

<b><u>BILL OF QUANTITIES FOR HVAC WORK FOR BANK OF INDIA,</u></b> <b><u>ZONAL OFFICE BUILDING, SECTOR -31 CHANDIGARH</u></b>					
S.No.	Description	Qty	Unit	Rate (In Rs.)	Amount (In Rs.)
	The prices are to be quoted include the supply and installation at site of all the equipments, ancillary materials as specified and all such items what so ever which may be required to fulfill the intent and purpose as laid down in the specification and/or the drawings and shall include all taxes and duties on a works contract basis.				
	<b>PART -A (EQUIPMENT)</b>				
<b>1</b>	<b>PACKAGED, DUCTABLE &amp; SPLIT/CASSETTE AIR CONDITIONERS</b>				
	Providing, fixing & Testing of Air Cooled Packaged/Ductable type Split air-conditioners fitted with hermetic sealed scroll compressor , an outdoor unit with Factory charged R-22 Gas & oil suitable for 380-440 volt, 50 Hz ( 3 Phase supply), with Condenser fan, outer casing, indoor fan coil unit(s) consisting of centrifugal fans, fan motor, DX cooling coil, outer casing, filter, control & power panel with remote control etc. complete with all ancillary, foundation and allied minor civil works including mounting fitting indoor units at there respective locations, Leak testing entire system, Lifting & Shifting and commissioning as per instructions of engineer in charge of following ratings (Note:- Rates to be excluding Referigent pipe, Drain pipe, Insulation of piping, MS Stands, etc.)				
	<b>Make : Blue Star/Hitachi/Daikin/ Voltas/ Carier</b>				
<b>1.1</b>	22 TR Floor Standing Packaged AC with 11 tr x 2 scroll compressors & nominal capacity outdoor unit with matching capacity indoor unit suitable for atleast 8800 cfm air capacity.	1	Nos		
<b>1.2</b>	16.5 TR Floor Standing Packaged AC with 5.5 tr x 2 scroll compressors & nominal capacity outdoor unit with matching capacity indoor unit suitable for atleast 6600 cfm air capacity.	1	Nos		
<b>1.3</b>	8.5 TR Ductable type AC with Scroll Compressor nominal capacity outdoor unit with matching capacity indoor unit suitable for atleast 3500 cfm air capacity.	3	Nos		

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1.4	5.5 TR Ductable type AC with Scroll Compressor nominal capacity outdoor unit with matching capacity indoor unit suitable for atleast 2200 cfm air capacity.	3	Nos		
1.5	3.0 TR Ductable type AC with Recip. Compressor nominal capacity outdoor unit with matching capacity indoor unit suitable for atleast 1200 cfm air capacity.	1	Nos		
1.6	Hi-Wall Split Air conditioners (3 star Rating) with Stabilizer & remote Control etc. complete for rated capacity.				
i	2.0 tr	1	Nos		
ii	1.5 tr	2	Nos		
iii	1.0 tr	4	Nos		
1.7	Cassette Air conditioners(3 star Rating) with Stabilizer & remote Control etc. complete for rated capacity.				
i	2.0 tr( Rotary/Recip. compressor)	4	Nos		
ii	3.0 tr( Scroll compressor)	2	Nos		
2	<b>Exhaust Fans</b>				
2.1	Supply, installation, testing & commissioning of In-line fan for toilet and Pantry exhaust complete as per specification & drawings				
i	650 CFM (Toilet Exhaust)	Nos.	6		
ii	300 CFM (Fresh Air)	Nos.	2		
iii	400 CFM (Pantry Exhaust)	Nos.	2		
	<b>(Crompton/ECE/Orient)</b>				
	<b>Total of Equipment (Part A)</b>				

