Waterman CP Series

Pre-engineered Water Treatment Plants
Safe, pure, drinking water for 10,000 to 400,000 People (50 to 800 m³/hour output)

Waterman CP Plants
Permanent Installations specifically designed to be:
► Low in capital and operating costs
► Low in civil engineering content
► Easily transported and quickly erected in difficult terrain
► Simple to operate, simple to maintain
► Easy to extend as population or demand grows
Waterman CP Series

The Waterman CP Series is a range of standardised, prefabricated potable water treatment works. It is an extension of the ‘packaged plant’ concept but the Waterman CP Series begins at flow capacities where ‘packaged plants’ finish. Waterman CP – a full-size, conventional waterworks that provides a long-lasting solution to your immediate need for safe, pure drinking water from lake, river, well or borehole sources.

**Simple civil works**
Flat slab bases for clarifier and filter, and a blockwork chemical house, minimise and simplify the civil works associated with the treatment plant. PCI can provide the civil designs.

**Low capital and shipping cost, easy overland delivery**
The clarifier, filter and clear water tanks are assembled from pack-flat, bolted plates. Shipping space is minimised and overland delivery made easy.

**Quick, simple erection**
The use of impact-resistant, glass-coated, bolted steel plates ensure that the clarifier, filter and clear water tanks are quickly assembled by unskilled labour and grouted in on the prepared bases.

**Low running cost**
Chemical flocculation is hydraulic and water flow through the plant by gravity. The only electrical consumption is the low power drives for the chemical metering pumps and the intermittent use of the airscour blower and upwash pump for filter cleaning.

**Minimum maintenance, long-lasting**
Maintenance of the tank shells is eliminated by the use of a fired glass coating, which is completely rustproof and needs no maintenance during its lifetime. None of the units have any internal moving parts so again maintenance is eliminated.

**Electrics, pumping**
PCI include all electrics for a working plant - no problems without side contractors. Additionally PCI can supply diesel alternator sets as part of the contract.

Also, PCI can supply high and low lift pumps or hydropneumatic units to suit each individual requirement.

<table>
<thead>
<tr>
<th>Model</th>
<th>Output</th>
<th>Output</th>
<th>million</th>
<th>Approx. population served, at a daily per capita consumption of:</th>
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<tbody>
<tr>
<td></td>
<td>m³/hr</td>
<td>Lit/sec</td>
<td>gal/d</td>
<td>110 lit (25 gal)*</td>
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<tr>
<td>CP65</td>
<td>65</td>
<td>18</td>
<td>0.34</td>
<td>14,000</td>
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<tr>
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<td>100</td>
<td>28</td>
<td>0.52</td>
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<td>150</td>
<td>42</td>
<td>0.78</td>
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<td>200</td>
<td>56</td>
<td>1.0</td>
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<td>83</td>
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<td>110</td>
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<td>170</td>
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<td>800</td>
<td>220</td>
<td>4.2</td>
<td>170,000</td>
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</table>

*110 lit (25 gal) assumes piped supply to most households, remainder standpipes, plus some light industry.
*45 lit (10 gal) assumes mostly standpipe supplies.
**Process**

After pH correction and the dosing of a coagulant, flocculation and settlement of the raw water occurs in a simple, flat-bottomed, up-flow, sludge-blanket clarifier.

Coagulated raw water first enters a central contact/flocculation chamber in the clarifier and then passes into the body of the tank. Microfloc particles in the slowly rising water are captured by the mature floc forming the established blanket. Surplus floc spills over the rim of suspended sludge cones to settle and concentrate, while clarified water passes into a decanting trough. The sludge collected in the cones is drained to waste.

The Waterman CP filter, like the clarifier, employs a simple flat slab base. A nozzled lateral system collects filtered water, and distributes scour air and backwash water during the filter cleansing cycle. The lateral system sits within a gravel-packing layer beneath the filter sand and enables the filter to be constructed, like a water storage tank, from a simple ring wall erected on a plain concrete base slab.

Filtered water receives a final pH-correction dose, and a disinfectant dose, before gravitating to a wash-water storage tank and hence into supply. A backwash pump draws from this tank to wash the filter. Alternatively, a much larger tank can be supplied which provides treated water storage, as well as storage for filter washing.

Above: Plant layout of a standard Model CP100
Waterman CP plants are essentially pre-engineered units with standardised pipework, ancillary equipment, site layout, etc. This brings the benefits of speedy manufacture, fast delivery and simple site erection. However, the intrinsic flexibility of the CP range of process tanks can be tailored to meet individual process or operational needs and site space limitations – especially in the instance of larger more complex plants. In the illustration above, high lift pumps, a large treated water tank and coagulant aid dosing have been incorporated. Additionally, raw water aerators, alternative disinfection systems, diesel generators, etc. can be provided; or the clarification stage can be omitted when treating many borehole waters.