

TICEL BIO PARK LTD

COMPETITIVE TECHNO COMMERCIAL TENDER

**SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF ACMV,
FIRE PROTECTION AND IBMS WORKS IN CONSTRUCTION OF TICEL
BIO PARK-III,**

**At SF No. 66, 67, 68 & 75, Off Maruthamalai Road, Somayampalayam Village,
Bharathiyar University P.O, Coimbatore - 641 046
(G +13 UPPER FLOORS)**

BILL OF QUANTITIES

VOLUME - IV

DUE DATE FOR SUBMISSION: ON OR BEFORE 03.04.2019 BY 15.00 Hours

TO BE SUBMITTED TO:

**M/s TICEL BIO PARK Ltd
CSIR Road,
Taramani, Chennai - 600 113.
Telephone No.: +91 44 22542061
Fax No: 91-44-2254 2055
E-mail: md@ticelbiopark.com**

ENGINEERING CONSULTANTS:M/s TAAMAESSEK ENGINEERING CONSORTIUM

**Architects & Engineers
No 5, 1st Floor,
Bishop Wallers Avenue West.
Off TTK Road, Mylapore,
Chennai- 600 004 – INDIA.
Tel No: 044-24671139 / 57
Fax No: 044-24672237
E-Mail: info@taamaesek.com**

TENDER SUBMITTED BY:

M/s. _____

Address _____

2019

ABSTRACT FOR ACMV,IBMS & FPS WORKS				
S.No	Description	Total Supply	Total Erection	Total Supply + Erection
		Amount	Amount	Amount
AIR CONDITIONING & MECHANICAL VENTILATION WORKS				
A	Plant room - High side works			
B	B. Main building - Low side works (Piping)			
C	C. Ventilation works			
D	D. Main building - Ground Floor Air Handling Units			
E	E.LAB TYPICAL FLOOR CSUS			
	Sub Total HVAC- (I)			
INTEGRATED BUILDING MANAGEMENT SYSTEMS				
1	ACCESS CONTROL SYSTEM WORKS			
2	BUILDING MANAGEMENT SYSTEM			
3	CCTV SYSTEM			
4	DATA NETWORK			
5	FIRE ALARM SYSTEMS			
6	PUBLIC ADDRESS SYSTEM			
7	EPABX			
	Sub Total for IBMS Works (II)			
FIRE PROTECTION WORKS				
A	PUMP ROOM			
B	HYDRANT SYSTEM			
C	SPRINKLER SYSTEM			
D	EXTINGUISHERS			
E	GAS SUPPRESSION SYSTEM			
	Sub Total for Fire protection System Works(III)			
	TOTAL - (I)+(II)+(III)			
	GRAND TOTAL -(SUPPLY + ERECTION)			

SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF ACMV, FIRE PROTECTION SYSTEM AND IBMS WORKS IN CONSTRUCTION OF TICEL BIO PARK – III

Bill Of Quantities									
S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
I	AIR CONDITIONING & MECHANICAL VENTILATION WORKS								
	A. Plant room - High side works								
1	Supply, installation, testing and commissioning of Air cooled chillers with following particulars								
a	Actual.capacity. of 226 TR Air Cooled screw chillers (Imported),1.24 KW/TR temp: 7 deg C leaving and 12 deg C entering condition, at Coimbatore ambient condition DB temp. 98deg F and WB temp. 76 Deg F,main disconnect switch, required pressure diff.sensor,Black Epoxy coated fins, Condensor fins covered with 12 guage SS316 mesh for mechanical protection. Compressor sound jacket using Armasound material required thickness of 100mm thick with 22G Alu cladding with suitable vibration isolator. Orign of Chillers shall be Europe/USA only for detail specification refer Volume III	nos	2						
b	Suitable cable entry adaptor box with isolator and should have weather protection type	nos	2						
c	Differential pressor sensor	nos	2						
d	Vibration isolator	nos	2						
e	Flow switch	nos	2						
f	Compressor sound jocket	nos	2						
g	Plant Manager	nos	1						
h	Flange end connection	nos	2						
2-a	Supply, installation, testing and commissioning of End suction long coupled base mounted primary pumps for air cooled chillers with bronze impeller, capacity of 603 US gpm @15m head for detail specification refer Volume III	nos	3						
b	Supply and installation of Suitable Inertia frame with Vibration mounting for the above selection of pumps-required concrete M30 grade with reinforcement 200 Kg/Cum	nos	3						
c	Supply and installation of Suitable IP55 VFD with PID controller (A0-2,Ai-4,DO-5,DI -5) with disconnect switch including suitable type enclosure box and required BMS compatable for the above operation	nos	3						
d	Supply and installation of insulation for Pump casing using 30mm thick nitrile rubber insulation with 22G al cladding for the above mentioned pumps	lot	3						
e	Supply and installation for 2 run of 6 SWG GI wire for earthing, App. cable length shall be 25 rmt	lot	3						
f	Supply and installation of Emergency Lockable Push button station for the above, Fire rated type with required support	lot	3						
g	Supply and installation of Emergency Locakable Push button station cabling for the above 3 core 1.5 square copper armoud fire rated cable length shall be 25rmt to 30rmt between motor to vfd	lot	3						
h	Supply and installation of Enamel painting for pump base and required water flow sticker has to be enisized	lot	3						
3-a	Supply, installation, testing and commissioning of end suction back pulout, long coupled base mounted Secondary pumps with bronze impeller with capacity of 1121 US gpm @ 34m head for detail specification refer Volume III	nos	3						
b	Supply and installation of Suitable Inertia frame with Vibration mounting for the above selection of pumps-required concrete M30 grade with reinforcement 200 Kg/Cum	nos	3						
c	Supply and installation of Secondary Pump controller with Suitable IP55 VFD with PID controller (A0-2,Ai-4,DO-5,DI -5) with disconnect switch incloding suitable Cubical type enclosure boxas per the IS standard and bypass arrangement for star delta starter arrangement and required BMS compatable for the above operation	nos	3						
d	Supply and installation of insulation for Pump casing using 30mm thick nitrile rubber insulation with 22G al cladding for the above mentioned pumps	lot	3						
e	Supply and installation for 2 run of 25x1.5 mm GI flat for earthing , App. cable length shall be 25 rmt	lot	3						
f	Supply and installation of Emergency Lockable Push button station for the above , Fire rated type with required support	lot	3						
g	Supply and installation of Emergency Locakable Push button station cabling for the above , 3 core 1.5 square copper armoud fire rated cable length shall be 25rmt to 30rmt between motor to vfd	lot	3						
h	Supply and installation of Enamel painting for pump base and required water flow sticker has to be enisized	lot	3						
i	Supply and instalation of 3nos of DP sensor of Secondary pump operation with required amplifier and nessesery support and copper tubing between dp sensor to chilled water line,	lot	3						
j	Supply and installation for 4 core 1.5 square screened copper armoud fire rated cable, length shall be app 1400 rmt between dp sensor to vfd	rmt	1400						
4	Supply, installation, testing and commissioning of Swing type Non return Valve suitable for the pipes, pressure rating of PN16, with insulation and 24g Alu cladding								

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
	a 300 mm dia	nos	Qro						
	b 200 mm dia	nos	3						
	c 150 mm dia	nos	3						
5	Supply, installation, testing and commissioning of Metallic bellows suitable for pipes, pressure rating of PN16								
	a 200 mm dia	nos	6						
	b 150 mm dia	nos	10						
6	Supply, installation, testing and commissioning of Suction Guide suitable for pipes with pressure rating of PN16-with insulation and 24g Alu cladding								
	a 200 mm dia	nos	3						
	b 150 mm dia	nos	3						
7	Supply, installation, testing and commissioning of two way on/off motorised isolation valve suitable for pipes, with actuator 230v power supply, BMS compatible, pressure rating of PN16,suitable for chilled water application-with insulation and 24g Alu cladding								
	a 150 mm dia	nos	2						
8	Supply, installation, testing and commissioning of Manual Balancing valve suitable for pipes,pressure rating of PN16-with insulation and 24g Alu cladding								
	a 300 mm dia	nos	1						
	b 200 mm dia	nos	1						
	c 150 mm dia	nos	3						
9	Supply, installation, testing and commissioning of Butterfly valve with extended stem of 100mm length, pressure rating of PN16								
	a 400 mm dia	nos	12						
	b 300 mm dia	nos	2						
	c 200 mm dia	nos	6						
	d 150 mm dia	nos	12						
	e 100 mm dia	nos	2						
	f 80 mm dia	nos	2						
	g 65 mm dia	nos	4						
	h 50 mm dia	nos	30						
10	Supply, installation, testing and commissioning of pressurised closed expansion tank with stand by motor and bms compatible -capacity of 5000 lit. for water. 100mm thick rigid puff insulation with 20G GI galding with float valve arrangement	nos	1						
11	Supply and installation of ms angle support for plant room supports.	kg	2000						
12	Supply and installation of 12mm thick Ms Checkered plate for shaft closings etc.	kg	2000						
13	Supply, Laying and commisioning of PVC insulated, copper conductor 1.1kv grade, Armoured copper cable,FRLS XLPE from VFD to Motors								
	a 3.5C x 240 sqmm FRLS xlpe Cable	Rmt	112						
	b 4C X25 sqmm FRLS xlpe	Rmt	230						
	c 4C X10 sqmm FRLS xlpe	Rmt	132						
	d 4C X 6 sq.mm. FRLS XLPE	QRO							
14	Supply and Installation of cable end termination with Double brass compression gland and Copper lugs for the following sizes of PVC Insulated XLPE armoured conductor FRLScopper cable of 1.1KV grade complete as required..								
	a 3.5C x 240 sqmm FRLS xlpe Cable	nos	6						
	b 4C X25 sqmm xlpe	nos	4						
	c 4CX10 sqmm xlpe	nos	6						
15	Supply and installation of Copper earth plate								
	a 25 x3 mm x 2 run (route length)	rmt	80						
	b 8SWG Cu Wire	rmt	180						
16	Supply and installation of GI Perforated Tray with angle supports								
	a 600mm width	rmt	104						
	b 450mm width	rmt	10						
	c 300mm width	rmt	12						
	d 200mm width	rmt	28						
	e 150mm width	rmt	63						
17	Supply and installation of Pressure gauge with SS syphons,niddle Valves,100mm dia range -0 to 15 kg/cmsq	nos	20						
18	Supply and installation of Temp. gauge with SS thermowell,100mm dia, -10 to 20 deg C	nos	6						
19	Supply and installation of 25mm Ball valves with flange end, pressure rating PN 16 with insulation and 24g Alu cladding	nos	18						
20	Supply and installation of Auto air vent size 25mm dia with 9 rmt 20mm copper piping	nos	10						
21	Supply, installation, testing and commissioning of Electromagnetic Descaler for Chilled water flow suitable capacity-300 mm dia	nos	1						
22	Supply, installation, testing and commissioning of Centrifugal, Side Stream Filter for Chilled water, 300mm dia- 2400 gpm.	nos	1						

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
23	Supply, installation, testing and commissioning of trible duty valves for pumps, pressure rating of PN16 - with insulation and 24g Alu cladding								
	a 250 mm dia	nos	3						
	b 200 mm dia	nos	3						
24	Supply, installation, testing and commissioning of MS C class pipe with TF quality Thermocole, density 32 Kg/m3 of 100mm thick for 600 mm to 150mm and below pipe 50mm thick and 24G Al.cladding, providing and fixing in position necessary fittings like bends, elbows, tees, reducers, mating flanges, nipples for mounting sensor (if any) & sockets for BAS (if any), fabricated to size and shape in workshop or brought out ready made where available of acceptable quality. The quoted price shall inclusive of necessary supports, hangers, welding, smooth finishing, anchors, saddles, sleeves, brackets, adequate number of expansion joints, clamps, bolts, nuts and all accessories as required to complete the installation. Test points to be provided in the pipeline wherever required.- under ground piping civil scope including, excavation, dewatering, brickworks, pedestals, covers, etc.,								
	a 300mm dia	rmt	156						
	b 250mm dia	rmt	34						
	c 200mm dia	rmt	83						
	d 50mm dia	rmt	50						
25	Supply, installation, testing & commissioning of flow switches as required with all fittings and control wiring.	set	4						
26	Carrying out on site hydronic water balancing for chilled water circuit through suitable software.	Lot	1						
	B. Main building - Low side works (Piping)								
27	Supply, installation, testing and commissioning of Under ground burried, MS C class pipe with TF quality Thermocole, density 32 Kg/m3 of 100mm thick for 600 mm to 150mm and below pipe 50mm thick and 24G Al.cladding, providing and fixing in position necessary fittings like bends, elbows, tees, reducers, mating flanges, nipples for mounting sensor (if any) & sockets for BAS (if any), fabricated to size and shape in workshop or brought out ready made where available of acceptable quality. The quoted price shall inclusive of necessary excavation backfilling, compaction methodology shall be as per the Engineer-Incharge ,100mm thick M.sand cushioning,compacting of soil upto 1.5mtr depth from finished ground level and all accessories as required to complete the installation. Test points to be provided in the pipeline wherever required/ as per the drawing.								
	a 300 mm dia	Rmt	650						
28	Supply, installation, testing and commissioning of MS C class pipe with TF quality Thermocole, density 32 Kg/m3 of 100mm thick for 600 mm to 150mm and below pipe 50mm thick and 24G Al.cladding, providing and fixing in position necessary fittings like bends, elbows, tees, reducers, mating flanges, nipples for mounting sensor (if any) & sockets for BAS (if any), fabricated to size and shape in workshop or brought out ready made where available of acceptable quality. The quoted price shall inclusive of necessary supports, hangers, welding, smooth finishing, anchors, saddles, sleeves, brackets, adequate number of expansion joints, clamps, bolts, nuts and all accessories as required to complete the installation. Test points to be provided in the pipeline wherever required.								
	a 300 mm dia	rmt	133.4						
	b 250 mm dia	rmt	40						
	c 200 mm dia	rmt	34						
	d 150 mm dia	rmt	10						
	e 125 mm dia	rmt	16						
	f 100 mm dia	rmt	114						
	g 80 mm dia	rmt	598						
	h 65 mm dia	rmt	161						
	i 50 mm dia	rmt	771						
	j 40 mm dia	rmt	164						
	k 32 mm dia	rmt	10						
	l 25 mm dia	rmt	58						
	m 20 mm dia	rmt	12						
29	Supply and installation of GI pipe with Insulated Condensate Drain/process cooling piping-25mm thick TF quality Thermocole density 32 Kg/m3, 24G AL. cladding								
	a 100 mm dia	rmt	12						
	b 80 mm dia	rmt	386						
	c 65 mm dia	rmt	QRO						
	d 50 mm dia	rmt	401						
30	Supply, installation, testing and commissioning of Manual Balancing valve pressure rating of PN16-with insulation, suitable for 230v supply								
	a 200 mm dia	nos	2						

