

## ORAKEI MARINA CASE STUDY HYNDS UP-FLO™ FILTER



*High performance, ease of installation and a small footprint have made the Hynds Up-Flo™ Filters the ideal solution to treat the stormwater runoff for the new Orakei Marina Development.*

*The Up-Flo™ systems are now effectively protecting the precious eco-systems of the Hauraki Gulf.*

### The Site

Orakei Marina in Hobson Bay, Auckland has recently undergone a significant upgrade with the addition of 172 new berths and over a hectare of carpark and garden areas.

Since the 1980's, many development groups have failed to gain consent to build a marina on the Okahu Landing site, but Orakei Marina Development Ltd submitted a proposal which met all the statutory criteria and gained approval to commence construction early in 2005.

### The Problem

Orakei Marina's development not only had to comply with strict environmental requirements but also had to overcome the challenges of working in tidal conditions.

These conditions necessitated a shallow drainage network across the site so traditional stormwater treatment systems requiring high head-loss through the systems were impractical for this site.

The restricted site area combined with the tidal ground water conditions also meant that all drainage work had to be completed quickly and effectively.

### The Solution

Hynds Environmental supplied three Hynds UpFlo™ Filters to treat the stormwater runoff from the marina's Northern, Central and Southern carparks. The total runoff area was 11790m<sup>2</sup>.

The Up-Flo™ Filters were delivered to site in standard 1200mm manholes, ready to be quickly and easily installed into the drainage network. With an outlet invert of approximately 1.5m below the finished ground level and minimal head loss required across the systems, the Up-Flo™ Filters were ideal for the shallow drainage network of the site.

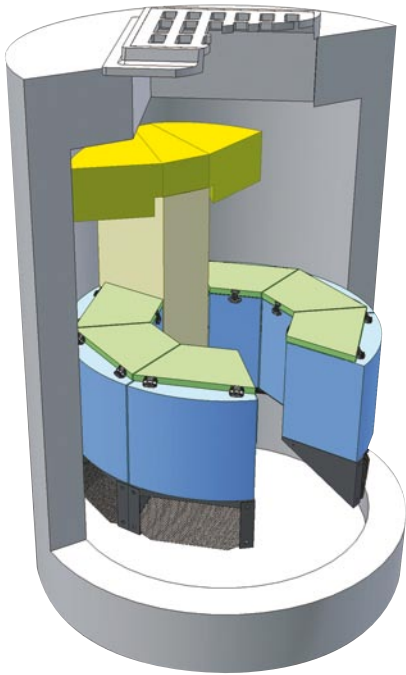
With a removal efficiency of greater than 90% for particles with a mean particle distribution of 20 microns, the Up-Flo™ Filters meet and exceed the ARC's requirements for stormwater treatment of 75% Total Suspended Solids removal.

### Project Summary

- Total Catchment Area – 11790m<sup>2</sup> of grass and paving
- Three off Hynds Up-Flo™ Filters supplied designed to treat independent runoff areas.
- Achieves >75% Total Suspended Solids (TSS) removal
- Removes >90% Suspended Solids (TSS) with a mean particle size of 20 microns (0.02mm)
- 1200mm diameter chamber x 2.4m deep. Invert level of outlet pipe is 1.5m below ground level

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## HYNDS UP-FLO™ FILTER



*Hynds Up-Flo™ Filter – standard 1200mm dia model.*

### Performance

The Hynds Up-Flo™ Filter offers unrivalled performance in stormwater filtration. The system is designed to remove more than 90% Total Suspended Solids (TSS) with a mean particle size of 20 microns (0.02mm). The Hynds Up-Flo™ Filter has been accepted by the Auckland Regional Council as achieving 75% TSS removal.

### System Maintenance

Maintenance of a Hynds Up-Flo™ Filter is simple and inexpensive and no specialised or heavy lifting equipment is necessary. The system's open design allows easy access to its components. Floatables are simply removed from the sump by vactor truck and the media packs are replaced by hand.

### How They Work

#### Treatment

During a rain event, stormwater enters the chamber via an inlet pipe or overhead grate. Gross debris and sediment settle out in the sump. As water fills the chamber, flow is directed up through the angled screen into the filter module. Flow is evenly distributed across the media for maximum treatment. Treated flow exits the filter module via a conveyance channel to an outlet module.

#### Siphonic Bypass

Flows in excess of the designed filtration capacity are discharged directly to the outlet using a Siphonic Bypass.

#### Drain Down

The Hynds Up-Flo™ Filter has a patented Drain Down system to ensure that the filter media is not submerged between storms.



*Installation of the Hynds Up-Flo™ Filter.*

### Further Information

For further information on Hynds Environmental's stormwater treatment systems, please call them on 0800 425 433 or visit their website at [www.hynds.co.nz](http://www.hynds.co.nz)

## Hynds Environmental Systems Limited

### North Island

PO Box 17388, Greenlane 1546,  
Auckland, New Zealand  
Telephone +64 9 571 0090  
Facsimile +64 9 571 0091  
Email [sales@hyndsenv.co.nz](mailto:sales@hyndsenv.co.nz)

### South Island

PO Box 16552, Hornby 8441,  
Christchurch, New Zealand  
Telephone +64 3 344 1370  
Facsimile +64 3 344 1375  
Email [mikes@hyndsenv.co.nz](mailto:mikes@hyndsenv.co.nz)

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[www.hynds.co.nz](http://www.hynds.co.nz)

Reference EV45 April 2007