S.No.	Description	Qty	Unit	Rate (In Rs.)	Amount (In Rs.)
	<b>PART- B (Refrigerant Piping)</b>				
<b>3</b>	<b>REFRIGERANT PIPING</b>				
	Supplying, Installation, Testing and Commissioning of Refrigerant piping of sufficient sizes (as per IS Code) complete with all fittings such as bends, tees, elbows etc. including insulation not less than 0.80 mm thickness as per specifications. The quoted rates shall include rates for chiseling, making good of wall, clamps etc. including other civil works.				
<b>3.1</b>	Refrigerant piping for 11.0 TR units	54	Rmt		
<b>3.2</b>	Refrigerant piping for 8.50 TR Units	60	Rmt		
<b>3.3</b>	Refrigerant piping for 5.5 TR units	45	Rmt		
<b>3.4</b>	Refrigerant piping for 3.0 TR units	55	Rmt		
<b>3.5</b>	Refrigerant piping for 2.0/1.5/1.0 TR units	165	Rmt		
<b>4</b>	<b>DRAIN WATER PIPING</b>				
	Supplying, Installation, Testing and Commissioning of Drain water piping with PVC pipe, ISI marked heavy duty pipes complete with all fittings such as bends, tees, elbows, flanges, supports, anti-vibration hangers and insulation with 6mm x-linked polyethylene. The quoted rates shall include rates for chiseling, making good of wall, clamps etc. including civil work. <b>(Diplast, Polyplast, Prakash)</b>				
<b>4.1</b>	25 mm	200	Rmt		
<b>4.2</b>	32 mm	140	Rmt		
<b>4.3</b>	65mm dia 2mm th.	200	Rmt		
<b>5</b>	Providing & fixing M.S. Stands for out door units made from 40X40X6mm Ms angle Complete i.e. welding, painting with synthetic enamel paint, fixing at their respective location including Civil work etc complete				
<b>5.1</b>	For 11/8.75/5.5/3.0 tr (Floor Mounted)	15	No.		
<b>5.2</b>	For 2.0/1.5 tr (Wall Mounted)	10	No.		
	<b>Total of Ref. Piping (Part -B)</b>				

S.No.	Description	Qty	Unit	Rate (In Rs.)	Amount (In Rs.)
	<b>PART- C (AIR DISTRIBUTION)</b>				
<b>6</b>	<b>Ducting (Rectangular Duct)</b>				
	Supplying, Installation, Testing and Commissioning of GI ducting, material as per technical specifications and drawings complete with all fitting, accessories, dampers, vanes, take offs, canvas connections transformation. The rate shall include suspension and supporting arrangement with angle iron and dash fasteners including civil work.				
	<b>SAIL/ESSAR/JINDAL</b>				
<b>6.1</b>	0.63 mm (24 G)	680	sqmt		
<b>6.2</b>	0.80 mm (22 G)	150	sqmt		
<b>6.3</b>	1.0 mm (20 G)	80	sqmt		
<b>6.4</b>	1.2 mm (18 G)	60	sqmt		
<b>7</b>	<b>Grills and diffusers</b>				
	Supply, fixing, Testing & Commissioning of grills & diffusers as per specifications and drawings.				
<b>7.1</b>	Extruded Aluminium powder coated supply air diffusers with volume control dampers and mounting frames finished in approved shade size 450 x 450. <b>(Carryair/Tanus/Tristar)</b>	20	Nos		
<b>7.2</b>	Extruded Aluminium powder coated return air diffusers without volume control dampers and mounting frames finished in approved shade size 450 x 450. <b>(Carryair/Tanus/Tristar)</b>	20	Nos		
<b>7.3</b>	Extruded Aluminium powder coated supply air linear grills without volume control dampers and mounting frame. finished in approved shade.				
<b>i</b>	150 mm high <b>(Carryair/Tanus/Tristar)</b>	16	Sqm		
<b>7.4</b>	<b>Volume control dampers</b>				
<b>i</b>	Supplying and fixing of aluminium volume control damper for linear grills as per specifications. <b>(Carryair/Tanus/Tristar)</b>	8	Sqm		
<b>7.5</b>	Providing and fixing Fire retardant non porous double layer flexible connection between each indoor unit and duct. (150mm)	10	sets		
<b>7.6</b>	Supply, installation, testing and balancing of inlet air <b>louvers</b> with bird screen and volume damper for fresh air in powder coated extruded aluminium construction as per specifications and approved shop drawings. <b>(Carryair/Tanus/Tristar)</b>	2	Sqmt.		
<b>7.7</b>	Supply, Installation of 300mm Dia Jet Nozzle Diffuser for Supply of Air, sufficient for double height area. <b>(Carryair/Tanus/Tristar)</b>	10	No.		
<b>7.8</b>	Supply, installation, testing of Fire Damper with Motorised Actuators for Supply air Ducts.	10	No.		

