

AVIATION COMPLEX AT BLUE AREA, ISLAMABAD

BIL NO. 2.A: PLUMBING WORKS

BILL OF QUANTITIES

Item No.	Item Description	Unit	Qty	Unit Rate (Rs.)	Total Amount (Rs.)
(i)	(ii)	(iii)	(iv)	(v)	(vi)

GENERAL NOTE

Supply, installation, testing and commissioning of the following items of work, including all labour, tools, plant, accessories, etc. required for completion of each item as per drawings, specifications and as approved by the Engineer.

A. SANITARY FIXTURES AND FITTINGS

(Ref. Specs 5100)

BP-01	Wall hung water closet vitreous china including hydraulic seat & cover with concealed flushing cistern, water saving dual flush button plate, concealed drain bend and all other accessories, etc. complete in all respects, imported of approved make, model & size fixed to concrete, brick or stone work. (for executive toilets)	Each	34
BP-02	European water closet with flushing cistern water saving dual flush type (one piece set), vitreous china, including hydraulic seat & cover, CP tee stop cock, flexible connection etc. complete in all respects, of approved make, model & size fixed to concrete, brick or stone work.	Each	238
BP-03	European water closet with flushing cistern water saving dual flush type (one piece set), vitreous china, including hydraulic seat & cover, CP tee stop cock, flexible connection etc. complete in all respects, of approved make, model & size fixed to concrete, brick or stone work. (for Handicapped Toilet)	Each	51
BP-04	Water closet Asiatic pattern, vitreous china, with integral foot rest, including uPVC P-trap, flushing cistern, CP tee stop cock, flexible connection, flush pipe etc. complete in all respects, of approved make, model & size fixed to concrete, brick or stone work.	Each	154
BP-05	Vanity type wash hand basin (undercounter), vitreous china, including CP lever type hot & cold water mixer, CP 1.25" waste, CP bottle trap with union 1.25", CP Tee stop cocks, flexible connections, jointing and sealing material, etc. complete in all respects, of approved make, model & size fixed to concrete, brick or stone work.	Each	349

Item No.	Item Description	Unit	Qty	Unit Rate (Rs.)	Total Amount (Rs.)
(i)	(ii)	(iii)	(iv)	(v)	(vi)
BP-06	Vanity type wash hand basin (undercounter), vitreous china, including CP sensor type hot & cold water mixer, CP 1.25" waste, CP bottle trap with union 1.25", CP Tee stop cocks, flexible connections, jointing and sealing material, etc.complete in all respects, imported of approved make, model & size fixed to concrete, brick or stone work. (for executive toilets)	Each	42		
BP-07	Wash hand basin with half pedestal, vitreous china, including CP lever type hot & cold water mixer, CP 1.25" waste, CP bottle trap with union 1.25", CP Tee stop cocks, flexible connections, jointing and sealing material, etc.complete in all respects, of approved make, model & size fixed to concrete, brick or stone work. (for Handicapped Toilet)	Each	51		
BP-08	Providing and fixing CP Lever type Bath shower of open wall installation style of approved make jointing and sealing material, fixed to concrete, brick, stone or wood work complete in all respects.	Each	1		
BP-09	Providing and fixing CP Lever type Bath shower of open wall installation style imported of approved make jointing and sealing material, fixed to concrete, brick, stone or wood work complete in all respects. (for executive toilets)	Each	14		
BP-10	Stainless Steel Kitchen sink single bowl including swan neck CP sink mixer, CP waste 1-1/2" dia., heavy duty MS painted brackets etc., of approved make, model & size complete in all respects fixed to concrete, brick or stone work.	Each	51		
BP-11	CP Muslim shower combined with double bib cock including all fittings.	Each.	431		
BP-12	CP Muslim shower combined with double bib cock imported of approved make including all fittings. (for executive toilets)	Each.	46		
BP-13	Providing and fixing CP Ablution Mixer of approved make jointing and sealing material, fixed to concrete, brick, stone or wood work complete in all respects.	Each.	24		
BP-14	Grab Bars set (02 folding) with WC, of non slip finish for handicapped toilet of approved make, size & shap with all fittings for complete installation.	Each.	51		
BP-15	Grab Bars set (02No.fixed) with wash hand basin, of non slip finish for handicapped toilet of approved make, size & shap with all fittings for complete installation.	Each.	51		
BP-16	CP Bib cock including all fittings for complete installation.	Each.	208		
BP-17	CP Bib cock with locking arrangement including all fittings for complete installation.	Each.	10		

