Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 19 - Construction/Demolition Waste Management And Disposal.

.3 Section 01 78 30 - Closeout Submittals.

.4 Section 22 10 10 – Pumps.

.5 Section 01 91 41 – Commissioning.

.6 Section 01 91 41 – Commissioning: Training.

1.2 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

1.3 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for incorporation into manual specified in Section 01 78 30 - Closeout Submittals.

.2 Provide process flow diagram of water treatment in glazed hardwood frame.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.4 Divert unused metal materials from landfill to metal recycling facility as approved by Departmental Representative.

.5 Fold up metal banding, flatten and place in designated area for recycling.

1.5 EXTRA MATERIALS

.1 Provide spare parts in accordance with Section 01 78 30 - Closeout Submittals.

.2 Provide:

.1 filters – 3 replacement cartridges,

.2 UV bulbs – 2 sets,

.3 level controls – one spare.

.3 Deliver to Departmental Representative, upon completion of the Work of this Section.

.4 Store where directed by Departmental Representative.

Part 2 Products

2.1 ASSEMBLED UNIT

.1 Water Treatment 0.3 to 1.0 L/s

.1 Provide plant which operates at constant rate, starts and stops automatically dependent upon water requirements.

.2 Plant to clarify, remove objectionable organic matter.

.3 Plant to consist of: UV treatment, treatment tank, bio-filter, storage tank, booster pump, filter, pressure tank and pressure control. Size as indicated.

.4 Follow manufacturers' specifications and installation guidelines.

.5 UV Treatment:

.1 NSF/ANSI 55 Class A, providing 55 mJ/cm² at 0.9 L/sec and 75% transmittance

.2 316 ss self cleaning mechanism

.3 On board micro processor control and monitor

.4 Acceptable Product: Hallett 15XS

.6 Treatment Tank A:

.1 High Density liner polyethylene (HDLPE), natural white colour

.2 Nominal capacity 1300 litre

.3 UV stabilized

.4 NSF Standard 61

.5 Acceptable Product

.1 Fabco (Snyder / RTS Open top) complete with lid, Part No. 57600 VOT, 1200 Dia, 1350 High

.6 Tank Stand: Acceptable Product

.1 Fabco (Snyder / RTS), Part No. 176000IN, 450 high.

.2 150 Dia. Goose neck air vent, complete with insect screen.

.7 Bio-filter:

.1 Membrane, combination of ultrafiltration and microfiltration, arranged as flat plates in a cartridge, aerated by a subhousing air grid.

.2 Blower: capable of delivering 20 – 60 m^3/hour, complete with inlet filter and all piping.

.3 Submersible filtrate pump to pump treated water from unit to storage tank.

.4 Controls: complete control panel

.1 Provide power to blower, filtrate pump, and level controls

.2 Visual and audible alarms to alarm blower failure and high water, manual silence button

.3 Equipped with sequencing fixed reactor timed controlled feature

.5 Treatment unit is to be easily accessible for filter replacement and other maintenance.

.6 Acceptable Product: BioBarrier® 0.5

.8 Storage Tank

.1 High Density Linear Polyethylene (HDLPE), natural white colour.

.2 Nominal capacity 750 litres.

.3 UV stabilized.

.4 NSF Standard 61

.5 Acceptable Product:

.1 Fabco (Snyder / RTS Open top), complete with lid, Part No. 57200 VOT, 915 Dia, 1350 high

.6 Tank Stand: Acceptable Product

.1 Fabco (Snyder /RTS) Part No. 1730001N, 450 high.

.9 Booster Pump:

.1 In accordance with Section 22 10 10.

.1 Pressure Filter Housing:

.1 304 stainless housing, CPVC standpipe, up flow design, brass wing nuts

.2 NPS 2 inlet and outlet, NPS 1 drain

.3 Certified to ANSI-NSF 61

.4 Flow rate to 3 L/sec

.5 Acceptable Product: Harmsco® Model WB 40 SC-2.

