



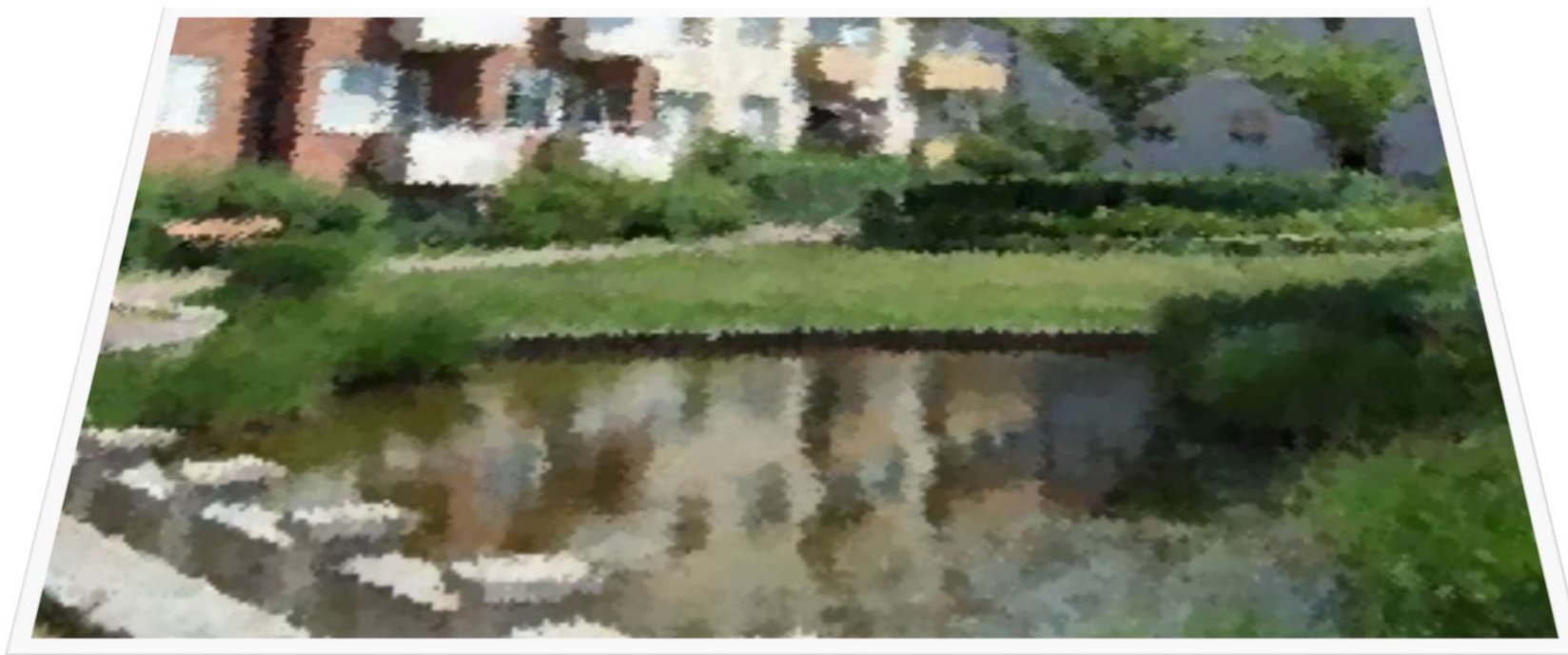
# 2017 Stormwater Victoria Conference Asserting the Sustainable Drainage Agenda





## Overview

- Successful Sustainable Drainage on a Macro Scale
- Sustainable Drainage Philosophy
- Integrating Sustainable Drainage on a Micro Scale
- Asserting the Sustainable Drainage Agenda



<https://connect.innovateuk.org/web/sustainable-drainage-systems-suds/article-view/-/blogs/british-water-suds-sabs-national-standards-one-day-conferences-22nd-23rd-march-2011>





