

Atlantis®
GREEN CITIES FOR LIFE

Bondi Beach

Project Location

Bondi Beach, NSW, Australia

Atlantis Application

Stormwater Harvesting

Project Overview

The Bondi Beach project was established through a joint agreement between Waverley Council and Atlantis Water Management to evaluate the infiltration and filtration performance of amended soil profiles using untreated urban stormwater runoff. The system receives raw runoff directly from a kerb gutter on Campbell Parade, incorporating pollutant screening, temporary storage, irrigation through six filter beds and subsurface infiltration.

Runoff passes through two separate trash screens before entering a drainage control unit and two 3,000 L holding tanks. Stored water is subsequently pumped through an irrigation system to six amended-soil filter beds, while larger storm events can discharge to a sub-surface percolation tank for groundwater infiltration.

Technical Summary

Project	Bondi Beach
Location	Bondi Beach, NSW, Australia
Application	Stormwater Harvesting
Completion	--
Size	6,000 L
Surface Use	--
Atlantis System	Flo-Tank®

Design Challenge

The project required a system capable of receiving untreated stormwater runoff from Campbell Parade and using it to evaluate the infiltration and filtration performance of different amended soil profiles. This required controlled collection and distribution of the runoff so that untreated and treated water quality could be compared across multiple soil configurations.

The hydraulic arrangement also needed to manage different runoff conditions. Solid pollutants such as paper, cans and cigarette butts had to be removed before runoff entered the storage system. Under normal operation, collected water needed to be stored and distributed to the soil filter beds for irrigation and testing. During larger storm events, excess water required an alternative pathway through a sub-surface percolation tank connected to the groundwater system.

Six separate filter beds were required to evaluate different soil profiles. Water samples collected after passing through each profile were compared with the initial untreated runoff to assess filtration efficiency

01 Receive raw stormwater runoff from a kerb gutter on Campbell Parade.

02 Remove solid pollutants using two separate trash screens.

03 Store collected runoff within two 3,000 L holding tanks.

04 Pump stored runoff through distribution lines connected to the irrigation system.

05 Irrigate and evaluate six separate amended-soil filter beds.

06 Irrigate and evaluate six separate amended-soil filter beds.

Solution

Raw stormwater runoff from Campbell Parade was directed through two trash screens to remove solid pollutants before entering a drainage control unit and two 3,000 L holding tanks. Once sufficient water had accumulated, it was pumped from the holding tanks through distribution lines connected to the irrigation system.

The irrigation system supplied untreated runoff to six individual filter beds, each containing a different soil profile:

- A: Existing soil
- B: Clean washed sand
- C: Existing soil with 5% Zeolite
- D: Existing soil with 10% Zeolite
- E: Existing soil with 5% Zeolite and bacterial agents
- F: Existing soil with 10% Zeolite and bacterial agents.

As water permeated through the soil profiles, treated water returned to six individual collection pits for sampling. These samples were compared with the initial untreated runoff to evaluate the filtration efficiency of each amended soil. For larger storm events, the system was connected to a sub-surface percolation tank, allowing stormwater to infiltrate into the groundwater system.

Independent testing identified reductions across multiple water-quality parameters, including nickel, copper, zinc, lead, COD, BOD, suspended solids, faecal coliforms, total P.A.H., total phosphorus and total oxidised nitrogen.

Benefits

- 6,000 L combined holding capacity provided by two 3,000 L tanks.
- Two-stage trash screening removes solid pollutants including paper, cans and cigarette butts before storage.
- Six different soil profiles enabled direct evaluation of stormwater filtration performance.
- Sub-surface percolation provided an infiltration pathway during larger storm events.
- Independent testing reported 98.9% removal of suspended solids.
- Independent testing reported removal rates of 90% nickel, 78.2% copper, 99.2% zinc and 99.59% lead.

Considerations

The system required integration of several separate components: two trash screens, a drainage control unit, two 3,000 L holding tanks, distribution lines, an irrigation system, six individual filter beds and a sub-surface percolation tank.

Each filter bed required a distinct soil configuration so that water passing through the six profiles could be collected independently and compared with untreated runoff. The six configurations ranged from existing soil and clean washed sand to amended soils incorporating 5% or 10% Zeolite, with or without bacterial agents.