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
31	Supply, installation, testing and commissioning of Butterfly Valve with extended stem of 100mm length, pressure rating of PN16, Suitable for chilled water application -SS wafer/stem for chilled water application - with insulation and 24q Alu cladding								
	a 250 mm dia	nos	2						
	b 200 mm dia	nos	2						
	c 150 mm dia	nos	QRO						
	d 125 mm dia	nos	QRO						
	e 100 mm dia	nos	28						
	f 80 mm dia	nos	10						
	g 65 mm dia	nos	20						
	h 50 mm dia	nos	116						
	i 40 mm dia	nos	41						
32	Supply, installation, testing and commissioning of Ball valve with strainer flange end, pressure rating of PN25-with insulation and 24G Alu cladding								
	a 32 mm dia	nos	2						
	b 25 mm dia	nos	14						
33	Supply and installation of SMACNA standard, factory fabricated, flanged GI ducting,180GSM, 450pa, using food grade sealant for leakage arresting, wall to wall duct crossing area to be sealed with fire retardant sealant								
	a 18G	sqmt	48						
	b 20G	sqmt	90						
	c 22G	sqmt	1200						
	d 24G	sqmt	1450						
34	Supply and installation of al.powdered coated grilles with VCD and wooden frame for grille erection.	sqmt	22						
35	Supply and installation of volume control damper/collar damper with heavy duty type aluminum anodized profile materials.	sqmt	18						
36	Supply of Motorized Fire and smoke damper where 3V blades and outer frames shall be of 16G GSS construction. The Fire dampers shall be UL 555 or UL 555S rated and certified by UL. All fire dampers shall be complete with factory fabricated and fitted duct sleeve. Fire damper rating shall comply with leakage Class-1 (8 CFM@ 4 Inch WG static); closure temperature of 74 C and damper shall be 90 Minutes fire rated. The damper construction should be with frame, blades, blade stops, seals, linkage, axles, transformer to convert 240 V AC to DC Voltage, motorized spring return type electric actuator of 230VAC which can be mounted internal or external as per requirement, extended sleeve of 400mm length & thickness of 20G with complete boxing, the damper shall have auxiliary / momentary switch to provide NO/NC signals with Resettable link (RRL), Damper position feedback switch complete in all respect as per specification and drawings etc. with actuator and control panel.	sqmt	18						
37	Supply and installation of Butterfly dampers dia 300 mm	nos	QRO						
38	Supply and installation of Butterfly dampers dia 250 mm	nos	QRO						
39	Supply and installation of Butterfly dampers dia 200 mm	nos	QRO						
40	Supply and installation of toilet exhaust disc valves (size 100 to 150mm) with control damper	nos	274						
41	Supply and installation of Duct Thermal Insulation materials constructed by laminating a closed cell cross linked polyethylene foam with tough re inforced aluminum foil facing of 19 mm thick insulation for SA duct passing through the Conditioned space, Class O standards, thermal conductivity 0.032 w/m k(20 deg c .50-70% R.H)	sqmt	1900						
42	Supply and installation of Duct Thermal Insulation materials constructed by laminating a closed cell cross linked polyethylene foam with tough re inforced aluminum foil facing of 13 mm thick insulation for RA duct passing through the Conditioned space, Class O standards, thermal conductivity 0.032 w/m k(20 deg c .50-70% R.H)	sqmt	1600						
43	Supply, installation, testing and commissioning of Duct Accoustic (Nitrile rubber base, Open cell material 25mm thick, Thermal conductivity 0.047w/m.k@20deg C, excellent absorption, 99.9% reduction of bacterial growth, class1 fire performance, with a density of 140-180Kg/cubicmeter).	sqmt	60						
44	Supply and installation of non return air dampers low leakage type with spring loaded.	sqmt	10						
45	Supply, installation of gripple hanger system for ducts instalation -length shall be 10m and hanging weight 60 -120kg.	nos	1						
46	Supply & installation of SS 316 pipe of 50mm dia for pressure difference	nos	54						
C. Ventilation works									
47a	Supplying, installing, testing and commissioning of Double skin cabinet typeliftwell pressurization, inner skin and outer skin shallbe 0.64mm thick, Aerofoil backward curve fan with motor of IE 2 type, inlet and outlet damper needs to be provided, inlet section having 900mm wide plenum section with 10micron filter, limit swith and view glass and etc, cabin shall be outdoor type - Capacity of 21500cfm-40mm total static for detail specification refer Volume III	nos	2						

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
b	Supply and installation of Suitable IP55 VFD with PID controller (A0-2.Ai-4,DO-5,DI -5) with disconnect switch including suitable type enclosure panel and required BMS compatible for the above operation	nos	2						
c	Supply and installation of fire rated 4core x 16Sqmm copper armoured XLPE cable for the above with suitable cable Tray	Rmt	75						
d	Supply and installation of fire rated 4core x 16Sqmm Double compression cable gland for the above termination	lot	2						
e	Supply and installation for 2 run of 6 G GI wire for earthing, App. route length shall be 30 rmt	lot	2						
f	Supply and installation of Emergency Lockable Push button station for the above, Fire rated type with required support	lot	2						
g	Supply and installation of Emergency Lockable Push button station cabling for the above, 3 core 1.5 square XLPE copper armoured fire rated cable length shall be 20rmt between motor to Push button	lot	2						
h	Supply and installation of PCC pedestal 300 X 300 X 200mm H with required M30 Grade concrete with 2 nos of 12mm Thick Rubber pads for the each fan Supports. Anchroing with frame	lot	2						
i	Charges for Air balancing works for the above with low side	lot	2						
j	Supply and installation of Limit switch/bulk head cabling from ahus to vfd, app length shall be 30rmt of 3core 1.5sqmm copper XLPE armoured cable with end termination	lot	2						
k	Supply and installation charges for fire rated canvas connection for the above	lot	2						
l	Supply and installation of outdoor type Rigid mounted canopy for the above	lot	2						
48a	Supplying, installing, testing and commissioning of Double skin cabinet type liftwell pressurization , inner skin and outer skin shall be 0.64mm thick, Aerofoil backward curve fan with motor of IE 2 type, inlet and outlet damper needs to be provided, inlet section having 900mm wide plenum section with 10micron filter, limit switch and view glass and etc, cabin shall be outdoor type - Capacity of 30000 cfm-40mm total static for detail specification refer Volume III	nos	1						
b	Supply and installation of Suitable IP55 VFD with PID controller (A0-2.Ai-4,DO-5,DI -5) with disconnect switch and required BMS compatible for the above operation	nos	1						
c	Supply and installation of fire rated 4corex 16 sqmm XLPE copper armoured cable for the above with suitable cable Tray	Rmt	75						
d	Supply and installation of fire rated 4corex16 Sqmm Double compression cable gland for the above termination	lot	1						
e	Supply and installation for 2 run of 25x1.5 mm GI Flat for earthing, App. length shall be 30 rmt	lot	1						
f	Supply and installation of Emergency Lockable Push button station for the above, Fire rated type with required support	lot	1						
g	Supply and installation of Emergency Lockable Push button station cabling for the above, 3 core 1.5 square mm XLPE copper armoured fire rated cable length shall be 20rmt between motor to Push button	lot	1						
h	Supply and installation of PCC pedestal 300X300X200mm H with required M30 Grade concrete with 2 nos of 12mm Thick Rubber pads for the each fan Supports. Anchroing with frame	lot	1						
i	Charges for Air balancing works for the above with low side	lot	1						
j	Supply and installation of Limit switch/bulk head cabling from ahus to vfd, app length shall be 30rmt of 3core 1.5sqmm XLPE copper armoured cable with end termination	lot	1						
k	Supply and installation charges for fire rated canvas connection for the above	lot	1						
l	Supply and installation of outdoor type Rigid mounted canopy for the above	lot	1						
49a	Supplying, installing, testing and commissioning of Single skin cabinet type shall be 0.64 mm thick, Aerofoil backward curve fan with motor of IE 2 type, inlet and outlet damper needs to be provided, inlet section having 900mm wide plenum section with 10micron filter, limit switch, cabin shall be outdoor type - Capacity of 4200cfm-25 mm external static (Electrical Room) for detail specification refer Volume III	nos	2						
b	Supply and installation of fire rated 4corex2.5Sqmm XLPE copper armoured cable for the above with suitable cable Tray	Rmt	75						
c	Supply and installation of fire rated 4corex2.5Sqmm Double compression cable gland for the above termination	lot	2						
d	Supply and installation for 2 run of 10G GI wire for earthing, App. route length shall be 30 rmt	lot	2						
e	Supply and installation of Emergency Lockable Push button station for the above, Fire rated type with required support	nos	2						
f	Supply and installation of Emergency Lockable Push button station cabling for the above, 3 core 1.5 square mm XLPE copper armoured fire rated cable length shall be 30 mtr between starter Panel to Push button	lot	2						
g	Supply and installation of PCC pedestal 300X300X200mm H with required M30 Grade concrete with 2 nos of 12mm Thick Rubber pads for the each fan Supports. Anchroing with frame	lot	2						
h	Charges for Air balancing works for the above with low side	lot	2						
i	Supply and installation of Limit switch cabling from limit switch to starter panel, app length shall be 30rmt of 2 core 1.5sqmm XLPE copper armoured cable with end termination	lot	2						
j	Supply and installation charges for fire rated canvas connection for the above	lot	2						
k	Supply and installation of outdoor type Rigid mounted canopy for the above	lot	2						

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
50a	Supplying, installing, testing and commissioning of Single skin cabinet type shall be 0.64 mm thick, Aerofoil backward curve fan with motor of IE 2 type, inlet and outlet damper needs to be provided, inlet section having 900mm wide plenum section with 10micron filter, limit switch, cabin shall be outdoor type - Capacity of 10500cfm-25mm external static (Pump Room) for detail specification refer Volume-III	nos	4						
b	Supply and installation of fire rated 4core x 4Sqmm XLPE copper armoured cable for the above with suitable cable Tray	Rmt	100						
c	Supply and installation of fire rated 4core x 4Sqmm Double compression cable gland for the above termination	lot	4						
d	Supply and installation for 2 run of 6G GI wire for earthing, App. cable length shall be 90 rmt	lot	4						
e	Supply and installation of Emergency Lockable Push button station for the above, Fire rated type with required support	lot	4						
f	Supply and installation of Emergency Lockable Push button station cabling for the above, 3 core 1.5 square mm XLPE copper armoured fire rated cable length shall be 30 mtr between starter Panel to Push button	lot	4						
g	Supply and installation of PCC pedestal 300 X 300 X 200mm H with required M30 Grade concrete with 2 nos of 12mm Thick Rubber pads for the each fan Supports. Anchroing with frame	lot	4						
h	Charges for Air balancing works for the above with low side	lot	4						
i	Supply and installation of Limit switch cabling from limit switch to starter panel app length shall be 30rmt of 2 core 1.5sqmm XLPEcopper armoured cable with end termination	lot	4						
j	Supply and installation charges for fire rated canvas connection for the above	lot	4						
k	Supply and installation of outdoor type Rigid mounted canopy for the above	QRO							
51a	Supplying, installing, testing and commissioning of Single skin cabinet type shall be 0.64 mm thick, Aerofoil backward curve fan with motor of IE 2 type, inlet and outlet damper needs to be provided, inlet section having 900mm wide plenum section with 10micron filter, limit switch, cabin shall be outdoor type - Capacity of 15000cfm-40mm external static (STP Room) for detail specification refer Volume-III	lot	4						
b	Supply and installation of fire rated 4corex 6 sq.mm copper XLPE armoured cable for the above with suitable cable Tray	Rmt	100						
c	Supply and installation of fire rated 4corex 6 Sqmm Double compression cable gland for the above termination	nos	4						
d	Supply and installation for 2 run of 6 G GI wire for earthing, App. route length shall be 90 rmt	lot	4						
e	Supply and installation of Emergency Lockable Push button station for the above, Fire rated type with required support	lot	4						
f	Supply and installation of Emergency Lockable Push button station cabling for the above, 3 core 1.5 square mm XLPE copper armoured fire rated cable length shall be 30 mtr between starter Panel to Push button	lot	4						
g	Supply and installation of PCC pedestal 300 X 300 X 200mm H with required M30 Grade concrete with 2 nos of 12mm Thick Rubber pads for the each fan Supports. Anchroing with frame	lot	4						
h	Charges for Air balancing works for the above with low side	lot	4						
i	Supply and installation of Limit switch and cabling from limit switch to starter panel, app length shall be 30rmt of 2 core 1.5sqmm XLPE copper armoured cable with end termination	lot	4						
j	Supply and installation charges for fire rated canvas connection for the above	lot	4						
k	Supply and installation of outdoor type Rigid mounted canopy for the above	lot	4						
52a	Supplying, installing, testing and commissioning of Single skin cabinet type shall be 0.64 mm thick, Aerofoil backward curve fan with motor of IE 2 type, inlet and outlet damper needs to be provided, inlet section having 900mm wide plenum section with 10micron filter, limit switch, cabin shall be outdoor type - Capacity of 8200cfm-25mm external static (Fire Room) for detail specification refer Volume-III	nos	2						
b	Supply and installation of fire rated 4core x 4Sqmm XLPE copper armoured cable for the above with suitable cable Tray	Rmt	75						
c	Supply and installation of fire rated 4core x 4Sqmm Double compression cable gland for the above termination	lot	2						
d	Supply and installation for 2 run of 6 G GI wire for earthing, App. Route length shall be 90 rmt	lot	2						
e	Supply and installation of Emergency Lockable Push button station for the above , Fire rated type with required support	lot	2						
f	Supply and installation of Emergency Push button station cabling for the above, 3 core 1.5 square mm copper armoured fire rated XLPE cable length shall be 30 mtr between starter Panel to Push button	lot	2						
g	Supply and installation of PCC pedestal 300 X 300 X 200mm H with required M30 Grade concrete with 2 nos of 12mm Thick Rubber pads for the each fan Supports. Anchroing with frame	lot	2						
h	Charges for Air balancing works for the above with low side	lot	2						
i	Supply and installation of Limit switch cabling from limit switch to starter panel, app length shall be 30rmt of 2 core 1.5sqmm XLPE copper armoured cable with end termination	lot	2						
j	Supply and installation charges for fire rated canvas connection for the above	lot	2						
k	Supply and installation of outdoor type Rigid mounted canopy for the above	lot	2						