# New York Water Supply – Catskills Project





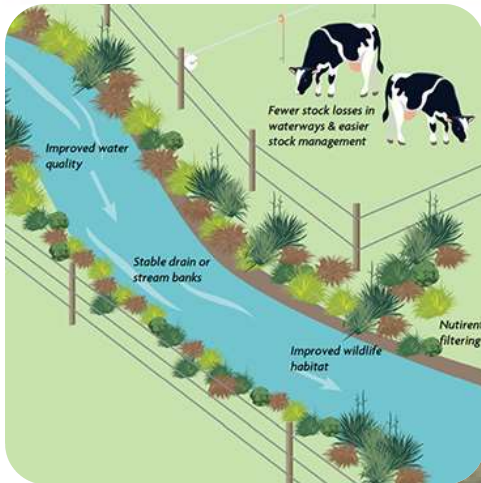
## New York Water Supply – Catskills Project



- In early 1990s water treatment costs (including construction and operation of filtration systems required to meet EPA standards) were estimated at:
  - US\$6 - 8 billion capital cost
  - US\$200 - 300 million annual operating and maintenance costs
- Innovative alternative cost effective and environmentally sensitive approach, which involved implementing sustainable drainage practices was adopted - Filter Avoidance Determination (FAD)



## New York Water Supply – Catskill Project



- FAD (received EPA approval in 1993) has a simple concept - pay landowners to leave to nature a buffer zone at stream edges.
