
SuDS: Water, People, Places
Mike Henderson, AECOM


DANGER


DRINKING WATER
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V236 JMY

Water Sensitive Urban Design [waa-ter sen-si-tiv ur-buh'n dih-zahyn]

Verb

Water Sensitive Urban Design (WSUD) is the process of integrating water cycle management with the built environment through planning and urban design.

Sustainable Drainage Systems (SuDS) are the component elements that build up to deliver a WSUD approach:

- **At Best** they form a train to convey, cleanse and store surface water for local reuse through multifunctional green infrastructure
- **At worst** they should reduce peak flow to alleviate pressure on the surface water sewer system

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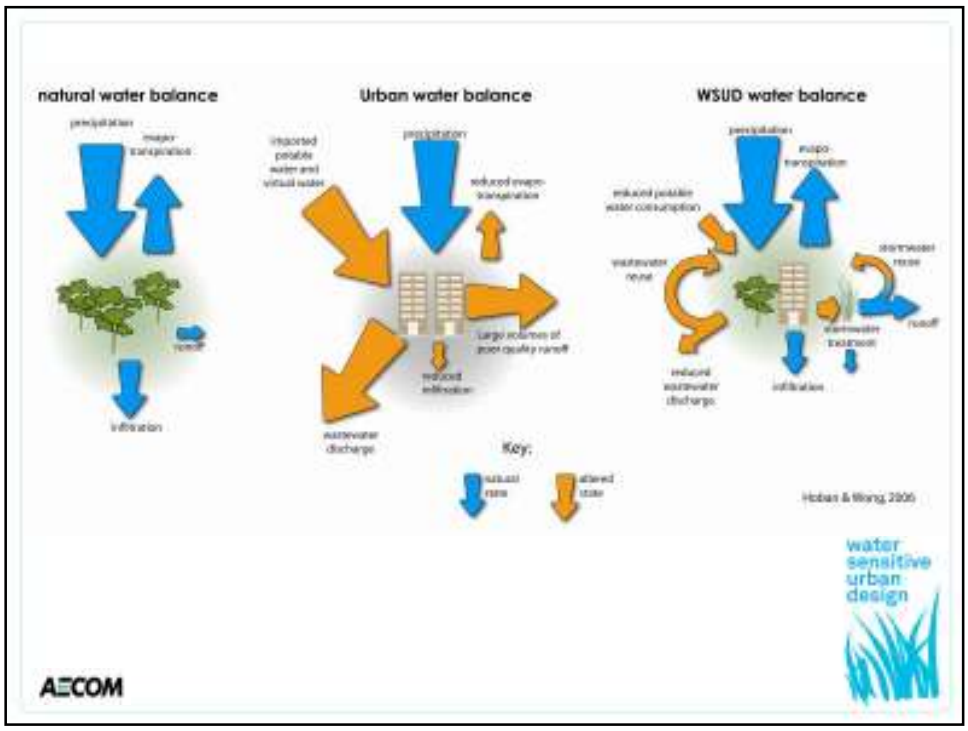
water sensitive urban design