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
53a	Supplying, installing, testing and commissioning of Single skin cabinet type shall be 0.64 mm thick, Aerofoil backward curve fan with motor of IE 2 type, inlet and outlet damper needs to be provided, inlet section having 900mm wide plenum section with 10micron filter, limit switch, cabin shall be outdoor type - Capacity of 17000cfm-25mm external static (DG Room) for detail specification refer Volume-III	nos	4						
b	Supply and installation of fire rated 4core x 6Sqmm copper XLPE armoured cable for the above with suitable cable Tray	Rmt	100						
c	Supply and installation of fire rated 4corex6Sqmm Double compression cable gland for the above termination	lot	4						
d	Supply and installation for 2 run of 6 G GI wire for earthing, App. route length shall be 90 rmt	lot	4						
e	Supply and installation of Emergency Lockable Push button station for the above, Fire rated type with required support	lot	4						
f	Supply and installation of Emergency Push button station cabling for the above, 3 core 1.5 square mm XLPE copper armoured fire rated cable length shall be 30 mtr between starter Panel to Push button	lot	4						
g	Supply and installation of PCC pedestal 300 X 300 X 200mm H with required M30 Grade concrete with 2 nos of 12mm Thick Rubber pads for the each fan Supports Anchroing with frame	lot	4						
h	Charges for Air balancing works for the above with low side	lot	4						
i	Supply and installation of Limit switch cabling from limit switch to starter panel, app length shall be 30rmt of 2 core 1.5sqmm XLPE copper armoured cable with end termination	lot	4						
j	Supply and installation charges for fire rated canvas connection for the above	lot	4						
k	Supply and installation of outdoor type Rigid mounted canopy for the above	lot	4						
54a	Supplying, installing, testing and commissioning of Inline fans, The casing shall be single skin, internally acoustically lined and constructed of galvanized steel sheet. The fan shall be forward curve impeller fitted with maintenance free external rotor motor. The motor shall be suitable for 3 phase 50 cycles AC supply. Low sound level exceeding not more than 39 dBA at three meter distance. All necessary standard accessories like flexible connectors, vibration isolators etc.- 1000 cfm -25mm of total static for detail specification refer Volume-III	lot	58						
b	Supply and installation of Rigid MS supports with Enamel painting for the above	lot	58						
c	Charges for Air balancing works for the above with low side	lot	58						
d	Supply and installation charges for fire rated canvas connection for the above	lot	58						
55a	Supplying, installing, testing and commissioning of Inline fans, The casing shall be single skin, internally acoustically lined and constructed of galvanized steel sheet. The fan shall be forward curve impeller fitted with maintenance free external rotor motor. The motor shall be suitable for 3 phase 50 cycles AC supply. Low sound level exceeding not more than 39 dBA at three meter distance. All necessary standard accessories like flexible connectors, vibration isolators, 10micron filter, etc.- 1250 cfm -25mm of total static for detail specification refer Volume-III	lot	28						
b	Supply and installation of Rigid MS supports with Enamel painting for the above	lot	28						
c	Charges for Air balancing works for the above with low side	lot	28						
d	Supply and installation charges for fire rated canvas connection for the above	lot	28						
56a	Supplying, installing, testing and commissioning of Inline fans, The casing shall be single skin, internally acoustically lined and constructed of galvanized steel sheet. The fan shall be forward curve impeller fitted with maintenance free external rotor motor. The motor shall be suitable for 3 phase 50 cycles AC supply. Low sound level exceeding not more than 39 dBA at three meter distance. All necessary standard accessories like flexible connectors, vibration isolators, fine filter, etc., - 200cfm -15mm of total static for detail specification refer Volume -III	nos	3						
b	Supply and installation of Rigid MS supports with Enamel painting for the above	lot	3						
c	Charges for Air balancing works for the above with low side	lot	3						
d	Supply and installation charges for fire rated canvas connection for the above	lot	3						
57	Supply and installation of SMACNA standard, factory fabricated, flanged GI ducting, 180GSM, 450pa, using food grade sealant for leakage arresting, wall to wall duct crossing area to be sealed with fire retardant sealant								
a	18G	sgmt	40						
b	20G	sgmt	90						
c	22G	sgmt	40						
d	24G	sgmt	400						
58	Supply and installation of al.powdered coated grilles 200X200 exhaust air grilles	sgmt	841						
59	Supply and installation of al.powdered coated grilles.	nos	250						
60	Supply and installation of al.powdered coated grilles with VCD.	sgmt	15						
61	Supply and installation of volume control damper/collar damper with heavy duty type aluminum anodized profile materials	sgmt	4						
62	Supply and installation of 16G GI powder coated fusible link type fire damper.	sgmt	10						

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
	D. Main building - Ground Floor Air Handling Units								
63a	Supply, installation, testing and commissioning of Double skin air handling unit with 50mm thick puff 48 kg/cm2 density , inner and outer skin shall be 0.64mm thick, 8 ROW deep coil having 13 FPI with coil face velocity 450 FPM, Aerofoil backward curved fan, IE2 -TEFC Squirrel gauge induction motor, commissioning filter, 10microm pre filter and 5micron back filter washable type, 900mm depth Return air plenum section with fresh air and return air aluminum damper and outlet aluminum damper, SS 304- 18G drain pan with 32mm thick nitrile insulation, limit switch and safety guard, view panel, required spring mounted vibration isolator for the above- Capacity of 21 TR- 8000CFM, 26mm external Static, ceiling suspended type for detail specification refer Volume III	nos	1						
b	Supply and installation of Suitable IP55 VFD & PID controller (A0-2,Ai-4, DO-5,DI -5) with disconnect switch enclosure box and required BMS compatible for the above operation	nos	1						
c	Supply and installation of Suitable fire rated 4C x 2.5Sqmm XLPE copper armoured cable for the above with suitable cable tray	Rmt	30						
d	Supply and installation of Suitable fire rated Double compression cable gland for the above termination.	lot	1						
e	Supply and installation for 2 run of 12G GI wire for earthing, App. route length shall be 30 rmt	lot	1						
f	Supply and installation of Emergency Push button station for the above, Fire rated type with required support	lot	1						
g	Supply and installation of Emergency Lockable Push button station cabling for the above, 3 core 1.5 square copper XLPE armoured fire rated cable length shall be 20rmt between motor to Push button	lot	1						
h	Supply and installation of threaded rod approx length of 1.4meter- 4nos, 16 nos of 12mm Thick Rubber pads, MS support for the AHU supports.	lot	1						
i	Supply and installation of Regid MS supports with Enamel painting for valve packages	lot	1						
j	Charges for Air balancing works for the above with low side	lot	1						
k	Charges for Water balancing for the above mentioned	lot	1						
l	Supply and installation of Limit switch/bulk head cabling from ahus to vfd, app length shall be 90rmt of 3core 1.5sqmm XLPE copper armoured cable with end termination	lot	1						
m	Supply and installation charges for fire rated canvas connection for the above.	lot	1						
n	supply and instalation of AHUs/CSUs manifold for the above capacities which include required pipe supply and return line with Puff insulation 24Gi clading, 5nos of Islation butter fly valve, suitable size Self dynamic valves, 2 nos pressure gauge, 2 nos temp gauge drain valve, auto airvent with islation vae	lot	1						
64a	Supply, installation, testing and commissioning of Double skin air handling unit with 50mm thick puff 48 kg/cm2 density, inner and outer skin shall be 0.64mm thick, 6 ROW deep coil having 13 FPI with coil face velocity 450 FPM, Aerofoil backward curved fan IE2 - TEFC Squirrel gauge induction motor, commissioning filter, 10microm pre filter and 5micron back filter washable type, 900mm depth Return air plenum section with fresh air and return air aluminum damper and outlet aluminum damper, SS 304- 18G drain pan with 32mm thick nitrile insulation, limit switch and safety guard, view panel, required spring mounted vibration isolator for the above- Capacity of 19 TR- 8800CFM, 18mm external Static, ceiling suspended type for detail specification refer Volume-III	nos	1						
b	Supply and instalation of Suitable IP55 VFD & PID controller (A0-2,Ai-4, DO-5,DI -5) with disconnect switch enclosure box and required BMS compatible for the above operation	nos	1						
c	Supply and installation of Suitable fire rated 4C x 2.5Sqmm XLPE copper armoured cable for the above with suitable cable tray	Rmt	30						
d	Supply and installation of Suitable fire rated Double compression cable gland for the above termination.	lot	1						
e	Supply and installation for 2 run of 12G GI wire for earthing, App. route length shall be 90 rmt	lot	1						
f	Supply and installation of Emergency Push button station for the above, Fire rated type with required support	lot	1						
g	Supply and installation of Emergency Lockable Push button station cabling for the above, 3 core 1.5 square mm XLPE copper armoured fire rated cable length shall be 20rmt between motor to Push button	lot	1						
h	Supply and installation of threaded rod approx length of 1.4meter- 4nos, 16 nos of 12mm Thick Rubber pads, MS support for the AHU supports.	lot	1						
i	Supply and installation of Regid MS supports with Enamel painting for valve packages	lot	1						
j	Charges for Air balancing works for the above with low side	lot	1						
k	Charges for Water balancing for the above mentioned	lot	1						
l	Supply and installation of Limit switch/bulk head cabling from ahus to vfd, app length shall be 90rmt of 3core 1.5sqmm XLPE copper armoured cable with end termination	lot	1						
m	Supply and installation charges for fire rated canvas connection for the above.	lot	1						
n	supply and instalation of AHUs/CSUs manifold for the above capacities which include required pipe supply and return line with Puff insulation 24Gi clading,5nos of Islation butter fly valve, suitable size Self dynamic valves, 2 ns pressure gauge, 2 nos temp gauge drain valve, auto airvent with islation vae	lot	1						

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
65a	Supply, installation, testing and commissioning of Double skin air handling unit with 50mm thick puff 48 kg/cm ² density, inner and outer skin shall be 0.64mm thick, 6 ROW deep coil having 13 FPI with coil face velocity 450 FPM, Aerofoil backward curved fan, IE2 -TEFC Squirrel gauge induction motor, commissioning filter, 10microm pre filter and 5micron back filter washable type, 900mm depth Return air plenum section with fresh air and return air aluminum damper and outlet aluminum damper, SS 304- 18G drain pan with 32mm thick nitrile insulation, limit switch and safety guard, view panel, required spring mounted vibration isolator for the above- Capacity of 15 TR- 8300CFM, 18mm external Static, ceiling suspended type for detail specification refer Volume-III	nos	1						
b	Supply and installation of Suitable IP55 VFD & PID controller (A0-2,Ai-4, DO-5,DI -5) with disconnect switch enclosure box and required BMS compatible for the above operation	nos	1						
c	Supply and installation of Suitable fire rated 4C x 2.5Sqmm copper armoured cable for the above with suitable cable tray	Rmt	30						
d	Supply and installation of Suitable fire rated Double compression cable gland for the above termination.	lot	1						
e	Supply and installation for 2 run of 12G GI wire for earthing, App. Route length shall be 90 rmt	lot	1						
f	Supply and installation of Emergency Push button station for the above, Fire rated type with required support	lot	1						
g	Supply and installation of Emergency Lockable Push button station cabling for the above, 3 core 1.5 square mm XLPE copper armoured fire rated cable length shall be 20rmt between motor to Push button	lot	1						
h	Supply and installation of threaded rod approx length of 1.4meter- 4nos, 16 nos of 12mm Thick Rubber pads, MS support for the AHU supports.	lot	1						
i	Supply and installation of Regid MS supports with Enamel painting for valve packages	lot	1						
j	Charges for Air balancing works for the above with low side	lot	1						
k	Charges for Water balancing for the above mentioned	lot	1						
l	Supply and installation of Limit switch/bulk head cabling from ahus to vfd, app length shall be 90rmt of 3core 1.5sqmm copper armoured cable with end termination	lot	1						
m	Supply and installation charges for fire rated canvas connection for the above.	lot	1						
n	supply and instalton of AHUs/CSUs manifold for the above capacities which include required pipe supply and return line with Puff insulation 24Gi cladding, 5nos of Isolation butter fly valve, suitable size Self dynamic valves, 2 nos pressure gauge, 2 nos temp gauge drain valve, auto airvent with isolation vale	Nos	1						
66 a	Supply, installation, testing and commissioning of ceiling mounted 4 way 2.0 TR cassette type suitable for chilled water application with necessary filters, cooling coil, cordless remote controller, inlet isolation valve with strainer, outlet isolation ball valve, 2 way modulation valve with actuator, step down transformer, temperature sensor, drain pan and condensed water lifting pump, etc as per the specification given in Volume-III. The unit Power input shall be suitable for 1 phase, 230 V, 50 Hz.	sets	3						
b	Providing Power wiring with 3 x 2.5 sq. mm copper TRS Flexible cord with 5 A Plug top for connecting the Cassette unit from the 5 A socket outlet with switch fixed at the ceiling. The 5 A socket out let wiring will be done by other agencies.	sets	3						
67a	Supply, installation, testing and commissioning of ceiling mounted 4 way 2.5 TR cassette type suitable for chilled water application with necessary filters,cooling coil, cordless remote controller, inlet isolation valve with strainer, outlet isolation ball valve, 2 way modulation valve with actuator, step down transformer, temperature sensor, drain pan and condensed water lifting pump,etc as per the specification given in volume-III. The unit Power input shall be suitable for 1 phase, 230 V, 50 Hz.	Nos	3						
b	Providing Power wiring with 3x2.5 sq. mm Copper TRS Flexible cord with 5 A Plug top for connecting the Cassette unit from the 5 A socket outlet with switch fixed at the ceiling. The 5 A socket out let wiring will be done by other agencies.	Nos	3						
68	Deleted								
69 a	Supply, installation, testing and commissioning of ceiling mounted 4 way 3.5 TR cassette type suitable for chilled water application with necessary filters, cooling coil, cordless remote controller, inlet isolation valve with strainer, outlet isolation ball valve, 2 way modulation valve with actuator, step down transformer, temperature sensor, drain pan and condensed water lifting pump, etc as per the specification given in volume III. The unit Power input shall be suitable for 1 phase, 230 V, 50 Hz.	Nos	8						
b	Providing Power wiring with 3 x 2.5 sq. Copper TRS Flexible cord with 5 A Plug top for Connecting the Cassette unit from the 5 A socket outlet with switch fixed at the ceiling. The 5 A socket out let wiring will be done by other agencies.	sets	8						