Item No.	Item Description	Unit	Qty	Unit Rate (Rs.)	Total Amount (Rs.)
(i)	(ii)	(iii)	(iv)	(v)	(vi)
BP-18	Providing and fixing 05 piece CP Bath Accessories set comprising CP toilet paper holder, CP Soap dish, CP towel rail, CP towel ring and CP robe hook with brackets, fixing plugs and screws etc. imported of approved make fixed to concrete, brick, stone or wood work, complete in all respects. (for executive toilets)	Each	14		
BP-19	Providing and fixing glass cosmetic shelf with brackets, fixing plugs and screws etc. of approved make fixed to concrete, brick, stone or wood work, complete in all respects.	Each	51		
BP-20	Providing and fixing CP Towel Rail 600mm long, with fixing plugs and screws etc. of approved make fixed to concrete, brick, stone or wood work, complete in all respects.	Each	167		
BP-21	CP Toilet paper holder of any shape, pattern and size, of approved make, complete with plugs, screws etc., fixed to concrete, brick, stone or wood work, complete in all respects.	Each	232		
BP-22	CP Soap Dispenser of any shape, pattern and size having capacity of 0.5Liter, of approved make, complete with plugs, screws etc., fixed to concrete, brick, stone or wood work, complete in all respects.	Each	277		
BP-23	CP Soap Dish of any shape, pattern and size, of approved make, complete with plugs, screws etc., fixed to concrete, brick, stone or wood work, complete in all respects .	Each	436		
BP-24	Small hook complete of any size and shape, of approved make, with plugs and screws, fixed to concrete, brick stone or wood work, complete in all respects.	Each	477		
BP-25	05mm thick Glass mirror Belgium make or approved equivalent including hard board behind it, approved bedding around it and all other fittings for complete installation	Sft	4,200		
BP-26	Electric water heater of 30liters capacity, including tee stop cocks on inlet/outlet connections and all other accessories for complete installation.	Each.	1		
BP-27	Electric Hand Dryer (automatic) with easy to mount kit of approved make & model and all required accessories complete.	Each.	111		
BP-28	Electric water coolers of 40Gallons capacity, minimum two taps, including Tee stop cock on inlet, and all other accessories for complete installation.	Each.	102		
BP-29	Triple water filter (10") including inlet and outlet connections, power supply, and all accessories for complete installation	Each.	1		

Item No.	Item Description	Unit	Qty	Unit Rate (Rs.)	Total Amount (Rs.)
(i)	(ii)	(iii)	(iv)	(v)	(vi)

B. WATER SUPPLY PIPES AND FITTINGS

(Ref. Specs 5100, 5220)

G.I. water pipes conforming to BS-1387, Medium Grade, l/c all fittings, wrapping polythene tape, giving anticorrosion treatment, 25mm thick glass wool thermal insulation, aluminium vapour barrier, 28swg GI cladding, applying protective painting, clamps, hangers & supports, making holes in concrete or masonry and then repairing holes, flushing, disinfecting, testing and commissioning etc. of approved make, of the following diameters complete in all respects.

BP-30	(a) 3/4 inch	Rft	10
BP-31	(b) 1 inches	Rft	315
BP-32	(c) 1-1/4 inches	Rft	340
BP-33	(d) 1-1/2 inches	Rft	10
BP-34	(e) 2 inches	Rft	580
BP-35	(f) 2-1/2 inches	Rft	105
BP-36	(g) 3 inches	Rft	35
BP-37	(h) 4 inches	Rft	270
BP-38	(i) 6 inches	Rft	10

G.I. water pipes conforming to BS-1387, Medium Grade, l/c all fittings, wrapping polythene tape, giving anticorrosion treatment, applying protective painting, clamps, hangers & supports, making holes in concrete or masonry and then repairing holes, flushing, disinfecting, testing and commissioning etc. of approved make, of the following diameters, complete in all respects.

BP-39	(a) 3/4 inch	Rft	10
BP-40	(b) 1 inches	Rft	15
BP-41	(c) 1-1/4 inches	Rft	175
BP-42	(d) 1-1/2 inches	Rft	80
BP-43	(e) 2 inches	Rft	15
BP-44	(f) 2-1/2 inches	Rft	10
BP-45	(g) 3 inches	Rft	190
BP-46	(h) 4 inches	Rft	1,260
BP-47	(i) 6 inches	Rft	25

