AMP 5 Star Green Building
Coronation Drive Office Park 4

Hydrasyst’s The Grey Box™ waste water recycling system was specified to provide the building’s grey water treatment system by the hydraulic and environment design engineers, Cundall Australia. This was due to Hydrasyst holding Queensland Government Chief Executive approval No 19/2008 for commercial building grey water treatment and in addition requiring only a small footprint.

The Grey Box™ was installed in the carpark basement of the building, designed to capture 100% of the buildings grey water from showers and hand basins. Once treated the water is stored in holding tanks, then distributed via a pump pressure set through the building and its external grounds.

Green Build Council of Australia
The Grey Box™ system was specified to meet the 5 star building rating from the Council’s Green Star program. Green Star is a comprehensive, national, voluntary environmental rating system that evaluates the environmental design and construction of buildings.

With more than 4 million square metres of Green Star-certified space around Australia, and a further 8 million square metres of Green Star-registered space, Green Star has transformed Australia’s property and construction market.

Green Star was developed for the property industry in order to: Establish a common language; Set a standard of measurement for green buildings; Promote integrated, whole-building design; Recognise environmental leadership; Identify building life-cycle impacts; and Raise awareness of green building benefits.

Water recycling process
Figure 1 overleaf shows the treatment process for The Grey Box plant used for building waste water recycling using InoCep® hollow fibre ceramic membranes. The plant operates with a process capacity of 30kl per day of grey water, recovering 82% of waste water discharged from the building.

The raw grey water is captured, and then passes through a 50-100μm pre filter, to remove suspended matter. Next, the waste stream is channelled through four InoCep® modules, utilizing “in-out” cross flow filtration.

In this installation, to maintain plant performance the system is backwashed using the recycled water every five minutes. This process takes 4 seconds to complete. The recycled permeate water is then delivered to holding tanks, ready for reuse through a dual pressure set pump station.

The plant is operated by a program logic control unit with associated touch screen interface. The day to day plant operation is monitored remotely by ISS facilities management and Hydrasyst.

Benefits
• Footprint
The Grey Box offered the smallest footprint on the market and in this application allowed for an additional two car parking spaces.

• Acoustic Benefits
The Grey Box generates only 85db of noise during operation, in an open cyclone wire fence enclosure. If necessary this could be significantly reduced with a solid wall enclosed space around the unit.

• Water Savings
The Grey Box design capacity can reduce the buildings annual water consumption by 7,800,000 liters, represented by a financial saving $31,746. Figures quoted Urban Utilities 2011/2012. www.urbanutilities.com.au

• Environmental Advantages
The building owner is not restricted to use water for irrigation during drought conditions. The Green Star building, including the grey water treatment plant reduces its environmental impact on neighbouring communities.

Table of comparison: water quality of grey water to treated recycled water

<table>
<thead>
<tr>
<th>Source</th>
<th>Turbidity (NTU)</th>
<th>pH</th>
<th>Total dissolved</th>
<th>Total suspended solids (TSS-PPM)</th>
<th>COD-PPM</th>
<th>BOD-PPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laundry raw grey water</td>
<td>&gt;100</td>
<td>10.8</td>
<td>1080mg/l</td>
<td>&gt;1000</td>
<td>130</td>
<td></td>
</tr>
<tr>
<td>Grey Box treated water</td>
<td>&lt;1.0</td>
<td>6.85</td>
<td>388mg/l</td>
<td>&lt;3mg/l</td>
<td>101</td>
<td>5</td>
</tr>
</tbody>
</table>

Operating parameters

- **Pre treatment**: 100 microns
- **Trans membrane pressure (TMP)**: 3 bar
- **Permeate flux**: 500LMH
- **Operating temperature**: 60°C
- **Backwash pressure**: 5 bar
- **Backwash duration**: 15 seconds
- **Backwash frequency**: 15 minutes
- **Daily process volume**: 20 kilo litres
- **Grey water recovered volume**: 78%
- **Daily energy consumption**: 23.6kwh

Fig 1. System Flow Chart

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