natural water balance
Urban water balance
WSUD water balance
Key:
water sensitive urban design
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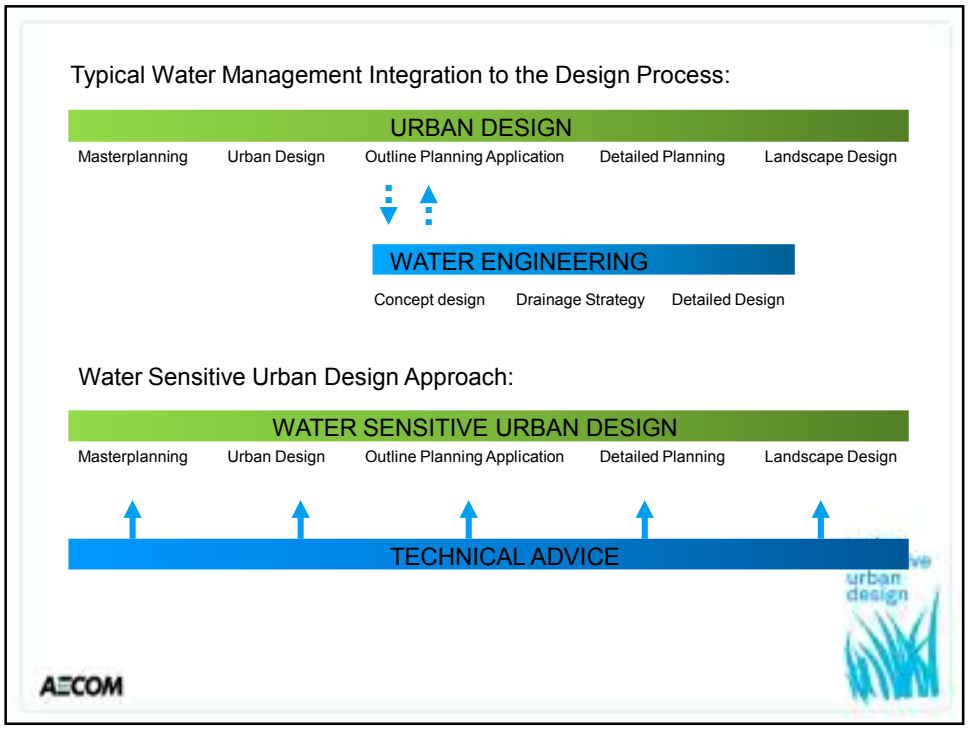
Typical Water Management Integration to the Design Process:
URBAN DESIGN
Masterplanning
Urban Design
Outline Planning Application
Detailed Planning
Landscape Design
WATER ENGINEERING
Concept design
Drainage Strategy
Detailed Design
Water Sensitive Urban Design Approach:
WATER SENSITIVE URBAN DESIGN
Masterplanning
Urban Design
Outline Planning Application
Detailed Planning
Landscape Design
TECHNICAL ADVICE
urban design
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- **NPPF – "priority to the use of SuDS"**
- **Flood and Water Management Act 2010 and SAB's**
- **National SuDS Standards?**

defra
Department for Environment Food and Rural Affairs

Objective:

to respond in a positive manner...

...and create a tool for placemaking

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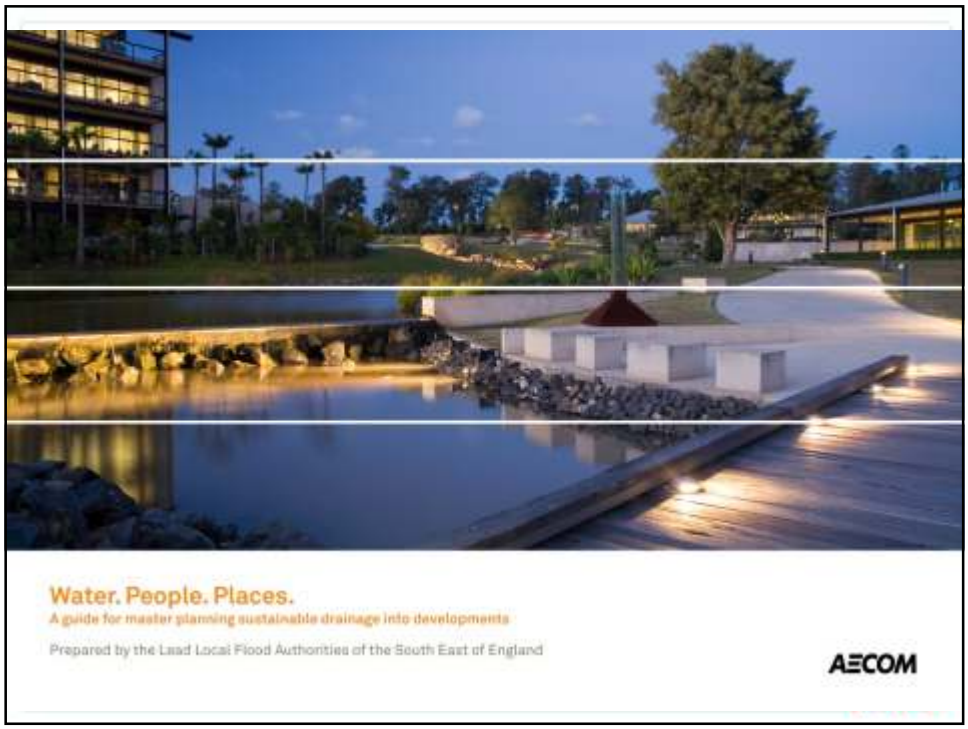

1. Design framework

INTEGRATION INTO THE MASTERPLANNING PROCESS

Prepare.
Define.
Design.