Item No.	Item Description	Unit	Qty	Unit Rate (Rs.)	Total Amount (Rs.)
(i)	(ii)	(iii)	(iv)	(v)	(vi)
	PPR water pipes PN-20 (for Drinking water supply), inside building (un-exposed to sunlight conditions) conforming to DIN 8077-78, I/c all fittings (PN-25), clamps, hangers & supports, cutting, jointing, making holes in concrete or masonry and then repairing holes, supports and hangers etc. of approved make of the following diameters.				
BP-48	(a) 25mm	Rft	4,770		
BP-49	(b) 32mm	Rft	180		
BP-50	(c) 40mm	Rft	515		
BP-51	(d) 50mm	Rft	10		
	PPR water pipes PN-20 (for Drinking water supply), inside building (on roof) conforming to DIN 8077-78, I/c all fittings (PN-25), with 25mm thick glass wool thermal insulation, aluminium vapour barrier, 28swg GI cladding, clamps, hangers & supports, cutting, jointing, making holes in concrete or masonry and then repairing holes, supports and hangers etc. of approved make of the following diameters.				
BP-52	(a) 40mm	Rft	10		
BP-53	(b) 50mm	Rft	335		
	PPR water pipes PN-20 (for cold water supply), inside building (un-exposed to sunlight conditions) conforming to DIN 8077-78, I/c all fittings (PN-25), clamps, hangers & supports, cutting, jointing, making holes in concrete or masonry and then repairing holes, supports and hangers etc. of approved make of the following diameters.				
BP-54	(a) 25mm	Rft	15,500		
BP-55	(b) 32mm	Rft	7,410		
BP-56	(c) 40mm	Rft	4,555		
BP-57	(d) 50mm	Rft	2,565		
BP-58	(e) 63mm	Rft	1,240		
BP-59	(f) 75mm	Rft	180		
BP-60	(g) 90mm	Rft	120		
BP-61	(h) 110mm	Rft	355		

Item No.	Item Description	Unit	Qty	Unit Rate (Rs.)	Total Amount (Rs.)
(i)	(ii)	(iii)	(iv)	(v)	(vi)
	PPR water pipes PN-20 (for hot water and hot water return), inside building (un-exposed to sunlight conditions) conforming to DIN 8077-78, l/c all fittings (PN-25), 25mm thick glass wool thermal insulation, aluminium vapour barrier, clamps, hangers & supports, cutting, jointing, making holes in concrete or masonry and then repairing holes, supports and hangers etc. of approved make of the following diameters.				
BP-62	(a) 20mm	Rft	3,800		
BP-63	(b) 25mm	Rft	7,500		
BP-64	(c) 32mm	Rft	2,155		
BP-65	(d) 40mm	Rft	2,540		
BP-66	(e) 50mm	Rft	2,260		
BP-67	(f) 63mm	Rft	120		
BP-68	(g) 75mm	Rft	415		
BP-69	(h) 90mm	Rft	10		
	G.I. pipes with specials and clamps etc, conforming to ASTM A-106 A53 Sch: 40, Grade-B including fittings & specials , fixing, cutting, welding, fixing & support systems; and other fittings complete with and including the cost of breaking, through walls and slabs, making walls & slabs good thereafter, etc, painting with two coats of approved enamel paint after cleaning the pipe.				
BP-70	(a) 1-1/2 inches	Rft	10		
BP-71	(b) 2 inches	Rft	10		
BP-72	(c) 3 inches	Rft	10		
BP-73	(e) 4 inches	Rft	1,430		
BP-74	(f) 6 inches	Rft	1,865		

Item No.	Item Description	Unit	Qty	Unit Rate (Rs.)	Total Amount (Rs.)
(i)	(ii)	(iii)	(iv)	(v)	(vi)

C. SOIL, WASTE AND VENT PIPES & FITTINGS

(Ref. Specs 5100)

Toilet & Kitchen Drainage

uPVC Soil, Waste and vent pipes conforming to ISO:3633 type "B" or BS-4514/5255 class "A" of the following diameters, including imported rubber ring/solvent cement fittings, jointing, cutting, breaking concrete/masonry and then making it good, core cutting & filling with non shrink grout of approved manufacturer wherever required and applying painting, cleaning and testing etc. complete in all respects.

BP-75	(a) 1-1/2 inches	Rft	5,130
BP-76	(b) 2 inches	Rft	10,260
BP-77	(c) 3 inches	Rft	28,570
BP-78	(d) 4 inches	Rft	18,220
BP-79	(e) 6 inches	Rft	6,395

25mm thick glass wool insulation with aluminium vapour barrier for Sanitary & Storm drainage pipes soundproofing inside the building including taping/wrapping all related works for complete installation, of approved manufacturer of the following pipe diameters:

BP-80	(a) 2 inches	Rft	10
BP-81	(b) 3 inches	Rft	250
BP-82	(c) 4 inches	Rft	250
BP-83	(d) 6 inches	Rft	500

BP-84	uPVC Multi Floor Trap (110x75mm) with CP Push fit Top Tile strainer; supports; making required number of connections; breaking concrete or masonry work & then making it good; etc.	Each	282
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BP-85	3"dia uPVC Floor Trap with CP Push fit Top Tile strainer; supports; making required number of connections; breaking concrete or masonry work & then making it good; etc.	Each	640
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uPVC Cleanout plugs of the following diameter, including access plug, transition pipe, breaking concrete or masonry work & then making it good, etc. complete in all respects.

