

Hornsby Shire Council

Project Title: Water conservation and reuse at Council's Nursery and Park Depot, Pennant Hills

Catchment area: Lane Cove River Catchment

Sub Catchment: Byles Creek catchment

Project Summary

The major aim of the project is to implement and demonstrate water sensitive best management practices at the Hornsby Shire Council's nursery and Parks depot site located at Pennant Hills in the Lane Cove Catchment. The project involves upgrading the existing irrigation system and the installation of a functional water treatment and reuse facility to ensure that Council's operations are not further degrading the surrounding regionally significant bushland and that Council meets their environmental objectives to reduce and reuse water.

The objectives of this project include:

- use the Nursery/depot site as a demonstration of best practice in the nursery industry and promote this technology to acceptable commercial and domestic applications;
- use the adjoining Earthwise Cottage as a demonstration of ecologically sustainable principles in action;
- demonstrate the cost savings to Local Government in stormwater reuse;
- significantly reduce the volume of stormwater/irrigation water leaving the site and highlight stormwater quality performance through sampling and analysis;
- reduction in weed proliferation and germination downstream of the site through sustained bush regeneration techniques;
- records of community, academic and governmental visitors using the site for educational and training purposes; and
- integrate sustainable water practices across all disciplines and divisions of Council.

The underlying rationale for the project stems from the paradigm that stormwater is a valuable resource that should be harnessed rather than allowed to become a conduit for environmental degradation. The Project was conceived by members of the Water Catchments Team in the Environment Division of Hornsby Shire Council, serves to demonstrate elements of Council's own Sustainable Water DCP in place since 1998. The educational component of the project targets the entire community but it particularly focuses on the horticultural industry and local government depot operations. An extensive education and demonstration campaign will be conducted with the assistance of the NSW Nursery & Garden

Industry and NSW Agriculture, targeting local government, community and industry groups who will have the opportunity to tour the site and the sustainable Earthwise Cottage adjoining the site. After completion of the project water usage and quality at the nursery will be quantified and compared to historic usage at the site. A reduction in usage and pollutants will indicate that the project has been successful in achieving its objectives. This will serve as the basis for a detailed cost-benefit study, the results of which will be used to promote such innovative technology for at-source stormwater treatment and reuse.

Project Outcomes

Organisational

Staff involved in this project were fortunate to have been long associated with the development and integration of Council's Sustainable Water DCP (1998) which aims to integrate and apply WSUD into the development control process and Council's own improvement programs. Staff within Councils' Parks and Bushland Teams were fully aware of the need to pro-actively maximise efficiency, conserve water and implement sustainable practices prior to the upgrade works. Multi-disciplinary meetings were used to progress the original grant application (Stormwater Trust funded), the design and staging of construction. This consultation and communicative process between staff, community and the nursery industry is not only a requirement under Council's planning legislation, but is also an essential part of internal integration within Council.

Through initiatives with its special Environment Levy (since 1994) and the commencement of the Local Government Amendment (ESD) Act 1997, Council has adopted a strategic approach towards the incorporation of ESD principles when carrying out their own functions. The approach has created linkages between Council's environmental charter, its approval function, its management plan, annual report and State of Environment Report (SoER). The upgrade and launch of Council's adjoining Earthwise Cottage and Community Nursery in September 2002, was an example of how sustainability indicators are being developed to inspire change on a community and staff level towards a more sustainable future.

Environmental

Environmental benefits of the Project include:

- Lighting upgrades as part of Council's Energy Performance Contract (EPC);
- Water Conservation measures including flow controls, water efficient fittings and appliances and a rainwater tank;
- Stormwater reuse measures which aim to replace the need for irrigation to be done with the town water supply (Cost saving estimated at \$4,000p.a);

- Photo Voltaic Cells (Cost Saving \$257 p.a. & Greenhouse tonnage saving of 2.9 tonnes p.a.);
- Air Conditioning upgrades (Cost Saving \$323 p.a. & Greenhouse tonnage saving of 2.6 tonnes p.a.);
- Composting system and permaculture garden;
- Green waste depot and reuse area producing high quality mulch;
- Planting of indigenous plants and sustainable garden;
- Noxious weed removal;
- Use of environmentally friendly paints and rendering; and
- Vision murals on the cottage walls.