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
70	SUB METERING Supply of ULTRASONIC BTU: BTU meter shall include the following Cold Meter Integrators & Ultrasonic Flow meters. Cold Meter Integrators: Shall include matched pair temperature sensor [Pocket for insertion to be included]. Shall have the features of working on Battery power supporting up to 16 Years, Data logging for up to 5 years, no external power supply, 8 Digit LCD display, Protection category of IP65, M-BUS O/P card and vendor to furnish the country of origin of these meters. Flow meters: The flow meter shall include screwed / Flanged meters incorporate with ultrasonic flow sensing technology with totalising register. The meter shall be complying with EN 1434 and MID in class2 standards. The flow sensor shall have a Dynamic flow range of at least 1:250 [i.e Minimum flow: Nominal flow]. AND ANY COMMUNICATION PORTCOL REQUIREMENT								
	Btu Transmitters as per the specification for tenant billing. Btu Meters shall consist of following items of following sizes:-								
	a) Inline Flow Meter								
	b) Match Pair Sensors								
	c) Heat Integrator								
	d) Minimum 4 Data / Meter to Master Contoroller - T1 / T2 / Flow / KWH - with 2 mtr 2C shielded communication cable								
	a 65mm dia	Nos	7						
	b 50mm dia	Nos	48						
70	Supply, installation, testing and commissioning of MS C class pipe with TF quality Thermocole, density 32 Kg/m3 of 100mm thick for 600 mm to 150mm and below pipe 50mm thick and 24G AL cladding, providing and fixing in position necessary fittings like bends, elbows, tees, reducers, mating flanges, nipples for mounting sensor (if any) & sockets for BAS (if any), fabricated to size and shape in workshop or brought out ready made where available of acceptable quality. The quoted price shall inclusive of necessary supports, hangers, welding, smooth finishing, anchors, saddles, sleeves, brackets, adequate number of expansion joints, clamps, bolts, nuts and all accessories as required to complete the installation. Test points to be provided in the pipeline wherever required.								
	a 100 mm dia	rmt	122						
	b 80 mm dia	rmt	96						
	c 65 mm dia	rmt	56						
	d 50 mm dia	rmt	190						
	e 40 mm dia	rmt	384						
	f 32 mm dia	rmt	260						
71	Supply and installation of GI pipe with Insulated Condensate Drain / process cooling piping-25mm thick TF quality Thermocole density 32 Kg/m3, 24G AL cladding								
	a 50 mm dia	rmt	120						
	b 40 mm dia	rmt	300						
	c 32 mm dia	rmt	576						
72	Supply, installation, testing and commissioning of Self Dynamic Valve with extended stem of 100mm length, pressure rating of PN16, SS wafer/stem for chilled water application.-with insulation and 24g AL cladding, suitable for 230v supply power								
	a 100 mm dia	nos	QRO						
	b 80 mm dia	nos	QRO						
	c 65 mm dia	nos	4						
	d 50 mm dia	nos	30						
	e 40 mm dia	nos	QRO						
	f 32 mm dia	nos	QRO						
	g 25 mm dia	nos	QRO						
73	Supply, installation, testing and commissioning of Ball valve with flange end, pressure rating of PN25-with insulation and 24G al cladding								
	a 32 mm dia	nos	25						
	b 25 mm dia	nos	38						
74	Supply, installation, testing and commissioning of Y strainer - Bronze mesh Of 2mm thick , pressure rating of PN16, with insulation and 24g AL cladding.								
	a 80 mm dia	nos	QRO						
	b 65 mm dia	nos	4						
	c 50 mm dia	nos	30						
	d 40 mm dia	nos	QRO						
	e 32 mm dia	nos	QRO						
	f 25 mm dia	nos	QRO						
76	Supply and installation of Pressure gauge with SS syphons, niddle Valves, 100mm dia range -0 to 10 kg/cmsq	nos	104						

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
77	Supply and installation of Temp. gauge with SS thermowell, 100mm dia, -10 to 20 deg C	nos	104						
78	Supply and installation of 25mm Ball valves for ahus drain pressure rating PN 16 with insulation and 24g AL cladding	nos	2						
79	Supply and installation of Auto air vent size 25mm dia with 9 rmt 20mm copper piping	nos	2						
80	Supply and installation of test point of size 25mm dia	nos	52						
E.LAB TYPICAL FLOOR CSUS									
81a	Supply, installation, testing and commissioning of clean room type, AHUs with assembled condition All Sheet metal cabinet type double skin air handling units with 50MM Thick thermal break insulated puf panel with 0.640mm skin on both sides, Pre filter 10micron, bag filter 5mm, with separate sections, 6 Row coil, 3 row SS316 water carryover plate, SS316 18Gauge drain pan with 25mm thick insulation, bulk head arrangemnt, DIDW fans with IE3 Motor, Return air, supply air & plenum sections with damper arrangement. Section provision for Thristor strip heater bank must be provided in the AHU, Unit should be suitable for ceiling suspended & floor mounted options. Noise level should be less than 65 from 1mtr distance, Fan should operate in 600rpm, accordingly fan selectin should be made.								
	Units shall be complete with opposed blade volume control dampers at its outlet and necessary drain valve. Duct flexible connector (fire proof) shall be provided at outlets.Limit switches for the doors with necessary cabling works for the proper function.Bulk head fitting including necessary electrical and control cabling for its proper operation. cabling between CSUs to VFD, with neccessary conduits appr. 75-90 rmt.								
	14TR capacity, 7200 Dcfm, 50 mmwg fan ext. static, 6 row cooling coil,run around heat pipes,two pass SS eleminator, ceiling Suspended- Lab 1 to 4	Nos	48						
b	IP 55 VFD-HVAC series with 32A TPN MCB Isolator	nos	48						
c	Supply and installation of Suitable fire rated 4C x 4sq.mm XLPE copper armoured cable for the above, App. cable length shall be 90 rmt.	lot	48						
d	Supply and installation of Suitable fire rated Double compression cable gland for the above termination.	lot	48						
e	Supply and installation for 2 run of 12G GI wire for earthing, App. route length shall be 90 rmt	lot	48						
f	Supply and installation of Emergency lockable Push button station for the above, Fire rated type with required support	lot	48						
g	Supply and installation of Emergency Lockable Push button station cabling for the above, 3 core 1.5 square mm XLPE copper armoured fire rated cable length shall be 20rmt between motor to Push button	lot	48						
h	Supply and installation of Supports for the Ceiling mounted AHU with suitable vibration isolator	lot	48						
i	Supply and installation of Regid MS supports with Enamel painting for valve packages	lot	48						
j	Charges for Air balancing works for the above with low side	lot	48						
k	Charges for Water balancing for the above mentioned	lot	48						
l	Supply and installation of Limit switch/bulk head cabling from ahus to vfd, app length shall be 90rmt of 3core 1.5sqmm XLPE copper armoured cable with end termination	lot	48						
m	Supply and installation charges for fire rated canvas connection for the above.	lot	48						
n	supply and instalton of AHUs/CSUs manifold for the above capacities which include required pipe supply and returen line with Puff insulation 24Gi clading, 5nos of Islation butter fly valve, suitable size Self dynamic valves, 2 nso pressure gauge, 2 nos temp gauge drain valve, auto airvent with isolation vale	Nos	48						
82 a	Supply, installation, testing and commissioning of clean room type, AHUs with assembled condition All Sheet metal cabinet type double skin air handling units with 50MM Thick thermal break insulated puf panel with 0.640mm skin on both sides, Pre filter 10micron, bag filter 5mm, with separate sections, 6 Row coil, 3 row SS316 water carryover plate, SS316 18Gauge drain pan with 25mm thick insulation, bulk head arrangemnt, DIDW fans with IE3 Motor, Return air, supply air & plenum sections with damper arrangement. Section provision for Thristor strip heater bank must be provided in the AHU, Unit should be suitable for ceiling suspended & floor mounted options. Noise level should be less than 65 from 1mtr distance, Fan should operate in 600rpm, accordingly fan selectin should be made.								
	Units shall be complete with opposed blade volume control dampers at its outlet and necessary drain valve. Duct flexible connector (fire proof) shall be provided at outlets.Limit switches for the doors with necessary cabling works for the proper function.Bulk head fitting including necessary electrical and control cabling for its proper operation. cabling between CSUs to VFD, with neccessary conduits appr. 75-90 rmt.								
	18TR capacity 10050 Dcfm, 50 mmwg fan ext. static, 6 row cooling coil,run around heat pipes, two pass SS eleminator, ceiling Suspended - Lab 1 to 4 at 13th floor	nos	4						
b	IP 55 VFD-HVAC series with 32A TPN MCB Isolator	lot	4						
c	Supply and installation of Suitable fire rated 4 C x 4 sq.mm XLPE copper armoured cable for the above, App. cable length shall be 90 rmt.	lot	4						
d	Supply and installation of Suitable fire rated Double compression cable gland for the above termination.	lot	4						

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
e	Supply and installation for 2 run of 12G GI wire for earthing, App. route length shall be 90 rmt	lot	4						
f	Supply and installation of Emergency Lockable Push button station for the above, Fire rated type with required support	lot	4						
g	Supply and installation of Emergency Lockable Push button station cabling for the above, 3 core 1.5 square copper armoured fire rated cable length shall be 20rmt between motor to Push button	lot	4						
h	Supply and installation of Supports for the Ceiling mounted AHU with suitable vibration isolator	lot	4						
i	Supply and installation of Regid MS supports with Enamel painting for valve packages	lot	4						
j	Charges for Air balancing works for the above with low side	lot	4						
k	Charges for Water balancing for the above mentioned	lot	4						
l	Supply and installation of Limit switch/bulk head cabling from ahus to vfd , app length shall be 90rmt of 3core 1.5sqmm XLPEcopper armoured cable with end termination	lot	4						
m	Supply and installation charges for fire rated canvas connection for the above.	Nos	4						
n	supply and instalton of AHUs/CSUs manifold for the above capacities which include required pipe supply and return line with Puff insulation 24Gi cladding,5nos of Islation butter fly valve, suitable size Self dynamic valves, 2 nso pressure gauge, 2 nos temp gauge drain valve, auto airvent with isolation vane	Nos	4						
83	Supply and instalation of MS supports	kg	2000						
Sub Total									
Considered -Import duty tax BCD 10% & Ecess 0.3% for Imported item									
GST extra at Actuals at 18%									
Grand Total									
II INTEGRATED BUILDING MANAGEMENT SYSTEM WORKS									
ACCESS CONTROL SYSTEM WORKS - BILL OF QUANTITIES									
1	Controllers								
a	Supply, Installation, Testing and Commissioning of controller 2Door (4 Readers) Networkable, micro processor controlled, 5000 card holder capacity and 10000 event memory with support for Card Reader, Exit Switch, and lock automation, as specified in the Tender Specifications.	nos.	2						
b	Supply, Installation, Testing and Commissioning of Proximity Readers for access door.	nos.	2						
2	Biometric Attendance								
a	Supply, Installation, Testing and Commissioning of Biometric Attendance System (Fingerprint) Networkable, 32 bit processor, 5000 card holder capacity and 10000 event memory	nos.	1						
3	Locks and Accessories								
a	Supply and Commissioning of Double Leaf Electromagnetic locks for Access Control System with necessary hardware as specified for centralized security monitoring - suitable for double door	nos.	QRO						
b	Supply and Commissioning of Single Leaf Electromagnetic locks for Access Control System with necessary hardware as specified for centralized security monitoring - suitable for double door	nos.	2						
c	Supply Supply, Installation, Testing and Commissioning of Exit Switch for door access	nos.	2						
d	Supply Supply, Installation, Testing and Commissioning of Emergency Door Release Switch for door access	nos.	QRO						
e	Supply and Commissioning of Door Position Switch for Access Control System with necessary hardware as specified for centralized security monitoring.	nos.	2						
f	Supply Supply, Installation, Testing and Commissioning of Door Buszzer for door open too long alarm	nos.	2						
q	Supply and testing of Smart Cards as specified in the Tender Specifications	nos.	50						
4	Safety and Signage								
a	Supply, Installation, Testing and Commissioning of Handheld Metal Detectors with built-in rechargeable battery. Should be highly sensitive and detect ferrous, non-ferrous materials, concealed weapons like gun, blade, pin etc; should give auto visual indication with red, green leds, buzzer. Should be able to operate minimum 36 hours from fully charged battery. Should be supplied with rechargeable battery.	nos.	2						
b	Supply, Installation, Testing and Commissioning of automatic Boom Barrier with 6m boom length at 700 to 1000mm height complete with LED strip, heavy duty motor housed in IP 54 or better housing, photo cell/optical sensor built-in as per technical specification. Shall have option for integrating with access control system. Should be operatable using push buttons in case of emergency.The Boom barrier shall be able to operate manually by cranking or release key. Boom Barrier shall be suitable for Left and Right hand assembly. Boom Barrier shall have automatic reverse movement upon hitting or obstacle.	set	2						
c	Supply, Installation, Display of varous Safety Signs of various sizes at different locations like reception, fire exit doors, lifts, emergency assembly points etc. Prior approval of the design, color, size is necessary	lot	1						