1. Buildings and built form
2. The street network
3. Open spaces and landscape areas

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A	AIMS AND OBJECTIVES	document aspirations
	OUTLINE BUSINESS CASE	viability, feasibility, pragmatic
B	CONTEXT APPRAISAL	understanding the baseline and how a place works
	SPATIAL FRAMEWORK	opportunities and constraints
	ASSEMBLE MASTER PLANNING TEAM	the right range of skills for the team
C	INITIAL TESTING	
	LAND USE & DESTINATION	land use distributions and relationships
	KEY CONNECTIONS	strategic connections between destinations
	OPEN SPACES	connected green infrastructure
	MASTER PLAN OPTION TESTING	
D	PREFERRED STRATEGY	
	BLOCK STRUCTURE	patterns of blocks and density areas
	MOVEMENT FRAMEWORK	street hierarchies and the character of routes
	OPEN SPACE NETWORK	functions and characters of open space
	BUSINESS CASE	
E	DESIGN REFINEMENT	
	CONCEPT ARCHITECTURE	character areas and building typologies
	CONCEPT STREET DESIGN	highways and streets
	CONCEPT LANDSCAPES	open spaces and public realm
	DEVELOPER BRIEF OR GUIDELINES	

A Prepare.

1. Aims and objectives
- Set out water management objectives
  - Run-off rates
  - Water quality issues
  - Water supply and demand

2. Developing the business case
- Identify synergies and challenges
  - Wider catchment flood risk
  - Open space requirements
  - Ecological networks
  - Contamination containment

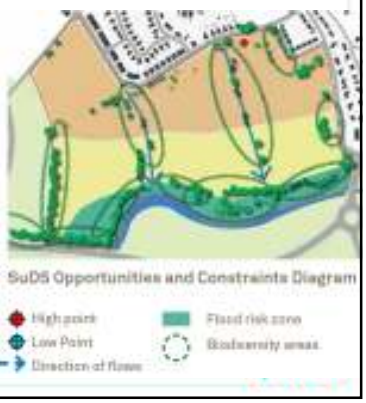
water sensitive urban design

B Define.

1. Context appraisal
- SuDS baseline

2. Spatial framework
- Identify flow paths / low points
- Identify discharge points
- SuDS opportunities and constraints diagram

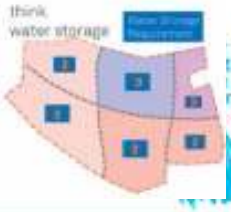
3. Assemble the right team



C Design.

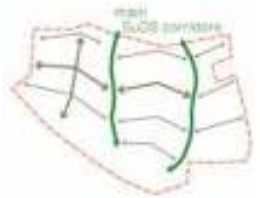
Initial Testing – the relationship between development area and water

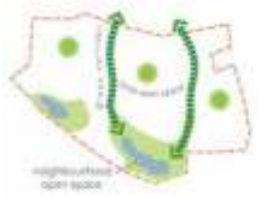
- Identify SuDS catchments
- Allocate treatment stages
- Estimate attenuations volumes

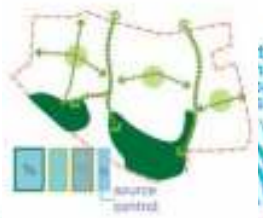


C Design.

- Structures and conveyance paths
- Green and open space
- Outline water management diagram

