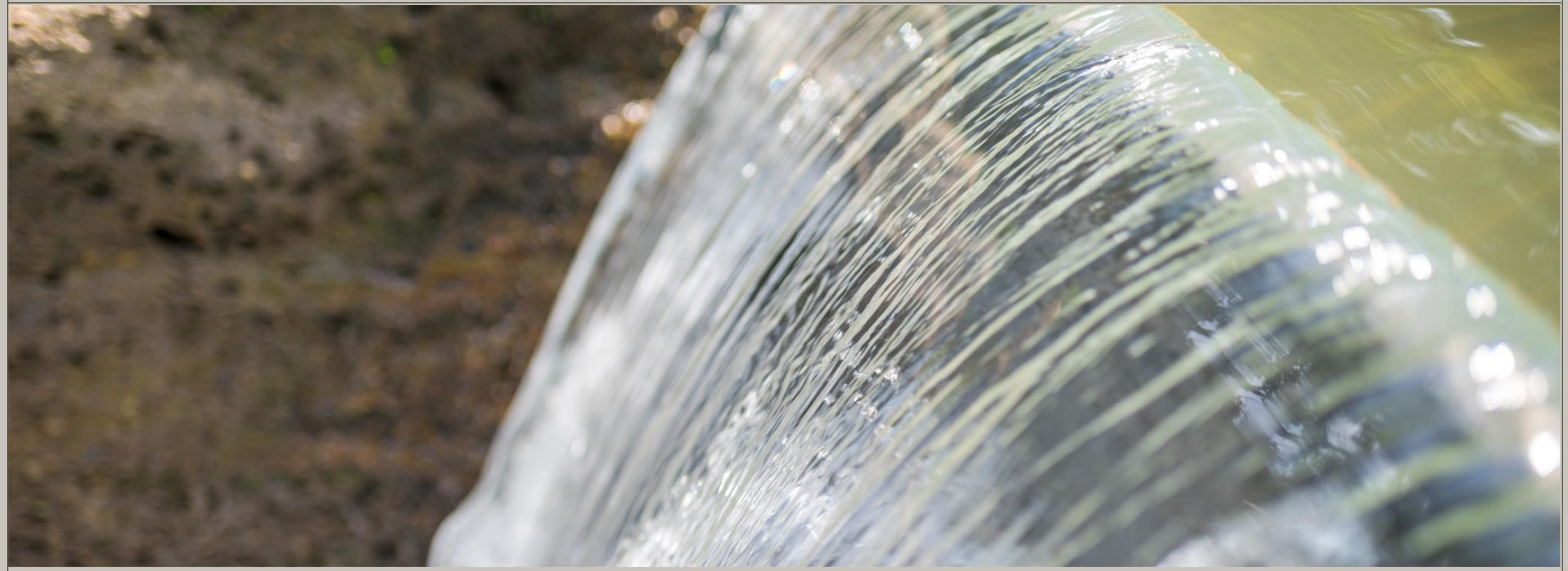


NATIONAL SUDS STANDARDS (ENGLAND, 2025)

New guidelines for sustainable drainage across England

INTRODUCTION TO NATIONAL SUDS STANDARDS

OVERVIEW OF NATIONAL SUDS STANDARDS

Comprehensive SuDS Framework

The 2025 National SuDS Standards provide detailed guidance for sustainable drainage system design and implementation in England.

Multi-functional Infrastructure

Standards promote infrastructure that integrates flood mitigation, water quality, amenity, and biodiversity benefits.

Voluntary yet Influential

Though non-statutory, the standards strongly influence planning and approvals across multiple sectors.

Nature-Based Solutions

Emphasizes early integrated design and nature-based approaches to enhance environmental and social benefits.

HOW THE NATIONAL STANDARDS WORK

HIERARCHY AND FIXED STANDARDS FRAMEWORK

Drainage Hierarchy Overview

The drainage hierarchy prioritises runoff destinations, encouraging reuse and infiltration before discharge to sewers or watercourses.