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
d	Supply, Installation, Display of Emergency Contact Numbers inside lift. Prior approval of the design, color, size is necessary	lot	1						
5	CABLES								
a	Supply, Installation, Testing and Commissioning of 2 core x 1.0 Sq mm multi strand, ATC, PVC Sheathed Cable to connect access controllers in 1" FRLS PVC Conduit as specified in the Tender Specifications	mtr	QRO						
b	Supply, Installation, Testing and Commissioning of 4 core x 1.0 Sq mm multi strand, ATC, PVC Sheathed Cable to connect access controllers in 1" FRLS PVC Conduit as specified in the Tender Specifications	mtr	50						
c	Supply, Installation, Testing and Commissioning of 8 core x 1.0 Sq mm multi strand, ATC, PVC Sheathed Cable to connect access controllers in 1" PVC Conduit as specified in the Tender Specifications for power supply	mtr	60						
d	Supply, Installation, Testing and Commissioning of 25MM PVC 1.6mm thick conduits to connect access controllers as specified in the Tender Specifications for power supply	mtr	60						
e	Supply, laying, Testing and commissioning of 32mm PVC Conduit, 1.6mm thick with necessary joints, bends and accessories	mtr	QRO						
	SUB TOTAL								
	BUILDING MANAGEMENT SYSTEM								
1	CENTRAL WORK STATION SYSTEM								
	Supply, Installation, Testing & Commissioning of Intel core i7 processors with min 2.8 Ghz, 6MB Cache or better, 8 GB RAM expandable to 16 GB, 3 PCI Slots, On-board Graphics with at least 1280 x 1024 res., 1TB SATA Hard Disk Drive, built in 16X DVD Writer, 350W SMPS 220v, 50 Hz Power Supply, Wired 104 Keys US Standard Layout keyboard, PS/2 or USB Wired Mouse with Mouse Pad, 4USB Ports, 10/100/1000 Mbps Ethernet Port with WoL support, 24" LED Monitor SVGA 1024 X 768 min. Resolution. Should be supplied with Microsoft(R) Windows(R) 8 64Bit Professional or latest, Antivirus Software licensed for 1 year.(AfeTr DLP of 12 months) Should be supplied with A4 Size Laser Jet, Black & white A-4 size printers Printer.	Set	1						
2	SOFTWARE & NETWORK CONTROLLER - 5000 IO POINTS								
	Supply, Installation, Testing & Commissioning of BMS System Software: Graphical Software meeting the requirements in the Given I/O Summary and technical specifications including configuration and facility to create / provide the graphic mapping for all I/O Summary points, animate the Graphics, Navigation between pages, display of logs, changing the time zones, pop up alarms, configurable password protection for Building Management System as per Specifications. Software shall be able to communicate with Lon works, Bacnet, Mod bus devices simultaneously, open protocol, licensed for 5000 Points upgradable to unlimited point capacity subject to space requirements. All the above software should be licensed to the TICEL.	Nos	1						
3	Supply, Installation, Testing & Commissioning of Interface Network controller (Router) Supply, installing, testing and commissioning of Network Supervisory Controller unit for connecting all controllers to it and transferring data to PC platform & Soft Integration with HVAC equipments and all other 3rd party equipments	Lot	1						
4	Supply, Installation, Testing & Commissioning of Network Controller Access: Multiple Operator Access with Max support for User Access Level with passwords with various configuration privileges for monitoring and control of DDC Controllers - using with Open protocol (for intergeration controllers)								
	All intergeration controllers should be enclosed in Rittal Panels with Proper power supply and Connections								
4.1	Chiller Integration - 100 points	Lot	1						
4.2	Chiller pump panel intergeration - 200 points	Lot	1						
4.3	transformer ,Electrical panel and Energy meters - 1200 Points	Lot	1						
4.4	LIFT integration - 100 points	Lot	1						
4.5	DG Integration - 100 points	Lot	1						
4.6	FAS Integration - 1000 points	Lot	1						
4.7	VFD Integration - 150 points	Lot	1						
4.8	STP & ETP Integration - 200 points	Lot	1						
4.9	UPS Integration - 200 points	Lot	1						

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
5	DDC CONTROLLERS								
	Supply, Installation, Testing & Commissioning of Automation stations / DDC Controller with I/O module etc., The controllers shall be microprocessor based standalone and net workable type with real time clock and historical database of min 1 MB. The DDC's shall be capable of peer to peer communication without help of system interface controller or PC. with locable mounting cabinets duly powder coated connector strip, internal wiring and space to house controller & relays, connector strip current transformer, MCB, internal wiring. (Contractor shall confirm his I/O provision w.r.t requirement on basis of data point) on BACnet /IP. Ref IO Summary. Each DDC shall not have more than 5 IO modules, and shall have required IO Points (DI, DO, AI, DO) as per IO schedule								
5.1	DDC Controller with Rittal enclosures for Chiller, Pumps etc	nos	1						
5.2	DDC for Tanks	Lot	1						
5.3	DDC for AHUs (2AHUs per DDC Panel)	nos	28						
5.4	DDC for Fresh/Ventilation/Exhaust/Air Panel (10 Fresh Air/Ventilation/Exhaust Fan/DDC Control Panel)	nos	3						
5.5	DDC Panel for lift, tank levels	nos	1						
6	Supply, installation, testing & commissioning of Router with Firewall, with 2xWAN Ports, 4 LAN Ports. Should come with 5 User license for remote VPN connections.	set	1						
7	Supply, Installation, Testing & Commissioning of below Field Devices								
7.1	Outside Air Temperature , RH Sensor & CO2 sensor	nos	1						
7.2	Immersion Temp Sensor - 150 mm Length	nos	10						
7.3	Duct Temp Sensor	nos	55						
7.4	Filter DP Switch	nos	55						
7.5	Run Sts DP Switch	nos	55						
7.6	BTU meter - 50 mm dia	nos	58						
7.7	Flame proof level Switch	nos	2						
7.8	Water tank level switches	nos	4						
8.0	Supply, Installation, Testing & Commissioning of below cables, conduits & trays								
8.1	Signal cable for analog input & outputs: 2 Core X 1.5 mm PVC sheathed shielded copper unarmored cable.	Rmt	1,500						
8.2	Signal cable for digital input & outputs: 2 Core X 1.0 mm PVC sheathed unshielded copper unarmored cable	Rmt	4,500						
8.3	Signal cable for digital input & outputs: 2 Core X 1.0 mm PVC sheathed shielded copper unarmored cable	Rmt	3,500						
8.4	Signal cable for digital input & outputs: 4 Core X 1.0 mm PVC sheathed unshielded copper unarmored cable	Rmt	1,000						
8.5	25mm dia PVC Conduit with Accessories	Rmt	5,000						
8.6	Supply and Erection of perforated 300mm cable tray with cover, necessary supports, bolts, nuts, etc	Rmt	500						
9	Cable Tray								
	Supply, erection of following sizes GI Perforated type cable rack system made out of sheet steel folded to required shape with adequate number of supports.								
	The cable rack shall have runners runs of suitable size, horizontal elbow, vertical elbow 90 Deg. Up vertical elbow 90 Deg. Down, re-deep, coupler plates, materials. The cable racks shall be suspended from ceiling supported from side walls in columns etc. with adequate size supporting angles / channels with fasteners, welding, anchor bolts, nuts etc. The rack shall have suitable cable clamping arrangements etc.								
a	150mm Perforated Cable Tray	mtr	QRO						
b	300mm Perforated Cable Tray	mtr	QRO						
c	450mm Perforated Cable Tray	mtr	60						
	Sub Total								
	CCTV SYSTEM								
1	Workstation: Supply, Installation, Testing and commissioning of IBM PC compatible system minimum of i5, 8GB RAM, built-in Intel HD Display, 1TB Hard Disk, Optical Reader/Writer Drive, Wired Keyboard, 21" LED Display with PCIExpress Slots: 1 PCIe (x1); 1 PCIe (x16), 4xUSB2.0 ports, 1 RS232 or RS485 port, Windows 7 Professional or later 64Bit or later, Antivirus Software with License. Power Input: 220V AC, 50Hz	nos.	1						
2	Monitors: Supply, Installation, Testing and commissioning of LED Monitors, 40" 1,920 x 1,080 (16:9) Full HD, Power Input: 220V AC, 50Hz	nos.	2						

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
3	NVRs: Supply, Installation, Testing and commissioning of NVR, Embedded System with 32Ch input, up to 12 Megapixels resolution recording with Support for H.265/H.264 video formats. Should support 4 SATA HDDs, Up to 6TB for each HDD, Third-party IP camera supported with ONVIF conformance. Output support for 2-ch HDMI, 1-ch VGA. HDMI, P2P, UPnP, NTP, DHCP, PPPoE and Mobile Client. Support minimum 2x10/100Mbps Network ports and 320Mbps incoming bandwidth and 320Mbps outgoing bandwidth. Storage Media should be sized and configured for 32 cameras at H.264 Base-Medium Quality profile. 720p_15FPS_30 Days	nos.	2						
4	Storage: Storage Media, surveillance grade, 3.5", 4TB Capacity, 6Gb/s and sustained transfer rate of 175MB/s with operating temperature support of 0 to 75 deg centigrade	nos	4						
5	Dome IR Cameras, 30m: Supply, Installation, Testing and commissioning of IP 2MP Dome Cameras, IR Range 30m, 1/2.7" Image Sensor, 2.8mm 1080P(1920x1080) @25FPS, with Dual Stream H.264 Main Profile and MJPEG. Should support PoE Power (802.af Type 1). Should support Smart Detection, DWDR, Day/Night (ICR), 3DNR, AWB, AGC, BLC features. 0.2Lux/F2.0 (Color), 0Lux/F2.0(IR on). IR Range should be 30m or more. Camera should be IP65 rated or more or more and ONVIF compliant. Power Input: 12VDC.	nos.	43						
6	Bullet IR Cameras, 30m: Supply, Installation, Testing and commissioning of IP 2MP Bullet Cameras, IR Range 30m, 1/2.7" Image Sensor, 2.8mm 1080P(1920x1080) @25FPS, with Dual Stream H.264 Main Profile and MJPEG. Should support PoE Power (802.af Type 1). Should support Smart Detection, DWDR, Day/Night (ICR), 3DNR, AWB, AGC, BLC features. 0.2Lux/F2.0 (Color), 0Lux/F2.0(IR on). IR Range should be 30m or more. Camera should be IP65 rated or more or more and ONVIF compliant. Power Input: 12VDC.	nos	1						
7	Bullet IR Cameras, 50m: Supply, Installation, Testing and commissioning of IP 2MP Bullet Cameras, IR Range 50m, 1/2.7" Image Sensor, 2.8-12mm 1080P(1920x1080) @25FPS, with Dual Stream H.264 Main Profile and MJPEG. Should support PoE Power (802.af Type 1). Should support Smart Detection, DWDR, Day/Night (ICR), 3DNR, AWB, AGC, BLC features. 0.2Lux/F2.0 (Color), 0Lux/F2.0(IR on). IR Range should be 30m or more. Camera should be IP65 rated or more and ONVIF compliant. Power Input: 12VDC.	nos.	11						
8	Cables & Conduits, Accessories								
a	Supply, installation, testing & commissioning of UTP CAT6 Network Cable in existing conduits from camera to Network Switch	mtr	2,281						
b	Supply, installation, testing & commissioning of STP CAT6 Network Cable camera to Network Switch	mtr	260						
c	Supply, laying, Testing and commissioning of 20mm PVC Conduit, 1.6mm thick with necessary joints, bends and accessories for CCTV, Data, Telephone	mtr	2,240						
d	Supply, laying, Testing and commissioning of 25mm PVC Conduit, 1.6mm thick with necessary joints, bends and accessories for CCTV, Data, Telephone	mtr	2,148						
9	Cable Tray								
	Supply, erection of following sizes GI Perforated type cable rack system made out of sheet steel folded to required shape with adequate number of supports.								
	The cable rack shall have runners rugs of suitable size, horizontal elbow, vertical elbow 90 Deg. Up vertical elbow 90 Deg. Down, re-deep, coupler plates, materials. The cable racks shall be suspended from ceiling supported from side walls in columns etc. with adequate size supporting angles / channels with fasteners, welding, anchor bolts, nuts etc. The rack shall have suitable cable clamping arrangements etc.								
a	150mm Perforated Cable Tray	mtr	45						
b	300mm Perforated Cable Tray	mtr	10						
c	450mm Perforated Cable Tray	mtr	37						
10	Supplying and laying of following size HDPE PE-63 pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc..direct in ground (75 cm below ground level) including excavation and refilling the trench but excluding sand cushioning and protective covering etc., complete as required. 160 mm dia.(OD:160 mm & ID:135 mm nominal)	mtr	147						
	Utility Building								
11	Bullet IR Cameras, 30m: Supply, Installation, Testing and commissioning of IP 2MP Bullet Cameras, IR Range 30m, 1/2.7" Image Sensor, 2.8mm 1080P(1920x1080) @25FPS, with Dual Stream H.264 Main Profile and MJPEG. Should support PoE Power (802.af Type 1). Should support Smart Detection, WDR, Day/Night (ICR), 3DNR, AWB, AGC, BLC features. 0.2Lux/F2.0 (Color), 0Lux/F2.0(IR on). IR Range should be 30m or more. Camera should be IP65 rated or more or more and ONVIF compliant.	nos	5						
12	Bullet IR Cameras, 50m: Supply, Installation, Testing and commissioning of IP 2MP Bullet Cameras, IR Range 50m, 1/2.7" Image Sensor, 2.8-12mm 1080P(1920x1080) @25FPS, with Dual Stream H.264 Main Profile and MJPEG. Should support PoE Power (802.af Type 1). Should support Smart Detection, WDR, Day/Night (ICR), 3DNR, AWB, AGC, BLC features. 0.2Lux/F2.0 (Color), 0Lux/F2.0(IR on). IR Range should be 30m or more. Camera should be IP65 rated or more and ONVIF compliant.	nos.	4						