.10 Filter Cartridges:

.1 Polyester, pleated, area 3.5 m² minimum

.2 Nominal rating 0.35 micron

.3 Certified to ANSI-NSF61

.4 Acceptable Product: Harmsco® HL/40 – 0.35

.11 Pressure Tank

.1 Shell: high strength steel

.2 Diaphragm: Heavy Duty Butyl with anti-microbial liner

.3 Stainless steel connection

.4 Working pressure 1000 kPa

.5 Certified to ANSI-NSF 61

.6 Pre-pressurized to 260 kPa

.7 Acceptable Product: Amtrol® Well-X-Trol WX-255, nominal 300 litre

.12 Pressure Control

.1 Digital gauge and pump controller

.2 Adjustable from 70 to 550 kPa

.3 Adjustable differential 70 to 380 kPa

.4 Digital LED display

.5 NEMA 3 enclosure ULC listed

.6 Acceptable Product: Amtrol® Guardian CP™ Constant Pressure Digital Control.

.13 Pressure and Suction Gauges

.1 90 mm nominal Dia., range 0 to 700 kPa.

.14 Sampling Points

.1 To be NPS ¼" copper tube with quarter-turn valve.

2.2 MODE OF OPERATION

.1 All necessary controls and instrumentation to operate the system automatically in the following general mode is part of this section.

.2 Domestic water is supplied to the building by a pressure tank that includes a digital controller.

.1 When pressure in the system drops by 100 kPa, the booster pump will start and run until the shut-off set pressure is reached

.2 In the event of low suction pressure, the digital controller shuts the pump off, restarts after 60 minutes.

.3 Treated water storage tank (Tank B) stores potable water for the domestic booster pump.

.4 Treated water from Tank B overflows back into the rainwater storage system if tank is over-filled.

.5 Treated water is supplied to Tank B automatically by the bio-filter.

.1 The biofilter is programmed to run a minimum of 3 hours every 12 hours

.2 If the treated water storage tanks drops to 60% level, the biofilter will be started automatically and run for 3 hours.

.3 After a level operated cycle, the bio-filter will go back to time controlled cycling, running for 3 hours at the scheduled times.

.4 Time durations for the cycles must be manually adjustable from 1 hour to 6 hours

.6 Bio-filter Tank (Tank A) is filled by the submersible supply pump located outside the building. The tank is equipped with an overflow line capable of wasting 1 L/sec back into the rainwater storage tanks.

.7 Overflow level in the tank is set for 1200 mm above the tank bottom

.1 When the biofilter is started for the automatic cycle as per 2.2.2.5 above, the supply pump and UV disinfection unit will be started and run for the programmed duration plus an additional 30 minutes

.2 Tank A also contains a float located to trigger at 990 mm above the tank bottom. When started by the float, the supply pump and UV will operate for a minimum of 1 hour, to be adjustable from 30 minutes to 4 hours.

.8 The UV unit is a Class A unit, and has a flow control valve to limit flow to 0.9 L/sec, and a solenoid valve to shut the unit down and alarm if low UV or low transmittance is detected.

.1 In the event of solenoid closure or low UV alarm condition, the supply pump is to be stopped if in auto mode.

.2 A manual by-pass for the UV unit is available, and can be used in emergency by operating the supply pump in the "hand" mode.

.9 Submersible Supply Pump is located outside of the building in a pump chamber.

.1 There are three floats in the pump chamber

.1 Float 1 is a high level alarm, which lights a green indicator light on the panel to show that rainwater storage tanks are full.

.2 Float 2 is a low level warning alarm, which lights an orange indicator light on the panel to shown that the rainwater storage tanks are approaching 10% full.

.1 The low-level warning alarm is to be connected to a similar alarm mounted prominently in the main work station area. That alarm is to be labelled "LOW DRINKING WATER LEVEL. ORDER SUPPLEMENTAL WATER".

.3 Float 3 is a low level alarm, which causes 3 actions to occur:

.1 A red indication light on the panel is lit, showing low level lockout.

.2 An audible alarm is sounded, which can be silenced by momentary contact switch.

.3 The supply pump and UV unit are shut off and not allowed to operate in either hand or auto.

Part 3 Execution

3.1 INSTALLATION

.1 System to be completely accessible for removal, modification and cleaning.

.2 Water treatment piping:

.1 Pitch 1:100 in direction of flow, without pockets, to low points.

.2 Install valved drains at bottom of tanks.

.3 Minimize contamination by leaving pipe valves and fittings in sealed cartons until prior to their use and seal openings in piping system after installation.

.4 Use teflon tape only for threaded pipe. Do not use any form of thread lubricant.

END OF SECTION