

Lebanese University Campus - Hadath

Work Parcel 1: Mechanical Works

1.3.1.10 Variable Air Volumes Schedule

Bldg	VAV-1	VAV-2	VAV-3	VAV-4	VAV-5	VAV-6	Total
Fine arts institute B	0	2	5	15	11	0	33
Faculty of law, political sciences and administratio D	0	19	64	12	15	4	114
Faculty of pharmacy H	1	22	16	12	4	9	64
Extention of the faculty of sciences J	0	14	0	23	5	0	42
Faculty of medical sciences M1	0	16	38	54	13	15	136
Faculty of dentistry M2	0	1	5	3	11	0	20
Faculty of public Q	3	12	15	52	13	6	101
Technical building T2-T3	0	0	0	10	1	0	11
Industrial research institute Y	0	8	5	16	5	0	34
Total	4	94	148	197	78	34	555

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Work Parcel 1: Mechanical Works**1.3.1.11 Table of Sanitary Fixtures and Fire Extinguishers**

Description	Qty.
Drinking Fountains	166
Lavatories*	857
EW C(European Water Closet)**	531
AW C(Asiatic Water Closet)**	250
Urinals**	341
Fire Extinguishers FE-1	1289
Fire Extinguishers FE-2	492
Fire Extinguishers FE-3	109
Showers*	143
Hand Dryers	330
Liquid Soap Dispensers	314
Paper Towel Dispensers	360

*:Complete with all related accessories,angle valves,mixers and taps

** :Complete with all related accessories,flush valves/tanks

N.B: This list excludes FOS sanitary fixtures and fire extinguishers

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1.3.2.1 - Work Parcel 1 - List of HVAC Equipment

Conference Center (Bldg.F) - O & M Ref:1.5.1 - Set 4 / Div 2

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
Cooling / Heating	Air Handling Unit (AHU-F-1)	58 T.R	1	Constant Air Volume AHU with Supply air flow 10380 lps, External Static pressure 208 Pa, with 2 coils (heating / cooling)	✓
	Air Handling Unit (AHU-F-2)	57 T.R	2	Constant Air Volume AHU with Supply air flow 6780 lps, External Static pressure 200 Pa, with 2 coils (heating / cooling)	✓
	Air Handling Unit (AHU-F-3)	48 T.R	1	Constant Air Volume AHU with Supply air flow 9150 lps, External Static pressure 248 Pa, with 2 coils (heating / cooling)	✓
	Air Handling Unit (AHU-F-4)	31 T.R	1	Constant Air Volume AHU with Supply air flow 4970 lps, External Static pressure 216 Pa, with 2 coils (heating / cooling)	✓
	Air Handling Unit (AHU-F-5)	58 T.R	1	Constant Air Volume AHU with Supply air flow 10577 lps, External Static pressure 214 Pa, with 2 coils (heating / cooling)	✓
	Air Handling Unit (AHU-F-6)	62 T.R	1	Constant Air Volume AHU with Supply air flow 9696 lps, External Static pressure 285 Pa, with 2 coils (heating / cooling)	✓
	Air Handling Unit (AHU-F-7)	60 T.R	1	Constant Air Volume AHU with Supply air flow 9900 lps, External Static pressure 252 Pa, with 2 coils (heating / cooling)	✓
	split unit	24000 BTU/hr	1	York decorative wall type pump mode III.HA24FSA	✓

Ventilation	F-F-1	11830 Lps @ 235 Pa	1	Centrifugal fan	✓
	F-F-2	3600 Lps @ 134 Pa	1	In Line Centrifugal fan	✓
	F-F-3	2470 Lps @ 137 Pa	1	In Line Centrifugal fan	✓
	F-F-4	2080 Lps @ 125 Pa	1	In Line Centrifugal fan	✓
	F-F-5	2080 Lps @ 101 Pa	1	In Line Centrifugal fan	✓
	F-F-6	4085 Lps @ 202 Pa	1	In Line Centrifugal fan	✓
	F-F-7	357 Lps @ 40 Pa	1	Propeller Fan	✓
	F-F-8	63 Lps @ 45 Pa	1	Propeller Fan	✓
	F-F-9	855 Lps @ 71 Pa	1	Roof type fan	✓
	F-F-10	90 Lps @ 57 Pa	1	Roof type fan	✓

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1.3.2.1 - Work Parcel 1 - List of HVAC Equipment

Conference Center (Bldg.F) - O & M Ref:1.5.1 - Set 4 / Div 2

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
Ventilation	F-F-11	1655 Lps @ 118 Pa	1	Roof type fan	✓
	F-F-12	1110 Lps @ 101 Pa	1	Roof type fan	✓
	F-F-13	939 Lps @ 100 Pa	1	Roof type fan	✓
	F-F-14	1287 Lps @ 109 Pa	1	Roof type fan	✓
	F-F-15	2400 Lps @ 150 Pa	1	Centrifugal fan	✓
	F-F-16	1252 Lps @ 143 Pa	1	Roof type fan	✓
	F-F-17	5915 Lps @ 111 Pa	1	Fire rated centrifugal fan	✓
	F-F-18	2000 Lps @ 137 Pa	1	Centrifugal fan	✓
	F-F-19	2250 Lps @ 118 Pa	1	Centrifugal fan	✓
	F-F-20	850 Lps @ 99 Pa	1	Centrifugal fan	✓
	F-F-21	380 Lps @ 110 Pa	1	Centrifugal fan	✓
	F-F-22	5915 Lps @ 134 Pa	1	Fire rated centrifugal fan	✓
	F-F-23	2250 Lps @ 137 Pa	1	Centrifugal fan	✓
	F-F-24	6597 Lps @ 169 Pa	1	Centrifugal fan	✓
	F-F-25	660 Lps @ 119 Pa	1	Roof type fan	✓
	F-F-26	350 Lps @ 76 Pa	1	Roof type fan	✓
	F-F-27	70 Lps @ 40 Pa	1	Propeller Fan	✓
	F-F-28	70 Lps @ 40 Pa	1	Propeller Fan	✓
Cooling	End Suction Pumps (P-F-1)	42.8 Lps @ 21 m Head	2	End suction centrifugal secondary chilled water pump	✓
Heating	End Suction Pumps (P-F-2)	18.5 Lps @ 18 m Head	2	End suction centrifugal secondary hot water pump	✓
	Circulator Pumps (P-F-3)	8.24 Lps @ 16 m Head	2	Circulators for Heat exchanger	✓
	Circulator Pumps (P-F-4)	0.5 Lps @ 10 m Head	2	Circulators for Hot water storage tank	✓
	Expansion Tank (EX-F-1)	300 Lps	1	Expansion tank for heating system	✓
	Hot Water Storage Tank (HWST-F-1)	1500 Liter	1	Horizontal Type Hot Water Storage Tank of 0.5 Lps flow	✓
	Heat Exchanger (HEX-F-1)	862 Kw	1	Heat Exchanger Primary temperature 95 deg C, secondary temperature 60	✓

