

Design Assessment Checklists for Bioretention systems

Objectives

This checklist can be used by the organisation approving the drainage scheme (drainage approving body) to help assess submissions for drainage approval.

This checklist is aimed at providing a consistent assessment process and ensuring that designs meet the key design requirements set out in the SuDS Manual (CIRIA C697). The design guidance in the Manual provides details that support the implementation of this checklist so that designs and compliance assessment can be delivered effectively. **Appropriate page references are provided in the checklist.**

This checklist should form part of a suite of documents required for a submission for drainage approval, including (but not limited to):

- A Scheme Design Assessment;
- Detailed Infiltration Assessment (where infiltration components are proposed);
- A Scheme Health and Safety Risk Assessment (if required);
- A Scheme Construction Method Statement;
- A Scheme Maintenance Plan.

It can be used as a checklist by organisations responsible for the approval and adoption of SuDS to support their assessment of schemes, or it can be used as part of the required submissions from the developer. It can also help designers ensure that they have provided all relevant information to the drainage approving body in their submissions for approval.

The checklist allows simple designs to be assessed against the “Deemed to comply” requirements in Table 1. Deemed to comply requirements (DtCR) are a set of standard design principles that avoid the need for complicated design calculations, modelling or other justification. The requirements are taken from the SuDS Manual. If the design varies from the Deemed to comply requirements, the variations should be explained and justified at the appropriate points in the checklist with a reference to supporting evidence.

The checklist can be used for a single bioretention systems or groups of similar features with the same characteristics.

Note: Bioretention systems are principally treatment systems and should not be used as a flow pathway for design flow events.

Table 1 Deemed to Comply Requirements: Bioretention System

Parameter	Deemed to comply requirements
Surface area	Sufficient to store design treatment event at a depth of 150mm on the surface
Flow through filter bed	Design treatment event should fully drain between 40 and 48 hours
Minimum depth of filter bed	1.0m
Maximum longitudinal slope	1 in 20
Drop from adjacent surface onto bioretention system (for direct lateral inflows)	50mm to 100mm

Table 2 Design Assessment Checklist: Bioretention System

GENERAL INFORMATION			
Site ID			
Asset ID(s)			
Bioretention system location(s) and co-ordinates		Drawing Reference(s)	
Date of assessment		Specification Reference(s)	
Primary function of bioretention system	Treatment		

Check	DtCR	Summary details (See Note)	Acceptable (Y/N)	Comments/ Remedial actions
DIMENSIONS (SuDS Manual Ref.)				
Length (m)				
Width (m)				
Top surface area (m ²)				
Side slopes (1 in ?)				
Depth (m)				
Freeboard (m)				
Longitudinal slope (1 in ?)	✓			
INFLOWS (SuDS Manual Ref.)				
Provide a description of the contributing catchment land use and its size (m ²).				
Does the design include: <ul style="list-style-type: none"> • A suitable flow spreading device? • Appropriate drops from the runoff surface into the bioretention system? • Appropriate energy dissipation? 	✓			
OUTFALL ARRANGEMENTS (SuDS Manual Ref.)				
Provide details of any flow control systems, overflow arrangements (for events greater than the treatment capacity) and limiting discharge rate from bioretention system.				
Is the bioretention system designed to allow infiltration? If yes, attach Infiltration Assessment.				

Check	DtCR	Summary details (See Note)	Acceptable (Y/N)	Comments/ Remedial actions
Is a geomembrane required to prevent infiltration? If yes, give reason.				
Depth to maximum likely groundwater level (m)				
WATER QUALITY TREATMENT (SuDS Manual Ref.)				
For the 1 year 30 minute event or water quality treatment volume confirm:				
Maximum depth of surface ponding is 150mm	✓			
Surface ponding is fully drained down between 40h and 48h	✓			
Depth of filter bed (m)	✓			
STORAGE (SuDS Manual Ref.)				
Design return period(s) (years)				
Maximum design water depth(s) and level(s)				
Maximum design storage volume(s) (m ³)				
LANDSCAPE/BIODIVERSITY (SuDS Manual Ref.)				
Does the proposed planting have potential to create bio diverse habitats?				
Have native plant species been used? (Note if ornamental species are proposed, give reasons and describe measures that prevent their migration to natural water bodies)				
Is the proposed planting appropriate to the location, visually, relative to gradient, water depths etc. and with respect to access and maintenance?				
Where relevant, confirm planting design does not adversely impact highway visibility and safety requirements (check with highway authority).				
Is the proposed top soil profile suitable to sustain the proposed plant species and as permeable as the filter bed?				

Check	DtCR	Summary details (See Note)	Acceptable (Y/N)	Comments/ Remedial actions
CRITICAL MATERIALS/ PRODUCT SPECIFICATIONS				
Geomembrane				
Geotextile (non-woven)				
Topsoil				
Other (including proprietary systems):				
CONSTRUCTABILITY (SuDS Manual Ref.)				
Are there any identifiable construction risks? If yes, state and confirm acceptable risk management measures are proposed.				
MAINTAINABILITY (SuDS Manual Ref.)				
Confirm that access for maintenance is acceptable and summarise details.				
Are there specific features that are likely to pose maintenance difficulties? If yes, identify mitigation measures required.				
BIORETENTION DESIGN ACCEPTABILITY (SuDS Manual Ref.)		Summary details including any changes required	Acceptable (Y/N)	Date changes made
Acceptable: Minor changes required: Major changes required / re-design:				

Note: Input range if applied to > 1 system. If there is a DtCR (as indicated) confirm whether or not this is met and provide details of any variations.