S.No.	Description	Qty	Unit	Rate (In Rs.)	Amount (In Rs.)
	<b>(Carryair/Tanus/Tristar)</b>				
7.9	Supply, installation, testing & commesioning of slot diffuser ( 3 Slot)	10	Rmt		
	<b>(Carryair/Tanus/Tristar)</b>				
8	<b>INSULATION OF DUCTS</b>				
8.1	<b>Acoustic lining</b> of Duct work with 25 mm thick fire retardant, fiberglass(density 24kg/sqm) stick using shalikote primer hot bitumen and mechanically fastened, covered with RP tissue and 30G aluminum perforated sheet . Acoustic lining shall be rigid board Twiga 300.	200	sqmt		
	<b>(UP TWIGA)</b>				
8.2	Supply& fixing <b>thermal insulation</b> to Ducts with 9 mm thick Nitrile rubber & black BOPP tape 75 mm wide.. Complete in all respect.	500	sqmt		
	<b>(UP TWIGA)</b>				
8.3	Under deck insulation with fire retardant TF quality, Thermocole 50 mm thick, 16 kg./m3 density fixed to slab with cold adhesive and finally finished with a coat of fire retardant paint of Navaire make	450	Sqft.		
	<b>(THERMOPACKER)</b>				
	<b>Total of Air Distribution (Part -C)</b>				

S.No.	Description	Qty	Unit	Rate (In Rs.)	Amount (In Rs.)
	<b>PART- D ( ELECTRICAL WORK)</b>				
9	Designing, fabricating, transporting to site, installing, testing and commissioning of floor mounted, self supported, compartmentalized LT cubical pattern metal clad switch board, fabricated from 2mm (14 G) thick CRCA sheet steel suitable for 31 MVA rupturing capacity at 415 V, 3 phase, 4 wire, 50 HZ AC supply and equipped with PVC sleeved aluminium bus bars of specified rating and following switch gears inter connected by PVC sleeved solid conductors, including 7-tank cleaning, degreasing, phosphating process and treatment of panel with anti-corrosive zinc based primer paint and finally powder coating the panel, complete with earthing terminals, cable and bus bar alleys and hoisting hooks as required. The LT panel will comprise MCCBs/MCBs as described below for incoming and outgoing power supplies.				
	<b>Incoming MCCB</b>				
	a. 160A, TPN MCCB with 0-100A ammeter 100/5A Current Transformer & selector switch alongwith other accessories as specified. -1 No.				
	b. Phase indicating lights and indicating lights t for 'ON-OFF' status-1 set				
	c. 96 mm x 96 mm voltmeter with VSS and fuse of suitable range.-1 set				
	d. Bimetallic lugs shall be used at copper to aluminum joints.				
	<b>Bus - Bar</b>				
	a. 200 Amps TPN electrolytic aluminium E 91 grade bus bars with heat shrinkable insulation cover sleeves. -1 Set (R,Y,B &N 100%)				
	<b>Outgoings</b>				
	a. 63 Amps MPCB with amps meter (direct type )and ON-OFF indicators				
	b. Control wiring including relays, contactors etc.	1	No		
	<b>Sub-panels</b>				
10	Instalation, Testing & Commisioning Floor wise sub panels as per requirement, Drgs and Instructions of Bank Engineer/ Architect.	2	No		
	<b>(EMCO,TRICOLITE,STANDARD)</b>				