- Landowners were also required to employ farming techniques that prevented soil erosion from the buffer zone and its over saturation with noxious pollutants.



## New York Water Supply – Catskills Project



... and the results:

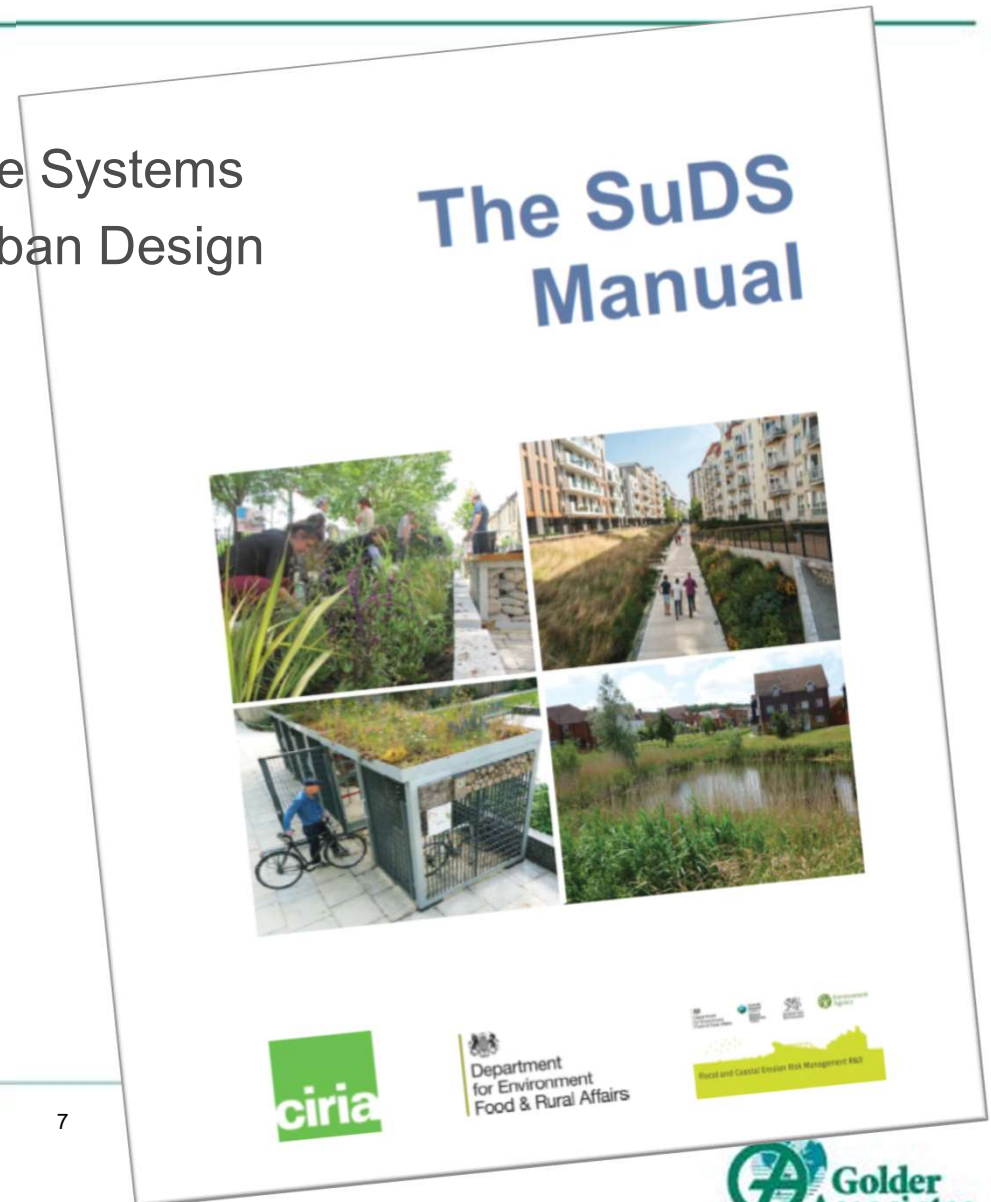
- **Clean Water** - all that is added to the water is chlorine and fluoride and in addition a barrier at the outfall is provided to stop the flow of dead fish.
- **EPA approval** - FAD has been regularly reviewed by the EAP and received continual approval to date with another review due this year.
- **Significantly Reduced Costs** - to date the estimated cost of protecting the Catskills and Delaware catchments in this way is in the region of US\$1 billion.





