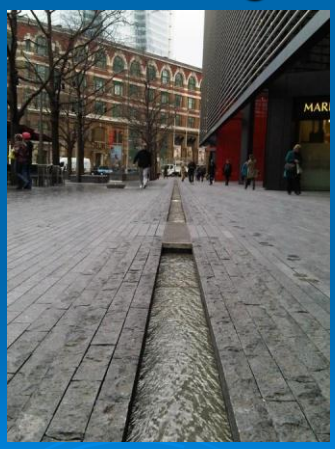
SuDS for Highways



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Integration

- Hard or soft SuDS?
- The most appropriate solution for the site given the constraints
- Sometimes landscape features are best
- Sometimes hard engineered solutions are best
- Often a combination is the right solution
- Try and put either in the wrong place and it will not work

Use of SuDS in highways

- Permeable pavements
- Bioretention
- Treatment channels and tree irrigation
- Swales, basins, ponds, wetlands
- Retrofitting

- We will hopefully dispel a few myths along the way

This is not SuDS!

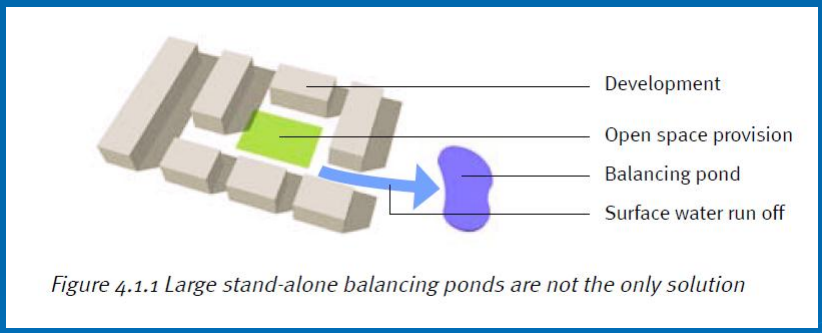
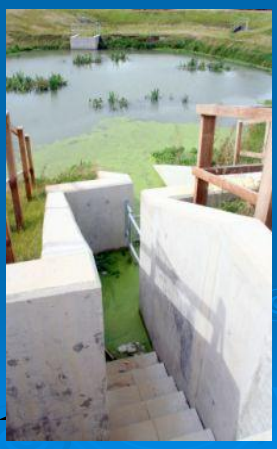


Figure 4.1.1 Large stand-alone balancing ponds are not the only solution

- Design like this -

This is not SuDS!

- And you get this



"Beauty is in the eye of the beholder"

End of pipe ponds/wetlands

- Are not SuDS
- Are a maintenance liability
- Have poor biodiversity
- Are not valued by the community

A question

- Would you rather adopt this?

Or this?

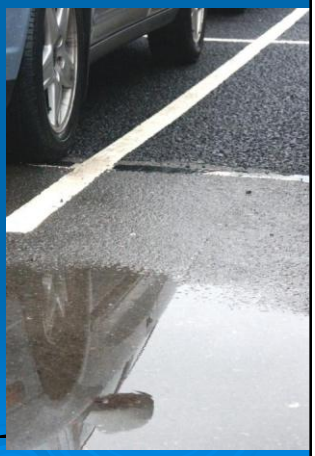
Permeable paving to canals – Brownfield site

After approx 50 to 60mm rainfall

4 years old at time of photo – never been cleaned

Permeable pavements

- Permeable pavements are an ideal SUDS solution for many sites
- Source control technique
- Can attenuate large rainfall events
- Reduce volume of runoff
- Prevent runoff for rainfall up to 5mm
- Good pollution removal capability
- Robust



BUT!

- They are not appropriate on all parts of all sites
- They are not the solution to all flood problems
- They need to be designed and constructed correctly
- Just like any other road construction or drainage system
- They are different to normal road construction
- This is no reason not to use them
- We need to apply engineering skills

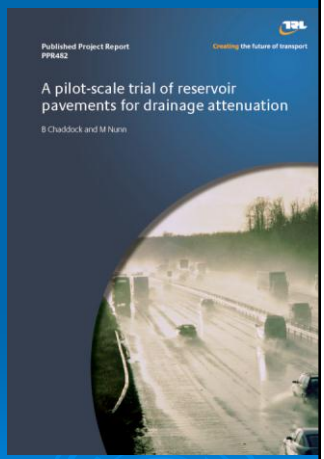
Water flows downhill

Durability

- If used in appropriate locations
- If designed and constructed correctly
- Permeable pavements are durable
- 11 year old permeable pavement on a landfill
- Still drains, structurally sound

Permeable paving within 5m of buildings

Guidance



Permeable pavements are good but!

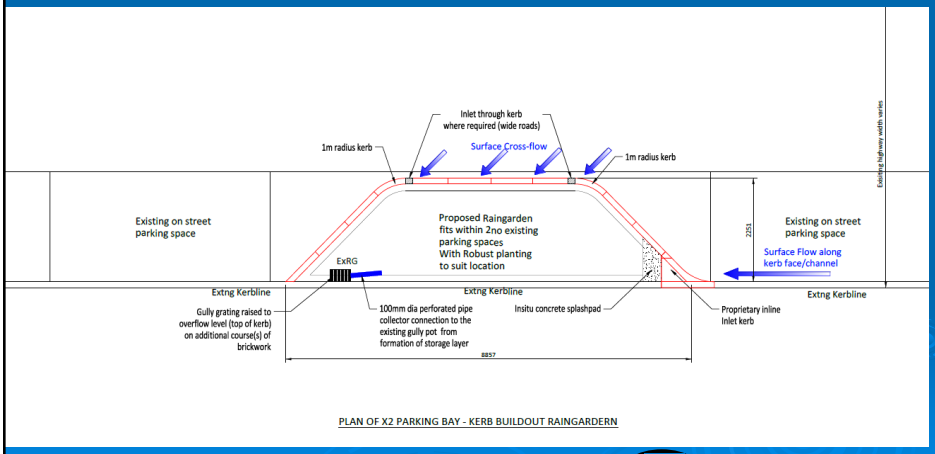
- We do not want a world where the only SuDS is permeable pavement
- Where HGVs are turning regularly they are not so good
- Use surface green features where appropriate
- There are other solutions that are equally as good

