Alternative Energy Sources

Wind turbine—Air-X 24 volt DC 400 watt

A small wind turbine has been installed (near the glasshouses) to generate sufficient power for pumping the rainwater from the detention tanks back up to the roof header tank that supplies the ground floor toilets and urinals.

The turbine incorporates the latest technology for quieter, more efficient performance. Micro-processors monitor wind speed and slow the blades as the turbine reaches its maximum rated operation to prevent 'flutter' and associated noise. Power generation may decrease in such circumstances but when wind speed drops, power output resumes. Micro-processors monitor battery voltage with increasing frequency as batteries near capacity. Charging ceases when batteries are fully charged. When voltage drops, charging resumes. This helps optimize battery utilisation and longevity. Automatic mains backup is built into the system.

Air-tower height: 8 metres
Rotor:3 carbon fibre composite blades, 1.15 metre diameter
The invertor / charger: SEA 24-3KS 24 volt 2300 watts
Batteries: 4 Hella Endurant Cyclemaster 6 volt 220 amp/hour
Pump: Wallace maxipump 3000, 230 volts 6.6 amps, 1.4 kilowatts

Start-up wind speed: 11 km /hr approx (7 mph)
Survival wind speed: 177 km / hr (110 mph)

Rated power: 400 watts @ 17km/hr (28 mph)
Kilowatt hrs per month: 38 kWhr/month @ 19 km/ hr (12mph)

Solar panels

Solahart 302K Black Chrome X11 units have been installed on the roof to provide hot water —with one system supplying laboratories and another system supplying the cafeteria.

The pressed steel absorber panel is electroplated with nickel (to resist corrosion) and then with a black chrome surface to increase energy absorption. The plate is housed inside a marine-grade aluminium case with polyester insulation, and low iron tempered glass.

Each of the steel absorber panels contains 35 multi-flow collectors to maximise exposure to the sun's radiation. This closed circuit of collectors is filled with a mix of water and Solahart Hartgard®.

Water is only held in the storage tank, which is well insulated to minimise heat loss at night.