BP-86	(a) 3 inches	Each	255
BP-87	(b) 4 inches	Each	205
BP-88	(c) 6 inches	Each	15

Item No.	Item Description	Unit	Qty	Unit Rate (Rs.)	Total Amount (Rs.)
(i)	(ii)	(iii)	(iv)	(v)	(vi)
	uPVC floor Cleanout of the following diameter, including screw type Stainless Steel/CP top tile access plug, transition pipe, breaking concrete or masonry work & then making it good, etc. complete in all respects.				
BP-89	(a) 3 inches	Each	1		
BP-90	(b) 4 inches	Each	1		
	Cawal on vent pipes of the following diameter.				
BP-91	(a) 3 inches	Each	1		
BP-92	(b) 4 inches	Each	18		
BP-93	(c) 6 inches	Each	4		
	<u>Basement Drainage</u>				
	uPVC Basement parking drainage pipes conforming to ISO:3633 type "B" or BS-4514/5255 class "A" of the following diameters, including imported rubber ring/solvent cement fittings, jointing, cutting, breaking concrete/masonry and then making it good, core cutting & filling with non shrink grout of approved manufacturer wherever required and applying painting, cleaning and testing etc. complete in all respects.				
BP-94	(a) 3 inches	Rft	10		
BP-95	(b) 4 inches	Rft	960		
BP-96	(c) 6 inches	Rft	8,385		
BP-97	04inches diameter Cast Iron Parking Drain with SS Top strainer of approved size, shape & make; supports; making required number of connections; breaking concrete or masonry work & then making it good; etc.	Each	190		
	uPVC Cleanout plugs of the following diameter, including access plug, transition pipe, breaking concrete or masonry work & then making it good, etc. complete in all respects.				
BP-98	(a) 6 inches	Each	90		
	G.I. pipes with specials and clamps etc, conforming to ASTM A-106 A53 Sch: 40, Grade-B including fittings & specials , fixing, cutting, welding, fixing & support systems; and other fittings complete with and including the cost of breaking, through walls and slabs, making walls & slabs good thereafter, etc, painting with two coats of approved enamel paint after cleaning the pipe.				
BP-99	(a) 2 inches	Rft	10		
BP-100	(b) 3 inches	Rft	2,660		

Item No.	Item Description	Unit	Qty	Unit Rate (Rs.)	Total Amount (Rs.)
(i)	(ii)	(iii)	(iv)	(v)	(vi)
<u>Storm drainage</u>					
uPVC storm drainage pipes conforming to ISO:3633 type "B" or BS-4514/5255 class "A" of the following diameters, including imported rubber ring/solvent cement fittings, jointing, cutting, breaking concrete/masonry and then making it good, core cutting & filling with non shrink grout of approved manufacturer wherever required and applying painting, cleaning and testing etc. complete in all respects.					
BP-101	(a) 3 inches	Rft	120		
BP-102	(b) 4 inches	Rft	140		
BP-103	(c) 6 inches	Rft	5,865		
Cast Iron roof drain, Angle type, of approved shape & make of following diameters, including Stainless steel/Brass strainer, flushing material, and all accessories for complete installation, as per specifications.					
BP-104	(a) 3 inches	Each	1		
BP-105	(b) 4 inches	Each	6		
BP-106	(c) 6 inches	Each	4		
Cast Iron roof drain, Globe type, of approved shape & make of following diameters, including strainer, flushing material, and all accessories for complete installation, as per specifications.					
BP-107	(a) 3 inches	Each	10		
BP-108	(b) 4 inches	Each	1		
BP-109	(c) 6 inches	Each	12		
BP-110	Construction of Gully Trap Chamber (12" x12" clear) including supply & fixing of 4" deep seal C.I. gully trap, construction of 4-1/2" thick brick masonry in 1:4 c/s mortar, 3" thick 1:4:8 P.C.C at bottom, 1:3:6 P.C.C around trap, (12" x 12") CI cover with frame (7 Kg), 1/2" thick 1:3 c/s plaster on inner face, etc complete in all respects as shown in drawings or as directed.	Each	8		
BP-111	Stainless Steel SS-304 Grease interceptor of 10gpm capacity with dia 2" inlet & outlet connections, complete unit of approved make, complete in all respects.	Each	1		