Project Outcomes

- Two 3,000 L holding tanks incorporated into the stormwater harvesting system.
- Six amended-soil filter beds established for comparative infiltration and filtration testing.
- 98.9% suspended solids removal reported through independent testing.
- Heavy-metal removal rates of 90% nickel, 78.2% copper, 99.2% zinc and 99.59% lead reported.
- 90.65% COD and 87.5% BOD removal reported.
- 87.2% faecal coliform and 94.4% total P.A.H. removal reported.

The project combined stormwater harvesting, controlled soil-profile testing and subsurface infiltration within a single system. By distributing untreated Campbell Parade runoff across six distinct soil profiles and collecting the treated water independently, the installation enabled direct comparison of filtration performance while retaining a separate percolation pathway for larger storm events.

Did You Know?

Independent testing reported removal rates of 99.2% for zinc, 99.59% for lead and 98.9% for suspended solids through the Atlantis infiltration system.

The soil profiles of each pit are as follows
A – existing soil
B – clean washed sand
C – existing soil with 5% Zeolite
D – existing soil with 10% Zeolite
E – existing soil with 5% Zeolite and bacterial agents
F – existing soil with 10% Zeolite and bacterial agents.

Table 1: Suspended Soilds

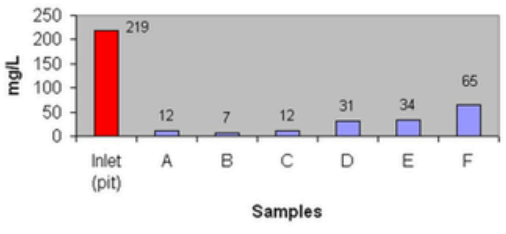


Table 2: Total Nickel

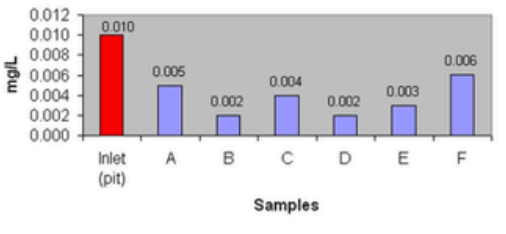


Table 3: Total Zinc

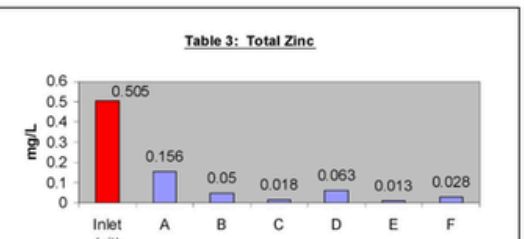
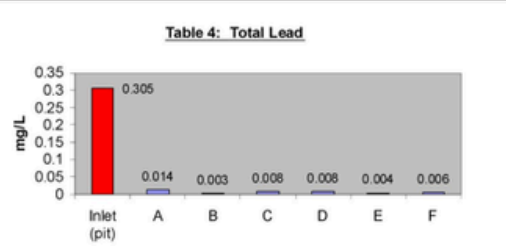
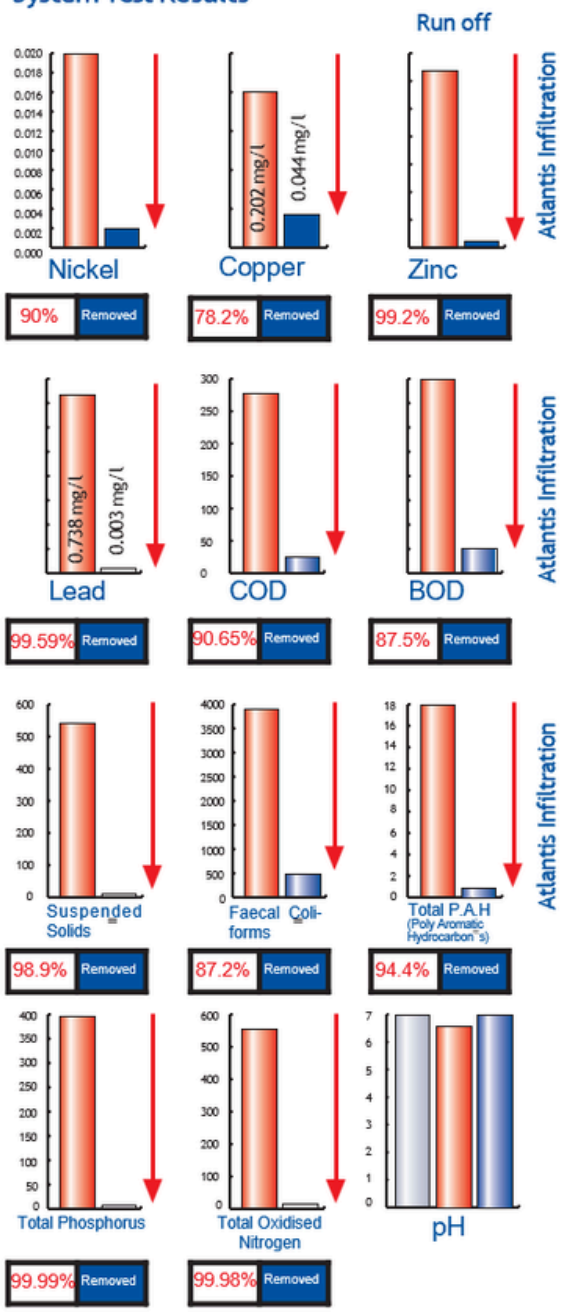