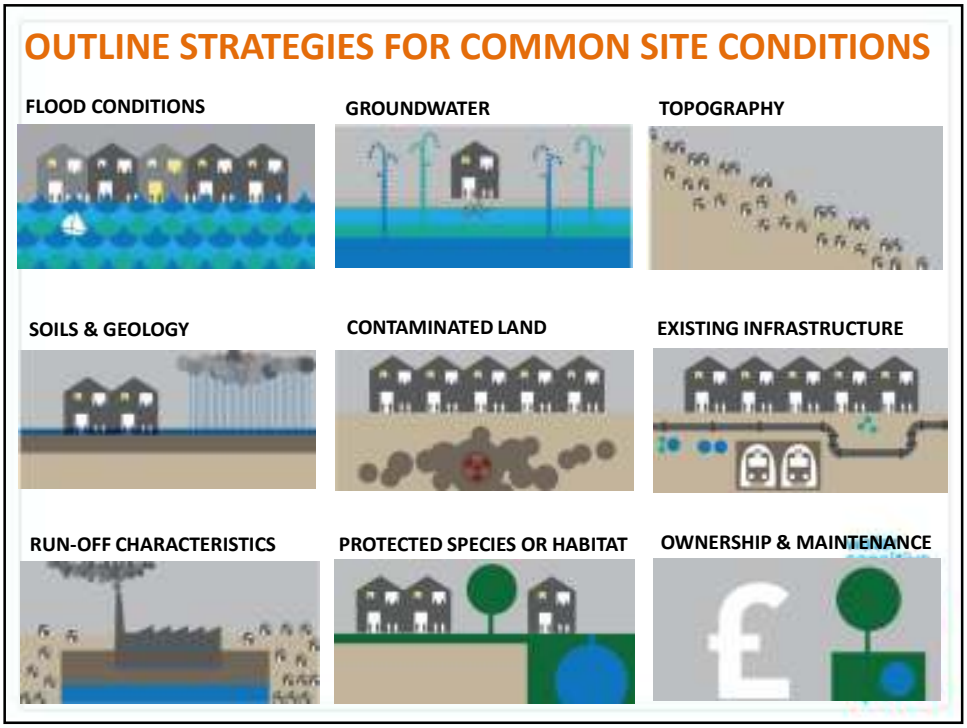


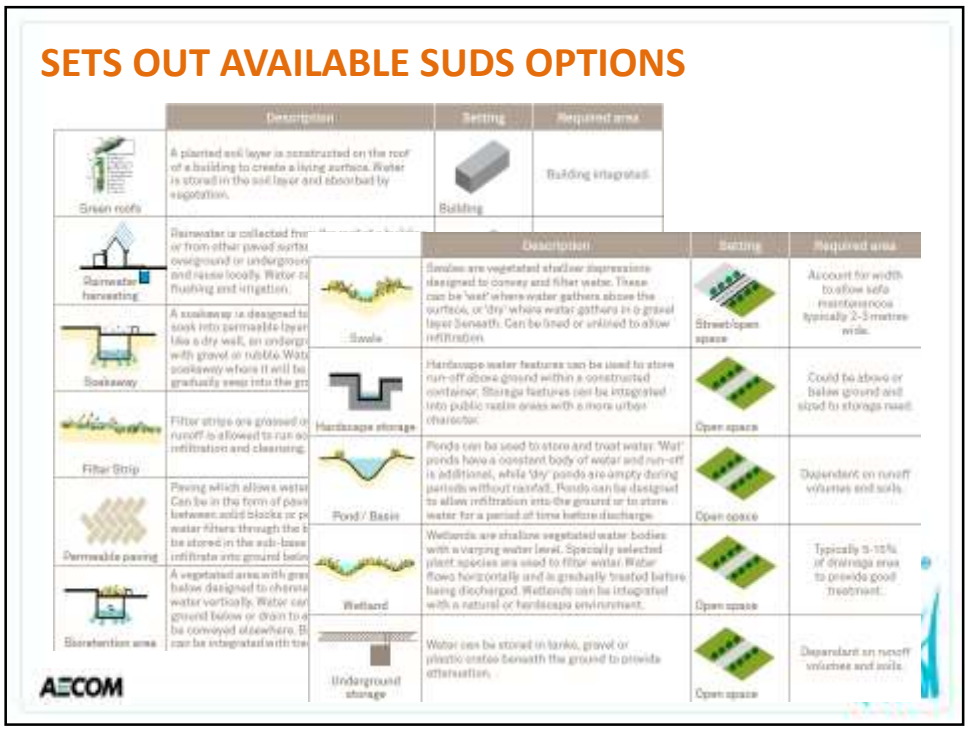




2. Reflect local conditions

OUTLINE STRATEGIES FOR COMMON SITE CONDITIONS




SETS OUT AVAILABLE SUDS OPTIONS
Description
Setting
Required area
Green roofs
Building
Building integrated
Rainwater harvesting
Soakaway
Filter Strip
Permeable paving
Bioretention area
Swale
Hardscape storage
Pond / Basin
Wetland
Underground storage
Street/open space
Open space
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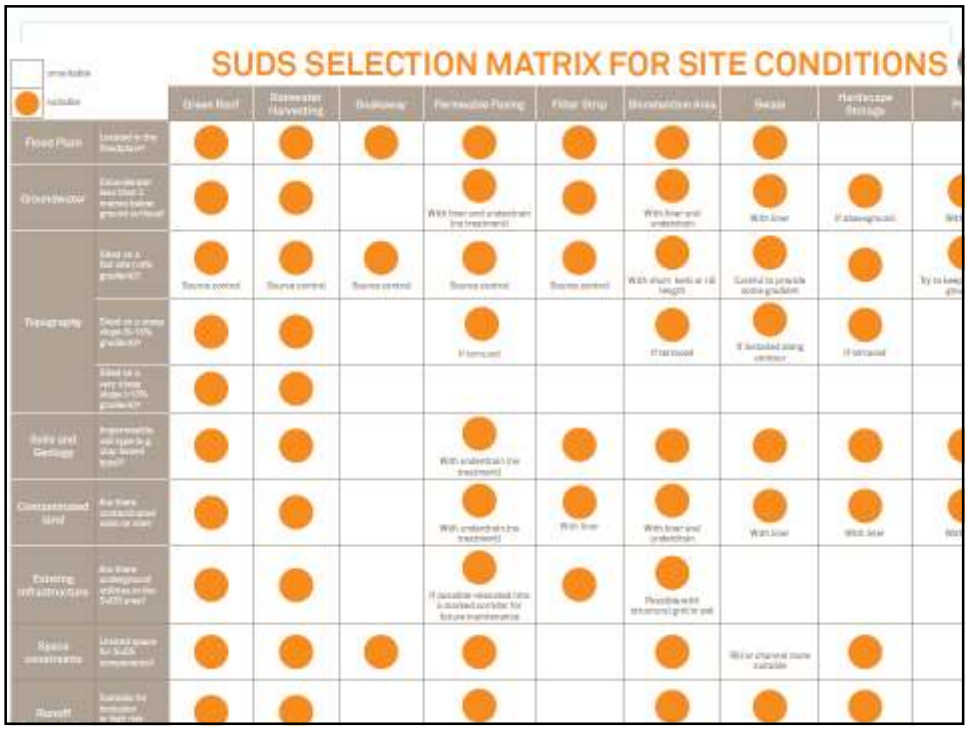