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
13	Cables & Conduits, Accessories								
a	Supply, installation, testing & commissioning of UTP CAT6 Network Cable in existing conduits from camera to Network Switch	mtr	174						
b	Supply, installation, testing & commissioning of STP CAT6 Network Cable camera to Network Switch	mtr	171						
c	Supply,Installation, Testing & Commissioning of CAT6 Patch Cable, 3m	Nos	24						
d	Supply, laying, Testing and commissioning of 25mm PVC Conduit, 1.6mm thick with necessary joints, bends and accessories	mtr	540						
	SUB TOTAL								
	DATA NETWORK								
1	Network Switch: Supply, installation, testing & commissioning of manageable L2 PoESwitch, 24Port, 10/100/1000, 2SFP Ports with support for Auto VLANS and support features like IP4/IP6, QoS, advanced security management, PoE management. Should support 802.3af (802.3at Type 1) specification.	Nos	5						
2	Patch Panels: Supply, installation, testing & commissioning of fully loaded CAT6 Patch Panel, 24 Ports.	nos.	5						
3	Network Rack								
a	Supply, Installation, Testing and commissioning of Network Racks, 6U, wall mount with accessories, Fixtures, Power Managers, Cable Managers and Organizers and lockable Front side glass door.	Nos	1						
b	Supply, Installation, Testing and commissioning of Network Racks, 9U, wall mount with accessories, Fixtures, Power Managers, Cable Managers and Organizers and lockable Front side glass door.	Nos	1						
c	Supply, Installation, Testing and commissioning of Network Racks, 22U, Floor Mount with Network Rack Accessories, Fixtures, Power Managers, Ventilation Fans, Cable Managers and Organizers, Castor Wheels. Side and Back Doors should be removable with Front side glass door. Dim (wxdxh): 600x800x1170mm. 1xSliding Shelf, 2xFixed shelves.	Nos	1						
d	Supply, installation, Testing and commissioning of one no of RJ-45 Data socket with modular plate mounted in manufacturers zinc passivated MS box.	Nos	2						
e	Supply, installation, Testing and commissioning of one no of RJ-11 Telephone socket and one no of RJ-45 Data socket with modular plate mounted in manufacturers zinc passivated MS box.	Nos	26						
5	Cables & Conduits								
a	Supply, installation, testing & commissioning of UTP CAT6 Network Cable in existing conduits from data point to Network Switch	mtr	517						
b	Supply, installation, testing & commissioning of STP CAT6 Network Cable data point to Network Switch	mtr	209						
c	Supply,Installation, Testing & Commissioning of CAT6 Patch Cable, 1m	Nos	48						
d	Supply,Installation, Testing & Commissioning of CAT6 Patch Cable, 3m	Nos	4						
	Utility Building								
6	Network Switch: Supply, installation, testing & commissioning of manageable L2 PoESwitch, 24Port, 10/100/1000, 2SFP Ports with support for Auto VLANS and support features like IP4/IP6, QoS, advanced security management, PoE management. Should support 802.3af (802.3at Type 1) specification.	Nos	1						
7	Patch Panels: Supply, installation, testing & commissioning of fully loaded CAT6 Patch Panel, 24 Ports.	nos.	1						
8	Supply, installation, testing & commissioning of 6 port simplex single mode LIU, rack mountable with SM SX Pigtails, fully loaded, inclusive of splicing charges	Set	2						
9	Supply, Installation, Testing, and commissioning of mini-GBIC SFP module with suitable 3mtr patch cords	Set	2						
10	Network Rack								
a	Supply, Installation, Testing and commissioning of Network Racks, 6U, wall mount with accessories, Fixtures, Power Managers, Cable Managers and Organizers and lockable Front side glass door.	Nos	1						
4	Supply, installation, Testing and commissioning of one no of RJ-11 Telephone socket and one no of RJ-45 Data socket with modular plate mounted in manufacturers zinc passivated MS box.	Nos	6						
11	Cables & Conduits								
a	Supply, installation, testing & commissioning of CAT6 Network Cable in existing conduits from data point to Network Switch	mtr	171						
b	Supply,Installation, Testing & Commissioning of CAT6 Patch Cable, 1m	Nos	24						
c	Supply,Installation, Testing & Commissioning of CAT6 Patch Cable, 3m	Nos	4						
d	Supply, installation, testing & commissioning of 6 core Single mode armoured OFC Network Cable in existing conduits from Network POE switch to Main Network Switch at below Ground level	mtr	298						

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
e	Supplying and laying of following size HDPE-63 pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc..direct in ground (75 cm below ground level) including excavation and refilling the trench but excluding sand cushioning and protective covering etc.. complete as required.								
	63 mm dia (OD-63 mm & ID-51 mm nominal)	mtr	RO						
SUB TOTAL									
FIRE ALARM SYSTEMS									
1	Supply, installation, testing & commissioning of Addressable fire alarm Panel with 160 Character Display with Touch key pad, Inbuilt RS-485 Networking Circuit for peer to peer networking, Inbuilt USB 2.0 Port for upload and download the Configuration tools, programming inputs, two inbuilt NAC's, and three Programmable Relays, and 2 Loop Card circuits expandable to 8 or more. Built-in Power Supply which operates on 120 to 220V AC \pm 10% with 50/60 Hz, battery backup 24V DC with built-in charger. The Fire Alarm Panel should be EN54 compliant. Optional: for BMS integration BacNet/MODBUS converter, Graphical Software, Software for TCP/IP Module, Provision for Auto dialler, Make. The panel shall have 240 Volts AC Power supply, automatic battery charger, 24V, sealed maintenance free batteries sufficient for 24 hours normal working and then be capable of operating the system for 30min during emergency condition as required. The scope of work includes, dressing of fire alarm cables with neat encasing from ceiling to the fire alarm panel & repeater panel. Should be supplied with 5 Loop cards in Total.	nos.	1						
2	Supply, installation, testing & commissioning of Active Repeater Panel at Security Room.	nos	1						
3	Supply, installation, testing & commissioning of BacNet/Modbus module for integrating with BMS system safety features.	nos	1						
4	Supply, installation, testing & commissioning of Addressable Active Repeater Panel which consists of display board which will have 160 Character Display with Touch key pad, Inbuilt RS-485 Networking Circuit for peer to peer networking, and One Fire Relays, power Supply Board which will have SMPS fully protected board, which operates on 120 to 220V AC \pm 10% with 50/60 Hz, battery backup 24V DC with built-in charger. The Repeater Panel should be EN54 compliant.	nos.	1						
5	Supply, installation, testing & commissioning of Addressable Multi Sensor - Heat Cum Smoke detector with programmable address setting or dip/rotary switch addressing, LED for detector status. Sleek low-profile housing design. Detector should be easily removable from base. Approval: EN54 compliant with standard base and junction box to be fitted below ceiling detectors. Should be supplied with base.	nos.	280						
6	Supply, installation, testing & commissioning of Addressable Multi Sensor - Heat Cum Smoke detector with programmable address setting or dip/rotary switch addressing, LED for detector status. Sleek low-profile housing design. Detector should be easily removable from base. Approval: EN54 compliant with standard base and junction box, to be fitted above ceiling detectors. Should be supplied with base.	nos.	154						
7	Supply, installation, testing & commissioning of Remote response indicator having LED mounted on false ceiling.	Nos	154						
8	Supply, installation, testing & commissioning of Analogue Addressable Fault Isolator Base capable of monitoring shorted loop circuit and automatically restore communications when shorted conditions are corrected. Should be programmable address setting or dip/rotary switch addressing. EN54 compliant with standard base and junction box.	Nos	52						
9	Supply, installation, testing & commissioning of Addressable Manual Call Point - Resettable type - Reset Lock & Key arrangement with back box with programmable address setting or dip/rotary switch addressing. EN54 compliant with standard base and junction box surface or flush mounted.	Nos	32						
10	Supply,Installation, Testing & Commissioning of Supply of Addressable Horn / Strobe wall mounted type rated at 85 dBA @ 1m for Audible annunciation and 15cd minimum flashing at 1 Hz for visual indication. Should be programmable address setting or dip/rotary switch addressing and supplied with suitable base and mounting accessories.	Nos	32						
11	Supply,Installation, Testing & Commissioning of Control Relays Module shall provide two dry potential free contacts for activating a variety of auxiliary devices and other firefighting / ventilation equipment. Shall have contact rating of minimum 1A @24V DC, MS Powder coated Junction Box for mounting on Surface. RM shall be loop powered & addressed by means of dip switches.	nos.	72						
12	Supply,Installation,Testing & Commissioning of Analogue Addressable Monitor module having Rotary, decimal addressing system or programmable binary coded address setting for monitoring the field devices & shall be capable of providing 1xSPDTcontact rated at 24v DC, minimum 1A. Modules in suitable ABS Plastic glossy Box. For flow switches.	nos.	82						
13	Supply and laying, connecting, testing & commissioning of 2C x 1.5 sq.mm, annealed tin alloy copper conductor, FRLS Cable. The scope of work includes necessary clamps, supports & fixings for the cables in concealed walls, exposed walls, Iron Beams, civil structures, etc..	Mts	4,600						

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
14	supply and installation of 25MM MS conduit with accessories such as junction boxes, bends, etc., The scope of work includes necessary clamps, supports & fixings for the conduits in concealed walls, exposed walls, Iron Beams, civil structures, etc.,	Mts	2,400						
15	20mm PVC 2mm thick ISI conduit with all necessary accessories inclusive clamps, junction boxes, bends, etc., The scope of work includes necessary clamps, supports & fixings for the conduits in concealed walls, exposed walls, Iron Beams, civil structures, etc.,	Mts	250						
	2Way Call Back Fire Telephone System								
16	Supply, installation, testing & commissioning of master panel for 2 way voice system, 8 zones. Should support Master to remote and remote to master calling facility, Group Calls, Conference Calls, Fully monitored for open and short circuit cable failures. Should be supplied with battery backup power.	set	1						
17	Supply, installation, testing & commissioning of Phone Jack with Monitor Module	nos	15						
18	Supply, installation, testing & commissioning of fire telephone mobile handset	nos	4						
19	Supply, laying, testing & commissioning of armoured 1.5 sqmm, FRLS cable inclusive of accessories in 20mm MS conduits	rmt	650						
	SUB TOTAL								
	PUBLIC ADDRESS SYSTEM								
1	Supply, installation, testing & commissioning of Digital Signal Processing Based Voice Alarm Controller - 4 inputs, supports Paging unit thru RS485 - Digital Amplifier inbuilt of 250 watts - 6 zones inbuilt, each zones shall supports maximum of 240 watts - Zones are expandable in the multiplication of 6 maximum of upto 120 zones - support Remote Paging Unit, integrated with Fire Alarm system, Emergency Inputs, supports 12 nos of Built in Programmable Digital Voice Alert message PC based Router Configuration - 3 levels of password protection - Event log facility - Overriding facility for Emergency Condition, ALL CALL facility - Zone paging facility - inbuilt MIC - 19" Rack Mountable. Works on 230 VAC.	Nos	1						
2	Supply, installation, testing & commissioning of 480 Watts power Calass B Amplifier unit with Inputs from main console, control wires, power cables, etc as required.	Nos	6						
3	Supply, installation testing & commissioning of reputed brand DVD player with USB connectable options.	Nos	1						
4	Supply, installation, testing & commissioning of 6W Ceiling Mountable ABS plastic grille with metal punched net, Flush mount speaker - Easy to install with spring catch mount - Connectors with screw for hooking up the wires tightly - 100V power taps. A circular template for marking a hole is accompanied with the speaker - Line Matching Transformer with the Tapping of 1.5, 3 and 6 watts. The scope of work includes necessary supports & fixings for the speakers in ceilings, Iron Beams, civil structures, iron tress etc. as per the site condition.	Nos	157						
6	Supply, installation, testing & commissioning of Wall 12W Mountable ABS plastic grille with metal punched net, Flush mount speaker 100V power taps. Line Matching Transformer with the Tapping of 3, 6, 12 watts. The scope of work includes necessary supports & fixings for the speakers in ceilings, Iron Beams, civil structures, iron tress etc. as per the site condition.	Nos	41						
7	Supply, installation, testing & commissioning of wall mounted Horn Speakers 30W with line Matching Transformer with the Tapping of 5, 10, 20 watts. The scope of work includes necessary supports & fixings for the speakers in ceilings, Iron Beams, civil structures, iron tress etc. as per the site condition. The speaker should be suitable for outdoor use.	nos	12						
8	Supply, installation, testing & commissioning of Wall mounted volume control complete with back box, necessary fixing accessories.	Nos	1						
9	Supply, installation, testing, commissioning of desktop remote paging microphone system, shall have 6 programmable keys & expandable up to 64 keys, with flexible neck mike, neccessary fixing & connecting accessories.	Nos	2						
10	Supply, installation, testing, commissioning of Hi- Fidelity UHF wireless Microphone along with receiver, 1 set of rechargeable batteries	Nos	1						
11	Supply and laying, connecting & commissioning of 2C x 1.5 sq.mm, ATC Copper conductor, FRLS Cable	mts	4,000						
12	20mm PVC 2mm thick ISI conduit with all necessary accessories inclusive clamps, junction boxes, bends, etc., The scope of work includes necessary clamps, supports & fixings for the conduits in concealed walls, exposed walls, Iron Beams, civil structures, etc.,	Mts	2,000						
13	Supply and laying, connecting, testing & commissioning of CAT6 cable, The scope of work includes necessary clamps, supports & fixings for the cables in concealed walls, exposed walls, Iron Beams, civil structures, etc.,	Mts	46						
14	Supply, installation, testing & commissioing of floor mounted powder coated 32U 19" Rack (W:600xD:800mm) with 6x5A Power Manager for console, 6Nos 500W amplifier & DVD Player, 2 Horizontal Cable Manager. Front Glass door with Lock & key for PA system.	Nos	1						
	SUB TOTAL								

