

Project: HVAC works of existing Test Research Laboratory Building, Construction of plant Room for HVAC works and Associated works at NIMR Campus, Sector 8, Dwarka, New Delhi

BOQ for Civil Work

Item No	Description Of Item	Total Qty	Unit	Rate in Figures(Rs)	Rate in Words(in Rs)	Amount in Figures (in Rs)
1	2	3	4	5	6	7
1.00	EARTH WORK					
1.01	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30cm in depth, 1.5m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50m and lift up to 1.5m, disposed earth to be levelled and neatly dressed.					
a)	All kinds of soil	569.00	cum			
b)	Ordinary rock	5.00	cum			
c)	Hard rock (blasting prohibited)	5.00	cum			
1.02	Earth work in excavation by mechanical means (Hydraulic excavator)/ manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift up to 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.					
a)	All kinds of soil.	10.00	cum			

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1	2	3	4	5	6	7
1.03	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift up to 1.5 m.	431.00	cum			
1.04	Extra for every additional lift of 1.5 m or part there of in.					
a)	All kinds of soil.					
i)	1.5 to 3.0m	96.72	cum			
ii)	3.0 to 4.5m	48.36	cum			
1.05	Supplying and filling in plinth with river sand under floors including, watering. ramming consolidating and dressing complete.	28.00	cum			
1.06	Extra for disposal of excavated earth for additional lead beyond 50m or part thereof upto 9 such additional leads					
a)	All kinds of soil	339.00	cum			
	Total					

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1	2	3	4	5	6	7
2.00	Concrete Work					
2.01	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level:					
a)	1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size)	1.00	cum			
b)	1:4:8 (1 Cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size).	26.00	cum			
c)	1:5:10 (1 cement : 5 coarse sand : 10 graded stone aggregate 40 mm nominal size)	28.00	cum			
2.02	Providing and laying cement concrete in retaining walls, return walls, walls (any thickness) including attached pilasters, columns, piers, abutments, pillars, posts, struts, buttresses, string or lacing courses, parapets, coping, bed blocks, anchor blocks, plain window sills, fillets etc. up to floor five level, excluding the cost of centering, shuttering and finishing:					
a)	1:2:4 (1 Cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size)	3.00	cum			

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1	2	3	4	5	6	7
2.03	Providing and laying damp-proof course 40mm thick with cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 12.5mm nominal size).	30.00	sqm			
2.04	Extra for providing and mixing water proofing material in CC/RCC work @ 1 kg per 50kg of cement.	8.00	per 50 kg cement			
2.05	Applying a coat of residual petroleum bitumen of penetration 80/100 of approved quality using 1.7kg per square metre on damp proof course after cleaning the surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil.	30.00	sqm			
Total						

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1	2	3	4	5	6	7
3.00	REINFORCED CEMENT CONCRETE					
3.01	Providing and laying in position machine batched, machine mixed and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete work including pumping of concrete to site of laying but excluding the cost of centering, shuttering, finishing and reinforcement. including Admixtures in recommended proportions as per IS 9103 to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per direction of Engineer-in-charge. M-25 grade reinforced cement concrete by using 380 kg. of cement per cum of concrete. All work up to floor V level.	251.00	cum			
3.02	Add or deduct for providing richer or leaner mixes respectively at all floor levels.					
i)	Providing M-30 grade concrete by using 400kg of cement per cum of concrete instead of M-25 grade B.M.C/ R.M.C..	64.00	cum			

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1	2	3	4	5	6	7
3.03	Centering and shuttering including strutting, propping etc. and removal of form for:					
a)	Foundations, footings, bases of columns, etc. for mass concrete.	63.00	sqm			
b)	Walls (any thickness) including attached pilasters, butteresses, plinth and string courses etc.	171.00	sqm			
c)	Suspended floors, roofs, landings, balconies and access platform.	294.00	sqm			
d)	Shelves (Cast in situ)		sqm			
e)	lintels, beams, plinth beams. girders. bressumers and cantilevers.	428.00	sqm			
f)	Columns, Pillars, Piers, Abutments, Posts and Struts.	310.00	sqm			
	Vertical and horizontal fins individually or forming box louvers band, facias and eaves boards.	72.98	Sqm			
g)	Small lintels not exceeding 1.5m clear span, moulding as in cornices, window sills, string courses, bands, copings, bed plates, anchor blocks and the like.	14.00	sqm			

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1	2	3	4	5	6	7
3.04	Extra for additional height in centering, shuttering wherever required with adequate bracing, propping etc. including cost of de-shuttering and decentering at all levels, over a height of 3.5 m, for every additional height of 1 metre or part thereof (Plan area to be measured)					
a)	Suspended floors, roofs, landings, beams and balconies (Plan area to be measured).	246.00	sqm			
3.05	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete (At all levels).					
a)	Thermo-Mechanically Treated bars	28907.00	Kg			
	Total					

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1	2	3	4	5	6	7
4.00	BRICK WORK					
4.01	Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in:					
a)	Cement mortar 1:6 (1 cement: 6 coarse sand)	18.00	cum			
4.02	Brick work with F.P.S. bricks of class designation 75 in superstructure above plinth level up to floor V level in all shapes and sizes in :					
a)	Cement mortar 1:6 (1 cement: 6 coarse sand)	77.00	cum			
4.03	Half brick masonry with F.P.S. bricks of class designation 75 in superstructure above plinth level up to floor V level.					
a)	Cement mortar 1:4 (1 cement :4 coarse sand)	75.00	sqm			
4.04	Extra for providing and placing in position 2 Nos. 6mm dia. M.S. bars at every third course of half brick masonry (with F.P.S. bricks).	75.00	sqm			

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1	2	3	4	5	6	7
4.05	Brick edging 7cm wide 11.4cm. deep to plinth protection with bricks of class designation 75 including grouting with cement mortar 1:4 (1 cement : 4 fine sand)	197.00	Metre			
	Total					

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1	2	3	4	5	6	7
5.00	DOORS, WINDOWS AND FITTINGS					
5.01	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/ appropriate Z sections and other sections of approved make conforming to IS: 733 and IS : 1285, fixed with rawl plugs and screws or with fixing clips, or with expansion hold fasteners including necessary filling up of gaps at junctions, at top, bottom and sides with required EPDM rubber/neoprene felt etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing / paneling, C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. (Glazing and paneling to be paid for separately) :					
5.01.1	For fixed portion					
a)	Powder coated aluminium (minimum thickness of powder coating 50 micron)	589.00	kg			

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1	2	3	4	5	6	7
5.01.2	For shutters of doors, windows & ventilators including providing and fixing hinges/pivots and making provision for fixing of fittings wherever required including the cost of EPDM rubber / neoprene gasket required (Fittings shall be paid for separately).					
a)	Powder coated aluminium (minimum thickness of powder coating 50 micron)	409.00	kg			
5.02	Providing and fixing anodised aluminium (anodised transparent or dyed to required shade according to IS: 1868. Minimum anodic coating of grade AC 15) sub frame work for windows and ventilators a with extruded built up standard tubular sections of approved make conforming to IS: 733 and IS : 1285 fixed with rawl plugs and stainless steel screws etc.	10.00	kg			

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1	2	3	4	5	6	7
5.03	Providing and fixing pressed steel door frames confirming to IS: 4351 manufactured from commercial mild steel sheet of 1.25 mm thickness including hinges jamb, lock jamb, bead and if required angle threshold of mild steel angle of section 50x25mm, or base ties of 1.25mm pressed mild steel welded or rigidly fixed together by mechanical means, adjustable lugs with split end tail to each jamb including steel butt hinges 2.5mm thick with mortar guards, lock strike-plate and shock absorbers as specified and applying a coat of approved steel primer after pre-treatment of the surface as directed by Engineer-in-charge:					
a)	Profile C	15.00	metre			
5.04	Providing and fixing glazing in aluminium door, window, ventilator shutters and partitions etc. with EPDM rubber / neoprene gasket etc. complete as per the architectural drawings and the directions of engineer-in-charge. (Cost of aluminium snap beading shall be paid in basic item) :					
a)	With float glass panes of 5.50 mm thickness	58.00	sqm			

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1	2	3	4	5	6	7
5.05	Providing and fixing powder coated aluminium grills (minimum thickness of powder coating 50 micron) of required size and approved pattern and quality made out with special extruded sections conforming to relevent IS Codes, fixed with rawl plugs and screws or with expansion hold fasteners fixed with suitable means as approved and as directed by Engineer in Charge including C.P. brass / stainless steel screws, all complete as per architectural drawings/ directions of Engineer-in-charge.	50.00	kg			
5.06	Providing and fixing ISI marked flush door shutters conforming to IS: 2202 (Part I) non-decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters :					
a)	35 mm thick including ISI marked Stainless Steel butt hinges with necessary screws.	9.00	sqm			

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1	2	3	4	5	6	7
5.07	Extra for providing lipping with 2nd class teak wood battens 25 mm minimum depth on all edges of shutters (over all area of door shutter to be measured) over item no. 5.09 above.	9.00	sqm			
5.08	Extra for providing vision panel not exceeding 0.1 sqm in all type of flush doors (cost of glass excluded) (overall area of door shutter to be measured) :					
a)	Rectangular or square.	5.00	sqm			
5.09	Providing & Fixing decorative high pressure laminated sheet of plain / wood grain in gloss / matt / suede finish with high density protective surface layer and reverse side of adhesive bonding quality conforming to IS : 2046 Type S including cost of adhesive of approved quality					
a)	1.0 mm thick.	18.00	sqm			

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1	2	3	4	5	6	7
5.10	Supplying and fixing rolling shutters of approved make, made of required size M.S. laths interlocked together through their entire length and jointed together at the end by end locks mounted on specially designed pipe shaft with brackets, side guides and arrangements for inside and outside locking with push and pull operation complete including the cost of providing and fixing necessary 27.5cm long wire springs grade No.2 and M.S. top cover of required thickness for rolling shutters.					
	80x1.25mm M.S. laths with 1.25 mm thick top cover.	21.00	sqm			
5.11	Providing and fixing ball bearing for rolling shutters.	8.00	No.			
5.12	Extra for providing grilled rolling shutters manufactured out of 8 mm dia. M.S. bar instead of laths as per design approved by Engineer-in-charge.(area of grill to be measured).	10.50	sqm			
	ALUMINIUM FITTINGS					

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1	2	3	4	5	6	7
5.13	Providing and fixing aluminium sliding door bolts ISI marked anodised (anodic coating not less than grade AC 10 as per IS: 1868) transparent or dyed to required colour or shade with nuts and screws etc. complete:					
a)	300x16 mm	1.00	each			
b)	250x16 mm	1.00	each			
5.14	Providing and fixing aluminium tower bolts ISI marked anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour or shade with necessary screws etc. complete:					
a)	250x10 mm	5.00	each			
b)	150x10 mm	100.00	each			
5.15	Providing and fixing aluminium handles ISI marked anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour or shade with necessary screws etc. complete :					
a)	125 mm	7.00	each			
b)	100 mm	4.00	each			

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1	2	3	4	5	6	7
5.16	Providing and fixing aluminium hanging floor door stopper ISI marked anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour and shade with necessary screws etc. complete.					
a)	Twin rubber stopper	4.00	each			
5.17	Providing and fixing bright finished brass 100 mm mortice latch and lock ISI marked with six levers and a pair of anodised (anodic coating not less than grade AC 10 as per IS : 1868) aluminium lever handles with necessary screws etc. complete (Best make of approved quality).	3.00	each			
5.18	Providing and fixing stainless steel (SS 304 grade) adjustable friction windows stays of approved quality with necessary stainless steel screws etc. to the side hung windows as per direction of Engineer-in-charge complete.					
a)	255 X 19 mm	84.00	each			

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1	2	3	4	5	6	7
5.19	Providing and fixing aluminium casement windows fastener of required length for aluminium windows with necessary screws etc. complete.					
a)	Powder coated minimum thickness 50 micron aluminium.	102.00	each			
	Total					

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6.00	Steel Works					
6.01	Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. all complete.					
a)	Fixed to steel windows by welding.	1295.00	kg			
6.02	Steel work welded in built up sections/ framed work including cutting ,hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel etc. as required.					
a)	In gratings, frames, guard bar, ladder, railings, brackets, gates and similar works.	100.00	Kg			
	Total					

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7.00	Flooring					
7.01	Cement concrete flooring 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate) finished with a floating coat of neat cement including cement slurry, but excluding the cost of nosing of steps etc. complete.					
a)	40mm thick with 20mm nominal size stone aggregate.	10.00	sqm			
7.02	Cement plaster skirting (up to 30 cm height) with cement mortar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement.					
a)	18 mm thick.	1.00	sqm			
7.03	Providing and fixing glass strips in joints of <i>terrazo</i> / cement concrete floors.					
a)	40 mm wide and 4 mm thick.	25.00	Metre			