Fixed Standards Components

Fixed standards define performance criteria for water interception, rainfall management, water quality, biodiversity, and maintenance.

Flexible Compliance Approach

Standards allow flexibility considering site conditions and development constraints with justified departures approved by authorities.

Typical SuDS Features

Common SuDS features include green roofs, permeable paving, swales, bioretention areas, and wetlands for effective drainage.

RUNOFF DESTINATION HIERARCHY

PRIORITISATION OF RUNOFF PATHWAYS

Rainwater Collection Priority

Collect rainwater for non-potable uses to reduce demand on potable water, promoting sustainability.

Ground Infiltration Importance

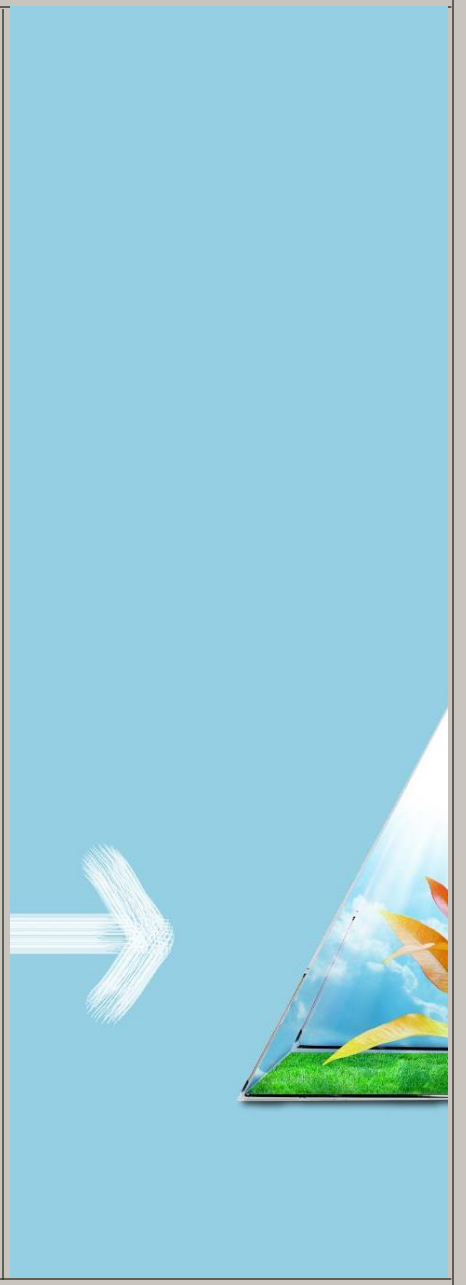
Infiltrate runoff into soil where conditions allow, supporting natural groundwater recharge.

Surface Water Discharge

Discharge runoff to rivers or lakes if collection and infiltration are unviable, minimizing impact.

Sewer Discharge as Last Resort

Use surface water sewers or combined sewer discharge only after all sustainable options are exhausted.



INTERCEPTION AND EVERYDAY RAINFALL MANAGEMENT

FIRST 5MM RAINFALL RETENTION

Purpose of First 5mm Retention

Retaining the first 5mm of rainfall reduces surface runoff and lowers pollutant transport from sites.

Interception Techniques

Key methods include green roofs, permeable pavements, rain gardens, and bioretention systems to capture rainfall.

Design Considerations

Effective design considers soil infiltration, vegetation, base layer depth, and runoff contributing area.

Distributed SuDS Benefits

Small, distributed Sustainable Drainage Systems features improve site performance when used strategically.

EXTREME RAINFALL AND FLOOD RISK MANAGEMENT

MANAGING HIGH-INTENSITY STORM EVENTS

SuDS Peak Flow Management

SuDS systems control peak flows during up to 1 in 30-year storm events to prevent flooding in unintended areas.