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
1	EPABX								
a	Supply, Installation, Testing and commissioning of fully automatic non blocking Hybrid EPABX with <u>04xCO Lines, 1xT1/E1/PRI, 2xDigital Ports, 48xSLT analogue extensions</u> expandable upto 100 lines, 50 IP Users, VMS system. Should support features like Call forwarding, DND, Override do not disturb, Speed dialing, Barge in, Call back, Call parking, Class of service, calling line identification (CLIP) on digital as well as analog extension and external Lines (P&T). The system should have an in-built comport/LAN port from which call-billing data can be obtained. Should be supplied with call billing software. The EPABX shall be compatible with the public switched telephone network of BSNL/other ISPs operating in India, TEC/DOT or similar standards certified as in Technical Specification.	nos.	1						
b	Expansion Module for PRI/T1/E1	nos.	QRO						
c	VOIP8 Module with 10 IP User License	nos.	QRO						
d	Voice Message System with 16 Mail Boxes	nos.	QRO						
2	Telephones								
a	Supply, Installation, Testing and commissioning of basic corded telephone with optical call alert, lcd display, CLIP feature, handsfree talking.	nos.	29						
b	Supply, Installation, Testing and commissioning of Digital Key telephones for operator with 2 line lcd, soft touch keys, programable soft keys, support for hands free head set.	nos.	2						
3	Accessories								
a	Supply, Installation, Testing and commissioning of 200pair MDF Box, with 20nos krone type punch down 10pair modules, back frame, powder coated lockable door.	nos.	1						
b	Supply, Installation, Testing and commissioning of 50pair IDF Box, with krone type punch down 10pair modules, back frame, powder coated lockable door.	nos.	1						
c	Supply, Installation, Testing and commissioning of 10pair MDF Box, with krone type punch down 10pair modules, back frame, powder coated lockable door.	nos.	14						
d	Supply, Installation, Testing and commissioning of MS Backbox with RJ11 Face Plate	nos.	77						
4	Cables & Conduits								
a	Supply, Installation, Testing and commissioning of 0.5mm 10pair Armoured PVC Telephone cable in existing conduits	mtr	920						
b	Supply, Installation, Testing and commissioning of 0.5mm 50pair Armoured PVC Telephone cable in existing conduits	mtr	6						
c	Supply, Installation, Testing and commissioning of 0.5mm 2pair PVC Telephone cable in existing conduits	mtr	5,933						
d	Supply, Installation, Testing and commissioning of 0.5mm 2pair Armoured PVC Telephone cable in existing conduits	mtr	209						
	Utility Building								
5	Accessories								
a	Supply, Installation, Testing and commissioning of 10pair MDF Box, with krone type punch down 10pair modules, back frame, powder coated lockable door.	nos.	1						
b	Supply, Installation, Testing and commissioning of MS Backbox with RJ11 Face Plate	nos.	5						
6	Cables & Conduits								
a	Supply, Installation, Testing and commissioning of 0.5mm 20pair Jelly Filled PVC Armoured Telephone cable at below Ground level	mtr	297						
b	Supply, Installation, Testing and commissioning of 0.5mm 2pair PVC Telephone cable in existing conduits	mtr	416						
	SUB TOTAL								
	Grand Total for IBMS works								
III	FIRE PROTECTION WORKS								
A	PUMP ROOM							-	
1	Supply, Installation, Testing and Commissioning of 171 Cum/hr. TEFC type electrically driven horizontal centrifugal (End Suction type) Main pumpset with class F insulation & IP 55 protection for Fire Hydrant & Sprinkler system at 141 Mtrs. Head and 2900 rpm with all necessary accessories like providing and fixing bronze impeller, stainless steel shaft coupling, coupling guard, mechanical seal, Cast Iron pump casing & baseplate for pump, fabricated mild steel channel with foundation bolts, etc Pump shall have electrical motor of adequate H.P. suitable for electric supply of 415V, 50 Hz, 3Ph Soft Starter connection.	Sets	2						

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
2	Supply, Installation, Testing and Commissioning of 171Cum/hr. diesel engine driven horizontal centrifugal pumpset (End Suction type) Standby pumpset for Fire Hydrant & Sprinkler system at 141 Mtrs. Head & 1800/2100 rpm with all necessary accessories like providing & fixing bronze impeller, stainless steel shaft, Direct coupling, Mechanical seal, Cast Iron pump casing, base plate for pump, fabricated mild steel channel with foundation bolts etc.,. It includes providing & fixing fuel 200 litres elevated tank with supply and return piping, steel supports for diesel tank, valves, fill and vent lines, flexible connections, 2 sets of battery with charging arrangement, alternator & instrument panel suitable for 24 volt DC including starting switches to be connected to control panel of diesel engine and exhaust silencer including necessary pipework with insulation and cladding apprx rmt 30mts, etc., Batteries, cooling water line for engine with required pipes, valves, fittings, exhaust fittings, etc.,. (note: Pipe work will be measured seperately)	Set	1						
3	Supply, Installation, Testing and Commissioning of 10.8 Cum/hr. TEFC type Vertical In line pump Jockey pumpset with class F inulation & IP 55 protection for Fire Hydrant & Sprinkler system at 141 Mtrs. Head and 2900 rpm with all necessary accessories like providing and fixing SS304 impeller & stage casing, stainless steel shaft, Mechanical seal, coupling guard & CI base for pump, fabricated mild steel channel with foundation bolts, etc. Pump shall have electrical motor of adequate H.P. suitable for electric supply of 415V, 50 Hz, 3Ph for Soft Starter connection.	Set	2						
4	Supply, Installation, Testing and Commissioning of C.I. body, EPDM seat, SGI disc, Butterfly valve PN 16, SGI Hand lever operated, wafer ends conforming to BS:5155.								
	300 mm NB.	Nos.	QRO						
	250 mm NB.	Nos.	1						
	200 mm NB.	Nos.	3						
	150 mm NB.	Nos.	3						
	100 mm NB.	Nos.	1						
	80 mm NB.	No.	5						
	50 mm NB	Nos.	4						
5	Supply, Installation, Testing and Commissioning of Flanged Ball type Non return Valve PN 16, SGI body & reinforced rubber coat ball, conforming to IS 5312, Vertical installation.								
	200 mm NB	Nos.	QRO						
	150 mm NB.	Nos.	3						
	100 mm NB	Nos.	QRO						
	80 mm NB	Nos.	3						
	50 mm NB	Nos.	4						
6	Supply, Installation, Testing and Commissioning of Flanged Dual plate, double spring Check valve PN 16, CI body & SS plates, conforming to IS 210 Horizontal installation.								
	250 mm NB.	Nos.	1						
	200 mm NB	Nos.	QRO						
	150 mm NB.	Nos.	QRO						
	80 mm NB	Nos.	QRO						
7	Supply, Installation, Testing and Commissioning of gunmetal gate valve having screwed ends as per specification with necessary flanges, nut, bolts & washers, etc. complete as required conforming to IS 778.								
	40 mm NB Gate valve	Nos.	QRO						
	32 mm NB Gate valve	Nos.	4						
	25 mm NB Gate valve	Nos.	16						
8	Supply, Installation, Testing and Commissioning of above ground piping carried out of MS class C Heavy Duty pipe as per IS : 1239 for pipes up to 150mm NB and as per IS : 3589 with a wall thickness of 6.35mm for pipes 200mm NB and above together with fittings, valves and accessories as under :								
	Work will include painting for the above ground piping with one coat of primer and two coat of enamel paint of approved colour. Work will include cleaning of pipe, degreasing, etc.								
	300 mm NB Pipes.	RMT	QRO						
	250 mm NB Pipes.	RMT	10						
	200 mm NB Pipes.	RMT	30						
	150 mm NB Pipes.	RMT	28						
	80 mm NB Pipes.	RMT	21						
	50 mm NB Pipes.	RMT	20						
	25 mm NB Pipes.	RMT	20						

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
9	Supply, installation testing & commissioning of Normex / equivalent Ball Type Foot Valve Flanged B-05 (N) Body & Cover : Grey Cast Iron FG 200, Ball : Synthetic Rubber Coated (Reinforced), Seat: Lead Tin Bronze (IS318), Fastners: Carbon Steel IS 1363 Class 4, Strainer: Cast Iron. Pressure Rating PN16.								
	200 mm NB Pipes.	Nos.	3						
	150 mm NB Pipes.	Nos.	QRO						
	100 mm NB Pipes.	Nos.	QRO						
	65 mm NB Pipes.	Nos.	2						
10	Supply, Installation, Testing and Commissioning of Dial type pressure guage with 150mm dial and a range of 0-25 Kg./sq.cm. together with siphon and pet cock.	Nos.	7						
11	Supply, Installation, Testing and Commissioning of pressure switches together with accessories.	Nos.	4						
12	Supply, installation and commissioning of precharged air vessel (size 450 mm Dia, 1500 mm height, 4-6mm thick MS) for pressurization of system complete with adequate pressure switches (as per design / requirement) with valves to operate as per operating sequences including 25 mm Dia drain valve, air release valve with stop cock on the top, 25 mm Dia inlet with isolating valve duly painted from inside and outside with two coats of synthetic enamel paint over a coat of zinc rich primer complete as required. (Vessel should be suitable for rated working pressure).	Set.	2						
13	Supply, Installation, Testing and Commissioning of Autostart IP55 panel for the Diesel engine complete auto/ manual switch, indication lamps protective fuses Battery charger with transformer with rectifier resistance DC ammeter, DC voltmeter, Trickle / booster / off selector switch - 2 Nos., suitable of working on 230 V, AC, single phase, enclosure being vermin & dust proof.	Set	1						
a	20Amps DPMCB - 2 Nos.								
b	Battery charger with transformer with rectifier resistance DC ammeter, DC voltmeter, Trickle / booster / off selector switch - 2 Nos.								
c	1 set of indicating lamps for the following:								
	1. phase indication								
	2. battery charger on,Healthy and Fault								
	3. over load relay								
	4. DC supply on								
	5. control switch on								
	6. Engine fails to start								
	7. Pump on								
	8. Low oil pressure								
	9. High water temperature								
	10. Auto manual selector switch								
d	1 sets of push button stations for the following :								
	1. Engine Start								
	2. Engine Stop								
	3. Engine - hooter ACK								
	4. Engine - fault reset								
e	Selector switches (Engine control, mode selector)-1 No.								
f	Auxiliary relays / contactors / timer for sequence operating for starting and stopping of the engine - 1 set.								
g	Hooter for audio alarm (Industrial type) - 1 No.								
14	Supply, Installation, Testing and Commissioning of Sheet steel fabricated cubicle type, MCC with Soft Starter IP55 panel for the electrical motor driven pumpset, soft starter for Jockey pumpset complete with isolator switch, voltmeter, ammeter manual / auto mode switch, indicating lamps etc., Potential free contacts pumps, for third party integration for Fire alarm system, BMS, etc., for identifying the on/off status, trip status for all pumps and lube oil level status for diesel driven pump. (Anunciation panel with required number of windows to indicate fault status of engine)	Set	1						
a	INCOMING : 2Nos, 630ATP&N 25KA MCCB, 630A TP&N copper Busbars with colour coded heat shrinkable PVC sleeves. 1 Set of RYB indicating lamps with individual HRC control fuses. 1 Nos. 96 sq.mm, 0-630 Amps, Ammeter with selector switch and suitable rated current transformers. 1 Nos. 0-600A 96sq.mm, Voltmeter with selector switch. Incomer shall be with mechanical interlock with 2 lock & 1 Key								
b	OUTGOING: Feeder for main pumps - 2nos. 400 A TP&N 25KA MCCB and Soft starter with overload relay, single phase preventor and indicating lamps with ON/OFF push buttons.								
c	Feeder for Jockey Pump - 2nos 63A 25 KA TP&N MCCB without releases Soft starter with over load relay, single phase preventor and indicating lamps with ON/OFF push buttons, 1 No . Automanual selector switch. 1no Dummy provision. 2nos 16A DP MCB for battery charger and control panel.								

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
15	Supply, Installation, Testing and Commissioning of 2XFYFR copper conductor, 1.1 KV grade armoured, MV cable of the following sizes as required, generally conforming to IS 7098 Part-I								
	a. 3 C X 150 sqmm	Mtr.	90						
	b. 4C X 16 sqmm	Mtr.	24						
	c. 12 C X 2.5 sqmm copper aromoured cable for Diesel engines.	Mtr.	48						
	d. 2 C X 2.5 sqmm copper aromoured cable for instrumentation	Mtr.	90						
16	Supply, Installation, Testing and Commissioning of cable end termination with brass compression gland and Aluminium lugs for the following sizes of 2XFYFR copper conductor cable of 1.1KV grade complete as required.								
	a. 3 C X 150 sqmm	Set	8						
	b. 4C X 16 sqmm	Set	2						
	c. 12 C X 2.5 sqmm copper aromoured cable for Diesel engines.	Set	2						
	d. 2 C X 2.5 sqmm copper aromoured cable for instrumentation	Set	20						
17	Providing and fixing 25 mm x 3 mm copper strip on surface or in recess for connections etc. as required.	Mtr.	45						
18	Providing and fixing following sizes of copper wire on surface or in recess for connections etc. as required.								
	8 SWG Copper	Mtr.	45						
19	Supply, Installation, Testing and Commissioning of perforated G.I.sheet cable tray with necessary angle iron suspension supports, anchor fasteners etc. complete. Maximum height of suspension shall not exceed 500 mm.Size of the tray shall be as mentioned below for laying the above mentioned cables.								
	a 600mm	Mtr.	30						
	b 300mm	Mtr.	30						
	c 150mm	Mtr.	30						
20	Supply, Installation, Testing and Commissioning of diesel engine exhaust pipe,100mm Dia Class C MS pipe with residential type silencer, mineral wool thermal insulation and 24G aluminium cladding, with necessary supports, clamps, bolts, nuts, necessary ss flexible connector etc.	Mtr.	30						
21	Supply and Erection Structural Supports like MS Angle / Channel / 'U' clamps, etc.,	Kgs.	750						
22	Supply, Installation, Testing and Commissioning of Drum type pressure reducing valve in Cast iron / Ductile Iron body, with diaphragm, 150mm dia flanges, accessories, including installation of downstream pressure relief valve, complete as per requirements and approved specifications and as per instructions of the engineer-in-charge. The appliance shall be rated for a working pressure upto 20 kg/cm2 and the pilot spring shall be suitable for a range of 2.0 to 10.0 kg/cm2. (Recommended Make: Lehry/Wilkins/OCV or approved Equivalent)	Nos.	2						
SUB TOTAL A									
B HYDRANT SYSTEM									
1	Supply, Installation, Testing and Commissioning of MS class C Heavy duty pipe as per IS : 1239 for pipes up to 150mm NB and as per IS : 3589 for above 150mm with a wall thickness of 6 mm for pipes 200mm NB and above together with fittings, valves and accessories as under:								
	a Work will include painting for the external below ground piping with all necessary fittings including weather proof protection with bitumatic paint and tape(4mm) before adhering the tape to the pipe, it is advisable to gently heat the synthetic primer coated pipe by a run of LPG torch until the wrapper gets blend with the pipe, tape is wrapped by spiral method over the pipe, the thickness of overlapped wrapping must be not less than 10mm thick in pipes and in joints wrapping thickness must be not less than 40mm Work will include cleaning of pipe, degreasing, excavation of soil 1.5mtr below the ground and to backfill with 100mm river sand the excavated soil. etc.								
	200 mm NB	RMT	1255						
	150 mm NB	RMT	900						
	100 mm NB	RMT	QRO						
	80 mm NB	RMT	22						
	50 mm NB	RMT	QRO						
	25 mm NB	RMT	QRO						
	b Work will include painting for the above ground piping with one coat of primer and two coat of enamel paint of approved colour. Work will include cleaning of pipe, degreasing, necessary supports, clamps, bolts, nuts,etc. Headers shall be worded indicating the direction of the pipe and its purpose.								

