

## WHY

- Urban areas produce excessive overland flow and flood water + more erosion.
- Urban areas cause greater water pollution.
- Surface water drainage combines with effluence and untreated water after heavy rainfall.

## ⑤ REGULATION

- Planning permissions apply SUD's concepts.
- Education
- Links with Environment Agency if discharged into water courses.

## ⑥ RIVER RESTORATION

- To improve environmental and amenity value
- SUSTAINABLE water courses

S                      E                      E  
amenity value    protects            reduce costs  
less floods       habitats            of flooding + treatment

## CONCEPTS

- Rain water should infiltrate
- Overflow should be free from pollution.
- Overland flow should not exceed that for undeveloped areas.

## SUSTAINABLE URBAN DRAINAGE SYSTEMS SUD's

## ④ ABOVE GROUND STORAGE

- Basins and retention ponds slow overland flow.
- These storage facilities may be permanent, semi-permanent or temporary.
- Planting in ponds give some water treatment.
- Green roofs intercept and store water.

## ③ BELOW GROUND STORAGE

- Gradual release of water to drains
- Water stored in aggregate and soakaways.
- Underground plastic honeycomb storage reduces overland flow.

## METHODS

### ① FILTER STRIPS AND SWALES

- Filter strips are vegetated areas that remove pollution by filtering.
- Swales are long, narrow ditches to slow overland flow and move water elsewhere.

### ② PERMEABLE SURFACES

Traditionally in urban areas impermeable surfaces move water to drains and underground pipes increasing run-off.

- Soakaways, gravel surfaces, paving with open joints, grass (reinforced if needed) allows infiltration, reduces overland flow.