D. VALVES AND FITTINGS
(Ref. Specs 5100, 5220)

Item No.	Item Description	Unit	Qty	Unit Rate (Rs.)	Total Amount (Rs.)
(i)	(ii)	(iii)	(iv)	(v)	(vi)
Brass gate valves, PN-16 conforming to BS standards of approved make or equivalent, including unions and jointing arrangement of pipes on both ends of valves; nuts, bolts etc. complete in all respects, of following internal diameters.					
BP-112	(a) 1/2 inch	Each	5		
BP-113	(b) 3/4 inch	Each	835		
BP-114	(c) 1 inch	Each	65		
BP-115	(d) 1-1/4 inch	Each	116		
BP-116	(e) 1-1/2 inch	Each	53		
BP-117	(f) 2 inch	Each	6		
Ductile Iron gate valves metal seated for potable water supply pipes conforming to BS-5163 (PN-16) including Adapters, flanges, nuts & bolts, transition pipe pieces with flanges, rubber seal, making required type of joints on both ends complete in all respect as shown on drawings or as directed by the Engineer of following diameters.					
BP-118	(a) 2-1/2 inches	Each	4		
BP-119	(b) 03 inches	Each	22		
BP-120	(c) 04 inches	Each	26		
BP-121	(d) 06 inches	Each	10		

Item No.	Item Description	Unit	Qty	Unit Rate (Rs.)	Total Amount (Rs.)
(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Brass swing type check valve, PN-16, conforming to BS standards of approved make or equivalent, including jointing arrangement of pipes on both ends of valves; nuts, bolts etc. complete in all respects, of following internal diameters.				
BP-122	(a) 01 inch	Each	1		
BP-123	(b) 1-1/4 inches	Each	2		
BP-124	(c) 1-1/2 inches	Each	1		
BP-125	(d) 02 inches	Each	1		
	Ductile Iron check valves metal seated for potable water supply pipes conforming to BS-5153 (PN-16) including Adapters, flanges, nuts & bolts, transition pipe pieces with flanges, rubber seal, making required type of joints on both ends complete in all respect as shown on drawings or as directed by the Engineer of following diameters.				
BP-126	(a) 03 inches	Each	10		
BP-127	(b) 04 inches	Each	1		
BP-128	(c) 06 inches	Each	1		
	Ductile Iron Flexible rubber joint (flanged) for potable water supply pipes conforming to BS standards (PN-16) including Adapters, flanges, nuts & bolts, transition pipe pieces with flanges, rubber seal, making required type of joints on both ends complete in all respect as shown on drawings or as directed by the Engineer of following diameters.				
BP-129	(a) 06 inches	Each	3		
	Ductile Iron Y-strainer with drain valve for potable water supply pipes conforming to BS standards (PN-16) including Adapters, flanges, nuts & bolts, transition pipe pieces with flanges, rubber seal, making required type of joints on both ends complete in all respect as shown on drawings or as directed by the Engineer of following diameters.				
BP-130	(a) 06 inches	Each	3		

Item No.	Item Description	Unit	Qty	Unit Rate (Rs.)	Total Amount (Rs.)
(i)	(ii)	(iii)	(iv)	(v)	(vi)
	Pressure reducing valve (PRV) arrangement/ station on water supply line comprising 01No. Brass/bronze pressure reducing valve and 03No. brass/bronze gate valves of PN16 pressure rating including fittings/unions, specials, jointing arrangement of pipes on both ends of valves, etc complete in all respects as per drawing of followings internal diameters:				
BP-131	(a) 3/4 inch	Each	4		
BP-132	(b) 1 inch	Each	6		
BP-133	(c) 1-1/4 inch	Each	32		
BP-134	(d) 1-1/2 inch	Each	32		
BP-135	(e) 2 inch	Each	1		
	Automatic Air relief valves, conforming to BS standards, PN-16, of approved make, including jointing arrangement of pipes on both ends of valves; nuts, bolts etc. complete in all respects..				
BP-136	(a) 3/4 inch	Each	16		
	Providing and Fixing Heavy duty uPVC, ball float valve set including 02number float valves (one working 2nd standby) with flanges and jointing arrangement with pipe; etc. complete in all respects.				
BP-137	(a) 03 inch	Each	4		

E. PLUMBING EQUIPMENT

SPECIAL NOTE

All jobs under this Section-E will include system control unit integration requirements with BMS. This integration shall be done over industry standard BACNet over IP Protocol and respective equipment suppliers are required to provide communication interfaces/cards supporting said Protocol, including providing, installing, testing & commissioning all required equipment/accessories for completion of each item, as per BMS specifications and as approved by the Engineer.

