SuDS not duds – interactions with spatial planning

SuDS: Water, People, Places

Mike Henderson, AECOM
SuDS not duds – interactions with spatial planning
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
SuDS not duds – interactions with spatial planning

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**
South East 7 Masterplanning for SUDS Guidance

- NPPF – “priority to the use of SuDS”
- Flood and Water Management Act 2010 and SAB’s
- National SuDS Standards?
Objective:

to respond in a positive manner...

...and create a tool for placemaking
1. Design framework

INTEGRATION INTO THE MASTERPLANNING PROCESS

Prepare. Define. Design.

- **AIMS AND OBJECTIVES**: document aspirations
- **OUTLINE BUSINESS CASE**: viability, feasibility, pragmatic
- **CONTEXT APPRAISAL**: understanding the baseline and how places work
- **SPIRITUAL FRAMEWORK**: opportunities and constraints
- **ASSEMBLE MASTER PLANNING TEAM**: the right range of skills for the team

**INTEGRATION**

- **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**

**PREVIOUS 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**

**PRESENTATION**

- **CONCEPT ARCHITECTURE**: character areas and building typologies
- **CONCEPT STREET DESIGN**: highways and streets
- **CONCEPT LANDSCAPES**: open spaces and public realm
- **DEVELOPER BRIEF OR GUIDELINES**
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

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
Design.
Initial Testing – the relationship between development area and water
- Identify SuDS catchments
- Allocate treatment stages
- Estimate attenuations volumes

Design.
- Structures and conveyance paths
- Green and open space
- Outline water management diagram
2. Reflect local conditions

<table>
<thead>
<tr>
<th>OUTLINE STRATEGIES FOR COMMON SITE CONDITIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FLOOD CONDITIONS</strong></td>
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<tr>
<td><img src="image" alt="Flood Conditions" /></td>
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<tr>
<td><strong>GROUNDWATER</strong></td>
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<td><strong>CONTAMINATED LAND</strong></td>
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<td><strong>EXISTING INFRASTRUCTURE</strong></td>
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<td><strong>RUN-OFF CHARACTERISTICS</strong></td>
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SETS OUT AVAILABLE SUDS OPTIONS

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<thead>
<tr>
<th>Description</th>
<th>Setting</th>
<th>Required area</th>
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<tbody>
<tr>
<td>Rainwater harvesting</td>
<td>Roof</td>
<td>Building integrated</td>
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<tr>
<td>Filter strip</td>
<td>Road</td>
<td>Open space</td>
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<tr>
<td>Grass swales</td>
<td>Decorative</td>
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</tr>
<tr>
<td>Permeable paving</td>
<td>Sidewalk</td>
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<td>Bioretention</td>
<td>Landscaping</td>
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SUDS SELECTION MATRIX FOR SITE CONDITIONS

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<thead>
<tr>
<th>Drainage</th>
<th>Water Quality</th>
<th>Infiltration</th>
<th>Permeable Paving</th>
<th>Filter Strip</th>
<th>Infiltration Area</th>
<th>Gravel</th>
<th>Vegetation</th>
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Mike Henderson - AECOM
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

![SUDDS SELECTION MATRIX FOR BENEFITS](image-url)
4. Creating great places