps, vibration isolators and fittings such as bends, tees, valves, gauges, strainers with insulation of 19 mm thick elastomeric nitrile rubber along with application of multicoating suitable for use with VRV / VRF piping for protection against mechanical damages, fungal growth, flame spread, water permeance and ultra violet radiations complete with OEM standards of VRV / VRF air conditioning system.	265.00	Rmt		
14	Supplying, laying / fixing, testing and commissioning of appropriate nominal refrigerant copper pipe of 19.1 mm dia (OD) for liquid line / suction line supply and return piping of suitable gauge (hard drawn copper pipe for liquid main line and for refrigerant) With 7 mill black colour glass cloth along with necessary supports, hangers, clamps, vibration isolators and fittings such as bends, tees, valves, gauges, strainers with insulation of 19 mm thick elastomeric nitrile rubber along with application of multicoating suitable for use with VRV / VRF piping for protection against mechanical damages, fungal growth, flame spread, water permeance and ultra violet radiations complete with OEM standards of VRV / VRF air conditioning system.	110.00	Rmt		
15	Supplying, laying / fixing, testing and commissioning of appropriate nominal refrigerant copper pipe of 22.2 mm dia (OD) for liquid line / suction line supply and return piping of suitable gauge (hard drawn copper pipe for liquid main line and for refrigerant) With 7 mill black colour glass cloth along with necessary supports, hangers, clamps, vibration isolators and fittings such as bends, tees, valves, gauges, strainers with insulation of 19 mm thick elastomeric nitrile rubber along with application of multicoating suitable for use with VRV / VRF piping for protection against mechanical damages, fungal growth, flame spread, water permeance and ultra violet radiations complete with OEM standards of VRV / VRF air conditioning system.	65.00	Rmt		
16	Supplying, laying / fixing, testing and commissioning of appropriate nominal refrigerant copper pipe of 28.6 mm dia (OD) for liquid line / suction line supply and return piping of suitable gauge (hard drawn copper pipe for liquid main line and for refrigerant) With 7 mill black colour glass cloth along with necessary supports, hangers, clamps, vibration isolators and fittings such as bends, tees, valves, gauges, strainers with insulation of 19 mm thick elastomeric nitrile rubber along with application of multicoating suitable for use with VRV / VRF piping for protection against mechanical damages, fungal growth, flame spread, water permeance and ultra violet radiations complete with OEM standards of VRV / VRF air conditioning system.	85.00	Rmt		
17	Supplying, laying / fixing, testing and commissioning of appropriate nominal refrigerant copper pipe of 41.3 mm dia (OD) for liquid line / suction line supply and return piping of suitable gauge (hard drawn copper pipe for liquid main line and for refrigerant) With 7 mill black colour glass cloth along with necessary supports, hangers, clamps, vibration isolators and fittings such as bends, tees, valves, gauges, strainers with insulation of 19 mm thick elastomeric nitrile rubber along with application of multicoating suitable for use with VRV / VRF piping for protection against mechanical damages, fungal growth, flame spread, water permeance and ultra violet radiations complete with OEM standards of VRV / VRF air conditioning system.	65.00	Rmt		
	DRAIN PIPE				
18	Supply, Installation, Testing & Commissioning of CPVC 25 mm with 9mm nitrile rubber with inbuild black colour glass cloth.	115.00	Rmt		
19	Supply, Installation, Testing & Commissioning of CPVC 32 mm with 9mm nitrile rubber with inbuild black colour glass cloth.	80.00	Rmt		
20	Supply, Installation, Testing & Commissioning of CPVC 40 mm with 9mm nitrile rubber with inbuild black colour glass cloth.	75.00	Rmt		
21	Supply, Installation, Testing & Commissioning of Corrosion Prevention Coating for fins (Coil Shield Plus) & Expose Copper Tube (AC Guard CP) per units.	2.00	Nos		
	ELECTRICAL SECTION				

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SR. NO.	DESCRIPTION OF ITEM	QUANTITY	UNIT	RATE	AMOUNT
	Supply, Installation, Testing & Commissioning of All control cables between indoor and outdoor unit laid in PVC Piping and clamped.				