S.No.	Description	Qty	Unit	Rate (In Rs.)	Amount (In Rs.)
<b>11</b>	<b>Power cable.</b>				
	Supplying and laying of following 1100 volt grade PVC insulated sheathed copper conductor armored cables on cable trays ( quantity of cable trays included in BOQ separately), fixed on wall or ceiling with suitable clamps, saddles, and fixing bolts, providing identification tags as required, jointing / connecting / terminating, testing and commissioning <b>(HAVELLS,POLYCAB,Fenolex)</b>				
<b>11.1</b>	3.5C x 25 sq.mm - Copper	110	RM		
<b>11.2</b>	4C x 16 sq.mm - Copper	80	RM		
<b>11.3</b>	4C x 10 sq.mm - Copper	200	RM		
<b>11.4</b>	4C x 6 sq.mm - Copper	150	RM		
<b>11.5</b>	4C x 4 sq.mm - Copper	150	RM		
<b>12</b>	<b>Control Cables</b>				
	Supply, laying testing and commissioning of 1100 volt grade un-armored XLPE insulated and sheathed copper conductor cables on cable trays including terminations with suitable clamps, saddles, hooks, bolts etc. complete as per specifications and requirement. (IS:1554-1976) (Part-I). <b>(HAVELLS,POLYCAB,Fenolex)</b>				
<b>12.1</b>	4.0 C x 2.5 sq.mm. - Copper	100	RM		
<b>12.2</b>	2.0 C x 2.5 sq.mm. - Copper	80	RM		
<b>12.3</b>	2.0Cx 1.5 sq.mm. - copper	200	Rm		
<b>13</b>	<b>Cable Trays (Perforated)</b>				
	Fabrication, supply and installing following sizes of perforated M.S. Cable trays perforated type, manufactured from 1.6mm thick CRCA sheet duly, derusted, pretreated before painting, then given 2 coats primer and finished paint shade gray including horizontal, right angle and vertical bends, reducers, tees, cross members and other accessories as required and duly suspended from the ceiling with M.S. rod suspension bars 1 on each side of size 8mmx1m length duly cut to required height as per site conditions including painting etc. as required. Providing spacing between hangers of cable trays i.e. upto 150mm width spacing should not less than 1.5m and above 150mm width spacing should be 0.9m, but at the location of cable tray joints hanger should be provided with 0.5m on both side of the joints. Cable tray shall be provided alongwith connecting plates required GI nut bolts etc.				
<b>13.1</b>	Cable Tray 300mm width x 50mm height x 2mm thickness	30	RM		

S.No.	Description	Qty	Unit	Rate (In Rs.)	Amount (In Rs.)
13.2	Cable Tray 150mm width x 50mm height x 2mm thickness	100	RM		
14	Earthing with G.I. earth plate 600x600x6 mm thick including accessories and providing masonry enclosure with cover plate, watering pipe, charcoal and salt mixture below 4.0 mtr below Ground lvl incl 25 x 6 mm GI strip upto Ground lvl.	2	NO		
15	Providing and fixing of G.I. earth wire along with cable complete as per specifications and as required as per I.E. Rules 1956..				
15.1	6 Swg Cu wire	400	Rm		
	<b>Total for Electrical Work (Part- D)</b>				

### SUMMARY

S.NO	DESCRIPTION	AMOUNT(Rs.)
A.	EQUIPMENT (Part A)	RS.
B.	REFERIGRENT PIPING (Part -B)	RS.
C.	AIR DISTRIBUTION (Part -C)	RS.
D.	ELECTRICAL WORKS (Part- D)	RS.
	TOTAL	