Bioretention - retrofit

- Ashford in Kent

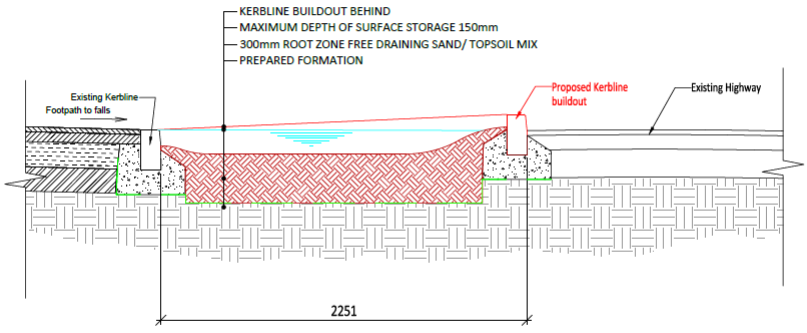
Retrofit

Retrofit bioretention - Lambeth



PLAN OF X2 PARKING BAY - KERB BUILDOUT RAINGARDERN

Section



TYPICAL SECTION THROUGH KERB BUILDOUT RAINGARDERN WITH SURFACE STORAGE ONLY

Swales, basins, etc

J4 Services, M8, Scotland

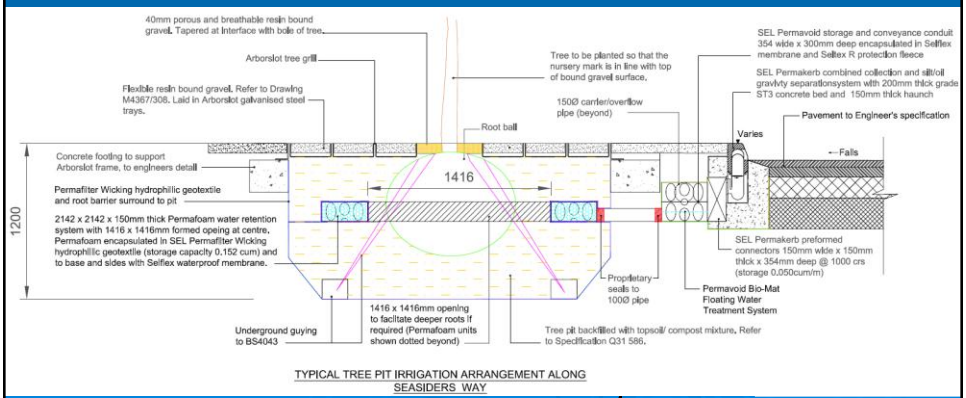
Near Stanstead, A120

Factory, Northumberland

Tree irrigation and attenuation

Blackpool

- Integrate SuDS and tree irrigation



TYPICAL TREE PIT IRRIGATION ARRANGEMENT ALONG SEASIDERS WAY

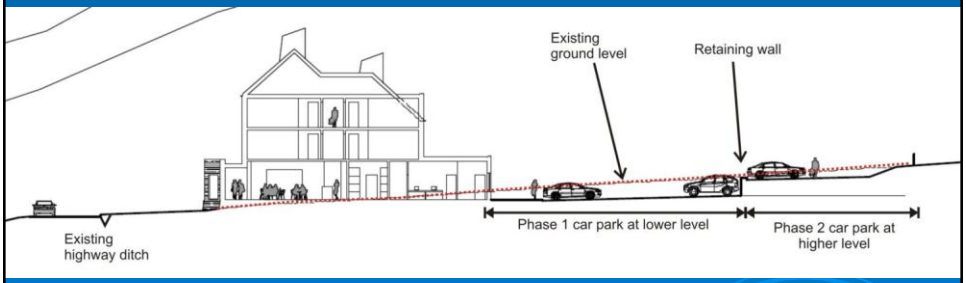
Blackpool

Treatment channels

- There are source control methods that are not in the SuDS Manual
- Meet all the performance requirements especially ease of maintenance

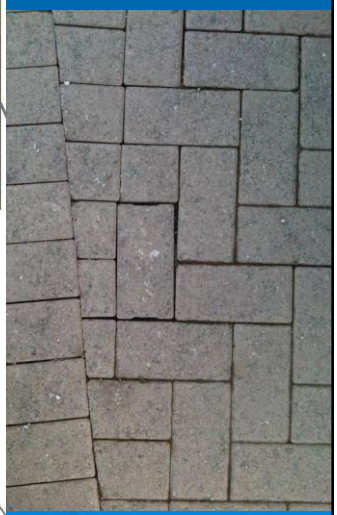
The most appropriate solution

- Will depend on site constraints



Supervision

SURFACE WATER MANHOLE – S70
DEPTH TO INVERT APPROX 2.95
DESIGNED 1 X 240mm ORIFICE
AS BUILT = 2 X 240mm ORIFICES



If you want safe and easy to maintain SuDS - avoid this

A final thought

"Those who say SuDS cannot be done should not interrupt the people who are doing it"

By using an appropriate combination of solutions and careful design at the right stage SuDS can provide an affordable solution on any site

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