22	Supplying, installing, testing and commissioning FR, XLPE Flexible cable 2 core 1.0sq.mm. copper conductor complete erected on wall/ ceiling complete as per specification	425.00	Rmt		
23	Supplying, installing, testing and commissioning FR, XLPE Flexible cable 3 core 2.5 sq.mm. copper conductor complete erected on wall/ ceiling complete as per specification.	90.00	Rmt		
24	Supplying, installing, testing and commissioning FR, XLPE Flexible cable 4 core 2.5 sq.mm. copper conductor complete erected on wall/ ceiling complete as per specification.	100.00	Rmt		
25	Supplying, erecting & terminating FR XLPE insulated, galvanised steel formed wire armoured (strip) cable 1100 V, 4 core 10 sq. mm. copper conductor complete erected with glands & lugs, on wall/ trusses/ pole or laid in provided trench/ pipe as per specification.	60.00	Rmt		
26	Providing & erecting hot dipped galvanised perforated type cable tray with manufactured from 16 SWG (1.6 mm thick) GI sheet of 300 mm width & 75 mm height complete with necessary coupler plates & hardware.	40.00	Rmt		
27	Supply, Installation, Testing, commissioning of fixing aluminum framing for holding for toilet propeller fans with necessary accessories.	1.00	Lot		
	VENTILATION SECTION				
	INLINE CABINET TYPE EXHAUST AIR FAN				
28	Supply, Installation, Testing, commissioning Ceiling Suspended Cabinet Type Exhaust Fans & Casing, drive, motor, mounting frame, starter, isolator & Necessary cabling & earthing strip For Following Capacities : As per AMCA210 standard "Laboratory Methods of testing fans for rating" Balancing quality - As per AMCA204, ISO 1940 standard. 1,600 CFM, 32mm St. Pr./Sutaible HP Stater Panel	2.00	Each		
29	Supply, Installation, Testing, commissioning Ceiling Suspended Inline Type Exhaust Fans & Casing, drive, motor, mounting frame, starter, isolator & Necessary cabling & earthing strip For Following Capacities : As per AMCA210 standard "Laboratory Methods of testing fans for rating" Balancing quality - As per AMCA204, ISO 1940 standard. 1,000	1.00	Each		
30	Supply, Installation, Testing, commissioning Ceiling Suspended Inline Type Exhaust Fans & Casing, drive, motor, mounting frame, starter, isolator & Necessary cabling & earthing strip For Following Capacities : As per AMCA210 standard "Laboratory Methods of testing fans for rating" Balancing quality - As per AMCA204, ISO 1940 standard. 800 CFM, 25mm St. Pr.	1.00	Each		
31	Supply, Installation, Testing, commissioning Ceiling Suspended Inline Type Fresh Air Fans & Casing, Filter, drive, motor, mounting frame, starter, isolator & Necessary cabling & earthing strip For Following Capacities : As per AMCA210 standard "Laboratory Methods of testing fans for rating" Balancing quality - As per AMCA204, ISO 1940 standard. 600 CFM, 25mm St. Pr.	1.00	Each		
32	Supply, Installation, Testing, commissioning Ceiling Suspended Inline Type Fresh Air Fans & Casing, Filter, drive, motor, mounting frame, starter, isolator & Necessary cabling & earthing strip For Following Capacities : As per AMCA210 standard "Laboratory Methods of testing fans for rating" Balancing quality - As per AMCA204, ISO 1940 standard. 1000 CFM, 25mm St. Pr.	1.00	Each		
33	Supply, Installation, Testing, commissioning Ceiling Suspended Inline Type Fresh Air Fans & Casing, Filter, drive, motor, mounting frame, starter, isolator & Necessary cabling & earthing strip For Following Capacities : As per AMCA210 standard "Laboratory Methods of testing fans for rating" Balancing quality - As per AMCA204, ISO 1940 standard. 1600 CFM, 25mm St. Pr./Sutaible HP Stater Panel	1.00	Each		
	DUCTING, GRILLES, DAMPER AND DIFFUSER				
	Supply, Installation, Testing, commissioning of FACTORY rectangular sheet metal ducts, as per specifications detailed in tender, made of Class VIII GP sheet as per SMACNA Standard for medium pressure air flow with TDF flanges, supports, anchor fasteners, food grade gaskets and RTV sealant in accordance with the approved shop drawings. It is mandatory to use factory fabricated ducts for minimum 90% of the ducting system. Use of Site fabricated ducts should be restricted to only 'to suit' pieces. Cold rolled sheets continuous galvanized sheet steel with zinc coating as per class VIII conforming to IS:277-1962 (revised)(where ever specified) of LFQ (Lock Forming Quality) grade. Galvanizing shall be of 120gms/sq. m (Total coating on both sides) The fabrication of the ducting system for air-conditioning & Ventilation shall conform to SMACNA-1995 standards ("HVAC Duct Construction Standards - Metal and Flexible - Second Edition - 1995"- SMACNA). Ducts of following Gauge/thickness with Flanges, G.I. Sheet Metal Rectangular Duct				
34	0.63 MM (24G) - Rectangular Duct	410.00	MT2		
35	Supply, fabrication, installation and testing of flexible canvas connections constructed between ductable unit/dampers/ducting of suitable size with fire resist flexible double canvas sleeve complete.	14.00	Nos.		