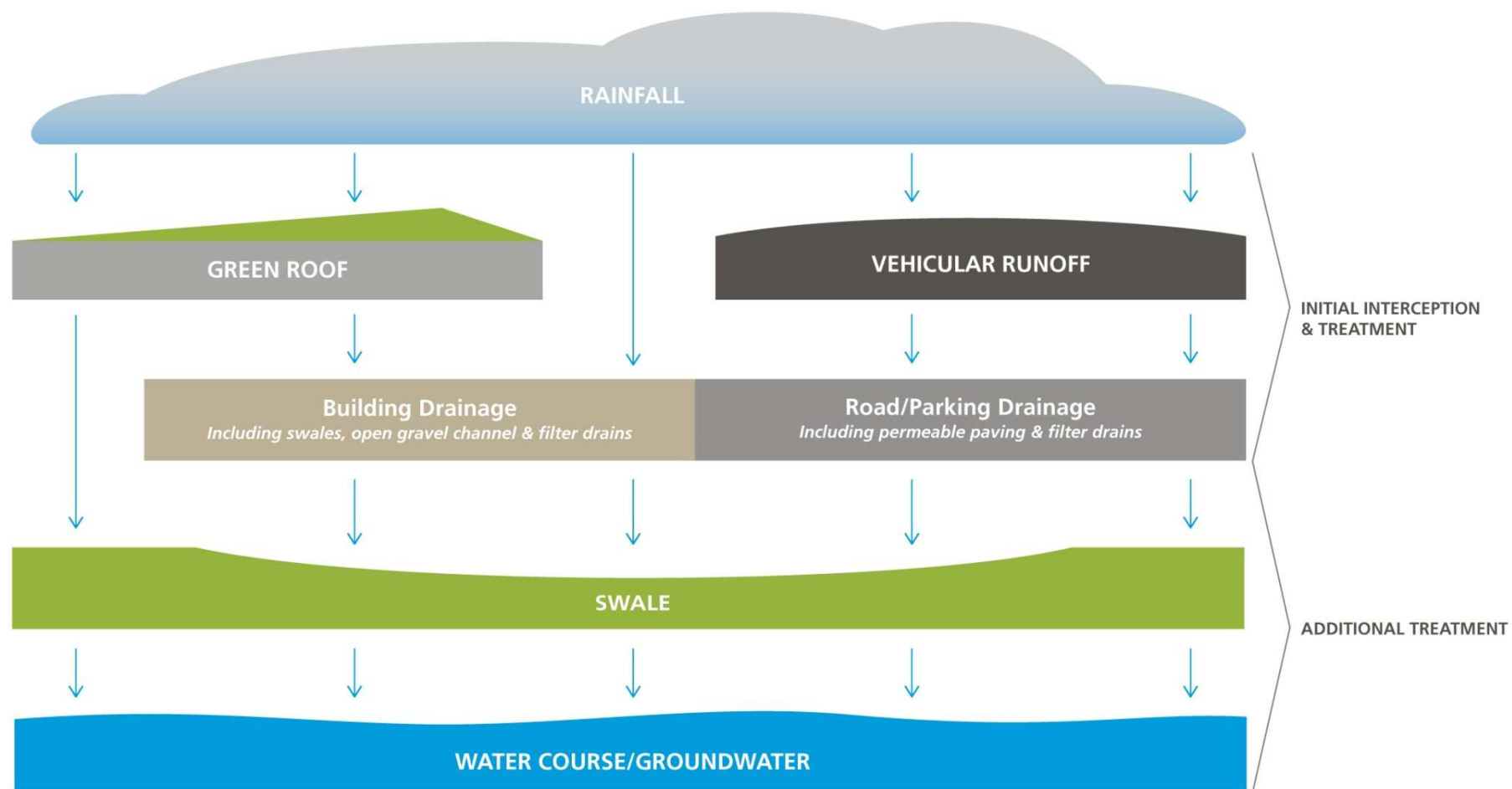
# Sustainable Drainage Philosophy

- What is sustainable drainage:
  - SuDS - Sustainable Drainage Systems
  - WSUD – Water Sensitive Urban Design
  - Best Management Practices
- SuDS ...
  - Quality
  - Quantity
  - Amenity
  - Biodiversity





# Treatment Train Approach







# Sustainable Drainage Components – Green Roofs



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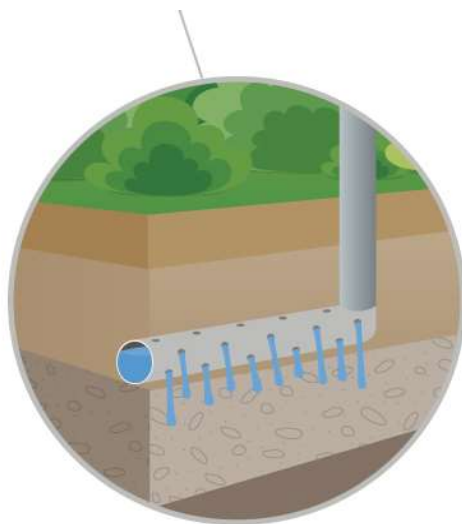
# Sustainable Drainage Components – Green Roofs