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1.3.2.1 - Work Parcel 1 - List of HVAC Equipment

Conference Center (Bldg.F) - O & M Ref:1.5.1 - Set 4 / Div 2

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
Piping System & Insulation	Black Steel	—	—	25mm to 160mm DN	✓
	Galvanized Steel	—	—	20mm to 50mm DN	✓
	Fiber Glass insulation	—	—	15mm to 65 mm thickness	✓
Ducting System & Insulation	Galvanized steel ducts- Medium Pressure	—	—	Gauge thickness-	✓
	Galvanized steel ducts- Low Pressure	—	—	Gauge thickness-	✓
	Fiber Glass insulation	—	—	Blanket type/40 mm thick	✓
	VAV-1	0-230 Lps	—	With Thermostat	✓
	VAV-2	235-470 Lps	—	With Thermostat	
	VAV-3	475-660 Lps	—	With Thermostat	
	VAV-4	665-1040 Lps	—	With Thermostat	✓
	VAV-5	1045-1320 Lps	—	With Thermostat	
	VAV-6	1325-1890 Lps	—	With Thermostat	✓
Valves	Gate Valves	—	—	125mm	✓
	Balancing Valves (Double regulating valve)	—	—	40mm to 50mm	✓
	Ball Valves	—	—	50mm	✓

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1.3.2.1-Work Parcel 1- List of Plumbing Equipment

Conference Center (Bldg.F) - O & M Ref: 1.5.1 - Set 4 / Div 1

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
Soft Water	Water Softener (WS-F-1)	0.5 lps	1	Simplex type WS with Exchange capacity 69225 g/m3, Hardness at inlet 350 ppm, Hardness at outlet 5 ppm, & resin volume 36 L	✓
Hot Water	Circulator pumps (P-F-51)	0.13 lps @ 20 m head	2	Hot Water storage tank circulator pumps one acting as stand by	✓
Drainage	Submersible Pump (P-F-52)	3.5 lps @ 8 m head	2	One acting as standby	✓
	Submersible Pump (P-F-53)	2.3 lps @ 9 m head	2	One acting as standby	✓
	Submersible Pump (P-F-54)	0.3 lps @ 7 m head	2	One acting as standby	✓
Piping System & Insulation	PVC	—	—	16mm to 50mm DN	✓
	Copper	—	—	15mm to 54 mm DN	✓
	Cast Iron	—	—	75mm to 110mm DN	✓
	Polypropylene	—	—	50mm to 110mm DN	✓
	Galvanized Steel	—	—	20mm to 80mm DN	✓
	HDPE	—	—	50mm to 200mm DN	✓
	BSP	—	—	15mm to 42mm DN	✓
	Fiber Glass Insulation	—	—	25mm to 67mm thickness	✓
Valves	Ball Valves	—	21	15mm to 50mm	✓
	Gate Valves	—	5	65mm to 110mm	✓
	Globe Valves	—	2	15mm	✓
Sanitary Fixtures & Accessories	Drinking Fountain	—	3	—	✓
	Lavatory Mixer LAV-1	—	13	—	✓
	Lavatory Tap LAV-2	—	33	—	✓
	Lavatory Mixer LAV-3	—	2	—	✓
	Sink Mixer	—	—	—	✓
	Sink Tap	—	—	—	✓
	Mop Sink Tap	—	2	—	✓
	Shower Mixers (SH-1)	—	7	—	✓
	Bib Cock Perineal Hose	—	6	—	✓
	Angle Valves/Flexibles	—	63	—	✓
	WC Flush Valves	—	41	—	✓
	Urinal Flush Valves	—	10	—	✓
	Flush Tanks	—	2	—	✓
	Hand Dryers	—	16	S/S Hand Dryers	✓
	Liquid Soap Dispensers	—	30	S/S Liquid Soap Dispensers with lock key	✓
	Paper Towel Dispenser	—	18	S/S Paper Towel Dispenser with lock key	✓

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1.3.2.2 - Work Parcel 1 - List of HVAC Equipment

Sport Complex (Bldg K) - O & M Ref: 1.5.1 - Set 7 / Div 2

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
Ventilation	F-K1-1	550 Lps @ 92 Pa	2	In Line Centrifugal fan	✓
	F-K1-2	288 Lps @ 25 Pa	2	Propeller	✓
	F-K1-3	1310 Lps @ 126 Pa	1	In Line Centrifugal fan	✓
	F-K1-4	1250 Lps @ 165 Pa	1	In Line Centrifugal fan	✓
	F-K1-5	288 Lps @ 25 Pa	1	Propeller Fan	✓
	F-K1-6	180 Lps @ 64 Pa	1	In Line Centrifugal fan	✓
	F-K1-7	126 Lps @ 20 Pa	1	Propeller	✓
	F-K1-8	687 Lps @ 30 Pa	1	Propeller	✓
	F-K1-9	126 Lps @ 20 Pa	1	Propeller	✓
	F-K1-10	288 Lps @ 25 Pa	1	Propeller	✓
	F-K1-11	167 Lps @ 20 Pa	1	Propeller	✓
	F-K2-1A	720 Lps @ 96 Pa	1	In Line Centrifugal fan	✓
	F-K2-1B	960 Lps @ 98 Pa	1	In Line Centrifugal fan	✓
	F-K2-2	167 Lps @ 20 Pa	1	Propeller	✓
	F-K2-3	1175 Lps @ 102 Pa	1	In Line Centrifugal fan	✓
	F-K2-4	1075 Lps @ 106 Pa	1	In Line Centrifugal fan	✓
	F-K2-5	555 Lps @ 25 Pa	1	Propeller	✓
	F-K2-6	687 Lps @ 30 Pa	1	Propeller	✓
	F-K2-7	81 Lps @ 20 Pa	1	Propeller	✓
	F-K2-8	126 Lps @ 20 Pa	1	Propeller	✓
	F-K2-9	288 Lps @ 25 Pa	1	Propeller	✓
	F-K3-1	4800 Lps @ 104 Pa	1	In Line Centrifugal fan	✓
	F-K3-2	4400 Lps @ 108 Pa	1	In Line Centrifugal fan	✓
	F-K3-3	400 Lps @ 66 Pa	1	In Line Centrifugal fan	✓
	F-K3-4	1260 Lps @ 140 Pa	1	In Line Centrifugal fan	✓
	F-K3-5	630 Lps @ 78 Pa	1	Roof type fan	✓
	F-K3-6	1530 Lps @ 100 Pa	1	Roof type fan	✓
	F-K3-7	630 Lps @ 78 Pa	1	Roof type fan	✓