Item No.	Item Description	Unit	Qty	Unit Rate (Rs.)	Total Amount (Rs.)
(i)	(ii)	(iii)	(iv)	(v)	(vi)
PUMPING MACHINERY (Ref. Specs 5240)					
BP-138	Automatically operated skid mounted horizontal centrifugal pump set (in pump room with UGWT) for lifting water from Underground water tank to Service floor water tank for potable water , comprising two (02) number pumps with electric motors (one working second standby), Each of Head=10Bars and discharge=500gpm, including all accessories, level switches to be installed in service floor tank & under ground water tank for automatic operation of pumps at set levels, dry running protection, combined motor control unit with automatic electronic duty cycle relay, check/test return line with flow meter, pressure gauges, Gate valves, check valves, flexible joints, Strainers, etc all of PN-16 pressure rating, manual tools, spare parts etc, complete in all respects as shown in drawings and as directed by the Engineer,	Job	1		
BP-139	Automatically operated skid mounted vertical centrifugal pump set (in service floor pump room) for lifting water from Service floor water tank to Overhead water tank for potable water , comprising two (02) number pumps with electric motors (one working second standby), Each of Head=08Bars and discharge=250gpm, including all accessories, level switches to be installed in service floor tank & under ground water tank for automatic operation of pumps at set levels, dry running protection, combined motor control unit with automatic electronic duty cycle relay, check/test return line with flow meter, pressure gauges, Gate valves, check valves, flexible joints, Strainers, etc all of PN-16 pressure rating, manual tools, spare parts etc, complete in all respects as shown in drawings and as directed by the Engineer,	Job	1		
BP-140	Automatically operated skid mounted vertical centrifugal pump set (in service floor pump room) for lifting water from Service floor water tank to Overhead water tank for HVAC water , comprising two (02) number pumps with electric motors (one working second standby), Each of Head=08Bars and discharge=250gpm, including all accessories, level switches to be installed in service floor tank & under ground water tank for automatic operation of pumps at set levels, dry running protection, combined motor control unit with automatic electronic duty cycle relay, check/test return line with flow meter, pressure gauges, Gate valves, check valves, flexible joints, Strainers, etc all of PN-16 pressure rating, manual tools, spare parts etc, complete in all respects as shown in drawings and as directed by the Engineer,	Job	1		

Item No.	Item Description	Unit	Qty	Unit Rate (Rs.)	Total Amount (Rs.)
(i)	(ii)	(iii)	(iv)	(v)	(vi)
BP-141	Automatically operated submersible drainage pump set to be installed in Basement-06 Sump pits , comprising 02No. pumps both working (lead & Lag) (minimum particle passage : 50mm) including all accessories, duct foot bend, guide rail ,pulling chain, Combined Motor Control panel, level switches, automatic electronic duty cycle relay manual tools spare parts, complete in all respects as per drawings and specs of approved make, Each pump of the following capacity and pumping head. Capacity = 100 gpm Head =3.5Bars	Job	4		
BP-142	Automatically operated submersible drainage pump to be installed in Basement-06 Lift pits , comprising 01No. pump with motor (minimum particle passage : 25mm) including all accessories, Motor Control panel, level switches, manual tools spare parts, complete in all respects as per drawings and specs of approved make, Each pump of the following capacity and pumping head. Capacity = 20 gpm Head =01 Bar	Job	8		
BP-143	Skid mounted, automatically operated fully integrated self priming Pressure Booster pump set for potable water supply comprising 04 pumps (03 working & 01 standby) with electric motors and integrated parts (intelligent controller, speed-controlled drive (VFD), integrated pressure tank, sensors, gate valves, non return valves, strainer etc) including all accessories, Motor control unit, Pressure switches, pressure guages, manual, tools, spare parts etc, Ech pump of the following Capacity and Pumping head. Capacity = 100 US gpm Head =02-03 Bars	Job	2		
BP-144	Hot water In-Line recirculation pump set comprising 02 pumps (01 working, 01 standby) with electric motor, including temperature sensor to automatically start & stop the pump to maintain desired temperature level, stainless stell impeller and shaft, gate valves, check valve and all other accessories for complete installation, manual, tools, spare parts etc.each pump of the following tentative Capacity and Pumping head. Capacity = 30 US gpm Head = 01 Bar	Job	2		

Item No.	Item Description	Unit	Qty	Unit Rate (Rs.)	Total Amount (Rs.)
(i)	(ii)	(iii)	(iv)	(v)	(vi)

DRINKING WATER FILTERATION PLANT

BP-145	Skid mounted Reverse Osmosis (RO) 3000 US Gallons Per Day Water Desalination / Reverse Osmosis System/plant complete for Drinking water supply, including treated water storage tanks 02No. each of 500gallons capacity, pressure pump with pressure tank and pressure sensors for auto operation, gate & check valves, inlet outlet connections, and all other accessories (all imported) complete unit for installation, of approved make. Major components: - Pressure booster feed pump set - Silica sand filter - Activated carbon filter - Jumbo cartridge filters 05 micron - Anti scalant dosing - RO unit - Treated watre storage tank - Booster Supply pump set - Granular Activated Carbon Filter - Jumbo cartridge filters 01 micron - UV Sterilizer tubes. - pressure pipes and guages.	Each	1		
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WATER SOFTNER PLANT