Technical

The main components of the Nursery upgrade can be summarized as follows:

1. Upgrade existing irrigation system for nursery operations including automatic timing system and water efficient sprinkler heads;
2. Re-grading of the site and the construction of a cut-off gravel trench and vegetated swale, two settling pits and a linear macrophyte bed for nutrient stripping;
3. Installation of two (2) stormwater collection tanks (214,000L capacity), pumps and a specialised Grodan media bio-filtration tank (27,000L) for further water filtration/treatment, storage and re-use;
4. Construction of stormwater overflow channel lined with sandstone spalls and access track;
5. Rehabilitate existing degraded receiving creekline;
6. Sampling and analysis of system performance for water quality, flow gauging and pollutant loads;
7. Use of mulching and xeriscaping around the site;
8. Installation of two (2) further rainwater tanks to collect roof water from the Earthwise cottage and Parks amenity block and use this for flushing of urinal and toilets;
9. Launch of a sustainable Earthwise Cottage adjoining the nursery operation (retrofit for energy, water and waste efficiencies);
10. Community, Council and industry education and demonstration in water sensitive design and best management practices for both residential and horticultural activities.

Survey and design of the system and layout was completed internally within Council with input from the NSW Nursery & Garden Industry and NSW Agriculture. Technical expertise and design was also sought from specialised irrigation contractors throughout the process.

In addition, members of Council's staff also attended a WSUD seminar/workshop on "Tackling the issues – cost maintenance and salinity" held 26 March 2003,

arranged to meet one of the WSUD officers at a case study site located at Victoria Park in Zetland (Landcom), and toured a sustainable nursery practice at Arcadia to gain first hand applied knowledge.

Transferable

Among Council's programs to pursue WSUD, there are many that are related to, or have an impact on, traditional local government engineering. The implications of achieving sustainable economic and social development in local government whilst maintaining ecological integrity has placed new demands on the roles of engineers and scientists. Understanding the framework of sustainable development and the process working towards its implementation requires different qualities from those expected of traditionally educated professionals. Changes have been made to design principles to incorporate initiatives outlined in Council's Sustainable Water DCP. This includes incorporating ecological considerations into projects such as minimising newly constructed impervious areas, maximising infiltration and focusing on the construction and reconstruction of more natural systems with consideration for habitat creation and preservation, and the aesthetics of completed projects. Watercourses are now rarely piped, grass swales and porous pavements have been trialed, rainwater tanks are being promoted on all new community buildings, and improving water quality is now an integral part of the design philosophy. This new philosophy is now part of our new design specifications for civil infrastructure within Council's Works Division.

It is important that all potential stakeholders be involved as early as possible ie. from the concept and planning phase through to design, construction and the operation, maintenance and monitoring of the system. This process is essential to demonstrate measurable outcomes, indicators of performance and informed feedback successes and lessons learnt. The regular meetings held onsite were necessary to flag legislative and policy requirements, ensure minimal interruption to current operations, raise historical and current issues and to communicate the importance of water sensitive urban design and its integration with other ESD principles. One important message for persons attempting similar projects is for design and construction staff to have a full appreciation of Sydney Water's position in relation to plumbing requirements (codes, standards, products) for reclaimed/recycled water and use of rainwater tanks eg. backflow prevention and cross-connection hazard risks.

Difficulties Encountered

The bringing together of different mono-disciplined individuals into a single multi-disciplinary team can prove difficult at times. There is potential to create a divergence of professional opinion and often dynamic tensions can hinder resolutions. This was particularly evident where conflicts of interest arose between design staff, tradesmen (electrician/plumber/irrigation contractors), operations staff and management. Often there was a need for shared values or

common ground which served as the basis for ongoing professional interaction. Major concerns were raised over staging of construction so as to maximise opportunity for each tradesperson and minimise disruption to existing nursery and parks operations.

In order to achieve integrated decision making on these more complex issues, it was important to maintain ongoing links and communication between staff and contractors in working towards a inter-disciplinary or more highly productive trans-disciplinary approach.

Pictures, Maps and Further Details (to be forwarded in mail)

1. Project overall layout Plan (A3 sheet)
2. Detail of tank set out (A3 sheet)
3. Grodan Product guide (A4 sheet)
4. Hornsby Earthwise Day promotional flyer
5. Photographic record (A4 sheets)
6. Self-evaluation Matrix results.

Team Members

Staff involved

Anthony Collins
Ross McPherson
Peter Coad
Rob Rajca
Simon Comish
Saba Arunanthy
* Peter Kemp
Geoff Witt
Adam Davis
Kate Parsons
Gavan Mathieson
Polly Thompson
Geoff Hudson
Yolande Frankin

Position (Council)

Catchment Remediation Project Manager
Manager Water Catchments
Env. Scientist (Water Quality)
Manager Design & Construction
Engineer Design Team
Construction Engineer
Manager Parks & Landscape
Parks Service Coordinator
Manager Env. Health & Protection
Env. Education & Policy Officer
Manager Bushland & Biodiversity
Biodiversity Officer
Bushland Community Programs Coord.
Community Nursery Coordinator

* On annual leave

Team Leader's Contact Details

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