

PROJECT NAME

Meadowbank Station Stormwater Treatment System

RESPONSIBLE COUNCIL: Ryde

CONSTRUCTION DATE: 2010

LOCATION: Meadowbank Railway Station, on the corner of Railway Road and Constitution Road.

SUB-CATCHMENT: Charity Creek

Overview

Council had scheduled an upgrade of the Meadowbank railway station plaza to provide a more vibrant, attractive and safe environment for railway users, Meadowbank TAFE students and surrounding businesses. As part of the civil and landscape construction work, this project installed a series of street tree pits and rain gardens to capture and treat polluted stormwater runoff from the surrounding streets and paved pedestrian areas.

Objectives

The driver for this project was the already scheduled upgrade of the plaza. Additional funding from the NSW Environmental Trust grant provided an opportunity to modify the design and incorporate some principles of Water Sensitive Urban Design and stormwater treatment.

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

- Reduce the volume and velocity of stormwater flowing into nearby creeks and natural areas
- Contribute to water quality improvements in the Parramatta River (by reducing stormwater and filtering pollutants that would have otherwise flowed into the River).

Approach

Four infiltration street tree pits were installed along Railway Road. These street tree pits (approximately 2m³ in size) are designed to capture stormwater runoff. The water flows through a grate and directly to the tree root system. Two rain garden beds were also installed, one at the pedestrian area near the railway station and the other at the corner of Railway Road and Constitution Road. The rain gardens absorb and treat water runoff coming from the surrounding roads and paved areas.

Stormwater flowing along the roads and paved surfaces is diverted into the tree pits and rain gardens via a series of inlets along the kerb of Constitution Road and Railway Road.

The rain garden bed on the road corner also treats rainfall collected from the roof of the adjacent building. The whole system is sunk below the level of the surrounding areas so that during periods of heavy rain and greater flow of water, the water can temporarily pond and gradually infiltrate into the soil.



Inlet to one of the biofiltration tree pits along Railway Road



Rain garden at the railway station



Rain garden at corner of Railway and Constitution Roads



Rain garden (and stormwater outlet) at the railway station

For supplementary technical information about this project go to 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 & City of Ryde 2010.
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Lessons learnt

The development of the project design did not adequately factor in the location and depth of the rock and underground services.

- The overall project cost was more than expected due to the need to cut and dispose of rock that was discovered 400mm underground during the time of excavation.
- Access to the site for construction and maintenance was challenging due to heavy vehicle and pedestrian traffic. The work had to be done in stages to allow adequate pedestrian access to shops and the railway station.
- The presence of underground services also provided challenges. One of the rain garden beds was built at a more shallow depth because of services underneath. This garden bed later had to be redone as it was not functioning properly.

Results & Outcomes

- This system successfully captures most of the stormwater from a commercial and industrial area of approx 1.2ha that was previously draining into Parramatta River.
- Water quality modeling of the system predicts that it is capable of significantly reducing water pollutants flowing into the River: a 31% reduction of Nitrogen, a 59% reduction of Phosphorus and a 71% reduction of Total Suspended Solids (inorganic particles suspended in the water).
- The modeling has also predicted a 100% reduction of gross pollutants (i.e. all leaves, rubbish etc will be captured by the system, before flowing downstream)
- The system is visually attractive and is functioning to both improve water quality and control water quantity. The growth of the plants (and their roots) in the rain gardens will help the system to become self-sustaining over time.