## Sustainable Drainage Components – Rain Gardens



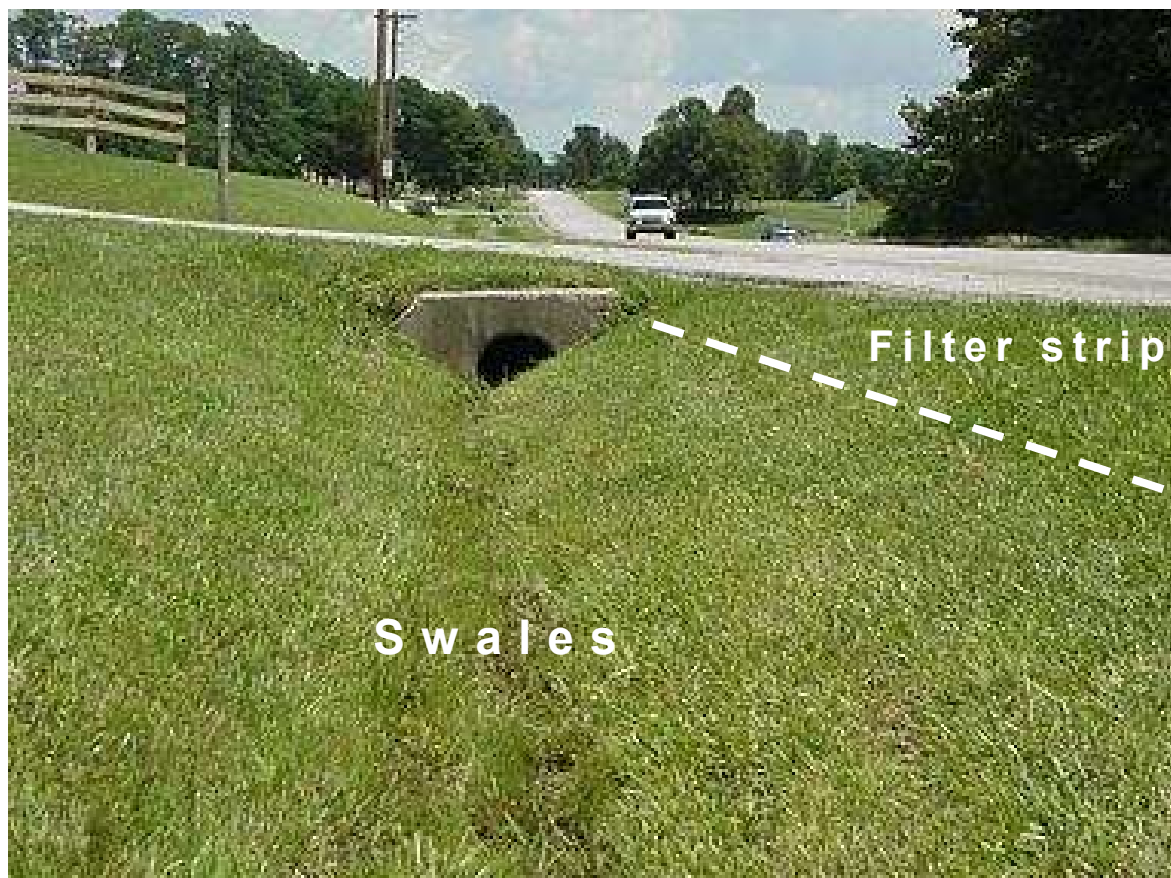
RAIN GARDEN





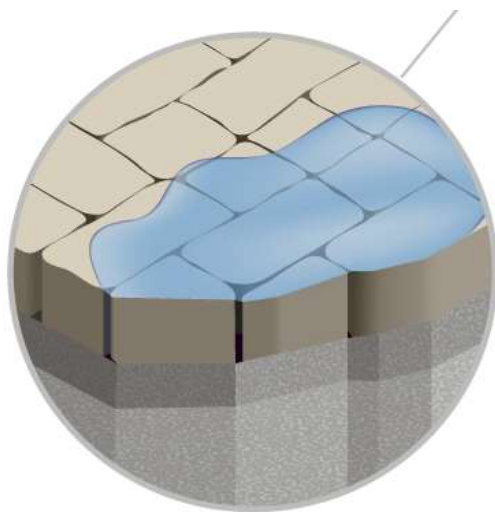


## Sustainable Drainage Components – Swales & Filter Strips





## Sustainable Drainage Components – Permeable Paving

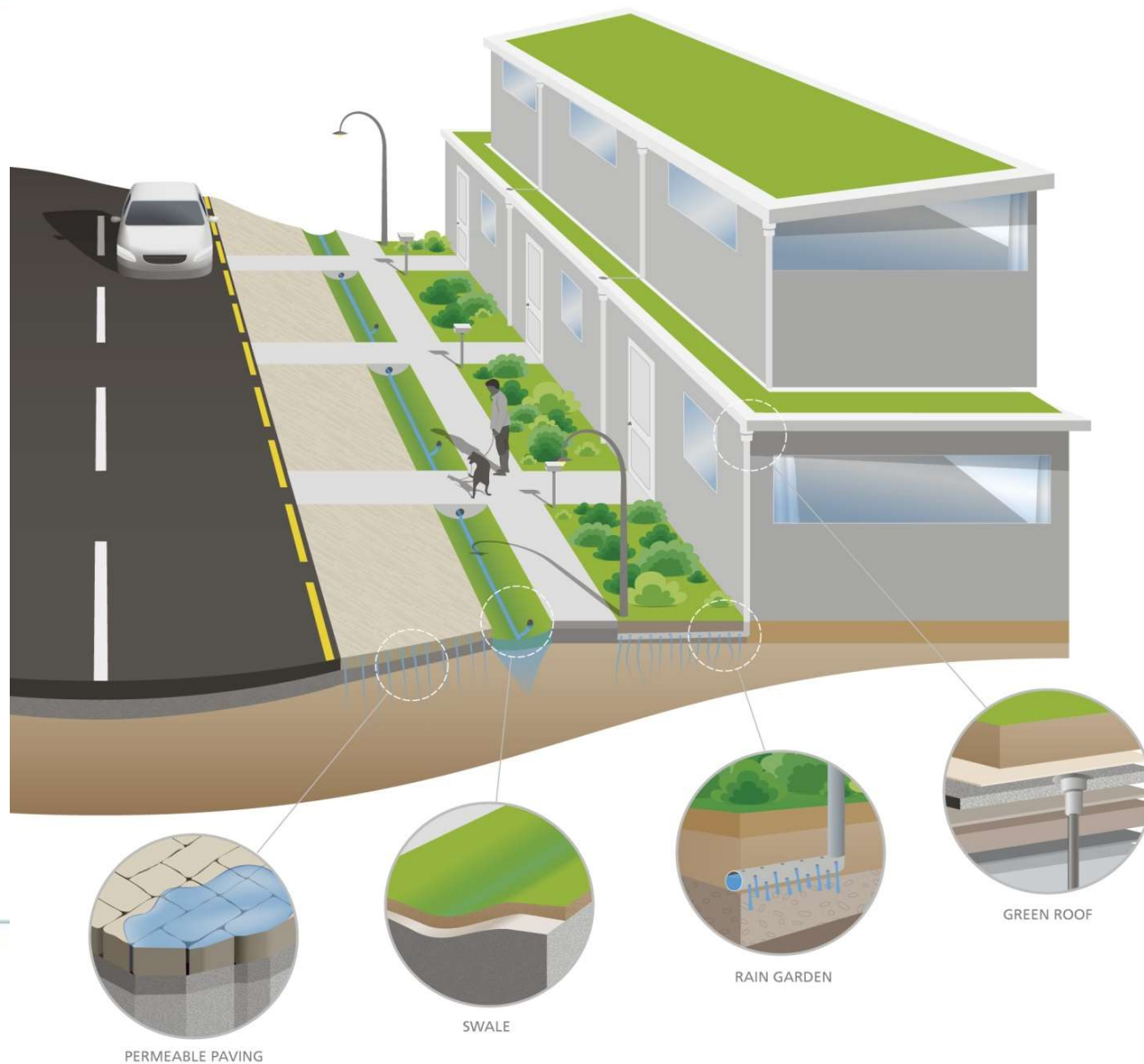


PERMEABLE PAVING





# Combining and Integrating Components = Sustainably Drained Developments



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## Asserting the Sustainable Drainage Agenda

- How do we Assert the Sustainable Agenda – ***target developers and consumers?***



- **Quality & Quantity** – assess the cost savings and return to developers?
- **Amenity** – recognise amenity in sustainable drainage and potentially count as part of open space requirements lead to denser developments and benefit developer?
- **Biodiversity** – hard to quantify and qualify, potential use as a marketing tool?
- **Energy** – green roofs can help in reducing heating and cooling costs



## Asserting the Sustainable Drainage Agenda

- How do we Assert the Sustainable Agenda – ***legislation and education?***



- **Legislation** – enforce more stringent legislation?
- **Education** – educate all stakeholders, dispel myths and concerns and demonstrate simplicity?
- **Promotion** – identify, quantify and promote the successes and their benefits?
- **Cost benefit analysis** - develop catchment-wide sustainable drainage masterplans and quantify the cost-effectiveness?
- **Integration** – designers to include at earliest stages of design to minimise impact on development.





## Thanks & Questions

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