

**PROJECT NAME**

## Church Street South Stormwater Treatment System

**RESPONSIBLE COUNCIL:** Parramatta

**CONSTRUCTION DATE:** 2008

**LOCATION:** Church Street South is located in the Parramatta central business district.

**SUB-CATCHMENT:** Parramatta

### Overview

Church Street South is a busy main street providing car and pedestrian access to many businesses, shops and restaurants. Stormwater runoff (and pollutants) from the road surface and impermeable (non-porous) paved areas flowed directly north into the Parramatta River, without any treatment. This project installed a series of interconnected rain gardens, two gross pollutant traps (GPTs) and several car parking bays lined with pervious pavers.

### Objectives

The driver for this project was the existing scheduled upgrade of this section of the Parramatta central business district as part of council's Better Neighbourhoods Program (the program aims to provide more vibrant, attractive and safer streetscapes for the surrounding businesses and pedestrians). Additional funding from the NSW Environmental Trust grant provided an opportunity to modify the design of the town centre upgrade and build in some principles of Water Sensitive Urban Design (WSUD) and stormwater treatment.

By capturing and treating the stormwater, the objectives were to:

- Reduce the volume and velocity of stormwater flowing to the Parramatta River
- Improve the quality of water entering the Parramatta River by reducing stormwater and pollutants that would have otherwise flowed into the River.
- Demonstrate how some WSUD technologies can be used in an existing constrained urban space.

### Approach

Six garden beds were constructed along the verge of Church Street. Each garden bed contains a specific mix of soil to support the vegetation and help the water to infiltrate. Stormwater runoff from the street is directed into the gardens beds, either directly flowing from the pedestrian pavement, or from the road via inlet slots within the kerb.

The inlet slots are orientated at right angles to the kerb which limits the amount of water flow that can enter the system. This avoids scouring and excessive flooding of the garden beds.

The garden beds were landscaped with a layer of rocks at the point of inlet to help disperse flow of water and catch large debris and sediments.



Inlet slots along Church Street gutter. Hedge vegetation of the garden bed in background.



Garden bed and access point to underground services.



Parking bay lined with pervious pavers. Rain garden bed in background.



Hedge vegetation in one of the garden beds and drip irrigation line (left)

For supplementary technical information about this project go to [www.parramattariver.org.au](http://www.parramattariver.org.au)

This project is supported by the Parramatta River Catchment Group, through funding from the NSW Environmental Trust's Urban Sustainability Program.

Photos supplied by Cardno Pty Ltd, 2010.  
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The garden beds were planted with hedge vegetation and covered with mulch to retain moisture. A drip irrigation system was installed in the garden beds to water the hedges during periods of extensive dry weather.

Several parking bays along Church Street were lined with pervious pavers, allowing stormwater to percolate through the paver gaps where it is filtered and absorbed.

Two small gross pollutant traps were installed within stormwater pits along Church Street South, to remove litter and large sediment particles.

## Lessons learnt

- The inlet slots into the garden beds need to be positioned at the right level to allow water to naturally drain with gravity into the garden beds. Initially the inlet slots were placed too high and had to be moved lower.
- A specific type of soil mix is required for the garden beds. Council staff had to closely supervise the construction phase to ensure the contractors used the required soil mix, and not a cheaper alternative.
- Some of the hedge plants died soon after planting due to an extended period of dry weather. A manually operated drip irrigation system was installed and a watering schedule has been established with council's maintenance staff.
- Several months after completion of the system, a section of the site had to be disturbed to access underground services. This situation cannot be avoided and is typical in a highly urbanised area where many utilities services are located underground. The underground work interrupted the establishment of the plants and the functioning of the WSUD system.

## Results & Outcomes

It has been estimated that this WSUD system installed in Church St South is capable of significantly reducing water pollutants flowing into the River, with a predicted 47% reduction of Nitrogen, a 71% reduction of Phosphorus and a 90% reduction of Total Suspended Solids (inorganic particles suspended in the water).