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1	2	3	4	5	6	7
7.04	Kota stone slab flooring over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab including rubbing and polishing complete with base of cement mortar 1 : 4 (1 cement : 4 coarse sand) :					
a)	25 mm thick.	275.00	sqm			
7.05	Kota stone slabs 25 mm thick in risers of steps, skirting, dado and pillars laid on 12 mm (average) thick cement mortar 1:3 (1 cement 3 coarse sand) and jointed with grey cement slurry mixed with pigment to match the shade of the slabs, including rubbing and polishing complete.	28.00	sqm			

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1	2	3	4	5	6	7
7.06	Providing and fixing 1st quality ceramic glazed wall tiles conforming to IS : 15622 (thickness to be specified by the manufacturer) of approved make in all colours, shades except burgundy, bottle green, black of any size as approved by Engineer-in-Charge in skirting, risers of steps and dados over 12 mm thick bed of cement Mortar 1:3 (1 cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm including pointing in white cement mixed with pigment of matching shade complete.	80.00	sqm			
7.07	Chequered terrazo tiles 22 mm thick with graded marble chips of size up to 6 mm in floors jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete on 20 mm thick bed of cement mortar 1:4 (1 cement :4 coarse sand) :					
a)	Medium shade using 50%white cement 50% ordinary cement	36.00	sqm			
	Total					

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8.00	CEILING & ROOFING					
8.01	Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces etc consisting of following operations: a) Applying a slurry coat of neat cement using 2.75 kg/sqm. of cement admixed with water proofing compound conforming to IS. 2645 and approved by Engineer-in-charge over the RCC slab including adjoining walls upto 300mm height including cleaning the surface before treatment. b) Laying brick bats with mortar using broken bricks/brick bats 25 mm to 115mm size with 50% of cement mortar 1:5 (1 cement: 5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge over 20 mm thick layer of cement mortar of mix 1:5 (1 cement :5 coarse sand) admixed with water proofing compound to IS : 2645 and approved by Engineer - in - charge to required slope and treating similarly the					

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	adjoining walls upto 300 mm height including rounding of junctions of walls and slabs c) After two days of proper curing applying a second coat of cement slurry using 2.75kg/ sqm of cement admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge. d) Finishing the surface with 20 mm thick jointless cement mortar of mix 1:4 (1 cement: 4 coarse sand) admixed with water proofing compound conforming to IS: 2645 and approved by Engineer-in-charge including laying glass fibre cloth of approved quality in top layer of plaster and finally finishing the surface with trowel with neat cement slurry and making pattern of 300x300 mm square 3mm deep. e) The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be done in order and as directed and specified by the Engineer-in-Charge :					
a)	With average thickness of 120mm and minimum thickness at khurra as 65 mm.	335.00	sqm			
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9.00	Finishing					
9.01	12 mm cement plaster of mix:					
a)	1:6 (1 cement: 6 fine sand)	307.00	sqm			
9.02	15 mm cement plaster on the rough side of single or half brick wall of mix:					
a)	1:6 (1 cement: 6 fine sand)	346.00	sqm			
9.03	18 mm cement plaster in two coats under layer 12 mm thick cement plaster 1:5 (1 cement: 5 coarse sand) finished with a top layer 6mm thick cement plaster 1:6 (1 cement: 6 fine sand).	1060.00	sqm			
9.04	6 mm cement plaster of mix:					
a)	1:3 (1 cement: 3 fine sand)	376.00	sqm			
9.05	Distempering with oil bound washable distemper of approved brand and manufacture to give an even shade					
a)	New work (two or more coats) over and including priming coat with cement primer.	1029.00	sqm			

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9.06	Finishing walls with water proofing cement paint of required shade :					
a)	New work (Two or more coats applied @ 3.84 kg/10 sqm).	1060.00	sqm			
9.07	Painting with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade:					
a)	Two or more coats on new work over an under coat of suitable shade with ordinary paint of approved brand and manufacture.	86.00	sqm			
9.08	Providing and fixing 24 gauge and 18mm mesh size chicken wiremesh at junction of concrete and brick work and other locations at all heights including cutting to required size and side laps of minimum 75mm and fixing in positions with nails/screws etc. as directed and as required at site.	25.00	sqm			
	Total					

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10.00	Miscellaneous					
10.01	Making plinth protection 50mm thick of cement concrete 1:3:6 (1 cement :3 coarse sand : 6graded stone aggregate 20mm nominal size) over 75mm bed by dry brick ballast 40mm nominal size well rammed and consolidated and grouted with fine sand including finishing the top smooth	161.00	sqm			

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Item No	Description Of Item	Total Qty	Unit	Rate in Figures(Rs)	Rate in Words(in Rs)	Amount in Figures (in Rs)
1	2	3	4	5	6	7
10.02	Providing and laying integral cement based treatment for water proofing on horizontal surface at all depth below ground level for under ground structures as directed by Engineer-in-Charge and consisting of : i) 1st layer of 22mm to 25mm thick approved and specified rough stone slab over a 25mm thick base of cement mortar 1:3 (1 cement : 3 coarse sand) mixed with water proofing compound conforming to IS:2645 in the recommended proportion over the leveling course (leveling course to be paid separately). Joints sealed and grouted with cement slurry mixed with water proofing compound. ii) 2nd layer of 25mm thick cement mortar 1:3 (1 cement: 3 coarse sand) mixed with water proofing compound in recommended proportions. iii) Finishing top with stone aggregate of 10mm to 12mm nominal size spreading @ 8 cudm/sqm thoroughly embedded in the 2nd layer.					
a)	Using rough kota stone.	41.00	Sqm			

Project: HVAC works of existing Test Research Laboratory Building, Construction of plant Room for HVAC works and Associated works at NIMR Campus, Sector 8, Dwarka, New Delhi

BOQ for Civil Work

Item No	Description Of Item	Total Qty	Unit	Rate in Figures(Rs)	Rate in Words(in Rs)	Amount in Figures (in Rs)
1	2	3	4	5	6	7
10.03	Providing and laying integral cement based treatment for water proofing on the vertical surface by fixing specified stone slab 22 mm to 25mm thick with cement slurry mixed with water proofing compound conforming to IS:2645 in recommended proportions with a gap of 20mm (minimum) between stone slabs and the receiving surfaces and filling the gaps with neat cement slurry mixed with water proofing compound and finishing the exterior of stone slab with cement mortar 1:3 (1 cement : 3 coarse sand) 20mm thick with neat cement punning mixed with water proofing compound in recommended proportion complete at all levels and as directed by Engineer-in-charge :					
a)	Using rough Kota stone	100.00	Sqm			
	Total					

**Project: HVAC works of existing Test Research Laboratory Building,
Construction of plant Room for HVAC works and Associated works at NIMR**

ABSTRACT OF COST(Civil Work)			
S.No	DESCRIPTION OF WORK		AMOUNT
1	EARTHWORK	Rs.	
2	CONCRTE WORK	Rs.	
3	RCC WORK	Rs.	
4	BRICK WORK	Rs.	
5	DOORS & WINDOWS	Rs.	
6	STEEL WORK	Rs.	
7	FLOORING	Rs.	
8	CEILING & ROOFING	Rs.	
9	FINISHING	Rs.	
10	MISCELLANEOUS	Rs.	
	TOTAL		

Project: HVAC works of existing Test Research Laboratory Building, Construction of plant Room for HVAC works and Associated works at NIMR Campus, Sector 8, Dwarka, New Delhi

BOQ for Civil Work

Item No	Description Of Item	Total Qty	Unit	Rate in Figures(Rs)	Rate in Words(in Rs)	Amount in Figures (in Rs)
1	2	3	4	5	6	7
10.04	Providing and fixing single leaf, powder coated GI sheet door frames manufactured from 18 SWG sheet and shutters double skin sandwich type powder coated GI sheet door shutters 44mm thick manufactured from 22 SWG sheet with PUF/ROCKWOOL/ EXPANDED POLY STYRINE infill including hinges, handles, both side locking cylindrical lock, kick plate with round or elliptical view glass, threshold ties, adjustable lugs with split end tail to each jamb including shock absorbers in colour as specified as directed by Engineer-in-charge:	60.00	Sqm			
10.05	Providing and fixing double leaf, powder coated GI sheet door frames manufactured from 18 SWG sheet and shutters double skin sandwich type powder coated GI sheet door shutters 44mm thick manufactured from 22 SWG sheet with PUF/ROCKWOOL/ EXPANDED POLY STYRINE infill including hinges, handles, both side locking cylindrical lock, kick plate with round or elliptical view glass, threshold ties, adjustable lugs with split end tail to each jamb including shock absorbers in colour as specified as directed by Engineer-in-charge:	60.00	Sqm			

Project: HVAC works of existing Test Research Laboratory Building, Construction of plant Room for HVAC works and Associated works at NIMR Campus, Sector 8, Dwarka, New Delhi

BOQ for Civil Work

Item No	Description Of Item	Total Qty	Unit	Rate in Figures(Rs)	Rate in Words(in Rs)	Amount in Figures (in Rs)
1	2	3	4	5	6	7
10.06	Providing and fixing tongue and groove fitting ceiling panels, double skin sandwich type 80mm thick polyster painted manufactured from GI sheet 0.5 mm thick with PUF/ ROCKWOOL/ EXPANDED POLY STYRINE infill including polysester painted grid sections suspended by threaded rods from the ceiling to any height and in colour as specified as directed by Engineer-in-charge:	400.00	Sqm			
10.07	Providing and fixing 3 phase electrically operated, heavy duty steel body hydraulic stacker of 1000 kg capacity and 1200 x 1200 mm platform with removeable railing with 1600mm verical lift as per technical specification and as directed by Engineer-in-charge:	1	each			
10.08	Providing and laying 3mm thick epoxy resin based jointless anti static floor coating in three coats (primer coat, base, top coat (2mm thick)) preparation of cement concrete flooring including cutting of grooves, providing copper wiring, connections etc. for elimination of static charge between the equipment base and floor surface to ensure leakage resistance of 10 ⁴ to 10 ⁸ ohms in static decay test of 0.02sec., all complete as specified and as per the direction of Engineer-in-Charge.The work shall be carried out through specialised agency empanelled by the manufacturer.	751.46	sqm			

Project: HVAC works of existing Test Research Laboratory Building, Construction of plant Room for HVAC works and Associated works at NIMR Campus, Sector 8, Dwarka, New Delhi

BOQ for Civil Work

Item No	Description Of Item	Total Qty	Unit	Rate in Figures(Rs)	Rate in Words(in Rs)	Amount in Figures (in Rs)
1	2	3	4	5	6	7
10.09	Cement concrete flooring 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate) in panels finished to true levels complete for base layer to epoxy resin floor.					
a)	40mm thick with 20mm nominal size stone aggregate.	751.46	sqm			
10.10	Finishing with epoxy paint (two or more coats) at all locations prepared and applied as per manufacturers specifications including appropriate priming coat, preparation of surface, etc. complete as specified and as per the direction of Engineer-in-Charge.	1730.4	sqm			

Project: HVAC works of existing Test Research Laboratory Building, Construction of plant Room for HVAC works and Associated works at NIMR Campus, Sector 8, Dwarka, New Delhi

BOQ for Civil Work

Item No	Description Of Item	Total Qty	Unit	Rate in Figures(Rs)	Rate in Words(in Rs)	Amount in Figures (in Rs)
1	2	3	4	5	6	7
	LIFT					
10.11	Design, manufacture, supply, installation, testing and commissioning of 500 kg two landing entrances goods lift with travel speed 0.5m per sec., 1000mm wide automatic power operated with double panel motor control system, variable frequency drive to achieve smooth running and accurate levelling of elevators for operation on 415Volts, 50 Hz 3 phase AC power, consisting of MS powder coated lift car, automatic control indicating signals and safety devices suitable for simplex full with attendant including lift well pressurization as required as per technical specification.	2	Set			
	DG SET					
10.12	Design, manufacture, supply, installation, testing and commissioning of SILENT TYPE DIESEL GENERATOR SET having prime power rating of 500 KVA, 415 V at 1500 RPM unity power factor suitable for 50 Hz 3 phase system comprising of suitable capacity water cooled radiator type diesel engine, direct injection type, 4 stroke with suitable number of cylinders coupled to brushless type 415Volts, 50 Hz, self exciting Alternator set mounted on common base frame with suitable size of flexible coupling, anti vibration mounting pads, engine alternator safeties etc. and following main components, complete all with accessories confirming to technical specifications and as required.					