Infiltration System Requirements

Infiltration systems must have soil permeability $\geq 1\times10^{-6}$ m/s and a minimum one-metre groundwater separation.

System Functionality Restoration

Stormwater systems must half-empty within 24 hours to be ready for subsequent rainfall events.

Alternative Design Measures

Where infiltration is inadequate, systems use detention basins, conveyance routes, and controlled discharges to protect infrastructure.

WATER QUALITY MANAGEMENT

POLLUTION CONTROL IN SUDS DESIGNS

Pollution Control at Source

Standard 4 focuses on controlling pollution at the source using site-specific treatment trains tailored to land use.

High-Risk Area Treatment

Industrial sites, large car parks, and HGV yards require robust treatment and may need Environmental Permits.

SuDS Treatment Components

Components like permeable pavements, swales, and wetlands remove sediments, hydrocarbons, nutrients, and metals in stages.

Water Quality Risk Assessment

Designers perform risk assessments considering contaminant loads, runoff frequency, and treatment performance.

AMENITY BENEFITS

ENHANCING PUBLIC REALM THROUGH SUDS

Multifunctional Green Spaces

SuDS features like swales, ponds, and rain gardens enhance public spaces by adding visual appeal and recreational opportunities.

Design Considerations

Effective SuDS design ensures accessibility, safety, seasonal interest, and fits local community character.

Community Engagement

Amenity-focused SuDS encourage community involvement and raise environmental awareness through interaction with nature.

Balancing Performance Objectives

Successful SuDS schemes balance amenity benefits with hydraulic efficiency and water quality management.

BIODIVERSITY SUPPORT

NATURE-BASED HABITAT CREATION

Biodiversity Net Gain Principles

Standard 6 incorporates biodiversity net gain to promote habitat creation and better ecosystem connectivity.

Naturalised Water Features

Swales, ponds, wetlands, and biodiverse basins provide vital environments where flora and fauna can flourish.

Design for Ecological Value

Incorporating varied planting zones, pollinator-friendly species, and natural materials increases habitat diversity and resilience.

Sustainable Maintenance and Viability

Design must consider maintenance, water levels, and vegetation succession to ensure habitats remain viable long-term.

MAINTENANCE AND OPERABILITY

ENSURING LONG-TERM PERFORMANCE

Maintenance Responsibilities

Clear maintenance duties are essential from early design stages, varying by property type and ownership.

Routine Maintenance Activities

Vegetation control, sediment removal, inspections, erosion repairs, and infiltration monitoring keep systems functional.

Design for Safe Access

Designs must ensure safe and practical access to support efficient and effective maintenance.

Impact on Component Choice

Long-term operability affects SuDS component selection, balancing management needs with system resilience.

DEPARTURES FROM STANDARDS

JUSTIFICATION AND APPROVAL OF NON-COMPLIANCE

Site Constraints Impact

Certain site conditions like limited space or soil contamination may prevent full regulatory compliance.

Requirement for Technical Justification

All non-compliance must be supported by thorough technical reasons and minimized departures.

Approval and Consultation Process

Early discussion with relevant authorities ensures proposed departures meet environmental and safety standards.

Transparent Documentation

Clear records and audit trails maintain accountability and protect flood risk and water quality objectives.

GROUND INVESTIGATION REQUIREMENTS

TESTING AND VERIFICATION FOR INFILTRATION SUDS

Ground Investigation Techniques

Detailed ground investigations include trial pits, permeability tests, groundwater monitoring, and soil characterisation to assess infiltration suitability.

Design Standards and Safety

A minimum one-meter unsaturated zone is required below infiltration features to prevent groundwater mounding and ensure capacity with safety factors.

Infiltration Component Sizing

Ground investigation results guide the sizing and placement of soakaways, infiltration trenches, and permeable surfaces for effective drainage.

Alternative Drainage Strategies

Poor infiltration may require combined systems with storage and controlled discharge to manage drainage effectively.