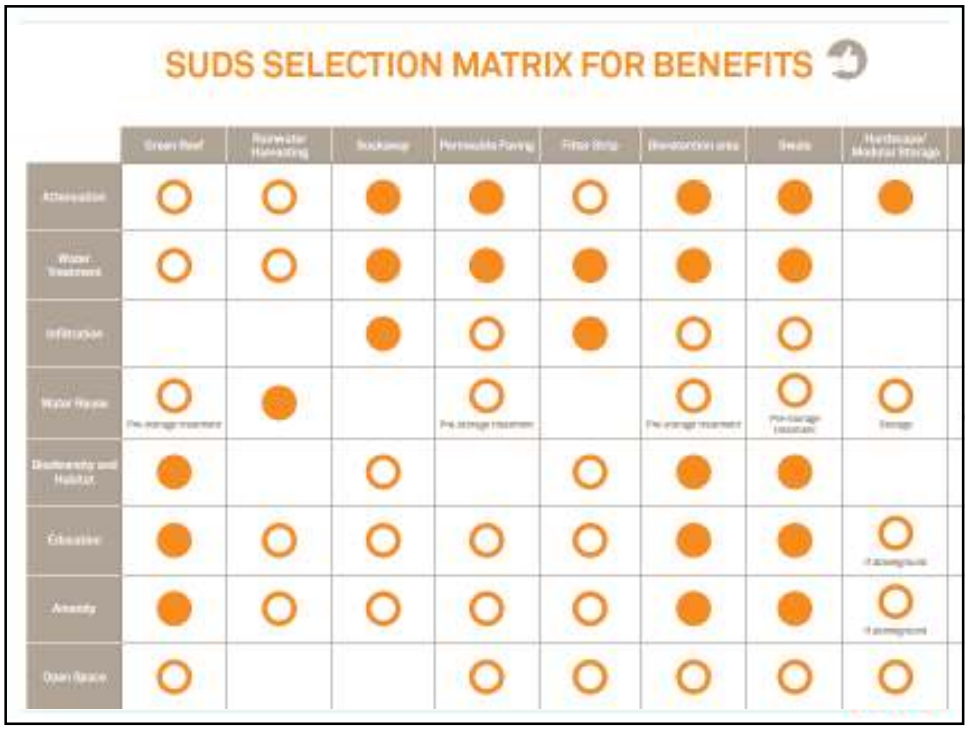

SUDS SELECTION MATRIX FOR SITE CONDITIONS
Green Roof
Rainwater Harvesting
Soakaway
Permeable Paving
Filter Strip
Bioretention Area
Swale
Hardscape Storage
Flood Plain
Groundwater
Topography
Soils and Geology
Contaminated land
Existing Infrastructure
Space constraints
Runoff

3. Maximising benefits

1. Attenuation
2. Water Treatment
3. Infiltration
4. Water Reuse
5. Biodiversity
6. Amenity
7. Education
8. Open Space
9. Character
10. Microclimate



4. Creating great places

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