Project: HVAC works of existing Test Research Laboratory Building, Construction of plant Room for HVAC works and Associated works at NIMR Campus, Sector 8, Dwarka, New Delhi

BOQ for Civil Work

Item No	Description Of Item	Total Qty	Unit	Rate in Figures(Rs)	Rate in Words(in Rs)	Amount in Figures (in Rs)
1	2	3	4	5	6	7
	Cooling System: Water cooled radiator type					
	Exhaust System: Pipe Chimney, Silencer and supports (as approved by Pollution Control Board/ Local Authorities)					
	Fuel system: Day tank(990Litres-1No.) and their interconnecting piping system.					
	Lube Oil System					
	Air System					
	Electronic Governor					
	Starting System					
	Coupling arrangement					
	Safety Controls					
	Instrument panel for engine					
	Control panel with metering, interlocks, and annunciators complete as per specifications.					
	Batteries, Boost and Trickle battery charger					
	Provision of Busduct connection from alternator terminals, to AMF Panel, control cable, neutral and equipment earthing complete as required.					
	Spring loaded cushy pads, foundation bolts etc.					
	Making Cement concrete foundation with 1:2:4(1 cement, 2 coarse sand, 4 graded stone aggregate 40mm nominal size) suitable for DG Set as per recommendation of manufacturer.					
	Sound proof Canopy with openable doors, fresh air, fans, control panel, as per requirement of Pollution Control Board.					
	All other minor civil, mechanical works including material supply and electrical works complete as required.					

Project: HVAC works of existing Test Research Laboratory Building, Construction of plant Room for HVAC works and Associated works at NIMR Campus, Sector 8, Dwarka, New Delhi

BOQ for Civil Work

Item No	Description Of Item	Total Qty	Unit	Rate in Figures(Rs)	Rate in Words(in Rs)	Amount in Figures (in Rs)
1	2	3	4	5	6	7
	DG SET as mentioned above	1	Set			
10.13	AMF - PANEL (FOR 500KVA DG SET)					
	Design, manufacture, supply, installation, testing and commissioning of M.V. Cubicle type totally enclosed free standing type dust damp and vermin proof panel complete with busbars, M.V. danger notice plate, ammeter, ammeter selector switch, voltmeter, voltmeter selector switch, PF meter indicating lamps, CT's, interconnections, interlocking between two feeders and bus coupler, with suitable capacity aluminium leads/ solid aluminium strips/rods, connection of incoming and outgoing cables with thimbles stove enamelled painted and having following incoming and outgoing switchgears as per technical specifications and as required.	1	Set			
	1 No. ACB Panels each having following					
	1 No. 1000A, 415/500V, Motorised fully drawout type (EDO), Four Pole, Air Circuit Breaker with microprocessor based overload, short circuit & earth fault trip including under voltage release and lockable trip push button. ACB should have Icw=Ics=50 KA for 1 sec.					
	1 Set of indicating lamps to indicate OPEN, CLOSE, TRIP for breaker					
	Push button to CLOSE the ACB					
	1 No. Multifunction meter with 1250/5A CT's and control MCBs					
	AMF Cubicle					
	1 No. frequency meter (45-55Hz)					

Project: HVAC works of existing Test Research Laboratory Building, Construction of plant Room for HVAC works and Associated works at NIMR Campus, Sector 8, Dwarka, New Delhi

BOQ for Civil Work

Item No	Description Of Item	Total Qty	Unit	Rate in Figures(Rs)	Rate in Words(in Rs)	Amount in Figures (in Rs)
1	2	3	4	5	6	7
	1 Set of over voltage relay					
	1 Set of under voltage relay					
	1 Set Master trip/ supervisory relay					
	1 Set of battery charger(with trickle & boost)					
	1 Set DC Voltmeter and Ammeter					
	1 Set Reverse Power and Reactive power relay					
	1 Set R.Y.B. Breaker ON/OFF and other fault indicator lamps					
	1 Set 8 window alarm annunciator with separate hooter, accept, reset, and rest push button.					
	1 No. Hooter					
	1 No. Engine Cranking Relay					
	1 Set of Main supply voltage monitor, alternate voltmeter monitor, and engine starting relays					
	1 Set of Auxillary relays, timer, push button, and control fuses.					
	ENCLOSURE:					
	Fabrication, PVC Sleeving, Control/Power Wiring and necessary hardware for complete load sharing etc. as required.					
	AMF PANEL for 500KVA DG SET as mentioned	1	Set			

Project: HVAC works of existing Test Research Laboratory Building, Construction of plant Room for HVAC works and Associated works at NIMR Campus, Sector 8, Dwarka, New Delhi

BOQ for Civil Work

Item No	Description Of Item	Total Qty	Unit	Rate in Figures(Rs)	Rate in Words(in Rs)	Amount in Figures (in Rs)
1	2	3	4	5	6	7
10.14	Providing and laying design mix cement concrete of M-25 grade, in roads, using cement content as per design mix, using coarse sand and graded stone aggregate of 40 mm nominal size in appropriate proportions as per approved & specified design criteria, providing dowel bars with sleeve/ tie bars wherever required, laying at site, spreading and compacting mechanically by using needle and surface vibrators, levelling to required slope/ camber, finishing with required texture, including steel form work with sturdy M.S. channel sections, curing, making provision for contraction/ expansion, construction & longitudinal joints (10 mm wide x 50 mm deep) by groove cutting machine, providing and filling joints with approved joint filler and sealants, complete all as per direction of Engineer-in-charge (Item of joint fillers, sealants, dowel bars with sleeve/ tie bars to be paid separately).	60	cum			
	TOTAL AMOUNT:					

	Design & Engineering Department						
	Name of Work:BOQ of Plumbing work of HVAC Plant room & Pump room, NIMR,Dwarka						
Sl. No.	Description of Item	Unit	Total Qty.	Rate in figures(in Rs.)	Rate in words(in Rupees)	Amount in figures(in Rs.)	
1	3	4	5				
	Note: Based on the tender drawing the agency has to prepare the internal & external plumbing shop drawing and obtain the approval of the same before execution						
1.00	WATER SUPPLY						
1.01	Providing and fixing Chlorinated Polyvenyl Chloride(CPVC)pipes having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings i/c fixing the pipe with clamps at 1.0 m spacing.This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in charge.						
	Internal work – Exposed on wall						
b)	20 mm nominal outer dia pipes (SDR-11)	Metre	20.0				
c)	25 mm nominal outer dia pipes (SDR-11)	Metre	25.0				
d)	32 mm nominal outer dia pipes (SDR-11)	Metre	30.0				
e)	40 mm nominal outer dia pipes (SDR-11)	Metre	25.0				
f)	50 mm nominal outer dia pipes (SDR-11)	Metre	20.0				
1.02	Making connection of G.I. distribution branch with G.I. main of following sizes by providing and fixing tee, including, cutting and threading the pipe etc. complete including obtaining approval for connection scheme from DJB/Municipal corporation :						
a)	50 to 80 mm nominal bore	Each	1.0				

Name of Work:BOQ of Plumbing work of HVAC Plant room & Pump room, NIMR,Dwarka						
Sl. No.	Description of Item	Unit	Total Qty.	Rate in figures(in Rs.)	Rate in words(in Rupees)	Amount in figures(in Rs.)
1	3	4	5			
1.03	providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end)					
a)	25 mm nominal bore	Each	4.0			
b)	32 mm nominal bore	Each	2.0			
c)	40 mm nominal bore	Each	2.0			
d)	50 mm nominal bore	Each	2.0			
1.04	Providing and fixing ball valve (brass) of approved quality, High or low pressure with plastic floats complete					
a)	20mm	Each	1.0			
1.05	Painting CPVC/G.I. pipes and fittings with synthetic enamel white paint over a ready mixed priming coat, both of approved quality for new work					
b)	20 mm nominal outer dia pipes	Metre	20.0			
c)	25 mm nominal outer dia pipes	Metre	25.0			
d)	32 mm nominal outer dia pipes	Metre	30.0			
e)	40 mm nominal outer dia pipes	Metre	25.0			
f)	50 mm nominal outer dia pipes	Metre	20.0			
1.06	Providing and placing on terrace (at all floor levels) polyethylene water storage tank ISI:12701 marked with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes but without fittings and the base support for tank					
	Treated water Tank and Untreated water tank	per litre	5000.0			

Name of Work:BOQ of Plumbing work of HVAC Plant room & Pump room, NIMR,Dwarka						
Sl. No.	Description of Item	Unit	Total Qty.	Rate in figures(in Rs.)	Rate in words(in Rupees)	Amount in figures(in Rs.)
1	3	4	5			
1.07	Providing and fixing enclosed type water meter (bulk type) conforming to IS : 2373 and tested by municipal board complete with bolts,nuts rubber, insersions etc. (the tail plases if required will be paid seperatly)					
a)	80mm dia nominal bore	Each	1.0			
1.08	Providing and fixing PTMT ball cock of approved quality, colour and make complete with Epoxy coated aluminium rod with L.P./H.P.H.D. plastic ball.					
a)	40 mm nominal bore, 206 mm long weighin not less than 690 gms	Each	1.0			
1.09	Cutting holes upto 30x30 cm in walls including making good the same					
	with F.P.S bricks	Each	10.0			
1.10	Providing & fixing full way lever operated forged brass ball valve of brass body with forged brass hard chrome plated steel ball tested to a pressure not less than 10 Kg / sqcm with threaded / flanged joints complete with nuts, bolts, gaskets, washers etc.					
b)	20 mm diameter	Each	2.0			
1.11	Providing and fixing mosquito proof coupling of approved Municipal design for scour and vent pipes for RCC overhead tanks complete in all respects					
a)	20 mm diameter	Each	2.0			
c)	40 mm diameter	Each	2.0			

Name of Work:BOQ of Plumbing work of HVAC Plant room & Pump room, NIMR,Dwarka						
Sl. No.	Description of Item	Unit	Total Qty.	Rate in figures(in Rs.)	Rate in words(in Rupees)	Amount in figures(in Rs.)
1	3	4	5			
1.12	Supplying, installing, testing and commissioning vertical online/horizontal centrifugal pumping set with mechanical seal, C.I. Housing, C.I. volute and SS impeller & SS shaft connected to a TEFC induction motor of suitable HP for 415 volts, 3 phase, 50 cycles A.C. supply with 150 mm dia pressure gauge with gunmetal isolation cock, vibration eliminating pads, base plate wiring upto panel and equipment for water level controller to start and stop the pump automatically at predecided levels of the water in the tank with provision of protection for dry run etc. complete in all respect (The shop drawing or the pumps along with its characteristics curves, model and technical data etc. are to be submitted for approval before purchase of pump).					
	Domestic water pumps (Treated water transfer&Raw water Transfer pump to terrace tank)					
	Capacity 30 lpm					
	Head 25M	Each	2.00			
	Soft water transfer pump					
	capacity 100 lpm & Head 25m	Each	2.00			
	SUB TOTAL(Water Supply)					

Name of Work:BOQ of Plumbing work of HVAC Plant room & Pump room, NIMR,Dwarka						
Sl. No.	Description of Item	Unit	Total Qty.	Rate in figures(in Rs.)	Rate in words(in Rupees)	Amount in figures(in Rs.)
1	3	4	5			
2.00	RAIN WATER PIPING					
2.01	Providing and fixing to the inlet mouth of rain water pipe cast iron grating 15 cm diameter and weighing not less than 440 grams	Each	7.0			
2.02	Providing and fixing rain water ,soil, waste and vent pipes.					
a)	100 mm dia.					
a i)	Centrifugally cast (spun) iron socketed pipe as per IS:3989	Metre	35.0			
2.03	Providing and fixing M.S holder-bat clamps of approved design to Sand Cast iron/ cast iron (spun) pipe embedded in and including cement concrete blocks 10x10x10 cm of 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) including cost of cutting holes and making good the walls etc.					
a)	for 100 mm dia. pipe	Each	10.0			
2.04	Providing and fixing plain bend of required degree.					
a)	100 mm					
a ii)	Sand cast iron S&S as per IS:3989	Each	7.0			
2.05	Providing and fixing heel rest sanitary bend.					
a)	100 mm dia					
a.ii)	sand cast iron S&S as per IS-3989	Each	7.0			
2.06	Providing and fixing collar					
a)	100 mm					
a.ii)	Sand cast iron S&S as per IS-3989	Each	5.0			
2.07	Providing lead caulked joints to sand cast iron /centrifugally cast (spun) iron pipes and fittings of diameter:					

Name of Work:BOQ of Plumbing work of HVAC Plant room & Pump room, NIMR,Dwarka						
Sl. No.	Description of Item	Unit	Total Qty.	Rate in figures(in Rs.)	Rate in words(in Rupees)	Amount in figures(in Rs.)
1	3	4	5			
a)	100 mm	Each	30.0			
2.08	Painting sand cast iron / centrifugally cast (spun) iron soil, waste vent pipes and fittings with paint of any colour such as chocolate, grey, or buff etc. over a coat of primer (of approved quality) for new work:					
a)	100 mm diameter pipe	Metre	35.0			
	SUB TOTAL(Rain Water pipe & fitting)					

Name of Work:BOQ of Plumbing work of HVAC Plant room & Pump room, NIMR,Dwarka						
Sl. No.	Description of Item	Unit	Total Qty.	Rate in figures(in Rs.)	Rate in words(in Rupees)	Amount in figures(in Rs.)
1	3	4	5			
3.00	WATER TREATMENT PLANT (for Domestic use))					
	Suplying, Installing, testing & commissioning of indoor package type water treatment plant of capacity 3.0 cum per hr. with 6 hours operation time, comprising of the following including all necessary piping, control valves, other accessories etc. complete as per drawing and as per drawing and as directed.					
	FILTER					
	Supply, installation & testing and commissioning of MULTI GRADE Filter vertical floor mounted fabricated with Fibre reinforced Plastic (FRP) with frontal piping & valves, back wash system & filter media etc. with single lever operated multiport valve system with standard fittings like manhole cover, pressure gauge at inlet & outlet, sampling cock, rinse drain valve, air vent valve with piping, bolts, nuts & rubber gaskets.					
	Flow rate = 3.0 cub. m/hour					
	Working pressure = 3.5 kg/Sq. cm.					
	UV WATER STERILISERS					
	High performance on line UV water sterilisers of capacity 1500lph designed on at least 50 J/Sq. M. UV dosage, comprising of glass UV chamber in SS 316 housing, UV lamp and electrical circuit, wall mounted model / line mounted model, capacity 50lpm, minimum lamp rating :120 watts - 1Nos.					

