



## Trash and Security Screen Guide 2009

A new guide by the Environment Agency offers information and advice on the design and management of trash and security screens upstream of culverts in England and Wales.

Culverts are conduits that enclose flowing bodies of water, for example to enable a stream to pass under a road. Trash screens are normally installed to reduce the amount of trash and debris entering the culvert, where it could cause a blockage, and security screens are usually set up to prevent unauthorised access to the culvert, especially by children playing nearby.

This guide outlines a risk-based approach to assessing the need for and design and management of trash and security screens. It will be useful to Environment Agency staff, local authorities and others involved in the installation and operation of such screens.

The guide recommends that asset managers and planners carefully consider the need for a screen, and fully investigate alternative options. New screens should only be installed where the benefits are significant and outweigh the risks. The risk-based approach outlined in the report uses a scoring system based on identifying hazards and assessing the probability of them occurring. A risk score is then used to decide whether or not to provide a screen.

If the decision is made to use a screen, the guide explains how to design a new one or refurbish an existing one. A flow chart is included in the report showing the step-by-step approach to assess the need for a screen and the processes to be followed during its subsequent design.

The goal of a trash screen should not be to trap as much debris as possible. In fact, the screen should trap as little debris as possible while still aiming to prevent blockage of the culvert. However, screens inevitably collect debris over time.

Designers should consider the maintenance needs for such screens, including regular cleaning of the screen and safe disposal of any accumulated debris, and the emergency response necessary if the screen becomes blocked during a flood.

Failure to address these issues could lead to serious flooding and subsequent legal action. Owners/operators of existing screens and designers of new screens should also consider whether to install remote water-level monitoring and CCTV.

The spacing between the bars of a screen should be carefully considered in terms of safety and the screen's main function. It is counter productive to have a screen that traps debris which would otherwise pass harmlessly through the culvert. The spacing must not prevent the passage of fish or wildlife where necessary. Security screens should be designed to have a space of no more than 140 mm between bars, to ensure children cannot slip through.

It should be possible for operatives to safely rake a screen under routine and most non-routine conditions. If a screen is drowned it may not be safe to clear, so the design should afford operatives early and safe access to the screen once water levels subside. Each method for screen cleaning should be evaluated separately and the design should minimise manual clearing and provide suitable safety arrangements.

The materials from which a screen and its associated platforms and support structure are made should be robust and durable. Many screens will be subject to a challenging environment such as corrosion or vandalism. Galvanized steel is a good material for screens, with a proven track-record.

If overtopping might occur when a screen becomes blocked and it is impracticable to put in place measures to avoid blockage of the screen, the provision of a safe overtopping flow route must be considered if the overtopping would otherwise result in damage to property and/or infrastructure.

This guide updates and supersedes the *Trash Screens: Design and Operation Manual*, published by the Environment Agency in 2002. That publication had itself updated and superseded National Rivers Authority (NRA) *Interim Guidance Notes for the Design and Operation of Trash Screens*, published in 1993.

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