Table 4: Total Lead



Independent Runoff Atlantis Infiltration System Test Results

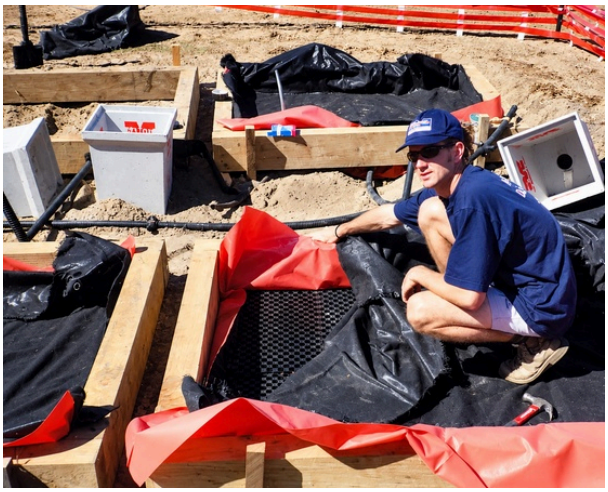


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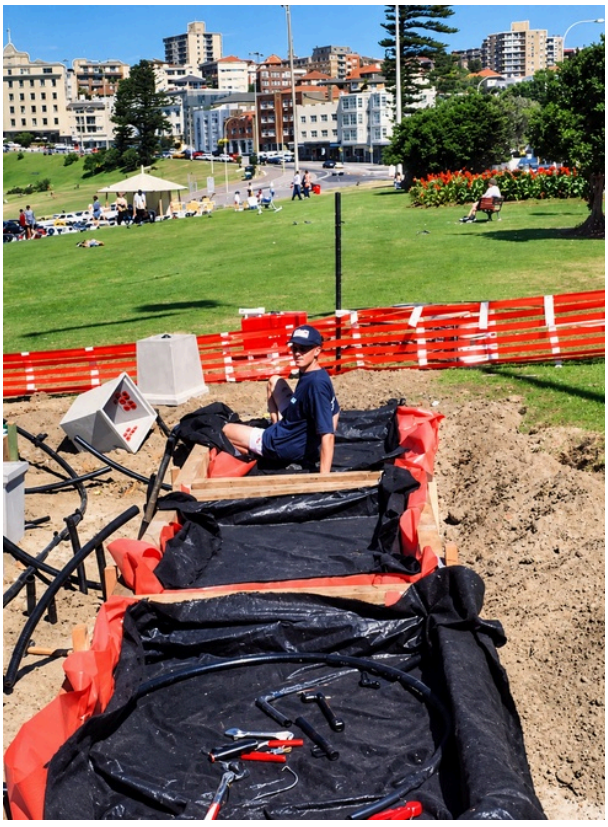
Runoff before Atlantis Filtration System

Runoff after Atlantis Filtration System

Pure rain water, contains zero contamination









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Thank You For Your Attention



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