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1.3.2.2 - Work Parcel 1 - List of HVAC Equipment

Sport Complex (Bldg K) - O & M Ref: 1.5.1 - Set 7 / Div 2

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
Ventilation	F-K3-8	1530 Lps @ 100 Pa	1	Roof type fan	✓
	F-K3-9	222 Lps @ 62 Pa	1	Roof type fan	✓
Cooling/Heating	Split Unit-K1	24000 BTU/hr	1	MDV	✓
	Split Unit-K2	24000 BTU/hr	1	YORK decorative wall type pump mode HL.HA24FSA	✓
	Split Unit-K2	18000 BTU/hr	1	MDV	✓
	Split Unit-K3	24000 BTU/hr	1	MITSUBISHI	✓
	DX Unit-K3	12000 BTU/hr	1	O-GENERAL	✓
Heating	Circulator Pumps (P-K1-1)	1.4 Lps @ 10 m Head	2	Circulators for Hot water storage tank	✓
	Circulator Pumps (P-K2-1)	1.4 Lps @ 8 m Head	2	Circulators for Hot water storage tank	✓
	Circulator Pumps (P-K3-1)	2.8 Lps @ 12 m Head	2	Circulators for Hot water storage tank	✓
	Hot Water Storage Tank (HWST-K1-1)	1900 Liter	1	Vertical Type Hot Water Storage Tank of 1.4 Lps flow	✓
	Hot Water Storage Tank (HWST-K2-1)	1900 Liter	1	Horizontal Type Hot Water Storage Tank of 1.4 Lps flow	✓
	Hot Water Storage Tank (HWST-K3-1)	3800 Liter	1	Vertical Type Hot Water Storage Tank of 2.8 Lps flow	✓
Piping System & Insulation	Black Steel	—	—	Dia 25mm to Dia 160mm	✓
	Galvanized Steel	—	—	Dia 20mm to Dia 50mm	✓
	Fiber Glass insulation	—	—	15mm to 65 mm thickness	✓
Ducting System & Insulation	Galvanized steel ducts- Medium Pressure	—	—	Gauge thickness-	✓
	Galvanized steel ducts- Low Pressure	—	—	Gauge thickness-	✓
Valves	Gate Valves	—	—	50mm	✓
	Balancing Valves (Double regulating valve)	—	—	40mm to 50mm	✓
	Globe Valves	—	—		✓
	Ball Valves	—	—	40mm	✓

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1.3.2.2-Work Parcel 1- List of Plumbing Equipment

Sport Complex (Bldg K) - O & M Ref: 1.5.1 - Set 7 / Div 1

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
Domestic Hot Water	EWII-K32-1	100 Liter	1	Electric Water heater 3000 W	✓
Hot Water	Circulator pumps (P-K1-51)	0.26 lps @ 11 m head	2	Hot Water storage tank circulator pumps one acting as stand by	✓
	Circulator pumps (P-K2-52)	0.26 lps @ 11 m head	2	Hot Water storage tank circulator pumps one acting as stand by	✓
	Circulator pumps (P-K32-54)	0.38 lps @ 11 m head	2	Hot Water storage tank circulator pumps one acting as stand by	✓
Drainage	Submersible Pump (P-K32-51)	6.3 lps @ 9 m head	2	One acting as standby	✓
	Submersible Pump (P-K32-52)	6.3 lps @ 9 m head	2	One acting as standby	✓
	Submersible Pump (P-K32-53)	6.3 lps @ 9 m head	2	One acting as standby	✓
	Submersible Pump (P-K31-56)	4.5 lps @ 9 m head	2	One acting as standby	✓
Piping System & Insulation	PVC	—	—	16mm to 50mm DN	✓
	Copper	—	—	15mm to 54 mm DN	✓
	Cast Iron	—	—	75mm to 110mm DN	✓
	Polypropylene	—	—	50mm to 110mm DN	✓
	Galvanized Steel	—	—	20mm to 80mm DN	✓
	HDPE	—	—	50mm to 200mm DN	✓
	Black steel pipes	—	—	15mm to 42mm DN	✓
	Fiber Glass Insulation	—	—	25mm to 67mm thickness	✓
Valves	Ball Valves	—	—	15mm to 40mm	✓
	Gate Valves	—	—	50mm to 250mm	✓
	Globe Valves	—	—	20mm to 25mm	✓
	Pressure Reducing Valve (PRV-K3)	62 L/s	1	4" pressure reducing valve	✓
Sanitary Fixtures & Accessories	Drinking Fountain	—	7	—	✓
	Lavatory Mixer LAV-1	—	15	—	✓
	Lavatory Tap LAV-2	—	55	—	✓
	Lavatory Mixer LAV-3	—	10	—	✓
	Mop Sink Tap	—	5	—	✓
	Shower Mixers (SH-1)	—	11	—	✓
	Shower Mixers (SH-2)	—	61	—	✓
	Bib Cock Perineal Hose	—	14	—	✓
	Angle Valves/Flexibles	—	105	—	✓
	WC Flush Valves	—	57	—	✓
	Urinal Flush Valves	—	23	—	✓
	Flush Tanks	—	10	—	✓