Name of Work:BOQ of Plumbing work of HVAC Plant room & Pump room, NIMR,Dwarka						
Sl. No.	Description of Item	Unit	Total Qty.	Rate in figures(in Rs.)	Rate in words(in Rupees)	Amount in figures(in Rs.)
1	3	4	5			
	Supplying, installing, testing and commissioning vertical online/horizontal centrifugal pumping set with mechanical seal, C.I. Housing, C.I. volute and SS impeller & SS shaft connected to a TEFC induction motor of suitable HP for 415 volts, 3 phase, 50 cycles A.C. supply with 150 mm dia pressure gauge with gunmetal isolation cock, vibration eliminating pads, base plate wiring upto panel and equipment for water level controller to start and stop the pump automatically at predecided levels of the water in the tank with provision of protection for dry run etc. complete in all respect (The shop drawing or the pumps along with its characteristics curves, model and technical data etc. are to be submitted for approval before purchase of pump).					
	Filter feed pump(1 no.)					
	Capacity 25 lpm					
	Head 35M	Set	1.00			
3.01	WATER TREATMENT PLANT (for A/C use))					
	Supplying, Installing, testing & commissioning of indoor package type soft water treatment plant of capacity 3 cum per hr. with 10 hours operation time, comprising of the following including all necessary piping, control valves, other accessories etc. complete as per drawing and as per drawing and as directed.					
a)	FILTER					
	Supply, installation & testing and commissioning of MULTI GRADE Filter vertical floor mounted fabricated with Fibre reinforced Plastic (FRP) with frontal piping & valves, back wash system & filter media etc. with single lever operated multiport valve system with standard fittings like manhole cover, pressure gauge at inlet & outlet, sampling cock, rinse drain valve, air vent valve with piping, bolts, nuts & rubber gaskets.					

Name of Work:BOQ of Plumbing work of HVAC Plant room & Pump room, NIMR,Dwarka						
Sl. No.	Description of Item	Unit	Total Qty.	Rate in figures(in Rs.)	Rate in words(in Rupees)	Amount in figures(in Rs.)
1	3	4	5			
	Flow rate = 3.0 cub. m/hour					
	Working pressure = 3.5 kg/Sq. cm.					
b)	Softener					
	Supply, installation & testing and commissioning of upflow cation Ion exchange resin water Softener fabricated with Fibre reinforced Plastic (FRP) with frontal piping & valves, back wash system & strongly acidic cation resin with regeneration assembly comprising of power valve ejector,brine suction valve,tankl etc. with single lever operated multiport valve system with standard fittings like pressure gauge at inlet & outlet, sampling cock, rinse drain valve, air vent valve with piping, bolts, nuts & rubber gaskets, pump and Panel complete in all respect.					
	Flow rate = 3.0 cub. m/hour					
	Working pressure = 3.5 kg/Sq. cm.					
	Raw Hardness-700-1500 mg/l					
	Soft water quality-Commercial zero hardness(less than 5ppm)					
	Output per Regeneration-10 cum.(min.)	Each	2.00			
3.02	Providing and fixing of OxiLyte (Mixed Oxidant) Generation System , based on ECA Technology, producing non toxic mixed Oxidant Slution at 1000 ppm of Oxidant Concentration or any other approved disinfection method excepted by HSCC. The solution should be at a pH 3+-0.5 suitable for 24x7 operations should produce 20L per hour. The system should be supplied complete with appropriate dosing pumps , valves, piping, fittings, chemical dosing tank etc. shope drawing complete in all respect.	set	1.00			
	Subtotal (Water treatment Plant,Pump and Equipment)					

Name of Work:BOQ of Plumbing work of HVAC Plant room & Pump room, NIMR,Dwarka						
Sl. No.	Description of Item	Unit	Total Qty.	Rate in figures(in Rs.)	Rate in words(in Rupees)	Amount in figures(in Rs.)
1	3	4	5			
4.00	WATER SUPPLY PUMP PANEL					
	Supply, installation, testing and commissioning of following M.V. cubicle type totally enclosed, wall mounted type, dust, damp and vermin proof, indoor type Distribution Board/Panel complete with busbars, M.V. danger notice plate, interconnections with suitable capacity aluminium leads/solid aluminium strips/rods, connection of incoming and outgoing cables with thimbles, powder coat painted and having following incoming and outgoing switchgears complete as required. Panel shall have IP-42 protection.					
	INCOMER :					
	63 Amp 415 volts, 35 KA (Isc), FP MCCB with e/f protectionthermal magnetic release having variable current settings of 0.8 to 1.0 In.					
	R,Y&B phase indicating lamp (LED type) with 2A control SP MCB					
	Extended rotary operating mechanism with door interlock with defeat feature and padlock facility. MCCB should have spreader links & phase barriers.					
	1 no. 0 to 500 V Digital voltmeter with selectot switch					
	1 to 0 to 63 Amps Digital ammeter with selector switch with one set of 60/5A C.T. s					
	BUSBARS :					
	100 Amp TPN busbars of aluminium					
	OUTGOINGS :					
i	4 Set of following (Soft Water Transfer Pump)					
	1 No. 25 Amp. 415/500 volts,25 KA, three Pole, Moulded Case Circuit Breaker with variable current setting of 0.8 to 1.0					
	Extended rotary operating mechanism with door interlock with defeat feature and padlock facility. MCCB should have spreader links & phase barriers.					
	Neon indicating Lamps for "ON" and "OFF" indication with 2A SP control MCBs.					

Name of Work:BOQ of Plumbing work of HVAC Plant room & Pump room, NIMR,Dwarka						
Sl. No.	Description of Item	Unit	Total Qty.	Rate in figures(in Rs.)	Rate in words(in Rupees)	Amount in figures(in Rs.)
1	3	4	5			
ii	4 Set of following (For Raw & Treated water pump, Filter Feed Pump)					
	1 No. 16 Amp. 415/500 volts,25 KA, three Pole, Moulded Case Circuit Breaker with variable current setting of 0.8 to 1.0					
	Extended rotary operating mechanism with door interlock with defeat feature and padlock facility. MCCB should have spreader links & phase barriers.					
	Neon indicating Lamps for "ON" and "OFF" indication with 2A SP control MCBs.					
	WATER SUPPLY PUMP Panel as mentioned above	Set	1.00			
4.01	STARTERS FOR THE WATER PUMPS					
i	Soft water Transfer Pump					
	1 No. 3 Phase, DOL starter of 1 HP with thermal overload relay, Push Buttons, Single Phase Preventer and Switches etc complete as required.	Each	2.00			
ii	For Raw & Treated water pump, Filter Feed Pump					
	1 No, DOL starter of 2 HP with thermal overload relay, Push Buttons, Single Phase Preventer and Switches etc complete as required.	Each	3.00			
	TOTAL FOR STARTERS FOR THE WATER PUMPS					
	TOTAL (Electrical Panel)					

ABSTRACT

**Name of Work:BOQ of Plumbing work of HVAC Plant room & Pump room,
NIMR,Dwarka**

S.No.	DESCRIPTION	Amount in words(in Rupees)
A	PLUMBING ,	
1.00	WATER SUPPLY	
2.00.	RAIN WATER PIPING	
3.00	WATER TREATMENT PLANT ,PUMP & EQUIPMENT	
4.00	ELECTRICAL PANEL	
	TOTAL	

BILL OF QUANTITIES FOR ELECTRICAL WORKS OF AC PLANT ROOM AT NIMR, DWARKA, NEW DELHI.

S.No.	Description.	Unit.	Qty	Rate in Figures (in Rs.)	Rate in words (in Rs.)	Amount in Rs.
1	2	3	5	6	7	8
	SUB HEAD- 1: MCB DISTRIBUTION BOARDS.					
1.00	MCB DISTRIBUTION BOARD					
1.01	Supplying & fixing following way, three pole and neutral,prewired,sheet steel, MCB distribution board, 415 volts,on recess/surface complete with loose wire box, terminal blocks, tinned copper busbar, neutral link, earth bar,din bar, detachable gland plate, interconnections, phosphatized and powder coated including earthing etc.Before procurement of DB the contractor has to take approval of DB schedule/ drawing of each DB , as per technical specifications and as required.(but without MCB & RCCB).					
	i 6 way (8+18), Double door	Each	1			
	ii 4 way (8+18), Double door	Each	1			
1.02	Supplying & fixing 6 Amps to 32 Amps rating, 240 volts,'B' series, miniature circuit breaker suitable for lighting & other loads of following poles in the existing MCB DB complete with connections, testing & commissioning etc. as per technical specifications & as required.					
	i Single pole	Each	23			
1.03	Supplying & fixing following rating, four pole, 415 volts, Miniature Circuit Breaker (MCB),in the existing MCB DB complete with connections, testing & commissioning etc. as per technical specifications and as required.					
	i 40 Amps	Each	1			

	ii	63 Amps	Each	1			
1.04		Supplying & fixing following rating, four pole, 415 volts, Residual Current Circuit Breaker (RCCB) having a sensitivity current upto 300 mA in the existing MCB DB complete with connections, testing & commissioning etc. as per technical specifications and as required.					
	i	40 Amps	Each	1			
	ii	63 Amps	Each	1			
1.05		Supplying and fixing Single pole Blanking plate in the existing MCB DB complete as required.	Each	8			
	TOTAL SUB HEAD-1: MCB DISTRIBUTION BOARDS.						
	SUB HEAD 2: WIRING						
2.00	WIRING						
2.01	i	Wiring for light point/fanpoint/ exhaust fan point/call bell point with 1.5 sq.mm. PVC insulated, fire retardant low smoke (FRLS) copper conductor cable, single core/ multi strand, in steel conduit (Including supplying & recess laying of MS conduit and accessories) including the following and complete as required.					
	ii	Supplying and Fixing Modular type switches (modular Bell push in case of call bell points) in suitable size modular metal boxes, base plate & modular cover plates, space for fixing electronic fan regulator in case of fan point wiring & space for fixing 5A socket on the board etc.					
	iii	Supplying and fixing Hexagonal fan Boxes with 3 mm thick hylem sheet covers in case of Fan Points					
	iv	Supplying & Fixing Ceiling Rose in case of Exhaust Fan Points etc.					