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
	200 mm NB	RMT	QRO						
	150 mm NB	RMT	30						
	100 mm NB	RMT	QRO						
	80 mm NB	RMT	22						
	50 mm NB	RMT	QRO						
	25 mm NB	RMT	QRO						
2	Supply, Installation, Testing and Commissioning of C.I. body, EPDM seat, SGI disc, Butterfly valve PN 16, SGI Hand lever operated, wafer ends conforming to BS:5155.								
	200 mm NB.	Nos.	QRO						
	150 mm NB.	Nos.	20						
	100 mm NB.	Nos.	QRO						
3	Supply and construction of PCC (1:2:4) pedestals / supports for Under ground / above ground pipes. Quoted rate shall inclusive of excavation (if required), chipping / chasing, shuttering, plastering (if required) etc. complete.	Nos.	60						
4	Supply and installation of RCC Hume pipes of 600 mm dia with collars for road / below floor crossing of Fire water pipes as per IS 458. The rate shall includes excavation, soil levelling for bed and ends shall be closed with Brick masonry work as directed by site engineer.	RMT	16						
5	Supply and installation of RCC Hume pipes of 300 mm dia with collars for road / below floor crossing of Fire water pipes as per IS 458. The rate shall includes excavation, soil levelling for bed and ends shall be closed with Brick masonry work as directed by site engineer.	RMT	52						
6	Supply, Installation, Testing and Commissioning of Air Release Valve with Ball Valve - 25 mm dia to all water risers all complete.	Nos.	8						
7	Supply, Installation, Testing and Commissioning of Internal hydrants including landing valve stations hose reels, etc., comprising of the following.								
	a 63mm dia Double outlet landing valve as per IS : 5290 together with cap and chain.	Nos.	28						
	b Hose reel drum assembly with swinging and rolling arrangement together with 19mm dia x 30 mtrs. long hose, cnc machined Single rod IS standard Bright Material with Special "O" rings & Grooved Nozzle. and 6.25mm nozzle durable Nylon material, Jet spray & shut by hand revolving., 19mm NB ball valve at tap-off etc., as per IS : 884.	Nos.	28						
	c 2 nos - 65 mm dia R.R.L Hose of 15 Mtrs. Length, together with heavy GM couplings combined with 2 nos nozzle & branch pipe as per IS2871.	Nos.	28						
	d Supply, Erection, Testing and Commissioning of MS hose cabinet stand mounted type, fabricated out of M.S sheet of 16 swg, with glass fronted (4mm thick glass with rubber beeding) door and size of the cabinet shall be 900mm x1200 mm x 250 mm, Quoted rate shall be includes suitable stand for mounting as fasteners etc., and cabinet shall be powder coated of approved colour both inside and outside.	Nos.	28						
8	Supply, Installation, Testing and Commissioning of External standpost type Yard hydrants comprising of the following.								
	a 63mm dia Single hydrant valve as per IS : 5290 together with cap and chain.	Nos.	7						
	b 2 nos - 65 mm dia R.R.L Hose of 15 Mtrs. Length, together with heavy GM couplings combined with 1 nos nozzle & branch pipe.	Nos.	7						
	c Supply, Installation, Testing and Commissioning of MS hose cabinet stand mounted type, fabricated out of M.S sheet of 16 swg, with glass fronted (4mm thick glass with rubber beeding) door and size of the cabinet shall be 600mm x750 mm x 250 mm, Quoted rate shall be includes suitable stand for mounting as fasteners etc., and cabinet shall be powder coated of approved colour both inside and outside.	Nos.	7						
	d Supply, Installation, Testing and Commissioning of FRP hose cabinet stand mounted type, fabricated out of M.S sheet of 16 swg, with glass fronted (4mm thick glass with rubber beeding) door and size of the cabinet shall be 600mm x750 mm x 250 mm, Quoted rate shall be includes suitable stand for mounting as fasteners etc., and cabinet shall be powder coated of approved colour both inside and outside.	Nos.	2						
9	Supply, Installation, Testing and Commissioning of Fire brigade inlet siamese connection (4way) manifold in including valves and check valve of size 150mm size along with 4 nos. 63mm dia instantaneous inlet arrangements to the main header with cap and chain etc., for external hydrants.	No.	1						
10	Supply, Installation, Testing and Commissioning of Fire brigade inlet siamese connection (4way) manifold in including valves and check valve of size 150mm size along with 4 nos. 63mm dia instantaneous inlet arrangements to the main header with cap and chain etc., for fire sump.	No.	1						

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
11	Construction of Valve Pits Size of 1000 x 1000 mm outer dimension and to be required. internal dimension as under, upto 1.5 Mtr depth with brick masonry in cement mortar 1:5, with thickness of masonry 225mm, 1:3:6 cement concrete foundation 150mm thick over 150mm sand bed, channelling in 1:2:4 cement concrete, plastering in 1:3 cement mortar for internal and external surface & finished with floating coat of neat cement. Fixing of 600*600 including precasting D.I. manhole heavy duty grade C-250,weight of cover must be 90kg theft proof cover and frame including painting of the frame & cover. The work shall include all necessary excavation and back filling.	Nos.	4						
10	Construction of Valve Pits Size of 800 x 800 mm outer dimension and to be required. internal dimension as under, upto 1.0 Mtr depth with brick masonry in cement mortar 1:5, with thickness of masonry 225mm, 1:3:6 cement concrete foundation 150mm thick over 150mm sand bed, channelling in 1:2:4 cement concrete, plastering in 1:3 cement mortar for internal and external surface & finished with floating coat of neat cement. Fixing of 600*600 including precasting D.I. manhole heavy duty grade C-250,weight of cover must be 90kg theft proof cover and frame including painting of the frame & cover .The work shall include all necessary excavation and back filling.	Nos.	2						
11	Supply & Fixing of Fire stop mortar system Hilti CP 636 , with minimum 2 hours fire rating when tested in accordance with UL 1479 standards, for horizontal openings in floors or slabs after passing service lines like Metal Pipes. The mortar shall be a light weight cementitious product and shall carry test certificate in accordance with IEC 60068-2-57:1999-11 (Environmental Testing) as per Part 2-57: Test for Vibration-Time-history method and VERTEQII for seismic zone 4. The product shall be age tested as per Dafstb and DIBT standards. The product shall carry test certificate for mold resistance rating of 0 as determined by ASTM G21-96. The product shall be UL listed & classified and shall bear the UL approval logo on the packing. Firestop installation should be done by Hilti trained applicators.	Sqm	33						
TOTAL -B									
C SPRINKLER SYSTEM									
1	Supply, Installation, Testing and Commissioning of FM approved & UL listed Control Valve consisting of - 1 no. Alarm valve(Clapper check type, Vertical mount), 1 no. Main stop valve, 1 no. water motor with alarm gong (light weight non metallic material), with strainer, Pressure guage drain valve and proper drain piping etc., as per specification.	Set	Qro						
	a 200 mm dia.	Set	1						
	b 150 mm dia.	Set	1						
2	Supply, Installation, Testing and Commissioning of above ground piping carried out of MS class C Heavy duty piping as per IS : 1239 for pipes up to 150mm NB & IS 3589 for above 150mm together with fittings, valves and accessories as under : upto 50mm socket welded fittings. 65mm dia & above must be with MS supports.								
	Work will include painting for the above ground piping with one coat of primer and two coat of enamel paint of approved colour. Work will include cleaning of pipe, degreasing, necessary angle supports, clamps, bolts, nuts,etc.								
	200 mm NB	RMT	58						
	150 mm NB	RMT	254						
	100 mm NB	RMT	319						
	80 mm NB	RMT	56						
	65 mm NB	RMT	33						
	50 mm NB	RMT	311						
	40 mm NB	RMT	390						
	32 mm NB	RMT	40						
	25 mm NB	RMT	1429						
3	Supply, Installation, Testing and Commissioning of C.I. Butterfly valve PN 16 Hand lever operated, wafer ends conforming to BS:5155.								
	200 mm NB	Nos.	QRO						
	150 mm NB	Nos.	6						
	100 mm NB.	Nos.	56						
	80 mm NB.	Nos.	20						
	65 mm NB.	Nos.	QRO						
	50 mm NB	Nos.	28						

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
4	Supply, installation, testing and commissioning of FM approved make vane type flow switches (flow sensors) suitable to be fixed directly on line of the following diameters, with 1 NO & 1 NC potential free contacts (suitable provision for IBMS system)								
	150mm dia	Nos.	QRO						
	100mm dia	Nos.	28						
	80mm dia	Nos.	7						
5	Supplying, Installing, testing and commissioning CI butterfly valves with tamper switch as per BS 5155 (PN 16) slim seal standard lever operated / gear operated type with required flanges, nuts, bolts etc. complete.								
	150mm dia	Nos.	QRO						
	100mm dia	Nos.	28						
	80mm dia	Nos.	7						
6	Supplying, installing, testing and commissioning of Inspection and testing assembly with sight glass, valves and accessories. (25 mm dia)	Nos.	35						
7	Supply, Installation, Testing and Commissioning of chromium finish, Upright / Pendent type sprinkler suitable to operate at 68/79 deg.C temperature (K=80).	No	497						
8	Supply, Installation, Testing and Commissioning of chromium finish, extended coverage side wall type sprinkler suitable to operate at 68/79 deg.C temperature (K=80).	No	20						
9	Supply, Installation, Testing and Commissioning of braided SS 304 flexi hose dropper 1.5mtr length with standard support accessories, neat finish, withstand system test and working pressure.	No	280						
10	Supply, Installation, Testing and Commissioning of braided SS 304 flexi hose dropper 1.2mtr length with standard support accessories, neat finish, withstand system test and working pressure.	No	40						
11	Supply, Installation, Testing and Commissioning of Rosette plates for sprinklers at False ceiling level.	Nos.	320						

S.No	Description	Unit	Qty	Supply		Erection		Total	
				Rate	Amount	Rate	Amount	Rate	Amount
12	Supply and installation of hot dip GI puddle flanges, as per IS-1239, fabricated out of 6mm MS Plate, fixed at the RCC walls of the fire tanks & Over head tanks, work includes painting with 2 coats of primer complete as required, refer tender dwas for details.								
	a 300mm Dia GI flange	Nos	QRO						
	b 250mm Dia GI flange	Nos	3						
	c 200mm Dia GI flange	Nos	QRO						
	d 150mm Dia GI flange	Nos	4						
	e 100mm Dia GI flange	Nos	1						
	f 80mm Dia GI flange	Nos	1						
13	Liasoning work for Obtaining Local Fire Authority NOC/Approvals for complete systyem & miscellaneous work etc.	Lot	1						
	SUB TOTAL C								
D	EXTINGUISHERS								
1	Supply and fixing of approved equivalent make ABC 6kg, IS 15683 Gas cartridge type with fire rating 4A 34B. Design, construction and testing as per IS 15683, Body hydro tested at 35bar, operating temperature 30°C to +55°C, external epoxy powder coating with PO shade No 538 of IS 5, supplied with standard accessories. Cylinder must be subjected to Anti-corrosive treatment of 7 tank process.	Nos	43						
2	Supply and fixing of approved equivalent make 4.5kg CO2 Type Fire Extinguisher with fire rating 21B. Design, construction and testing as per IS 15683, supplied with Body bearing IS 7285 mark, operating temperature -30°C to +55°C, external double PU paint coating with PO shade No 538 of IS 5, Packing 7ply thick corrugated, co2 purity IS 15222, Valve IS 3224, supplied with standard accessories.	Nos	64						
3	Supply and fixing of approved equivalent make 6kg DCP Powder type fire extinguisher, IS 15683 Gas cartridge type with fire rating 21B. Design, construction and testing as per IS 15683, Body hydro tested at 35bar, operating temperature -30°C to +55°C, external epoxy powder coating with PO shade No 538 of IS 5, supplied with standard accessories. Supplied with ISI marked gas cartridge as per IS 4947 and DCP (Sodium Bicarbonate base as per IS 4308) Cylinder must be subjected to Anti-corrosive treatment of 7 tank process.	Nos	42						
4	Supply and Fixing of 9L Mechanical Foam Type Fire Extinguisher, IS 15683 marked with Fire rating 4A 34B, Body Hydrotested at 35 bar, Operating temperature +5°C to +55°C, Internal and external epoxy powder coating with PO Red Shade No. 538 of IS 5, Supplied with ISI marked Gas Cartridge as per IS:4947 and with standard accessories.	Nos	2						
5	Supply and fixing of approved equivalent make HFC236fa Instaprotect (modular type), 10kg ceiling mounted fire extinguisher. Body hydro tested at 35bar, operating temperature -30°C to +55°C, external epoxy powder coating with PO shade No 538 of IS 5, supplied with standard accessories.Charged pressure 8kg/cm2. Cylinder must be subjected to Anti-corrosive treatment of 7 tank process. a. Firespot-Room Protection system-Clean Agent-HFC236fa- Modular-10 kg with solenoid valve,2 nos smoke detector ,fire alarm panel.Gunnebo or equivalent approved make control unit(SMS alert for Leak alarm), Hooter.	Set	Qro						
	SUB TOTAL-D								
E	GAS SUPPRESSION SYSTEM								
1	Suply and installlion of Novec 1230 System Siemens or Equivalent make, with 140 Ltrs. Cylinder with Valve & Container Straps with Sinorix 1230 gas	Nos	2						
2	Supply and fixing of Master cylinder comprising of Pr. Guage, Low Pr. Supervisory Switch, Electromagnetic Actuator, Pneumatic Actuator, Flexible Discharge Hose, Flexible Actuation Hose+1, Tee + 1, Elbow 7/16 JIC - 1/8 NPT,with Manual Actuator	Set	1						
3	Supply and fixing of check valves	Nos	2						
4	Supply and fixing of nozzles	Nos	6						
5	Supply and fixing of pressure switch	Nos	1						
6	Supply and fixing of Seamless Schedule 40 Piping, fittings & supports, etc. inclusive of all necessary fixing accessories, joints, bends, couplers as requires.	Lot	1						
7	Supply and fixing of Covetional Zzone Fire Alarm panel with Battery back, LCD Display	Nos	1						
8	Supply and fixing of Ravel or equivalent make smoke detectors with base	Nos	6						
9	Supply and fixing of Ravel or equivalent make Heat detectors with base	Nos	6						
10	Supply and fixing of Ravel or equivalent make Manual Release Switch with back box & necessary glass on top	Nos	1						
11	Supply and fixing of Ravel or equivalent make Abort Switch along with back box	Nos	1						
12	Supply and laying of 2c x 1.5 sq.mm FRLS Armour copper cable with accessories.	RMT	30						
	SUB TOTAL E								
	Grand Total for Fire Protection Systems								
	Grand Total for ACMV,IBMS & Fire Protection Systems								