Lebanese University Campus - Hadath**1.3.2.2-Work Parcel 1- List of Plumbing Equipment****Sport Complex (Bldg K) - O & M Ref: 1.5.1 - Set 7 / Div 1**

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
	Hand Dryers	—	14	S/S Hand Dryers	✓
	Liquid Soap Dispensers	—	57	Liquid Soap Dispensers with lock	✓
	Paper Towel Dispenser	—	25	Paper Towel Dispenser with lock	✓

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1.3.2.3 - Work Parcel 1 - List of HVAC Equipment

Library of Medical Sciences-(Bldg.M2) - O & M Ref: 1.5.1 - Set 9 / Div 2

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
Cooling / Heating	Air Handling Unit (AHU-M2-1)	23 T.R	1	Variable Air Volume AHU with Supply air flow 3580 lps, External Static pressure 811.3 Pa, with 2 coils (heating / cooling)	✓
	Air Handling Unit (AHU-M2-2)	21 T.R	1	Variable Air Volume AHU with Supply air flow 2920 lps, External Static pressure 656 Pa, with 2 coils (heating / cooling)	✓
	Air Handling Unit (AHU-M2-3)	51 T.R	1	Variable Air Volume AHU with Supply air flow 6372 lps, External Static pressure 993.6 Pa, with 2 coils (heating / cooling)	✓
	Air Handling Unit (AHU-M2-4)	43 T.R	1	Variable Air Volume AHU with Supply air flow 5016 lps, External Static pressure 928.5 Pa, with 2 coils (heating / cooling)	✓
Ventilation	Fan (F-M2-1)	450 Lps @ 100.1 Pa	1	Roof exhaust fan	✓
	Fan (F-M2-2)	6370 Lps @ 198.1 Pa	1	Exhaust centrifugal fan	✓
	Fan (F-M2-3)	910 Lps @ 103.6 Pa	1	Roof exhaust fan	✓
	Fan (F-M2-4)	105 Lps @ 59.5 Pa	1	Roof exhaust fan	✓
	Fan (F-M2-5)	247 Lps @ 69.1 Pa	2	Propeller	✓
	Fan (F-M2-6)	2495 Lps @ 392.6 Pa	1	Smoke exhaust fan	✓
Cooling	End Suction Pumps (P-M2-2)	13.37 Lps @ 21.04 m Head	2	End suction centrifugal secondary chilled water pump	✓

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1.3.2.3 - Work Parcel 1 - List of HVAC Equipment

Library of Medical Sciences-(Bldg.M2) - O & M Ref: 1.5.1 - Set 9 / Div 2

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
Heating	End Suction Pumps (P-M2-1)	5 Lps @ 18.07 m Head	2	End suction centrifugal secondary hot water pump	✓
	Circulator Pumps (P-M2-3)	2.22 Lps @ 13.91 m Head	2	Circulators for Heat exchanger	✓
	Expansion Tank (EX-M2-1)	250 L	1	Expansion tank for heating system	✓
	Heat Exchanger (HEX-M2-1)	234.47 Kw	1	Heat Exchanger Primary temperature 95 deg C, secondary temperature 60 deg C	✓

Piping System & Insulation	Black Steel			20mm to 300mm DN	✓
	Galvanized Steel			16mm to 50mm DN	✓
	Fiber Glass insulation			15mm to 50 mm thickness	✓

Ducting System & Insulation	GSD- Medium Pressure				✓
	GSD-Low Pressure				✓
	Fiber Glass insulation			Blanket type/40 mm thick	✓
	VAV-2	235-470 Lps		With Thermostat	✓
	VAV-3	475-660 Lps		With Thermostat	✓

Ducting System & Insulation	VAV-4	665-1040 Lps		With Thermostat	✓
	VAV-5	1045-1320 Lps		With Thermostat	✓
	VAV-6	1325-1890 Lps		With Thermostat	✓

Valves	Gate Valves			50mm to 100mm DN	✓
	Balancing Valves			50 mm to 100mm DN	✓
	3 Way Valves				✓
	Globe Valves				✓

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1.3.2.3 - Work Parcel 1 - List of Plumbing Equipment

Library of Medical Sciences-(Bldg.M2) - O & M Ref: 1.5.1 - Set 9 / Div 1

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
Soft Water	Water Softener (WS-M2-1)	0.5 lps	1	Simplex type WS with Exchange capacity 69225 g/m3, Hardness at inlet 350 ppm, Hardness at outlet 5 ppm, & resin volume 36 L.	✓
Drainage	Pump (P-M2-51)	1.1 Lps @ 10 m Head	2	Submersible	✓
Piping System & Insulation	PVC			20mm to 75mm DN	✓
	Galvanized Steel			65mm to 100mm DN	✓
	HDPE			50mm to 250mm DN	✓
	BSP			25mm to 80mm DN	✓
Valves	Ball Valves			15mm to 40mm	✓
	Gate Valves			50 mm	✓
Sanitary Fixtures & Accessories	Drinking Fountain				✓
	Lavatory Mixer LAV-1				✓
	Lavatory Tap LAV-2				✓
	Lavatory Mixer LAV-3				✓
	Mop Sink Tap				✓
	Bib Cock Perineal Hose				✓
	Angle Valves/Flexibles				✓
	WC Flush Valves				✓
	Urinal Flush Valves				✓
	Flush Tanks				✓
	Water Hammer Arrestor				✓
	Hand Dryers				✓
	Liquid Soap Dispensers				✓
	Paper Towel Dispenser				✓

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1.3.2.4 - Work Parcel 1 - List of HVAC Equipment