		Note :				
		i) Unless otherwise specified all the conduiting work to be done in recess				
		Point wiring as mentioned above	Point	51		
2.02	i	Wiring for twin control light points with 1.5 sq.mm. PVC insulated, FRLS copper conductor cable in MS conduit (including supplying and recess laying of MS conduit) including the following and complete as required.				
	ii	Supplying and Fixing Modular type two numbers 2 Way switches in suitable size modular metal boxes, base plate & modular cover plates etc.				
		Note :				
		i) Unless otherwise specified all the conduiting work to be done in recess				
		Wiring for twin control light points as mentioned above	Point	2		
2.03		Wiring for 5A light plugs with 1.5 sq.mm. PVC insulated, FRLS copper conductor cable including one number 1.5 sq.mm. PVC insulated, copper conductor cable for earthing in surface/recessed ISI marked MS conduit (including supply and recess laying of ISI marked MS conduit) as per technical specifications and as required.	Point	5		
2.04		Wiring for computer points (Three sockets & one switch) with 2.5 sq.mm. PVC insulated, FRLS copper conductor cable including one number 2.5 sq.mm. PVC insulated, copper conductor cable for earthing in surface/recessed MS conduit (including supply and recess laying of conduit) as per technical specifications and as required.	Point	2		

2.05		Wiring for 16 amp power plug with 2X4 sqmm PVC insulated, FRLS copper conductor, single core/multi strand cable in surface/recessed MS conduit (including supply and recess laying of MS conduit with all accessories) along with 4 sqmm PVC insulated, copper conductor, single core/multi strand cable for loop earthing etc per technical specifications & as required.				
		Directly from MCB-Distribution Board to the Socket Outlets	Point	14		
2.06		Wiring for submain/ circuit wiring with following sizes of PVC insulated, copper conductor single core/multi strand cable in recessed steel conduit (including supply & laying of recessed conduit) as required.				
	i)	2X2.5 Sqmm with 1 No. 2.5 sqmm PVC insulated, copper conductor for earthing.	Metre	80		
	ii)	4X10 Sqmm with 2 No. 10 sqmm PVC insulated, copper conductor for earthing	Metre	30		
	iii)	4X16 Sqmm with 2 No. 6 sqmm PVC insulated, copper conductor for earthing	Metre	15		
2.07		Supplying and fixing suitable Module metal box on surface or in recess including providing and fixing 3 pin 5/6 amps. modular socket outlet with shutters and 5/6 amps. modular type switch, base plate, modular cover plate, connections etc. and all civil works 'complete as required.	Each	5		
2.08		Supplying and fixing suitable module modular metal box on surface or in recess including providing and fixing 6 pin 15/16 A modular socket outlet with shutters and 15/16 A modular switch, base plate, modular cover plate, connections, etc. and all civil works complete as required.	Each	14		

2.09	Supplying and fixing suitable Module metal box on surface or in recess including providing and fixing three nos 3 pin 5/6 amps. modular socket outlet with shutters and one no. 10 amps. modular type switch, base plate, modular cover plate, connections etc. and all civil works 'complete as required. (For computer Points)	Each	2			
TOTAL SUBHEAD: 2- WIRING						
SUB HEAD: 3 - LIGHT FIXTURE AND FANS						
3.00	LIGHT FIXTURES AND FANS					
3.01	Supply of following light fixture with high efficiency electronic ballast, starter, capacitor, reflector, diffuser, MS body/housing holder etc. complete with all fixing accessories as required.					
	i 1X28 watt box type flourescent light fixture (Philips TMS 122M 1XTL5 28 W EBT or approved equivalent) (136b/136bw)	Each	5			
	ii 2X28 watt box type flourescent light fixture with reflector (Philips TMS 122M2XTL528 W EBT or approved equivalent) (236b)	Each	35			
	iii 1X36 watt surface mounted type flourescent light fixture with clear acrylic (GE TC 1X36 AO S HF or approved equivalent) (136b)	Each	2.00			
3.02	Supply of following compact flourescent light fixture with electronic ballast, starter, capacitor, yellow light lamps, reflector, diffuser, MS body/housing holder etc. complete with all fixing accessories as required.					

	i	1x9 watt Bulk Head light fixture (Philips FXC 101 1XPL-S/2P11 W ACO or approved equivalent) BH	Each	2			
	ii	2 X 11 watt surface mounted mirror optics (Philips FCS 518 2XPLS/2P 11 W I 240 V OR EQUIVALENT) (211CFLRECT)	Each	2			
	iii	3X11 watt Mirror top with dimpled frosted glass (Decon 62YU Tornado or approved equivalent) (w toilet)	Each	2			
	iv	Surface mounted Batten holder (Plastic) with 13 watt CFL	Each	2			
3.03		Supply of following ceiling fans (Crompton Greaves High Breeze or approved equivalent) complete with double ball bearing, motor, blades, downrod, canopies, capacitor, modular type electronic fan regulator, suitable for operation on 230 volts, 50 Hz., 1 phase, AC supply complete as required					
	i	1200 mm sweep	Each	6			
3.04		Supply of 900 RPM, 300 mm (Crompton Greaves Trans Air or approved equivalent) exhaust fan suitable for single phase 230 volts, 50 Hz., AC supply complete with motor, louvers/shutters etc. complete as required.	Each	2			
3.05		Supply of 450 mm sweep, crompton greaves model high flow 18" wall mounted fan complete with double ball bearing, motor, blades, capacitor etc suitable for single phase 230 volts, 50 Hz., AC supply, complete as required.	Each	2			

3.06	Installation, testing and commissioning of prewired, fluorescent fittings of all types, complete with all accessories and tube etc. directly on ceiling/wall, including connections with 1.5 sq.mm. PVC insulated, FRLS copper conductor, single core/ multi strand cable etc. as required.	Each	42			
3.07	Installation, testing and commissioning of prewired, compact fluorescent lamp fixture (CFL fixtures) of all types, complete with all accessories and lamp etc. directly on ceiling/wall, including connections with 1.5 sq.mm. PVC insulated, FRLS copper conductor, single core/ multi strand cable etc. as required.	Each	8			
3.08	Installation, testing and commissioning of ceiling fan and modular type electronic fan regulator (Electronic regulator to be fixed in switch board) including wiring the down rod and connection with 1.5 sqmm FR PVC insulated, copper conductor single core/multi strand cable including providing & fixing phenolic laminated sheet cover on the fan box, etc. as required.	Each	6			
3.09	Installation, testing and commissioning of exhaust fan up to 450 mm sweep in the opening, including making the hole to suit the size of the above fan including, fixing of louvers/ shutters with frame making good the damages etc. as required.	Each	2			
3.10	Installation, testing and commissioning of wall mounted fan up to 450 mm sweep including supply and fixing wall bracket arrangement complete as required.	Each	2			

		TOTAL SUBHEAD 3 : LIGHT FIXTURE & FANS					
		SUB HEAD 4 : TELEPHONE SYSTEM					
4.00		TELEPHONE SYSTEM					
4.01		Wiring for telephone point with Supply & laying two pair 0.5 Sq. mm solid, annealed copper conductor insulated with high density polythlene. The insulated cores twisted to from pairs, helically wrapped with polyster tape, over all insulation of FR PVC, unarmoured telephone cable in MS conduit (including supply & recessed laying of M.S. conduit), including providing & fixing of two module modular metal box on recess with following pair cord outlet, connections etc. complete as required.This also includes conduiting, wiring from floor Tag blocks to individual telephone outlets.					
	i	1 pair cord outlet (Jack Type)	Point	2			
	ii	2 pair cord outlet (Jack Type)	point	1			
4.02		Supplying, Installation, testing and commissioning of following sizes of telephone distribution board in M.S. hinged type lockable box duly painted complete with Krone type tag block etc. including terminations of cable as required.					
	i	10 Pair	Each	1			
4.03		Supplying and drawing of following pairs .5 mm dia annealed bare copper conductor Polythene insulated, core twisted into pairs armoured jelly filled telephone cable in the existing trench/ hume pipe/ GI pipe etc with saddels etc. complete as required.					
	i	10 Pair	Metre	50			
		TOTAL : SUB HEAD 4:TELEPHONE SYSTEM					

		SUB HEAD 5:CONDUITING FOR COMPUTER SYSTEM					
5.00		CONDUITING FOR COMPUTER SYSTEM .					
5.01		Supply and fixing of following sizes of rigid PVC conduit alongwith the accessories in recess including painting in case of surface conduit, or cutting the wall and making good the same in case of recessed conduit as required					
	i	20 mm dia	Metre	40			
	ii	25 mm dia	Metre	10			
5.02		Supplying and fixing two module modular plate (suitable for RJ-45 computer socket) with GI box complete as required.	Each	2			
		TOTAL SUB HEAD: 5 CONDUITING FOR COMPUTER SYSTEM					
		SUB HEAD 6: EARTHING SAFETY EQUIPMENT AND MISC. ITEMS					
6.00		EARTHING, SAFETY EQUIPMENTS AND MISC. ITEMS					
6.01		Earthing with GI plate 600mmX600mmX6mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. (but without charcoal or coke and salt) complete as required	Set	2			
6.02		Extra for using charcoal and salt for GI or copper plate earth electrode as required.	Set	2			
6.03		Supplying and laying 25mmX5mm GI strip at 0.5m below ground level as strip earth electrode, including soldering etc. as required.	Metre	10			

6.04	Providing and fixing 25mmX5mm GI strip on surface/on existing cable trench/RCC pipe/GI pipe or in recess for earth electrode as required.	Metre	15			
6.05	Providing and fixing M.V. danger notice plate of 200mmX150mm made of mild steel, atleast 2mm thick and vitreous enamelled white on both sides and with inscription in signal red colour on front side as required.	Each	1			
6.06	Supplying and laying of 1.1kV grade 1 metre wide anti skid chequered type rubber mat.	Metre	15			
6.07	Design, manufacture, supply and installation of Fire Buckets 13 litre capacity 4 Nos. duly filled with sand and GI pipe support stand for these buckets including painting etc. complete as required.	Set	1			
6.08	Supplying, storing, handling and fixing in position First Aid Medical Box complete as per technical specifications as required.	Each	1			
6.09	Supply and testing of 11kV ISI marked hand gloves	Each	1			
6.10	Providing & fixing rigid PVCpipe complete with fittings, clamps including trenching & refilling/ wall cutting & plastering, etc. (for cable entry) with all minor civil & mech. Works complete as required.					
	50 mm dia nominal bore	Metre	15			
	TOTAL SUB HEAD 6: EARTHING, SAFETY EQUIPMENT AND MISC. ITEMS					
	SUB HEAD 7: LT CABLES					
7.00	LT CABLES					

7.01		Supply of following sizes of 1.1 kV grade multicore aluminium conductor PVC sheathed armoured AYFY cable as per IS 1554.				
	i	3.5 Core 25 Sqmm.	Metre	66		
7.02		Laying of one number PVC insulated and PVC sheathed power cable 1.1kV grade direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc. as required				
	i	Size not exceeding 25 sq.mm	Metre	13		
7.03		Laying of one number PVC insulated and PVC sheathed power cable 1.1kV grade direct in the existing RCC/ Hume/Stoneware/Metal pipe as required				
	i	Size not exceeding 25 sq.mm	Metre	10		
7.04		Laying of one number PVC insulated and PVC sheathed power cable 1.1kV grade on surface or on existing cable tray complete as required.				
	i	Size not exceeding 25 sq.mm	Metre	10		

7.05		Supplying and making end termination with suitable size Copper lugs including double compression glands of following sizes of 1.1. kv grade multicore aluminium conductor PVC insulated and PVC sheathed					
	i	3.5 Core 25 Sqmm.	Each	4			
7.06		Fabricating and installing following size of perforated M.S. cable trays including horizontal and vertical bends, reducers, tees, cross members and other accessories as required and duly suspended from the ceiling with M.S. suspenders and including painting etc. as required :-					
	i	150 mm. width x 50 mm. depth x 1.6 mm. thickness	Metre	20			
		TOTAL SUB HEAD 7 : LT CABLES					
		GRAND TOTAL FOR ALL ELECTRICAL WORKS					

SUMMARY OF COST ESTIMATE FOR ELECTRICAL WORKS .			
S.No.	DESCRIPTION	Amount In Figure (In Rs.)	Amount in Words (Rs.)
1	SUB HEAD- 1: MCB DISTRIBUTION BOARDS.		
2	SUB HEAD 2: WIRING		
3	SUB HEAD: 3 - LIGHT FIXTURE AND FANS		
4	SUB HEAD 4 : TELEPHONE SYSTEM		
5	SUB HEAD 5:CONDUITING FOR COMPUTER SYSTEM.		
6	SUB HEAD 6: EARTHING SAFETY EQUIPMENT AND MISC. ITEMS		
7	SUB HEAD 7: LT CABLES		
	GRAND TOTAL FOR ALL ELECTRICAL WORKS		

BILL OF QUANTITIES - EQUIPMENTS FOR TEST RESEARCH LABORATORY, NIMR, DWARKA

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
The prices are to be quoted in the below mentioned form and shall include the supply, installation, testing & commissioning 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 specifications and or the drawings. The tenderer shall quote rates in figures and in words under column 5&6 and extend amount to column 7						
1.0	Autoclaves as per technical specifications					
1.1	Autoclaves (900x900x900mm)	1	No.			
1.2	Autoclaves (1200x1200x1200mm)	1	No.			
2.0	Pass Box as per technical specifications					
2.1	Pass Box (2'x2'x2')	1	No.			
2.2	Pass Box (4'x4'x4')	1	No.			
	Total for Equipments					