36	Supplying and erecting aluminium powder coated linear grill of suitable size for width length without collar dampers having matching colour with the existing false ceiling and suitable for deflection of 15/30/45°.	6.00	SQ.M		

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SR. NO.	DESCRIPTION OF ITEM	QUANTITY	UNIT	RATE	AMOUNT
37	Supply & Installation of Bird scree with cowpiece.	1.00	SQ.M		
INSULATION					
38	Supply, Installation, Testing and Commissioning of 25 mm thick insulation for supply Air,Fresh air duct Thermal insulation of fire retardant.The duct thermal insulation material shall be of closed cell structure nitrile rubber with factory laminated 7 mill glass cloth of density 40-60 kg/m3. The duct adhesive shall be as per OEM. The product shall have temepature range of -40°C to 105°C. The insulation material shall be fire rated for Class 0 as per BS 476 Part 6 : 1989 for fire propagation test and for Class 1 as per BS 476 Part 7, 1987 for surface spread of flame test. It should be CFC free.It should not be non-corrosive to copper and stainless when tested as per DIN 1988. The material should not develop crack when tested for Ozone resistance as per ASTM 1149. No cracks should be develop when exposed to UV as per ASTM G 154-04.The resistance microbiological growth should be in accordance to UL 181-and meet the acceptance criteria of resistance to fungal contamination as per ASTM G21. It should meet the acceptance criteria of resistance to bacterial contamination as per ASTM 2180.	180.00	SQ.M		
39	Supply & Installation of Exhaust Hood fabricated from 18g SS Sheets with SS Grease Stop Filters & Lights with Damper.Size : 600(W)x300(H)x7000(L)	2.00	Nos.		
DISMANTLING WORKS					
40	Dismantling & assemling with recomissioning of existing indoor unit (3.33TR VRF Cassette Unit)	8.00	Nos.		
41	Dismantling & assemling with recomissioning of existing indoor unit 4Nos Outdoor.	4.00	Nos.		
42	Supply, Installation, Testing and Commissioning of HVAC related CIVIL work like corecutting in wall & also fire sealent around the duct and copper pipe..	35.00	SQ.M		
DX SYSTEM					
43	Supplying, installing, testing & commissioning cassette type room Air conditioning unit 4.0TR capacity with refrigerant R32/410A 415V, 50 Hz, A.C. supply having 1 no of air handling unit (Mega split) mounting type complete with temperature display on indoor unit, minimum dust filter, noise level maximum 50dBA at position as per specification.	1.00	Nos.		
44	Supplying, installing, testing & commissioning cassette type room Air conditioning unit 3.0TR capacity with refrigerant R32/R410A 415V, 50 Hz, A.C. supply having 1 no of air handling unit (Mega split) mounting type complete with temperature display on indoor unit, dust filter, noise level maximum 50dBA at position as per specification.	1.00	Nos.		
45	Supplying, installing, testing & commissioning cassette type variable speed inverter technology with minimum 3 to 1 convertible mode for compressor room air conditioning unit 1.50TR capacity having ISEER minimum 5.00 suitable to operate on 250V, 50 Hz, A.C. supply having 1 no of air handling unit hi-wall/floor mounting type complete with refrigerant R32/R410A having copper condenser, dust filter, self diagnosis feature, stabilizer free operation, noise level maximum 50dBA at position as per specification.	1.00	Nos.		
46	Supplying and erecting iron work, sheet metal work consisting of CRCA sheets, various sections of iron, plates, chequered plates, rods, bars, MS pipes, etc. for panel board or any other purpose with bending, cutting, drilling and welding complete erected at the position with necessary materials duly painted with one coat of red oxide and two coats of enamel paint to match the switchgears or as per directions by the authority.	350.00	Nos.		
TOTAL AMOUNT					