Male Dormitories (Bldg R01) - O & M Ref: 1.5.1 - Set 11 / Div 2

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
Cooling / Heating	Air Handling Unit (AHU-R1-01)	42 T.R	1	Constant Air Volume AHU with Supply air flow 5707 lps, External Static pressure 242 Pa, with 1 coil	✓
	Air Handling Unit (AHU-R1-02)	18.7 T.R	1	Constant Air Volume AHU with Supply air flow 3721 lps, External Static pressure 384 Pa, with 1 coil	✓
	Air Handling Unit (AHU-R1-03)	25 T.R	1	Constant Air Volume AHU with Supply air flow 2332 lps, External Static pressure 183 Pa, with 1 coil	✓
	Air Handling Unit (AHU-R1-03A)	40 T.R	1	Constant Air Volume AHU with Supply air flow 5479 lps, External Static pressure 426 Pa, with 1 coil	✓
	Air Handling Unit (AHU-R1-03B)	10 T.R	1	Constant Air Volume AHU with Supply air flow 1431 lps, External Static pressure 188 Pa, with 1 coil	✓
	Air Handling Unit (AHU-R1-03C)	28 T.R	1	Constant Air Volume AHU with Supply air flow 3775 lps, External Static pressure 175 Pa, with 1 coil	✓
	Air Handling Unit (AHU-R1-04A)	25 T.R	1	Constant Air Volume AHU with Supply air flow 3350 lps, External Static pressure 315 Pa, with 1 coil	✓
	Air Handling Unit (AHU-R1-05)	12 T.R	1	Constant Air Volume AHU with Supply air flow 2000 lps, External Static pressure 129 Pa, with 1 coil	✓
	Air Handling Unit (AHU-R1-07)	12 T.R	1	Constant Air Volume AHU with Supply air flow 1638 lps, External Static pressure 258 Pa, with 1 coil	✓
	Air Handling Unit (AHU-R1-08)	21 T.R	1	Constant Air Volume AHU with Supply air flow 2823 lps, External Static pressure 246 Pa, with 1 coil	✓
	Air Handling Unit (AHU-R1-09)	37 T.R	1	Constant Air Volume AHU with Supply air flow 4982 lps, External Static pressure 300 Pa, with 1 coil	✓

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1.3.2.4 - Work Parcel 1 - List of HVAC Equipment

Male Dormitories (Bldg R01) - O & M Ref: 1.5.1 - Set 11 / Div 2

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
Cooling / Heating	Split Unit	10000 BTU/hr	2	CLIMA SMART	✓
	Split Unit	19000 BTU/hr	1	PETRA	✓
	Split Unit	24000 BTU/hr	1	PETRA	✓
	Split Unit	24000 BTU/hr	1	York high wall decorative heat pump model HLHA24FSA	✓
	Split Unit	32000 BTU/hr	1	York high wall decorative heat pump model MCH35/BOH35	✓
Ventilation	Air Handling Unit (AHU-R1-10)	48 T.R	1	Constant Air Volume AHU with Supply air flow 6538 lps, External Static pressure 290 Pa, with 1 coil	✓
	Air Handling Unit (AHU-R2-9)	35 T.R	1	Constant Air Volume AHU with Supply air flow 4277 lps, External Static pressure 249.8 Pa, with 1 coil	✓
	Air Handling Unit (AHU-R2-10)	56 T.R	1	Constant Air Volume AHU with Supply air flow 7116 lps, External Static pressure 395.7 Pa, with 1 coil	✓
	Air Handling Unit (AHU-R2-11)	20 T.R	1	Constant Air Volume AHU with Supply air flow 2684 lps, External Static pressure 295.7 Pa, with 1 coil	✓
	Fan Coil Unit (FCU-R-04)	0.75 T.R	61	Ceiling type FCU, 185 lps Supply air flow, External Static pressure 75 Pa, with 1 coil	✓
	Fan Coil Unit (FCU-R-06)	1 T.R	523	Ceiling type FCU, 247 lps Supply air flow, External Static pressure 75 Pa, with 1 coil	✓
	Fan Coil Unit (FCU-R-08)	1.5 T.R	93	Ceiling type FCU, 371 lps Supply air flow, External Static pressure 75 Pa, with 1 coil	✓
	Fan Coil Unit (FCU-R-10)	2 T.R	20	Ceiling type FCU, 494 lps Supply air flow, External Static pressure 75 Pa, with 1 coil	✓
Ventilation	F-R1-1	250 Lps @ 74 Pa	1	Roof type fan	✓
	F-R1-2	204 Lps @ 75 Pa	1	Roof type fan	✓
	F-R1-3	670 Lps @ 96 Pa	1	Roof type fan	✓
	F-R1-4	385 Lps @ 65 Pa	1	Roof type fan	✓
	F-R1-5	560 Lps @ 175 Pa	1	Roof type fan	✓
	F-R1-11	225 Lps @ 100 Pa	1	Roof type fan	✓

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1.3.2.4 - Work Parcel 1 - List of HVAC Equipment

Male Dormitories (Bldg R01) - O & M Ref: 1.5.1 - Set 11 / Div 2

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
	F-R1-12	114 Lps @ 90 Pa	1	Roof type fan	✓
	F-R1-14	1117 Lps @ 251 Pa	1	Inline Centrifugal fan	✓
	F-R1-15	2265 Lps @ 210 Pa	1	Inline Centrifugal fan	✓

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1.3.2.4 - Work Parcel 1 - List of HVAC Equipment

Male Dormitories (Bldg R01) - O & M Ref: 1.5.1 - Set 11 / Div 2

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
Ventilation	F-R1-18	760 Lps @ 65 Pa	1	Upblast	✓
	F-R1-19	725 Lps @ 134 Pa	1	Roof type fan	✓
	F-R1-20	788 Lps @ 110 Pa	1	Roof type fan	✓
	F-R1-21	467 Lps @ 90 Pa	1	Roof type fan	✓
	F-R1-26	2155 Lps @ 111 Pa	1	Inline Centrifugal fan	✓
	F-R1-27	2575 Lps @ 147 Pa	1	Inline Centrifugal fan	✓
	F-R1-28	190 Lps @ 100 Pa	1	Roof type fan	✓
	F-R1-29	77 Lps @ 35 Pa	1	Propeller Fan	✓
	F-R1-32	548 Lps @ 100 Pa	1	Inline Centrifugal fan	✓
	F-R1-33	685 Lps @ 140 Pa	1	Roof type fan	✓
	F-R1-34	771 Lps @ 130 Pa	1	Roof type fan	✓
	F-R1-35	1298 Lps @ 180 Pa	1	Roof type fan	✓
	F-R1-36	1281 Lps @ 176 Pa	1	Roof type fan	✓
	F-R1-37	174 Lps @ 50 Pa	1	Roof type fan	✓
	F-R1-38	990 Lps @ 100 Pa	1	Roof type fan	✓
	F-R1-40	8044 Lps @ 152 Pa	1	Centrifugal fan	✓
	F-R1-41	4876 Lps @ 140 Pa	1	Centrifugal fan	✓
	F-R1-42	9024 Lps @ 365 Pa	1	Centrifugal fan	✓
	F-R1-43	10340 Lps @ 329 Pa	1	Centrifugal fan	✓
	F-R1-44	990 Lps @ 100 Pa	1	Inline Centrifugal fan	✓
	F-R1-U58	206 Lps @ 40 Pa	1	Propeller Fan	✓
	F-R1-LR62	206 Lps @ 40 Pa	1	Propeller Fan	✓
	F-R2-1	1098 Lps @ 170 Pa	1	Roof type fan	✓
	F-R2-2	475 Lps @ 90 Pa	1	Roof type fan	✓
	F-R2-3	560 Lps @ 71 Pa	1	Upblast	✓
	F-R2-4	926 Lps @ 136 Pa	1	Roof type fan	✓
	F-R2-5	1276 Lps @ 120 Pa	1	Roof type fan	✓
	F-R2-6	3070 Lps @ 80 Pa	1	Roof type fan	✓