BILL OF QUANTITIES - HVAC WORKS FOR TEST RESEARCH LABORATORY, NIMR, DWARKA

Item No.	Description	Qty	Unit	Rate In Rs (in Figure)	Rate in Rs (in Words)	Amount (Rs.)
1	2	3	4	5	6	7
The prices are to be quoted in the below mentioned form and shall include the supply, installation, testing & commissioning 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 specifications and or the drawings. The tenderer shall quote rates in figures and in words under column 5&6 and extend amount to column 7						
(A)	EQUIPMENTS:-					
1.0	WATER CHILLING UNITS.					
1.1	Supply, installation, testing & commissioning of 200 TR (actual) capacity water cooled water chilling units (ARI Certified) as specified and shown in equipment schedule complete as per specifications with.					
	a. Screw Compressor with motor.					
	b. Drive package.					
	c. Mounting frames for all components					
	d. Water cooled condenser with accessories.					
	e. Chiller with accessories.					
	f. Refrigerant piping, fittings, accessories and valves etc.					
	g. Insulation of chiller and suction line.					
	h. First charge of refrigerant and oil.					
	i. Base frame with Vibration isolators					
	j. Automatic capacity control arrangement.					
	k. Lot Safety controls, flow switches, pressure gauge, thermometer etc. as per specifications.					
	l. Suitable capacity motor with necessary insulation , soft starter panel complete with all necessary switchgears and control complete as required					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	m. Necessary water drain & air purge valves wherever required					
	n. Necessary lubrication device as per specifications complete.					
	o. Microprocessor based control panel complete with accessories as per specifications.					
	Chilled Water Leaving temp. 44 deg. F					
	Chilled Water Entering temp. 54 deg. F					
	Chiller fouling factor = 0.0005 (FPS units)					
	Condenser Water Leaving Temp. 97.5 deg F					
	Condenser Water Entering Temp. 90 deg F					
	Condenser fouling factor = 0.001 (FPS units)					
	Complete water chilling machine as above.	2	Nos			
2.0	WATER CIRCULATION PUMPS					
2.1	Primary Chilled water Pumps					
	Supply, installation, testing and commissioning of vertical split casing end suction type centrifugal chilled water pump sets factory assembled and tested for rated efficiency mounted on a common base frame etc each capable of delivering specified flow rate complete with following as per specifications & schedule of equipments.					
	a. Pump with IP 55 TEFC induction motor with class F insulation.					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	b. Channel base with vibration isolators, coupling, coupling guard etc.					
	c. Cladded insulation and anti corrosive coating inside and outside casing etc. of chilled water pump.					
	d. 2 Nos.- 150 mm dia dial type pressure gauge					
	e. Pumps shall be suitable for operation on 415+/- 10% Volts/ 3ph / 50 Hz/AC power supply.					
	The pump characteristic shall be as follows:					
	Water flow rate=480 USGPM					
	Head = 14 Metre WC					
	Primary chilled water pumps as described above.	2	Nos			
2.2	Secondary Pumps & Variable Speed Pumping System					
	Supply, installation, testing and commissioning of split casing type centrifugal chilled water recirculation pumps mounted on a common base etc each capable of delivering specified flow rate complete with following as per specifications & schedule of equipments.					
	a. Pump with IP 55 TEFC induction motor with class F insulation					
	b. Channel base with vibration isolators, coupling, coupling guard etc.					
	c. Cladded insulation and anti corrosive coating inside and outside casing etc. of chilled water pump.					
	d. 2 Nos.- 150 mm dia dial type pressure gauge					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	e. Pumps shall be suitable for operation on 415+/- 10% Volts/ 3ph / 50 Hz/AC power supply.					
	f. The price will include control software and networking hardware and software for integration .					
	g. All pumps to be provided with separate VFD's (variable frequency drives). Control panel should also consist of cooling fan.					
	h. Electronic Differential Pressure Transmitters and PLC as required.					
	i. The cost will include making necessary flanged suction and delivery headers in C-Class MS					
	j. Complete set system to be mounted on a common MS base frame and shall follow following duty. The pump characteristic shall be as follows:					
	Water flow rate=480 USGPM					
	Head = 25 Metre WC					
	Secondary chilled water pumps as described above.	2	Nos.			
2.3	Condenser water Pumps					
	Supply, installation, testing and commissioning of vertical split casing end suction type centrifugal pump sets factory assembled and tested for rated efficiency mounted on a common base frame etc each capable of delivering specified flow rate complete with following as per specifications & schedule of equipments.					
	a. Pump with IP 55 TEFC induction motor with class F insulation					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	b. Channel base with vibration isolators, coupling, coupling guard etc.					
	c. Cladded insulation and anti corrosive coating inside and outside casing etc. of chilled water pump.					
	d. 2 Nos.- 150 mm dia dial type pressure gauge					
	e. Pumps shall be suitable for operation on 415+/- 10% Volts/ 3ph / 50 Hz/AC power supply.					
	The pump characteristic shall be as follows:					
	Water flow rate=800 USGPM					
	Head = 16 Metre WC					
	Condenser water pumps as described above.	2	Nos.			
2.4	Hot water Pumps					
	Supply, installation, testing and commissioning of vertical split casing type centrifugal hot water recirculation pump sets factory assembled and tested for rated efficiency mounted on a common base etc each capable of delivering specified flow rate complete with following as per specifications & schedule of equipments.					
	a. Pump with IP 55 TEFC induction motor with class F insulation					
	b. Channel base with vibration isolators, coupling, coupling guard etc.					
	c. Cladded insulation and anti corrosive coating inside and outside casing etc. of chilled water pump.					
	d. 2 Nos.- 150 mm dia dial type pressure gauge					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	e. Pumps shall be suitable for operation on 415+/- 10% Volts/ 3ph / 50 Hz/AC power supply. The pump characteristic shall be as follows: Water flow rate: 180 USGPM Head = 25 Metre WC					
	Hot water pumps as described above.	2	Nos.			
2.5	Supply installation testing and commissioning of pumping and control arrangement for run around loop between supply AHUs and corresponding Exhaust fan sections for exhaust air energy recovery, complete system including pipes, working and standby pumps, 3-way diverting valves, controls, sensors, electric panel and expansion tank etc.	2	Sets			
3.0	COOLING TOWER					
	Supply, installation, testing and commissioning of induced draft FRP type cooling towers for air conditioning system. Each tower shall be complete with distribution system, filling, louvers, steel ladder, fan and motor. Motor shall be IP 55 suitable for outdoor installation, 415±10% volts, 50 Hz, 3 phase power supply. Isolator enclosed in weather proof panel complete with earthing shall be included. Tower shall be selected on basis of water temperature 97.5 - 90 degree F, ambient wet bulb 83 deg F and water flow rate 800 US gpm. Capacity shall be as follows:- 250 TR capacity					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	Cooling Tower as described above.	2	Nos.			
4.0	Hot Water Generator					
	Supply, installation, testing & commissioning of Electric Hot Water Generator for winter heating/monsoon reheating system.Hot water shall be with IP 55 protection and compatible with controls, sensors,controll cabling,piping and fittings,thermal insulation, base frame etc. as per specifications.					
	Capacity : 180 KW					
	Status : 1(W) + 1(S)					
	USGPM: 180					
	Temp IN/OUT : 110/125 DegF	2	Nos.			
5.0	AIR HANDLING UNITS					
5.1	Supply, installation, testing and commissioning of draw through type Air Handling Units (double skin type) of horizontal /vertical type as specified & shown in schedule of equipment complete with the following :-					
	a. Fan Section and canvas connection,Mixing Box, Thermal break profile. (double skin type)					
	b. Centrifugal blower					
	c. Coil section with cooling coil and heating coil as per specifications.					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	d. Pre filters with filter section as required in all AHUs.					
	e. Fine and hepa filters with filter section wherever specifically specified as per AHU schedule .Wherever fine/hepa filters are specified, item shall include factory fabricated double skin plenum of same specifications as AHU panels and complete with filter frameworks.Fine/hepa filter section along with discharge plenum shall be part of AHU in upper tier. Each section shall be side openable for easy maintenance.					
	f. Drain pan, drain connection.					
	g. Squirrel cage induction IP 55 TEFC drive motor, drive arrangement, guard etc.					
	h. Necessary vibration isolators & supporting arrangement.					
	i. Fresh air intake arrangement, necessary water drain & air purge valves wherever required etc.					
	j. Canvass connections,necessary foundations, 2 nos pressure gauge, 2 nos thermometer etc					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	k Controls for AHUs comprising of a set of pressure independent type 2 Way Modulating Flow Control valve with integrated 2 way modulating control of required size having manual override facility alongwith proportional thermostat & wiring for interconnection with 1.5 sq. mm Cu Conductor multicore armoured complete as required.The valve actuator shall be capable of accepting 2-10 volt DC, 4-20 mA electric signal and shall provide similar transduced feedback output signal to control system. The minimum closeoff pressure of valve must be 1.5 times shut OFF head of pump.					
5.1.1	AHU-1- 11650 cfm/4+4 RD Cooling Coil/2 RD Heating Coil/ 6RD Run around coil for heat recovery /135 mm static (with pre, fine filters and Hepa filters)	2	Nos.			
5.1.2	AHU-2- 7600 cfm /4+4 RD Cooling Coil/2 RD Heating Coil/6RD Run around coil for heat recovery /135 mm static (with pre , fine and Hepa filter)	2	Nos.			
5.1.3	AHU-3- 3250 cfm/4+4 RD Cooling Coil/2 RD Heating Coil/125 mm static (with pre, fine filters and Hepa filters)	1	Nos.			
5.1.4	AHU-4- 2300 cfm/4 RD Cooling Coil/2 RD Heating Coil/40 mm static (with pre filters)	1	Nos.			
6.0	FAN COIL UNITS					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	Supply, installation, testing and commissioning of horizontal type sheet metal ceiling suspended FCU's each complete with 3 row deep chilled water cooling coil and 1 row deep hot water coil of copper tubes aluminium fins construction, centrifugal fan, 3 speed, IP 55, class F insulation motor, aluminium cleanable filters insulated condensate drain pan, coil piping connections, condensate drain connection, 2 way modulaing motorised valves with proportional thermostate, vibration isolator, wiring complete as required complete with ball valve, ball valve with strainer as required as per specification & drawings with the following capacities:-					
6.1	1.5 TR	1	No.			
7.0	Axial flow / Propeller Fans					
	Supplying, installing, testing and commissioning of direct driven Propeller fan for exhaust air as shown in drawings. Each fan shall be complete with permanent split capacitor or shaded pole motor, mounting plate, accessories like wire guard, bird screen and fixed louvers for weather protection as required. Fan selection arrangement and Electrical characteristics shall be as follows:					
7.1	300 mm dia 900 RPM fan suitable for 220 +/- 10% volts, 50 Cycles, 1 Phase AC Supply	1	Nos			

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
7.2	Duty: Lift well pressurisation					
	Air Quantity : 4000 CFM (axial fan)					
	Static Pressure : 25 mm wg					
	Motor Rating :2.0 HP	2	Nos.			
8.0	Inline Fans					
	Supply, installation, testing and commissioning of Inline Fans as shown in drawings and as per equipment schedule . Each fan shall be complete with centrifugal blowers, totally enclosed fan cooled motor. Fan motor shall be suitable for single phase, 220 +/- 6% V, 50 Hz AC supply. Item shall be complete with starter & cabling.					
	Duty: Change room exhaust					
8.1	Air Quantity : 400 CFM	1	Nos.			
	Static Pressure :20 mm wg					
9.0	Ventilation Fan Sections					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	Supply, installation, testing and commissioning of single skin construction fan sections suitable for outdoor duty. The unit shall be complete with belt driven double inlet double width, backward curved centrifugal fan, squirrel cage induction motor, vibration isolators, canvass connections, belt drive, pulley mounted on motor and fan shaft, belt guard mounted within the housing, The item shall have pre and fine filters as per specifications. The motor shall be suitable for operation on 3 Phase, 415 +/- 10% V, 50 Hz AC supply.					
	a. Casing (single skin type in 18 G GSS)					
	b. Centrifugal blower					
	c. Charcoal filter and Fine filters as per specifications.					
	d. Pre filters as required					
	e. Necessary foundations etc					
	f. Drive motor, drive arrangement, guard etc.					
	g Wiring for interconnection with AHU starter with 1.5 sq. mm Cu Conductor multicore armoured complete as required.					
	Location : Terrace					
9.1	EX-1&2					
	Air Quantity : 8000 CFM, with 6 RD runaround coil for heat recovery.	2	No.			
	Static Pressure : 60 mm wg					
	Motor Rating : 7.5 HP					
9.2	EX-3					
	Air Quantity : 2000 CFM	1	No.			