BP-146	Automatically operated Water Softener unit with backwashing and regeneration operations for potable water, to be installed on cold water supply line to hot water boiler; including sand filter, softener, control panel, multiport valve, gate & check valves, level switches, pressure guages, strainer, inlet & outlet connections, and all other accessories & equipment for complete installation as per water quality to be treated, uPVC pipes and fittings, installation, testing and commissioning, complete in all respects; of following capacity. Capacity = 50 USgpm	Each	2		
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HOT WATER SUPPLY BOILERS

Lower Zone (basements to Sevice floor)

BP-147	Supply, installation, testing and commissioning of Hot Water Boiler plant to deliver hot water from 40°F to 140°F to plumbing system; comprising of the following components complete in all respects: (a) Dual Fuel Burner (Gas and Diesel) Hot Water Boiler, boiler unit shall have tentative output capacity of 425KW with minimum working pressure of 03 bar, minimum efficiency 90%. The boiler shall be imported of European origin and constructed to CE Certified to the PED (Pressure Equipment Directive). The burner safety and operating controls shall incorporate the following: 1. Boiler on/off Switch	Job	1		
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Item No.	Item Description	Unit	Qty	Unit Rate (Rs.)	Total Amount (Rs.)
(i)	(ii)	(iii)	(iv)	(v)	(vi)
	2. Power ON indication light 3. Burner Control Programmer 4. Regulation thermostat 5. Safety Hi-limit thermostat 6. Water thermometer 0-120°C 7. Gas burner complete with gas train & control box 8. Electronic ignition controller 9. Ignition electrode 10. Ignition transformer 11. Gas Pressure switch 12. Working regulation gas valve 13. Safety gas valve The burner, ancillary equipment and controls shall all be assembled at the factory. The boiler control panel incorporating the electrical safety and operating controls shall be pre-wired and fully tested. (b) Two (02) Hot water storage calorifiers, each of 2500 liters capacity (Total capacity 5000 liters), constructed with high quality steel, built-in coil heat exchanger, working pressure minimum 10Bars, working temperature upto 95°C, High quality enamel coated from inside in accordance with DIN 4753-3, 18kg/m³ soft PU/Sponge foam insulation, Artificial Leather outer coating, , Auto air vent, Pressure gauge, Tank water thermometer bi-metal type, Valve drain at bottom of tank, In/Out/re-circulation connection sockets, Magnesium Anode protection, maximum legionella protection. Tank shall conform to TS 736 and TS EN 13445-3 standards or equivalent. (c) Diaphragm type expansion tank capacity 200-300 liters each, temperature range from -10°C to +100°C, design pressure 10 bars, food graded odourless EPDM membrane, air charging/relief valve. (d) Inline hot water circulation pump between storage tanks/calorifiers and hot water boilers, with VFD control and LCD display for water circulation from Boiler to Storage tank/calorifier coil with three operation modes i) Constant pressure operating mode ii) Variable pressure operating mode iii) Manual operating mode (e) Automatic control panel for temperature control and safety of system; comprising circuit breakers, overload relays, phase sequence relays, phase failures, temperature control and low water cut-off devices (f) Oil/Diesel tank of capacity 2000 liters, with level and allied connections, vent and overflow, made of high quality steel. (g) Skid, interconnection pipe work with insulation & cladding, fittings, pressure relief valve, pressure switches with all necessary gauges, valves and safety devices etc.; complete in all respects.				

Item No.	Item Description	Unit	Qty	Unit Rate (Rs.)	Total Amount (Rs.)
(i)	(ii)	(iii)	(iv)	(v)	(vi)

Upper Zone (Service floor to 26th floor)

BP-148 Supply, installation, testing and commissioning of Hot Water Boiler plant to deliver hot water from 40°F to 140°F to plumbing system; comprising of the following components complete in all respects:

Job 1

- (a) Dual Fuel Burner (Gas and Diesel) Hot Water Boiler, boiler unit shall have **tentative output capacity of 250KW** with minimum working pressure of 03 bar, minimum efficiency 90%. The boiler shall be imported of European origin and constructed to CE Certified to the PED (Pressure Equipment Directive). The burner safety and operating controls shall incorporate the following:

1. Boiler on/off Switch
2. Power ON indication light
3. Burner Control Programmer
4. Regulation thermostat
5. Safety Hi-limit thermostat
6. Water thermometer 0-120°C
7. Gas burner complete with gas train & control box
8. Electronic ignition controller
9. Ignition electrode
10. Ignition transformer
11. Gas Pressure switch
12. Working regulation gas valve
13. Safety gas valve

The burner, ancillary equipment and controls shall all be assembled at the factory. The boiler control panel incorporating the electrical safety and operating controls shall be pre-wired and fully tested.