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1.3.2.4 - Work Parcel 1 - List of HVAC Equipment

Male Dormitories (Bldg R01) - O & M Ref: 1.5.1 - Set 11 / Div 2

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
Ventilation	F-R2-7	620 Lps @ 95 Pa	1	Roof type fan	✓
	F-R2-8	1500 Lps @ 130 Pa	1	Roof type fan	✓
	F-R2-10	250 Lps @ 50 Pa	1	Upblast	✓
	F-R2-11	78 Lps @ 35 Pa	1	Roof type fan	✓
	F-R2-12	495 Lps @ 150 Pa	1	Inline Centrifugal fan	✓
	F-R2-13	1855 Lps @ 160 Pa	1	Inline Centrifugal fan	✓
	F-R2-14	4070 Lps @ 115 Pa	1	Inline Centrifugal fan	✓
	F-R2-15	1575 Lps @ 140 Pa	1	Inline Centrifugal fan	✓
	F-R2-17	520 Lps @ 160 Pa	1	Inline Centrifugal fan	✓
	F-R2-18	1000 Lps @ 110 Pa	1	Inline Centrifugal fan	✓
	F-R2-19	625 Lps @ 100 Pa	1	Roof type fan	✓
	F-R2-20	206 Lps @ 40 Pa	1	Propeller Fan	✓
	F-R2-21	206 Lps @ 40 Pa	1	Propeller Fan	✓
	F-R3-1	2430 Lps @ 245 Pa	1	Roof type fan	✓
	F-R3-2	480 Lps @ 93 Pa	1	Roof type fan	✓
	F-R3-3	465 Lps @ 111 Pa	1	Roof type fan	✓
	F-R3-4	800 Lps @ 139 Pa	2	Upblast	✓
	F-R3-6	135 Lps @ 54 Pa	1	Upblast	✓
	F-R3-7	1310 Lps @ 130 Pa	1	Roof type fan	✓
	F-R3-8	475 Lps @ 97 Pa	1	Roof type fan	✓
	F-R3-9	1836 Lps @ 186 Pa	1	Roof type fan	✓
	F-R3-10	42 Lps @ 47 Pa	1	Roof type fan	✓
	F-R3-LR	154 Lps @ 50 Pa	1	Inline Centrifugal fan	✓
	F-R4-1	1060 Lps @ 140 Pa	1	Upblast	✓
	F-R4-2	1120 Lps @ 140 Pa	1	Roof type fan	✓
	F-R4-3	718 Lps @ 141 Pa	1	Roof type fan	✓
	F-R4-4	300 Lps @ 63 Pa	1	Roof type fan	✓
	F-R4-5	101 Lps @ 70 Pa	1	Roof type fan	✓

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1.3.2.4 - Work Parcel 1 - List of HVAC Equipment

Male Dormitories (Bldg R01) - O & M Ref: 1.5.1 - Set 11 / Div 2

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
Ventilation	F-R4-6	2616 Lps @ 225 Pa	1	Roof type fan	✓
	F-R4-7	860 Lps @ 137 Pa	1	Upblast	✓
	F-R4-8	127 Lps @ 76 Pa	1	Roof type fan	✓
	F-R4-9	114 Lps @ 72 Pa	1	Roof type fan	✓
	F-R4-10	1121 Lps @ 136 Pa	1	Roof type fan	✓
	F-R4-11	63 Lps @ 45 Pa	1	Propeller Fan	✓
	F-R5-33	8360 Lps @ 80 Pa	2	Propeller Fan	✓
	F-R5-34	4165 Lps @ 75 Pa	2	Axial	✓
	Dehumidifier	500 W	1	Woods 2.4 A	✓
Cooling	End Suction Pumps (P-R1-1)	14.18 Lps @ 27 m Head	3	End suction centrifugal secondary chilled water pump	✓
	End Suction Pumps (P-R1-4)	17 Lps @ 26.5 m Head	3	End suction centrifugal secondary chilled water pump	✓
	End Suction Pumps (P-R1-7)	35.6 Lps @ 42.5 m Head	3	End suction centrifugal secondary chilled water pump	✓
Heating	End Suction Pumps (P-R1-2)	5.85 Lps @ 17.8 m Head	3	End suction centrifugal secondary hot water pump	✓
	End Suction Pumps (P-R1-5)	7 Lps @ 14.45 m Head	3	End suction centrifugal secondary hot water pump	✓
	End Suction Pumps (P-R1-8)	13 Lps @ 27.6 m Head	3	End suction centrifugal secondary hot water pump	✓
	Circulator Pumps (P-R1-3)	5.16 Lps @ 13.5 m Head	2	Circulators for Heat exchanger	✓
	Circulator Pumps (P-R1-6)	6.3 Lps @ 12.77 m Head	2	Circulators for Heat exchanger	✓
	Circulator Pumps (P-R1-9)	11.5 Lps @ 13 m Head	2	Circulators for Heat exchanger	✓
	Circulator Pumps (P-R1-10)	29.6 Lps @ 21.87 m Head	2	Circulators for Hot water storage tank	✓
	Expansion Tank (EX-R1-1A)	1000 Lps	2	Expansion tank for heating system	✓
	Expansion Tank (EX-R1-1B)	750 Lps	2	Expansion tank for heating system	✓
	Expansion Tank (EX-R1-1C)	1000 Lps	1	Expansion tank for heating system	✓
	Expansion Tank (EX-R1-1D)	1000 Lps	2	Expansion tank for heating system	✓
	Hot Water Storage Tank (HWST-R1-1)	4075 Liter	8	Vertical Type Hot Water Storage Tank of 3.68 Lps flow	✓
	Heat Exchanger (HEX-R1-1)	269 Kw	2	Heat Exchanger Primary temperature 95 deg C, secondary temperature 60 deg C	✓