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	Static Pressure :50 mm wg Motor Rating :1.5 HP					
9.3	EX-4&5					
	Air Quantity : 12500 CFM, with 6 RD runaround coil for heat recovery. Static Pressure : 60 mm wg Motor Rating : 10.0 HP	2	No.			
9.4	EX-6					
	Air Quantity : 1500 CFM Static Pressure : 50 mm wg Motor Rating : 1.0 HP	1	No.			
(B)	PIPING:-					
10.0	CONDENSER WATER PIPING & VALVES					
10.1	Supply, laying/fixing, testing and commissioning of M.S. heavy class ERW piping confirming to IS : 3589/IS:1239 with necessary clamps, supports, anti vibration mountings, hangers and fittings such as bends, tees, reducers etc. duly painted as per specifications :					
10.1.1	200 mm dia	120	RM			
10.1.2	150 mm dia	80	RM			

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
10.1.3	125 mm dia	30	RM			
10.1.4	50 mm dia	40	RM			
10.1.5	32 mm dia	45	RM			
11.0	Valves					
11.1	Butterfly valves :					
	Supply, fixing and testing of following valves, strainers, in the chilled water piping complete with companion flanges, nut bolts, gaskets, supports etc. duly insulated and painted as per specifications:					
11.1.1	200 mm dia	13	Nos			
11.1.2	150 mm dia.	2	Nos			
11.1.3	50 mm dia.	2	Nos			
11.1.4	32 mm dia.	2	Nos			
11.2	Balancing valves :					
11.2.1	200 mm dia.	4	Nos			
11.3	Non return/Check valves :					
11.3.1	200 mm dia	2	Nos			

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
11.4	Pot strainer with drain valve					
11.4.1	200 mm dia.	1	Nos			
12.0	CHILLED WATER PIPING					
	Supply, laying/fixing, testing and commissioning of M.S. heavy class ERW piping confirming to IS : 3589/IS:1239 with necessary clamps, supports, anti vibration mountings, hangers and fittings such as bends, tees, reducers etc. duly insulated and painted as per specifications :					
12.1	150 mm dia	285	RM			
12.2	125 mm dia	35	RM			
12.3	100 mm dia	165	RM			
12.4	80 mm dia	70	RM			
12.5	65 mm dia	35	RM			
12.6	50 mm dia	90	RM			
12.7	40 mm dia	25	RM			
12.8	32 mm dia	30	RM			
13.0	VALVES & STRAINERS					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	Supply, fixing and testing of following valves, strainers, in the chilled water piping complete with companion flanges, nut bolts, gaskets, supports etc. duly insulated and painted as per specifications:					
13.1	Butterfly valves :					
13.1.1	150 mm dia.	12	Nos			
13.1.2	100 mm dia.	12	Nos			
13.1.3	80 mm dia.	4	Nos			
13.1.4	65 mm dia	2	Nos			
13.1.5	50 mm dia.	4	Nos			
13.2	Balancing valves :					
13.2.1	150 mm dia	4	Nos			
13.2.2	100 mm dia	4	Nos			
13.2.3	80 mm dia	2	Nos			
13.2.4	65 mm dia	1	Nos			
13.2.5	50 mm dia.	2	Nos			
13.3	Non return/Check valves :					
13.3.1	150 mm dia	2	Nos			

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
13.3.2	100 mm dia	2	Nos			
13.4	Y- strainers with drain valve					
13.4.1	150 mm dia.	4	Nos			
13.4.2	100 mm dia.	4	Nos			
13.4.3	80 mm dia.	2	Nos			
13.4.4	65 mm dia	1	Nos			
13.4.5	50 mm dia.	2	Nos			
13.5	Providing and fixing in position the following Gate Valves duly insulated as per specifications:					
13.5.1	50 mm dia Valves	2	Nos.			
13.5.2	40 mm dia Valves	2	Nos.			
13.5.3	32 mm dia Valves	2	Nos.			
13.6	Supply, installation, testing and commissioning cooling thermostats for various Air Handling Units as per specifications.					
13.6.1	Proportional thermostats for Air Handling Units	6	Nos.			
13.6.2	Themostats for FCU	1	Nos.			
14.0	DRAIN PIPING					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	Supply, laying/fixing, testing and commissioning of G.I. medium class ERW piping confirming to IS:1239 with necessary clamps, supports, anti vibration mountings, hangers and fittings such as bends, tees, reducers etc. duly insulated and painted as per specifications for condensate					
14.1.1	50 mm dia	20	RM			
14.1.2	40 mm dia	20	RM			
14.1.3	32 mm dia	20	RM			
14.1.4	25 mm dia	10	RM			
15.0	EXPANSION TANK					
	Supply, installation, testing and commissioning of PVC., expansion tank of capacity 1000 litres made of PVC 2 layer sheet complete with 50 mm thick fire retardant type expanded polystyrene insulation finished with two layers of sand cement plaster and painted complete with vent, drain connections , float valve, quick fill connection, manhole cover etc as specified. (Of double layered Sintex or equivalent make.	2	Nos.			
(C)	AIR DISTRIBUTION:-					
16.0	GSS DUCTING					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	Supply, installation, testing and balancing of G.S.S ducting of following thickness including necessary supports, hangers, nut bolts, gaskets, splitter dampers, vanes canvass connections etc. complete as per specifications & approved shop floor drawings:					
16.1	1.25 mm (18 G) GSS	150	Sqm.			
16.2	1.0 mm (20 G) GSS	300	Sqm.			
16.3	0.80 mm (22 G) GSS	450	Sqm.			
16.4	0.63 mm (24 G) GSS	850	Sqm.			
17.0	FIRE DAMPERS					
17.1	Supply, installation, testing and commissioning of motorized combined smoke & fire dampers made out of GI sheet of at least 90 minutes fire rating complete with GI damper of required size, smoke sensor, etc as per specifications and shop drawings.	10	Sqm			
17.2	Actuator & control panel	24	sets			
18.0	VOLUME CONTROL DAMPERS					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	Supply, installation and testing of volume control dampers of GI sheet, box type to be provided in ducts complete with suitable links, levers and quadrants for manual control of air volume and air balancing as per specifications and drawings.	12	Sqm.			
19.0	CEILING DIFFUSERS					
19.1	Supply, Installation, testing and balancing of square/circular supply air diffusers of powder coated aluminium construction with attached volume control dampers as per specs. and drawings.	8	Sqm.			
19.2	Supply, installation, testing and balancing of square/circular return air diffusers of powder coated aluminium construction without volume control dampers as per specifications and drawings	8	Sqm.			
20.0	GRILLES					
	Supply, installation, testing and balancing of supply/return air grilles with/without volume control dampers of powder coated aluminium construction suitable for installation in walls, false ceiling boxing etc as per specifications and drawings.					
20.1	Supply / return air grilles in single louvers with volume control dampers.	12	Sqm.			

