

SMALL SCALE SuDS FOR INDIVIDUAL BUILDINGS

SOURCE CONTROL

DESCRIPTION

Sustainable Drainage Systems for individual buildings focus on reducing the amount of stormwater leaving a property and/or conserving water. This can be achieved by a variety of methods which are generally low cost and low maintenance, i.e.:

- ◆ Avoiding misconnections
- ◆ Minimisation of impermeable areas and diversion of run-off to infiltration/soakaway devices
- ◆ Rainwater harvesting: Water butts, Rainwater Tanks
- ◆ Greywater re-use
- ◆ Rooftop greening

AVOIDING MISCONNECTIONS

Misconnections of stormwater to foul sewers and wastewater to storm sewers result in considerable polluting impact in receiving waters. It is the responsibility of the developer and property owner to ensure that there are no such misconnections from their development/property. Rigorous policing of connections by the local authority is required to eliminate inappropriate discharges.

MINIMISATION OF IMPERMEABLE AREAS

DIVERTING TO INFILTRATION/SOAKAWAY DEVICES

The minimisation of impermeable areas can be achieved through the use of permeable paving or gravelled surfaces instead of conventional paving/concrete. The diversion of stormwater, such as the first flush of roof run-off or from disconnected downpipes, to infiltration devices such as soakaways, reduces the volume of water discharge to receiving waters. Roofwater can be discharged directly to the sub-base of infiltration devices. Maintenance requirements and costs are low. See separate SuDS information sheets (Infiltration trenches & Soakaways/Permeable paving) for further details.

WATER BUTT

A water butt is a receptacle or tank, usually covered and placed at ground level, connected to a downpipe, to provide offline attenuation of runoff from roofs. Pollutant removal improves if used in conjunction with first flush devices to divert the first 2mm of roof rainfall run-off and screens to filter out leaves and insects. Desludging is recommended on a regular (annual/biennial) basis.

RAINWATER TANKS

Rainwater tanks collect rainwater for re-use for car washing, gardens and firewater. Tanks can be placed on flat roofs of suitable bearing capacity or connected to downpipes and placed above or under ground. In the latter cases a pump will be required such that the water can be reused, for example, in toilet flushing.

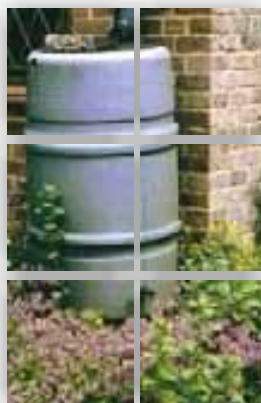
If connecting to the toilet or washing machine a minimum level of water must be maintained by a top-up system from the mains supply. A non-return valve is required to prevent backflow from the tank to the drinking water supply.



Effluent Discharge - Dry Weather Flow



Water Butt - (source: www.blackwell-ltd.com)



Water Butt - (source: www.southern water.co.uk)



Gutter Filter
(LB Plastics Ltd.)



Leafeater
(City Rainwater Tanks Aust Pty Ltd.)



Rainwater Tank

MORE OVERLEAF - 1 of 2

SMALL SCALE SuDS FOR INDIVIDUAL BUILDINGS

SOURCE CONTROL

GREYWATER TANKS

Greywater is a term applied to all bath, dish and laundry water except toilet waste and food waste derived from garbage grinders. Greywater tanks are generally placed underground. A pump is required such that the water can be re-used, for example, in toilet flushing or for watering plants.

When properly managed, greywater is a valuable resource which horticultural and agricultural growers as well as home gardeners can benefit from. It can also be valuable to landscape planners, builders, developers and contractors. While phosphorous, potassium and nitrogen makes greywater a source of pollution for lakes, rivers and groundwater they are excellent nutrient sources for vegetation when this particular form of wastewater is made available for irrigation. Greywater irrigation has long been practiced in areas where water is in short supply.

A key to successful greywater treatment lies in its immediate processing before it turns anaerobic. The simplest, most appropriate treatment technique consists of directly introducing freshly generated greywater into an active, live topsoil environment. Pollutant removal is achieved by treating the greywater with aerobic pre-treatment or anaerobic to aerobic pre-treatment.

Refer www.clivusmulttrum.com and www.greywater.com.

International Experience



Australia
The Healthy Homes project on Australia's Gold Coast is an environmentally sustainable demonstration project incorporating small scale SuDS. Refer to Case Study within this document and www.oca.nsw.gov.au/resource/wramsa_rtfwork.pdf.

ROOFTOP GREENING



Fleishman from www.ecocentre.com

DESCRIPTION
Rooftop greening involves vegetating urban walls and rooftops as a way of gaining access to valuable open space while making urban environments healthier more attractive places in which to live and work. Rooftop greening strategies aim to:

- reduce the quantity and increase the quality of surface water run-off
- improve indoor and outdoor comfort levels for residents
- conserve indigenous biodiversity (genetic, species and ecosystem)
- reduce energy demand for heating and cooling
- encourage environmentally responsive design strategies in the City.

Rooftop Greening is moving from the fringe to the mainstream for two reasons:

- 1) Increasing urban densities are leading to a desire for greater access to green open space; and
- 2) The role of urban vegetation in producing oxygen, fixing carbon dioxide and filtering urban air and water is becoming more widely recognised.

Rooftop Gardens can function as:
"Extensive" systems require little or no maintenance; are developed primarily for their environmental benefits; and normally consist of thin soils and hardy vegetation applied to large roof areas. The use of Sedum varieties is common.

"Intensive" systems require high levels of maintenance; are developed primarily for aesthetic enjoyment. Extensive greening is generally a much cheaper option than intensive greening. For design considerations refer www.roofmeadows.com. Also, Grodan (www.grodan.com) produce rockwool, a lightweight substrate.

International Experience

Germany



One in 10 flat roofs in German cities are of Esslingen in Germany has a by-law which requires that flat and sloping roofs (up to 15 degrees) must be vegetated. Similarly, in Mannheim, declining air quality prompted the City Council to impose a by-law in 1988 which requires all central business district buildings to be vegetated.

Japan



In Tokyo, guidelines encourage 20% of rooftop areas to be planted. From April 2001, companies that fail to meet these guidelines will face fines. Reductions have been implemented to fixed assets taxes for buildings with rooftop greening. These types of policies are expected to increase throughout Japan, as a consequence of revisions of city regulations.

The Takenaka Corporation have developed a "Thin Layer Rooftop Greening System," by using sedum varieties and a thin mat as a planting base, which reduces the live load on buildings and has limited maintenance requirements. Significant energy conservation has been achieved.

Refer www.takenaka.co.jp/takenaka_e/.

America



The award-winning Chicago City Hall green roof was installed for the Urban Heat Island Initiative project. The design includes a 3.5" deep 'extensive' system to 24" deep 'intensive' landscape islands. The project shows the benefit of green roofs in lowering summer temperatures within ultra-urban environments.

Refer www.cityofchicago.org.



Chicago City Hall 2002

Source www.roofmeadows.com

FROM PREVIOUS - 2 of 2