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1.3.2.4 - Work Parcel 1 - List of HVAC Equipment

Male Dormitories (Bldg R01) - O & M Ref: 1.5.1 - Set 11 / Div 2

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
Heating	Heat Exchanger (HEX-R1-2)	329 Kw	2	Heat Exchanger Primary temperature 95 deg C, secondary temperature 60 deg C	✓
	Heat Exchanger (HEX-R1-3)	600 Kw	2	Heat Exchanger Primary temperature 95 deg C, secondary temperature 60 deg C	✓
Piping System & Insulation	Black Steel			Dia 25mm to Dia 160mm	✓
	Galvanized Steel			Dia 20mm to Dia 50mm	✓
	Fiber Glass insulation			15mm to 65 mm thickness	✓
Ducting System & Insulation	GSD- Medium Pressure				✓
	GSD-Low Pressure				✓
	Fiber Glass insulation			Blanket type/40 mm thick	✓
	VAV-1	0-230 Lps		With Thermostat	✓
	VAV-2	235-470 Lps		With Thermostat	✓
	VAV-3	475-660 Lps		With Thermostat	✓
	VAV-4	665-1040 Lps		With Thermostat	✓
	VAV-5	1045-1320 Lps		With Thermostat	✓
	VAV-6	1325-1890 Lps		With Thermostat	✓
Valves	Gate Valves			65mm to 250mm	✓
	Balancing Valves			40mm to 80mm	✗
	Globe valves			40mm to 80mm	✗
	Ball Valves			25mm to 50mm	✗

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1.3.2.4 - Work Parcel 1 - List of Plumbing Equipment

Male Dormitories (Bldg R01) - O & M Ref: 1.5.1 - Set 11 / Div 1

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
Soft Water	Water Softener (WS-R01-1)	1 lps	3	Simplex type WS with Exchange capacity 69225 g/m3, Hardness at inlet 350 ppm, Hardness at outlet 5 ppm, & resin volume 72 L	✓
Hot Water Drainage	Circulator pumps (P-R01-51)	9.97 lps @ 26.26 m head	2	Hot Water storage tank circulator pumps one acting as stand by	✓
	Submersible Pump (SP-R01-1)	4.3 lps @ 7 m head	2	One acting as standby	✓
	Submersible Pump (SP-R01-2)	1.26 lps @ 7 m head	2	One acting as standby	✓
	Submersible Pump (SP-R01-3)	4.3 lps @ 7 m head	2	One acting as standby	✓
	Submersible Pump (SP-R01-4)	4.3 lps @ 7 m head	2	One acting as standby	✓
	Submersible Pump (SP-R01-5)	4.3 lps @ 7 m head	2	One acting as standby	✓
Piping System & Insulation	PVC			16mm to 50mm DN	✓
	Copper			15mm to 54 mm DN	✓
	Cast Iron			75mm to 110mm DN	✓
	Polypropylene			50mm to 110mm DN	✓
	Galvanized Steel			20mm to 80mm DN	✓
	HDPE			50mm to 200mm DN	✓
	BSP			15mm to 42mm DN	✓
	Fiber Glass Insulation			25mm to 67mm thickness	✓
Valves	Ball Valves			20mm to 50mm	✓
	Gate Valves			65mm to 75mm	✓
	Globe Valves			15mm to 25mm	✓
Sanitary Fixtures & Accessories	Drinking Fountain				✓
	Lavatory Mixer LAV-1				✓
	Lavatory Tap LAV-2				✓
	Lavatory Mixer LAV-3				✓
	Sink Mixer				✓
	Sink Tap				✓
	Mop Sink Tap				✓
	Shower Mixers				✓
	Bib Cock Perineal Hose				✓
	Angle Valves/Flexibles				✓
	WC Flush Valves				✓
	Urinal Flush Valves				✓
	Flush Tanks				✓
	Hand Dryers				✓

Lebanese University Campus - Hadath**1.3.2.4 - Work Parcel 1 - List of Plumbing Equipment****Male Dormitories (Bldg R01) - O & M Ref: 1.5.1 - Set 11 / Div 1**

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
	Liquid Soap Dispensers				✓
	Paper Towel Dispenser				✓

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1.3.2.5 - Work Parcel 1 - List of HVAC Equipment

Female Dormitories (Bldg R02) - O & M Ref: 12 - Set 12 / Div 2

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
Cooling / Heating	Air Handling Unit (AHU-R2-01)	42 T.R	1	Constant Air Volume AHU with Supply air flow 5695 lps, External Static pressure 310 Pa, with 1 coil	✓
	Air Handling Unit (AHU-R2-02)	76 T.R	1	Constant Air Volume AHU with Supply air flow 10322 lps, External Static pressure 375 Pa, with 1 coil	✓
	Fan Coil Unit (FCU-R-04)	0.75 T.R	1	Ceiling type FCU, 185 lps Supply air flow, External Static pressure 75 Pa, with 1 coil	✓
	Fan Coil Unit (FCU-R-06)	1 T.R	308	Ceiling type FCU, 247 lps Supply air flow, External Static pressure 75 Pa, with 1 coil	✓
	Fan Coil Unit (FCU-R-08)	1.5 T.R	24	Ceiling type FCU, 371 lps Supply air flow, External Static pressure 75 Pa, with 1 coil	✓
Ventilation	F-R6-1	1150 Lps @ 107 Pa	1	Inline Centrifugal fan	✓
	F-R6-2	1080 Lps @ 147 Pa	1	Inline Centrifugal fan	✓
	F-R6-3	265 Lps @ 68 Pa	1	Roof extractor type fan	✓
	F-R6-4	124 Lps @ 64 Pa	1	Roof extractor type fan	✓
	F-R6-5	940 Lps @ 154 Pa	2	Upblast centrifugal fan	✓
	F-R6-6	2086 Lps @ 148 Pa	1	Roof extractor type fan	✓
	F-R6-7	1495 Lps @ 149 Pa	1	Roof extractor type fan	✓
	F-R6-8	1495 Lps @ 168 Pa	1	Roof extractor type fan	✓
	F-R6-9	117 Lps @ 70 Pa	1	Roof extractor type fan	✓
	F-R6-10	850 Lps @ 159 Pa	1	Inline Centrifugal fan	✓
	F-R6-11	1500 Lps @ 170 Pa	1	Inline Centrifugal fan	✓
	F-R6-12	374 Lps @ 25 Pa	1	Propeller	✓
	F-R7-1	1370 Lps @ 130 Pa	1	Roof extractor type fan	✓
	F-R7-2	996 Lps @ 117 Pa	1	Roof extractor type fan	✓
	F-R7-3	1121 Lps @ 113 Pa	1	Roof extractor type fan	✓
	F-R7-4	1806 Lps @ 159 Pa	1	Roof extractor type fan	✓