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
20.2	Return air grilles in single louvers with volume control dampers.	4	Sqm.			
21.0	LINEAR GRILLES					
	Supply, installation and balancing of air linear grilles of powder coated aluminium construction suitable for installation in walls/false ceiling, boxing etc as per specifications and drawings.	5	Sqm.			
22.0	GRILLE DAMPERS					
	Supply, installation and balancing of aluminium construction volume control dampers for linear grills.	2	Sqm.			
23.0	MOTORISED DAMPERS					
23.1	Supply, installation, testing and commissioning of motorised dampers complete with actuator and panel and associated control wiring between actuator, AHU starter as required.	5	Sqm.			
23.2	Zero Leakage dampers					
23.2.1	Supply, installation, testing and commissioning of Zero Leakage dampers of aerofoil design complete with associated control wiring between actuator, AHU starter as required.	5	Sqm.			
23.2.2	Actuator & control panel	8	sets			
24.0	DUCTING INSULATION					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
24.1	Supply and fixing of 19 mm thick foil faced FR Closed Cell Chemically Crossed Linked polyethylene, Foam insulation for supply air ducting as per the specifications and approved shop drawings.	1000	Sqm.			
24.2	Aluminium clading on insulated ducts with 26 SWG aluminium sheet having ship lapped joints.	1000	Sqm.			
25.0	DUCT LINING					
25.1	Supply and fixing resin bonded fibre glass hard board acoustic insulation in supply air ducting covered with tissue paper and perforated aluminium sheet as specified.	100	Sqm.			
26.0	PLANT ROOMS ACOUSTIC INSULATION					
26.1	Supply and fixing of acoustic insulation on walls and ceiling of Air handling units rooms with 50mm thick resin bonded fibre glass slabs fixed in frame work and finished with vapour barrier and perforated aluminium sheet complete as per specifications and drawings.	500	Sqm.			
27.0	AIR- CONDITIONING PANELS					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	Supply, installation, testing and commissioning of A/C panels suitable for 415 V, 3 phase, 4 wires, 50 Hz power distribution system. The panel shall be cubicle non draw out type free standing floor mounting sheet metal enclosed flush front with aluminium busbars, separate earth bus bars to be provided throughout the length of the panel. The incoming & outgoing feeder breakers, fuses, indicating lamps etc. shall be accomodated in a modular multitier arrangement. The painting shall be done as per relavant IS codes as specified in the specifications. Adequate size cable alley shall be provided all round the panel and in the back for each cable bending and termination. The outgoing feeders inside the panel shall be connected through solid bus bar. Flexible cable links are not acceptable. Bus bars shall be provided with sleeves or heat resistant insulated paint. The panel shall be suitable for cable entry from top. The panel shall be fabricated after the approval of fabrication drawings.All the panels shall have minimum 20%spare capacity.					
27.1	Main/ Emergency Air-conditioning MCC in plant room					
	INCOMER					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	2 No. 630A, 415/500V, Motorised, Fully Drawout type: (EDO), Four Pole, Air Circuit Breaker with microprocessor based overload, short circuit, Instantaneous & earth Fault trip including under voltage release and lockable trip push button. The ACB should have Icw =Ics= 50KA for 1 sec.R, Y & B Phase indicating lamps (LED type) with 2A control SP MCBs.Digital multi function meter with one set of suitable CTs, CT shorting links, R/Y/B LED indicating lamps and 2A control SP MCBs.					
	1 set of indicating lamps to indicate OPEN, CLOSE, TRIP.					
	Push button to CLOSE the ACB.					
	1 Set of A meter with ASS and CTs.					
	BUSBARS : 800 A TPN					
	Bus Coupler					
	1 No. 630A, 415/500V, Motorised, Fully Drawout type: (EDO), Four Pole, Air Circuit Breaker with microprocessor based overload, short circuit, Instantaneous & earth Fault trip including under voltage release and lockable trip push button. The ACB should have Icw =Ics= 35KA for 1 sec.					
	1 set of indicating lamps to indicate OPEN, CLOSE, TRIP.					
	Push button to CLOSE the ACB.					
	1 Set of A meter with ASS and CTs.					
	OUTGOING					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	2 nos 400 Amp 415 volts, 35 KA microprocessor based FP MCCB having variable current settings. Extended rotary operating mechanism with door interlock with defeat feature and padlock facility. MCCB should be with spreader link and phase barriers. Indicating lamps (LED type) with 2A protection MCBs to indicate OPEN, CLOSE, TRIP for MCCB. Digital Ampere Metre of suitable range with suitable set of CT's and ASS. For water chilling machines.					
	3 Nos. 63 Amp 415 volts, 15 KA , FP MCCB with thermal magnetic release having variable current settings. Extended rotary operating mechanism with door interlock with defeat feature and padlock facility. MCCB should be with spreader link and phase barriers. Indicating lamps with 2A protection MCBs to indicate OPEN, CLOSE, TRIP for MCCB. Digital Ampere Metre of suitable range with suitable set of CT's and ASS with fully automatic star delta starter suitable for 15 hp Primary chilled water pumps.					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	3 Nos. 125 Amp 415 volts, 35 KA FP MCCB with thermal:magnetic release having variable current settings. Extended:rotary operating mechanism with door interlock with: defeat feature and padlock facility. MCCB should be with: spreader link and phase barriers. Indicating lamps with 2A: protection MCBs to indicate OPEN, CLOSE, TRIP for: MCCB. Digital Ampere Metre of suitable range with: suitable set of CT's and ASS with fully automatic star delta: starter suitable for 25 hp Secondary chilled water pumps.					
	4 Nos. 63 Amp 415 volts, 35 KA FP MCCB with thermal:magnetic release having variable current settings of 0.8 to: 1.0 In. Extended rotary operating mechanism with door: interlock with defeat feature and padlock facility. MCCB: should be with spreader link and phase barriers. Indicating: lamps with 2A protection MCBs to indicate OPEN, CLOSE, :TRIP for MCCB. digital Ampere Metre of suitable range: with suitable set of CT's and ASS with fully automatic star: delta starter suitable for 7.5 hp cooling towers.					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	3 Nos. 125 Amp 415 volts, 35 KA FP MCCB with thermal:magnetic release having variable current settings. Extended:rotary operating mechanism with door interlock with: defeat feature and padlock facility. MCCB should be with: spreader link and phase barriers. Indicating lamps with 2A: protection MCBs to indicate OPEN, CLOSE, TRIP for: MCCB. Digital Ampere Metre of suitable range with: suitable set of CT's and ASS with fully automatic star delta: starter suitable for 30 hp condenser water pumps.					
	2 Nos. 250 Amp 415 volts, 35 KA FP MCCB with thermal:magnetic release having variable current settings. Extended:rotary operating mechanism with door interlock with: defeat feature and padlock facility. MCCB should be with: spreader link and phase barriers. Indicating lamps with 2A: protection MCBs to indicate OPEN, CLOSE, TRIP for: MCCB. Digital Ampere Metre of suitable range with: suitable set of CT's and ASS for AHU distribution panels.					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	2 nos 400 Amp 415 volts, 35 KA microprocessor based FP MCCB having variable current settings. Extended rotary operating mechanism with door interlock with defeat feature and padlock facility. MCCB should be with spreader link and phase barriers. Indicating lamps with 2A protection MCBs to indicate OPEN, CLOSE, TRIP for MCCB. Dgital Ampere Metre of suitable range with suitable set of CT's and ASS. For hot water genetators.					
	Complete as above	1	Panel			
27.2	AHU MAIN DISTRIBUTION PANEL					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	<p>Supply, installation, testing and commissioning of A/C panels suitable for 415 V, 3 phase, 4 wires, 50 Hz power distribution system. The panel shall be cubicle non draw out type free standing floor mounting sheet metal enclosed flush front with aluminium busbars, separate earth bus bars to be provided throughout the length of the panel. The incoming & outgoing feeder breakers, fuses, indicating lamps etc. shall be accomodated in a modular multitier arrangement. The painting shall be done as per relavant IS codes as specified in the specifications. Adequate size cable alley shall be provided all round the panel and in the back for each cable bending and termination. The outgoing feeders inside the panel shall be connected through solid bus bar. Flexible cable links are not acceptable. Bus bars shall be provided with sleeves or heat resistant insulated paint. The panel shall be suitable for cable entry from top. The panel shall be fabricated after the approval of fabrication drawings.</p>					
27.2.1	AHU PANEL AHP I					
	INCOMER					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	1 Nos. 250 Amp 415 volts, 35 KA FP MCCB with thermal magnetic release having variable current settings .Extended rotary operating mechanism with door interlock with defeat feature and padlock facility. MCCB should be with spreader link and phase barriers.Indicating lamps with 2A protection MCBs to indicate OPEN, CLOSE, TRIP for MCCB. Digital Ampere Metre of suitable range with suitable set of CT's and ASS.					
	1 no. (0-500V) voltmeter with selector switch.					
	BUSBARS :					
	300 A TPN Aluminium bus bar 415V , 50 Hz.					
	OUTGOING					
	3 Nos. 125 Amp 415 volts, 25 KA FP MCCB with thermal magnetic release having variable current settings. Extended rotary operating mechanism with door interlock with defeat feature and padlock facility. MCCB should be with spreader link and phase barriers.Indicating lamps with 2A protection MCBs to indicate OPEN, CLOSE, TRIP for MCCB.					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	2 Nos. 63 Amp 415 volts, 15 KA FP MCCB with thermal magnetic release having variable current settings. Extended rotary operating mechanism with door interlock with defeat feature and padlock facility. MCCB should be with spreader link and phase barriers. Indicating lamps with 2A protection MCBs to indicate OPEN, CLOSE, TRIP for MCCB.					
	3 sets- 32 A FP MCCB 10 KA outgoing for with ON/OFF indicating lamps and push buttons complete as spare					
	3 sets- 16A FP MCCB 10 KA outgoing with ON/OFF indicating lamps and push buttons complete as spare					
	Complete as above	1	Panel			
28.0	AHU STARTER PANELS (AHSP)					
	Supply, installation, testing and commissioning of cubicle type totally enclosed wall/floor mounted free standing type, dust, damp and vermin proof for AHU made of 2mm thick CRCA sheet steel in compartmentalized design as per specification and drawings. These distribution boards shall be mounted on 50x50x6 MS angle frame work grouted to floor/walls of recessed. The rate includes the angle iron frame, support, painting, numbering, earthing etc. as required					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
28.1	AHU STARTER PANEL (ASHP-1)					
	INCOMER :					
	1 No. 125 Amps FP MCCB 25 KA, 1 no of 0-150 amp ammeter with selector switch & CT's , 1 no. 0-500 volt voltmeter with selector switch & fuses , 1set of indicating lights (RYB).					
	Bus Bar					
	150 A TPN Aluminium bus bar 415V , 50 Hz.					
	OUTGOINGS :					
	2 No. 63 Amps 415 MCCB 15 KA for 20 HP Motor with suitable Starters for motor with thermal overload protection,single phase preventor,spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button,ammeter with ASS and CTs for AHU motor as required.					
	2 No. 63 Amps 415 MCCB 15 KA for 7.5/10 HP Motor with suitable Starters for motor with thermal overload protection,single phase preventor,spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button,ammeter with ASS and CTs for fan sections at terrace.					
	2 No. 32 Amps 415 MCCB 10 KA ,spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button,ammeter with ASS and CTs for winter humidifier complete as required.					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	1 No. 32 Amps 415 MCCB 10 KA for, ON-OFF indication lamps with push button,ammeter with ASS and CTs.					
	Complete as above	1	No.			
28.2	AHU STARTER PANEL (ASHP-2)					
	INCOMER :					
	1 No. 125 Amps FP MCCB 25 KA, 1 no of 0-125 amp ammeter with selector switch & CT's , 1 no. 0-500 volt voltmeter with selector switch & fuses , 1set of indicating lights (RYB).					
	Bus Bar					
	125 A TPN Aluminium bus bar 415V , 50 Hz.					
	OUTGOINGS :					
	2 Nos. 63 Amps 415 MCCB 15 KA for 15 HP Motor with suitable Starters for motor with thermal overload protection,single phase preventor,spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button,ammeter with ASS and CTs for AHU motor as required.					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	2 Nos. 32 Amps 415 MCCB 10 KA for 7.5 HP Motor with suitable Starters for motor with thermal overload protection,single phase preventor,spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button,ammeter with ASS and CTs for AHU motor as required.					
	2 No. 32 Amps 415 MCCB 10 KA ,spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button,ammeter with ASS and CTs for winter humidifier complete as required.					
	1 No. 32 Amps 415 MCCB 10 KA for, ON-OFF indication lamps with push button,ammeter with ASS and CTs.					
	Complete as above	1	No.			
28.3	AHU STARTER PANEL (ASHP-3)					
	INCOMER :					
	1 No. 63 Amps FP MCCB 15 KA, 1 no of 0-63 amp ammeter with selector switch & CT's , 1 no. 0-500 volt voltmeter with selector switch & fuses , 1set of indicating lights (RYB).					
	Bus Bar					
	100 A TPN Aluminium bus bar 415V , 50 Hz.					
	OUTGOINGS :					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	1 Nos. 63 Amps 415 MCCB 15 KA for 7.5 HP Motor with suitable Starters for motor with thermal overload protection,single phase preventor,spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button,ammeter with ASS and CTs for AHU motor as required.					
	1 Nos. 16 Amps 415 MCCB 10 KA for 2 HP Motor with suitable Starters for motor with thermal overload protection,single phase preventor,spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button,ammeter with ASS and CTs for fan section					
	1 No. 32 Amps 415 MCCB 10 KA ,spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button,ammeter with ASS and CTs for winter humidifier complete as required.					
	1 No. 32 Amps 415 MCCB 10 KA for, ON-OFF indication lamps with push button,ammeter with ASS and CTs.					
	Complete as above	1	No.			
28.4	FAN/AHU STARTER PANEL					
	OUTGOING :					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	1 No. 32 Amps MCCB 10 KA for 1.5/2 HP Motor with suitable Starters for motor with thermal overload protection,single phase preventor,spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button,ammeter with ASS and CTs for AHU motor as required.	2	Nos			
28.5	LIFT WELL PRESSURISATION FAN PANEL					
	OUTGOING :					
	1 No. 16 Amps MCCB 10 KA for 2 HP Motor with suitable Starters for motor with thermal overload protection,single phase preventor,spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button,ammeter with ASS and CTs for Fan motor as required.	2	Nos			
29.0	CABLING					
	Supplying, laying, effecting proper connections, testing & commissioning of following size of 1.1 kv PVC insulated aluminium conducting armoured cables as per IS 1554 Part-1 laid underground/cable tray/on surface of wall/hume pipe etc. & termination with brass compression glands as required.					
29.1	3.5Cx 185 sq.mm cable	200	Metre			
29.2	3.5C x 95 sq.mm cable	300	Metre			

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
29.3	3.5Cx 25 sq.mm Cable	150	Metre			
29.4	3.5 C X 16 sq. mm. Cable	150	Metre			
29.5	4 C X10 sq. mm. Cable	50	Metre			
29.6	4 C X 6 sq. mm. Cable	35	Metre			
29.7	4 C X 4 sq. mm. Cable	100	Metre			
29.8	3C X4 sq. mm. Cable	200	Metre			
30.0	CABLE TRAYS					
	Supply & installation of following sizes of perforated MS cable trays including horizontal & vertical bends, reducers, tees, cross members and other accessories as required and duly supported from the ceiling/wall/floor with MS suspenders/supports and including painting etc. as required					
30.1	200 mm widthx50 mm deep x1.6 mmthickness	40	Metre			
30.2	150 mm widthx50 mm deep x1.6 mmthickness	75	Metre			
30.3	100 mm widthx50 mm deep x1.6 mmthickness	60	Metre			
31.0	EARTHING					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
31.1	Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	3	Sets			
31.2	Providing & fixing GI earth strip 40mm x 6mm on surface or in recess for earth connections etc. as required	25	Metre			
31.3	Providing and fixing GI earth strip on walls/ trenches complete as per specifications and as required.					
31.3.1	25mm x 5 mm	50	Metre			
31.4	Providing and fixing earth wire of complete as per specifications as required.					
31.4.1	4 SWG wire	50	Metre			
31.4.2	6 SWG wire	60	Metre			
31.4.3	8 SWG wire	40	Metre			
32.0	CONTROL CABLING					
	Supply, laying, effecting proper connections, testing & commissioning of 1.5 sq.mm. PVC insulated copper multicore cables from AHU's and AC equipments to central control console					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
32.1	19 core cable	25	Metre			
32.2	14 core cable	250	Metre			
32.3	10 core cable	100	Metre			
32.4	8 core cable	50	Metre			
32.5	6 core cable	50	Metre			
32.6	5 core cable	35	Metre			
32.7	3 core cable	25	Metre			
33.0	CONTROL CONSOLE /DESK					
33.1	For Plant room equipments:-					
	Supplying, installation, testing & commissioning of floor mounted desk type control console cum indicating panel in the A.C. plant room containing various indications and controls for the complete air-conditioning system comprising chilling units, chilled/ Hot/ condenser water pumps, cooling towers Hot water generator with test push button facility. The panel shall be fabricated from minimum 1.6mm thick M.S. powder coated sheet of approved design. The air-conditioning module of the central control cum indicating panel shall contain the following accessories.					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	Status indication (ON, OFF & fault) of each compressor for each chilling machine, hot water generator etc.					
	Push buttons and indicating lamps for remote start & stop and status indication for every nos of the water circulating pumps, Fans etc.					
	Push buttons and indication lamps for remote start & stop and status indication (On, Off & Fault) for every nos. cooling tower motors and low water level indication for every Nos. cooling towers.					
	Hooter and flashing lamp to indicate operation of any safety/ shut down with necessary contactors, accept, reset and test push buttons.					
	Complete wiring with copper conductor PVC insulated multicore 2.5 sq.mm stranded cable (including supply of cable, tray, clamps etc) from various equipments in the A.C. plant room, AHU's Terrace plant room and cooling towers etc to the control console panel as required.					
	COMPLETE PANEL AS ABOVE	1	Set			
33.2	For Animal house equipments:-					

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
	Supplying, installation, testing & commissioning of wall mounted desk type control console cum indicating panel in AHU room containing various indications and controls for the complete air-conditioning system comprising AHUs/ Ex. blower/ Fans etc with test push button facility. The panel shall be fabricated from minimum 1.6mm thick M.S. powder coated sheet of approved design. The air-conditioning module of the central control cum indicating panel shall contain the following accessories.					
	Status indication (ON, OFF & fault) of each compressor for each chilling machine, hot water boiler etc.					
	Push buttons and indicating lamps for remote start & stop and status indication for every nos Air Handling Units, Ex blower, Fans etc.					
	Hooter and flashing lamp to indicate operation of any safety/ shut down with necessary contactors, accept, reset and test push buttons.					
	Complete wiring with copper conductor PVC insulated multicore 2.5 sq.mm stranded cable (including supply of cable, tray, clamps etc) from various equipments in the A.C. plant room, AHU's Terrace plant room and cooling towers etc to the control console panel as required.					
	COMPLETE PANEL AS ABOVE	1	Set			

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs (in Figure) 5	Rate in Rs (in Words) 6	Amount (Rs.) 7
34.0	SITC of complete system with sensors and computer system for monitoring of Relative Humidity, Temperature and Pressure Balance of the rooms rooms in Animal area through computer system with zonal DDC panels, necessary controlers, software etc.	1	Set			
	TOTAL FOR HVAC WORKS					

	<u>MRC NIMR, DWARKA</u>		
	<u>SUMMARY SHEET FOR HVAC WORKS</u>		
SECTION	DESCRIPTION OF WORK		AMOUNT(Rs.)
A	EQUIPMENTS		
B	PIPING		
C	AIR DISTRIBUTION		
D	ELECTRICAL		
	GRAND TOTAL		