HR Wallingford
Working with water

Evaluating the site constraints

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This presentation

> Reasonably practicable…

> Evaluating constraints

> Design solutions

I can't infiltrate….

WHY?

1. Low permeability
   - Robust infiltration testing across site
   - $k > 1 \times 10^{-6}$m/s
   - The lower the permeability, the larger the storage need

I can't infiltrate…..

2. Geohazards
   - Infiltration could lead to settlement or collapse
   - Infiltration could lead to void formation
   - Swelling clays could cause hazards
   - Infiltration could adversely affect slope stability
   - Infiltration could damage foundations, services

NPPF & guidance

British Geological Society Datasets & Infiltration Map

3. High groundwater table
   - Need > 1m between infiltration surface and max level

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I can't infiltrate…..

4. Risk of groundwater contamination

Understand sensitivity & vulnerability of groundwater
Understand site hazard levels
Understand site contamination characteristics

Risk Assessment (follow EA guidance) ⇒

- **Isolate sources of high hazard**
- **Sufficiency of treatment to mitigate risks**
- **Infiltrate in areas sealed/isolated from contamination**
- **Plan infiltration in association with remediation strategy**

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I can't infiltrate

5. Risk of surface water contamination

Where clear, close hydrological links with surface water bodies

6. Hydraulic connectivity with combined sewer

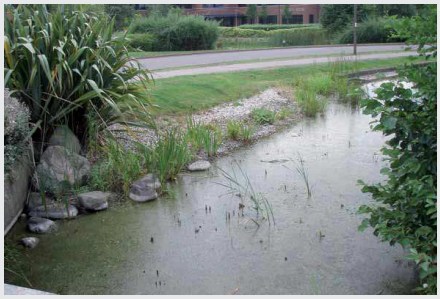
Where there are hydraulic paths between infiltration surface and combined sewer

7. Groundwater flooding

Where increased infiltration rates could exacerbate downstream groundwater flood risks

You can always…

- Maximise infiltration opportunities, where space and risk allow
- Use vegetated systems for Interception (lined if required)
- Implement SuDS without infiltration



I can't discharge to surface waters

> Too far

> Pumping would be required

> Conveyance route construction impracticable or unsafe

> Risk of flooding would rise

> Not possible to obtain right of discharge

I have no space for SuDS

> No car parking

> No public open space

> No pedestrian/transport corridors

> No opportunity to store and attenuate roof runoff within the curtilage of the building

My site is too steep

> Keeping water on the surface in shallow systems – minimise excavation depths

> Use contours (but care with exceedance flows design)

> Manage in stages ie not all at the site low point

Principles & reasonably practicable

> At source:

- Roofs: Green roofs, soakaways, raingardens, rainwater harvesting
- Car parks: Permeable paving, biofiltration zones
- Roads: Swales, trenches, biofilter channels
- Roundabouts: basins

Principles & reasonably practicable

> On the surface:

- Visible
- Easily accessible
- Maintenance needs obvious and easy to rectify
- Surcharging obvious and lower hazard
- Increased adaptability for higher future flows
- Natural treatment processes
- Co-benefits – urban cooling, biodiversity, re-use, amenity

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Principles & reasonably practicable

> Use public open space

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