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1.3.2.5 - Work Parcel 1 - List of HVAC Equipment

Female Dormitories (Bldg R02) - O & M Ref: 12 - Set 12 / Div 2

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
Ventilation	F-R7-5	850 Lps @ 98 Pa	1	Inline Centrifugal fan	✓
	F-R7-6	800 Lps @ 132 Pa	1	Inline Centrifugal fan	✓
	F-R7-7	59 Lps @ 25 Pa	1	Propeller	✓
	F-R7-8	400 Lps @ 82 Pa	1	Roof extractor type fan	✓
	F-R7-9	400 Lps @ 80 Pa	1	Roof extractor type fan	✓
	F-R7-10	1200 Lps @ 152 Pa	1	Upblast centrifugal fan	✓
	Dehumidifier	500 W	1	Woods 2.4 A	✓
Cooling	End Suction Pumps (P-R2-1)	26.6 Lps @ 28 m Head	3	End suction centrifugal secondary chilled water	✓
Heating	End Suction Pumps (P-R2-2)	11.14 Lps @ 18.27 m Head	3	End suction centrifugal secondary hot water pump	✓
	Circulator Pumps (P-R2-3)	18.5 Lps @ 12 m Head	2	Circulators for Hot water storage tank	✓
	Circulator Pumps (P-R2-4)	10 Lps @ 12.68 m Head	2	Circulators for Heat exchanger	✓
	Hot Water Storage Tank (HWST-R2-1)	4075 Liter	5	Vertical Type Hot Water Storage Tank of 3.7 Lps flow	✓
	Heat Exchanger (HEX-R2-1)	517 Kw	2	Heat Exchanger Primary	✓
Piping System & Insulation	Black Steel			Dia 25mm to Dia 160mm	✓
	Galvanized Steel			Dia 20mm to Dia 50mm	✓
	Fiber Glass insulation			15mm to 65 mm thickness	✓
Ducting System & Insulation	GSD- Medium Pressure				✓
	GSD-Low Pressure				✓
	Fiber Glass insulation			Blanket type/40 mm thick	✓
	VAV-1	0-230 Lps		With Thermostat	✓
	VAV-2	235-470 Lps		With Thermostat	✓
	VAV-3	475-660 Lps		With Thermostat	✓
	VAV-4	665-1040 Lps		With Thermostat	✓
	VAV-5	1045-1320 Lps		With Thermostat	✓
	VAV-6	1325-1890 Lps		With Thermostat	✓
Valves	Gate Valves		12	50mm to 125mm	✓
	Balancing Valves		54	40mm to 80mm	✓
	Ball Valves		32	25mm to 40mm	✓

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1.3.2.5 - Work Parcel 1 - List of Plumbing Equipment

Female Dormitories (R02) - O & M Ref:1.5.1 - Set 12 / Div 1

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
Soft Water	Water Softener (WS-R02-1)	1 lps	1	Simplex type WS with Exchange capacity 69225 g/m3, Hardness at inlet 350 ppm, Hardness at outlet 5 ppm, & resin volume 72 L	✓
Hot Water	Circulator pumps (P-R02-51)	4.42 lps @ 19 m head	2	Hot Water storage tank circulator pumps one acting as stand by	✓
Drainage	Submersible Pump (SP-R02-1)	1.26 lps @ 7 m head	2	One acting as standby	✓
	Submersible Pump (SP-R02-2)	1.26 lps @ 7 m head	2	One acting as standby	✓
	Submersible Pump (SP-R02-3)	0.9 lps @ 5 m head	2	One acting as standby	✓
Piping System & Insulation	PVC			16mm to 50mm DN	✓
	Copper			15mm to 54 mm DN	✓
	Cast Iron			75mm to 110mm DN	✓
	Polypropylene			50mm to 110mm DN	✓
	Galvanized Steel			20mm to 80mm DN	✓
	HDPE			50mm to 200mm DN	✓
	BSP			15mm to 42mm DN	✓
	Fiber Glass Insulation			25mm to 67mm thickness	✓
Valves	Ball Valves			25mm to 40mm	✓
	Gate Valves			50mm to 150mm	✓
	Globe Valves			15mm	✓

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1.3.2.5 - Work Parcel 1 - List of Plumbing Equipment

Female Dormitories (R02) - O & M Ref:1.5.1 - Set 12 / Div 1

System	Equipment	Capacity	Qty	Technical Description	Maintenance instruction provided in O&M Manuals listed in appendix 1.5.1
Sanitary Fixtures & Accessories	Drinking Fountain				✓
	Lavatory Mixer LAV-1				✓
	Lavatory Tap LAV-2				✓
	Lavatory Mixer LAV-3				✓
	Sink Mixer				✓
	Sink Tap				✓
	Mop Sink Tap				✓
	Shower Mixers				✓
	Bib Cock Perineal Hose				✓
	Angle Valves/Flexibles				✓
	WC Flush Valves				✓
	Urinal Flush Valves				✓
Sanitary Fixtures & Accessories	Flush Tanks				✓
	Hand Dryers				✓
	Liquid Soap Dispensers				✓
	Paper Towel Dispenser				✓