- (b) Two (02) Hot water storage calorifiers, each of 2000 liters capacity (Total capacity 4000 liters), constructed with high quality steel, built-in coil heat exchanger, working pressure minimum 10Bars, working temperature upto 95°C, High quality enamel coated from inside in accordance with DIN 4753-3, 18kg/m³ soft PU/Sponge foam insulation, Artificial Leather outer coating, , Auto air vent, Pressure gauge, Tank water thermometer bi-metal type, Valve drain at bottom of tank, In/Out/re-circulation connection sockets, Magnesium Anode protection, maximum legionella protection. Tank shall conform to TS 736 and TS EN 13445-3 standards or equivalent.
- (c) Diaphragm type expansion tank capacity 200-300 liters each, temperature range from -10°C to +100°C, design pressure 10 bars, food graded odourless EPDM membrane, air charging/relief valve.

Item No.	Item Description	Unit	Qty	Unit Rate (Rs.)	Total Amount (Rs.)
(i)	(ii)	(iii)	(iv)	(v)	(vi)
	(d) Inline hot water circulation pump between storage tanks/calorifiers and hot water boilers, with VFD control and LCD display for water circulation from Boiler to Storage tank/calorifier coil with three operation modes i) Constant pressure operating mode ii) Variable pressure operating mode iii) Manual operating mode				
	(e) Automatic control panel for temperature control and safety of system; comprising circuit breakers, overload relays, phase sequence relays, phase failures, temperature control and low water cut-off devices				
	(f) Oil/Diesel tank of capacity 2000 liters, with level and allied connections, vent and overflow, made of high quality steel.				
	(g) Skid, interconnection pipe work with insulation & cladding, fittings, pressure relief valve, pressure switches with all necessary gauges, valves and safety devices etc.; complete in all respects.				
F. MISCELLANEOUS ITEMS					
(Ref. Specs 5100, 5230)					
BP-149	Dia 2" u-turned G.I. vent pipes, puddle plate, with insect proof mesh at open end etc., complete in all respects.	Job	10		
BP-150	Dia 4" u-turned G.I. vent pipes, puddle plate, with insect proof mesh at open end etc., complete in all respects.	Job	14		
BP-151	3/4" diameter Galvanised MS ladder rungs for underground and overhead water tanks; each rung of 18" width, 6" projected outside the wall and 6" embedded in RCC on both ends; including all necessary works for complete installation.	Each	220		
	Heavy duty MS grating cover & frame on drain in 36inches openable panels as per drawings including coats of Red oxide/ enamel paint, including all fittings for complete installation.				
BP-152	(a) 12" wide	Rft	948		
BP-153	(b) 18" wide	Rft	300		
BP-154	(c) 24" wide	Rft	5		
	Cast Iron manhole cover & frame conforming to BS-497 including coats of Red oxide/ enamel paint, including all fittings for complete installation.				
BP-155	(a) 24" x 24" (70kg $\pm$ 5%)	Each	12		
BP-156	(b) 36" x 36" (150kg $\pm$ 5%)	Each	10		

Item No.	Item Description	Unit	Qty	Unit Rate (Rs.)	Total Amount (Rs.)
(i)	(ii)	(iii)	(iv)	(v)	(vi)
BP-157	(c) 36" x 36" (250kg ±5%) Cast Iron grating cover & frame conforming to BS-497 including coats of Red oxide/ enamel paint, including all fittings for complete installation.	Each	8		
BP-158	(a) 24" x 24" (70kg ±5%)	Each	10		
G. EXTERNAL WORKS (Ref. Specs 5100, 5216, 5220, 5230) G.I. water pipes conforming to BS-1387/BS EN- 10255, Medium Grade, l/c all fittings, wrapping polythene tape, giving anticorrosion treatment, applying protective painting, clamps, hangers & supports where required, making holes in concrete or masonry and then repairing holes, flushing, disinfecting, testing and commissioning etc. of approved make, of the following diameters, complete in all respects.					
BP-159	(a) 03 inches	Rft	200		
BP-160	(b) 04 inches uPVC non-pressure pipes for sanitary & storm drainage conforming to BS-5481/BS-4660 (SN8) with rubber ring fittings and specials compatible with pipe material as per manufacturer's recommendations, complete in all respects, flushing cleaning and disinfecting as per specifications and as directed by the Engineer of following diameters.	Rft	100		
BP-161	(a) 08 inches	Rft	50		
BP-162	(b) 10 inches	Rft	790		
BP-163	(c) 12 inches	Rft	210		
BP-164	(d) 18 inches	Rft	840		
Total Amount Rs.					