CLIMATE CHANGE AND URBAN CREEP

FUTUREPROOFING SURFACE WATER MANAGEMENT

Climate Change Adaptation

Designs must integrate climate change projections to handle increased rainfall intensity and storm durations effectively.

Urban Creep Consideration

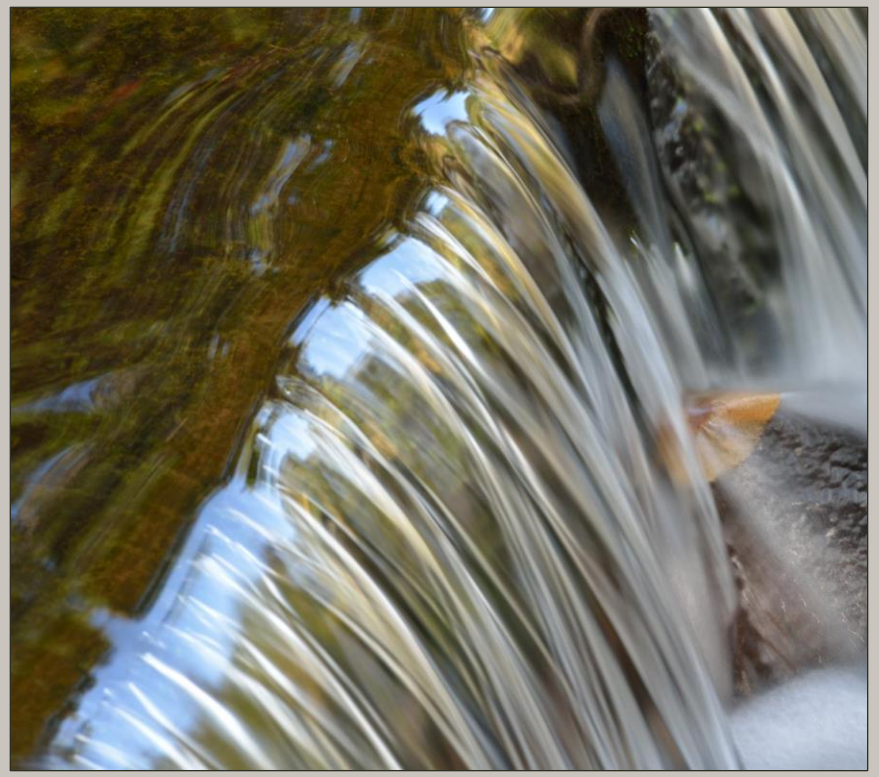
Systems should account for a 10% increase in impermeable surfaces caused by gradual urban development over time.

Performance and Sustainability

Futureproofing ensures system performance and reduces flooding risk throughout the development lifecycle.

DISCHARGE TO WATERCOURSES

SURFACE WATER OUTFALL DESIGN



Preference for Natural Channels

Standards prioritize using naturalised channels over engineered outfalls to minimize environmental impact.

Design Considerations

Designers must address erosion risks, flow velocities, water quality, and habitat protection in outfall designs.

Regulatory Compliance

High-risk sites require consultation with authorities and permits based on pollutant risks and discharge volumes.

Integration of Natural Features

Incorporating natural elements around outfalls enhances aesthetics, reduces maintenance, and supports biodiversity.

ENVIRONMENTAL PERMITTING

REGULATORY REQUIREMENTS FOR POLLUTANT CONTROL

Environmental Permits Requirement

Permits are needed when runoff contains pollutants affecting surface or groundwater, especially in industrial or waste sites.

Water Quality Assessment

Comprehensive assessment of water quality is necessary to design effective pollutant treatment and monitoring plans.

Role of SuDS

Sustainable Drainage Systems (SuDS) provide pre-treatment but are insufficient alone for high-risk pollutant runoff control.

Collaboration with Regulators

Early engagement with Environment Agency ensures compliance and prevents approval delays during design stages.