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Infiltration sustainable drainage systems (SuDS) use the storage capacity of the subsurface to attenuate rainwater. In the UK, the subsurface can provide effective and practical opportunities for infiltration, however various factors need to be considered during planning, design and installation. The British Geological Survey has developed an infiltration-to-the-ground GeoReport that provides a wealth of subsurface data to assist preliminary desk-based site assessment.

The infiltration-to-the-ground GeoReport will guide users through the considerations that are necessary for designing effective infiltration SuDS. The report poses seven questions and provides answers based on a wealth of BGS datasets and the expert judgement of a hydrogeologist. The questions include:

- Is the ground suitable for infiltration?
- Are there any significant constraints that mean an infiltration system should not be installed?
- To what extent will the ground drain?
- Is there potential for natural ground instability to be caused if water is added to the ground?
- To what extent will pollutants be naturally removed during transport through the unsaturated zone?
- What action should be taken?
- What is the natural extent of the subsurface properties described within the area of interest?

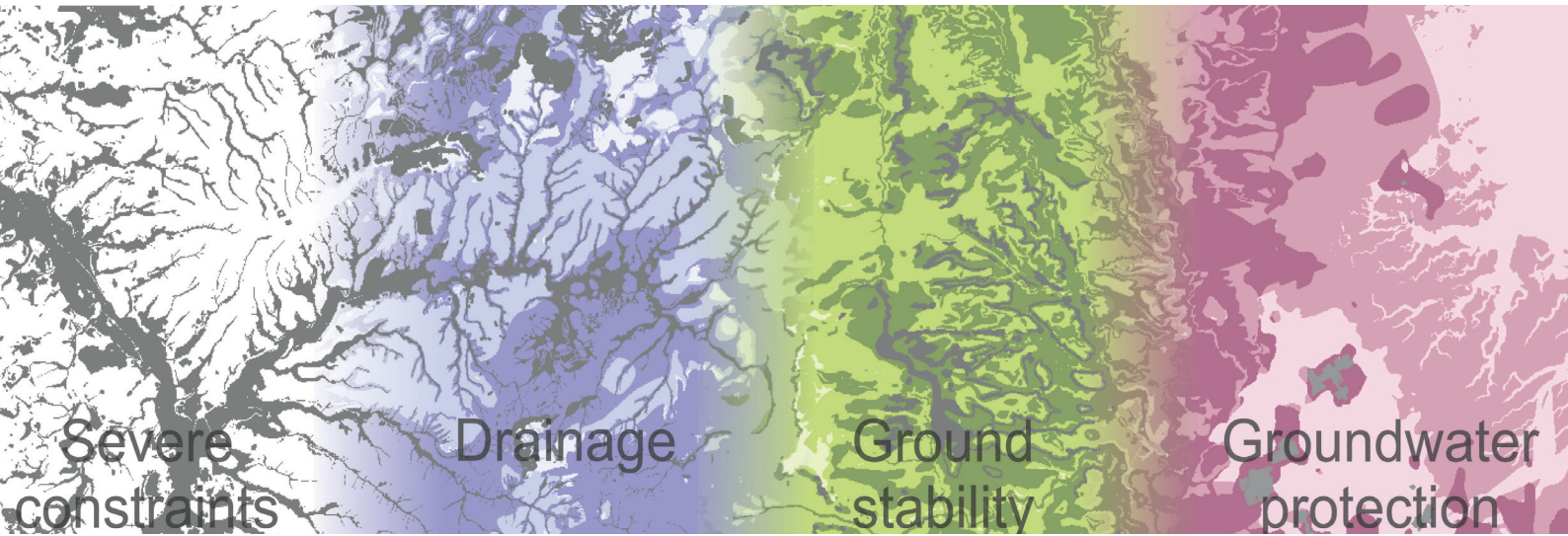
Data

The GeoReport draws on a total of 15 national BGS datasets at a scale of 1:50 000. Datasets queried include:

- unsaturated zone thickness
- superficial deposit permeability* and thickness
- bedrock permeability*
- groundwater flooding*
- artificial ground*
- geological indicators of flooding*
- hazards resulting from infiltration to soluble rocks*, landslides*, compressible ground*, collapsible ground*, running sands*, shrink-swell clays* and mining hazards*
- aquifer predominant flow mechanism (intergranular vs. fracture flow).

* Excerpts of maps marked with an asterisk are included in the GeoReport showing the variability in subsurface properties within 1:25 km² of the search location.





Severe
constraints

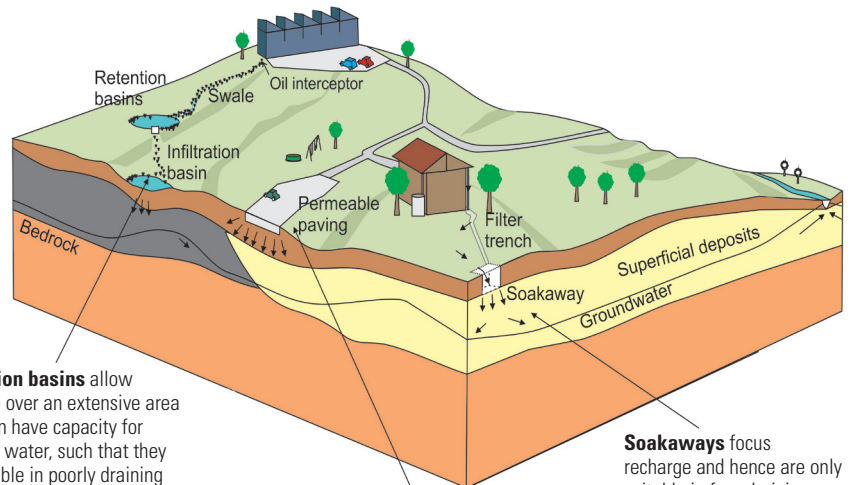
Drainage

Ground
stability

Groundwater
protection

Infiltration SuDS

Infiltration SuDS must be designed to be compatible with the properties of the subsurface so that infiltrating water does not result in waterlogging, ground instability or the deterioration to groundwater quality. Compatibility with the subsurface properties can be ensured through the selection of an appropriate infiltration SuDS design. Soakaways are a common type of infiltration device and are most suitable where the subsurface is free draining because surface water infiltration is focused over a relatively small surface area. There are other infiltration SuDS techniques which are appropriate for ground conditions which are less free draining. Such techniques may cover a larger surface area or provide sufficient space for ponding.



Infiltration basins allow recharge over an extensive area and often have capacity for standing water, such that they are suitable in poorly draining deposits.

Permeable pavements allow recharge over an extensive area, such that they are often suitable where drainage is insufficient for a soakaway.

Soakaways focus recharge and hence are only suitable in free-draining deposits.

National Infiltration SuDS Map

This GIS product comprises 24 bespoke national datasets that indicate the suitability of the ground for infiltration SuDS. For more information, contact suds@bgs.ac.uk

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**British
Geological Survey**

NATURAL ENVIRONMENT RESEARCH COUNCIL

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