Appendix 2G – Life Cycle Management Plan for Drainage

Introduction

Highway drainage systems are for the sole purpose of accepting surface water run-off from the highway. They are the responsibility of the Highway Authority unless they have been specifically adopted by a drainage authority or Water Company. Highway drainage systems are installed to capture surface water run-off to alleviate flooding and protect the fabric of the road. Many open ditch drainage systems are historic and are the responsibility of the adjoining landowner for maintenance.

Locations requiring a positive drainage system are identified during highway inspections and include locations where highway flooding or ponding occurs, or where excessive surface water flows in the channel. Remedial drainage measures are often required where the existing drainage system is defective or where structural weakness is attributable to a lack of positive drainage.

Before any alteration or addition is made to the drainage system a full assessment of the existing network should be undertaken to determine the most cost effective solution and identify the most appropriate management strategy as a thorough clean of the existing system could provide a satisfactory solution.

Drainage improvement schemes will be added to the structural maintenance programme and prioritised on the following basis:

- Frequency of Flooding/Flooding of residential or commercial property.
- Flooding or ponding on the highway presenting a hazard to road users.
- Seepage of water or water crossing the highway on bends and gradients liable to cause aquaplaning or formation of ice.
- To eliminate damage to the highway requiring immediate works i.e. severe scouring.
- Flooding of land adjacent to the highway will be considered as a separate measure on the basis of site specific evaluation.

For new connections, Developers should, in the first instance, contact the relevant Water Company to discuss/arrange joining the existing drainage system.

Gullies

The main type of feature used to drain the highway is known as a gully, Road gullies are generally designed with a sump which catches the detrius washed into it by the highway surface run off. To prevent this entering the piped system the gully outfall tends to be raised above the sump, leaving a storage area for the detrius to build up. This detrius, or road silt, needs to be removed on a regular basis to allow to drainage network to function efficiently. If this detruis is not periodically removed the outfall may become blocked and the gully rendered defective. .

Catchpits and Soakaways
A catchpit is a type of drainage structure designed to catch and trap debris, silt, and other solids carried by stormwater runoff. It typically consists of a chamber with an inlet and outlet, where the heavier particles settle to the bottom, preventing them from entering the main drainage system. Catchpits help maintain the efficiency of the drainage network by reducing blockages and protecting downstream components.

A soakaway is an underground drainage system designed to manage surface water runoff by allowing it to infiltrate into the ground. It typically consists of a pit filled with coarse stones, gravel, or special modular units that create voids for water storage. When surface water enters the soakaway, it slowly seeps into the surrounding soil, helping to prevent flooding and reducing the burden on conventional drainage systems

Grips
A highways grip is a shallow channel or trench cut into the verge (the strip of land alongside a road) to help with road drainage. These grips are designed to allow surface water to flow off the road and into adjacent ditches or watercourses, reducing the risk of water pooling on the road surface and improving overall road safety. Our approach to grip maintenance is detailed below.

Ditches
This is a natural conduit of water in an open channel. These can take flow from small watercourses, surface water systems and highway drainage. Thier ownership and responsibility for maintenance is often a point of contenious as they should maintained in an appropriate manor by the adjacent landowner, the ‘riparian owner’. In some cases this can be multiple individuals if the ditch passes through multiple properties or different landowners on either bank.

Culverts and Manholes
A culvert is a structure that allows water to flow under a road, railway, trail, or similar obstruction. Typically made from materials such as concrete, metal, or plastic, culverts are designed to manage water flow, preventing flooding and erosion. A manhole is an access point in a drainage system. Manholes are typically covered with a heavy, round or square metal cover known as a manhole cover.

Trash Screens
A trash screen is a type of barrier used in drainage systems to prevent debris and litter from entering watercourses, culverts, or other parts of the drainage network. It typically consists of metal bars or a mesh that allows water to pass through while trapping larger items such as leaves, branches, plastic waste, and other debris. By capturing this debris, trash screens help to reduce blockages and protect the downstream components of the drainage system.

Interceptors
A highways interceptor is a drainage structure designed to capture and treat surface water runoff from roads and highways. It typically consists of a chamber or series of chambers that trap pollutants, such as oil, grease, and sediment, before the water is discharged into the environment. This helps to prevent contamination of nearby watercourses and groundwater, ensuring that the runoff is cleaner and less harmful to the environment.

Ordinary Watercourse
Smaller minor watercourses are termed 'ordinary watercourses.' The respective District Council is the enforcement body for watercourses of this nature, however the reparian owner is still responsible for the ongoing maintainace of this drainage feature.

Major Rivers
Maintained and enforced by The Environment Agency.

Condition
Our approach to maintaining Highway Drainage Assets is aligned to the HMEP Guidance on the Management of Highway Drainage Assets and the Well Managed Highway Infrastructure Code of Practice and is as follows:

Activity	Frequency of Maintenance	Comments
Gully Emptying	• All Gullies emptied at least once per year. • More frequent emptying to those gullies identified as higher risk	Further details can be found at: https://www.gloucestershire.gov.uk/roads/road-maintenance/gully-emptying-schedules
Culverts Manholes Soakaways Catchpits Interceptors	No regular and planned cleansing arrangements This will be carried out on a reactive basis as required. For Culverts also see Appendix 2C Highways Structures.	
Highways Ditches and Grips	Highway maintainable ditches to be re-cut as required. Grips once per year and check and clean outfalls once per year.	Further details can be found at: https://www.gloucestershire.gov.uk/roads/road-maintenance/gully-emptying-schedules
Private Ditches	Where a 'positive' drainage system enters a roadside ditch, it will be checked once per year and cleaned on a needs basis.	Maintenance of all other ditches will remain the responsibility of adjoining landowners.

Serviceability and/or structural/visible integrity of drainage assets are also assessed through our Inspection regime, further details of which can be found at Highway Safety Inspection Manual and our Levels of Service can be found in Chapter 4.

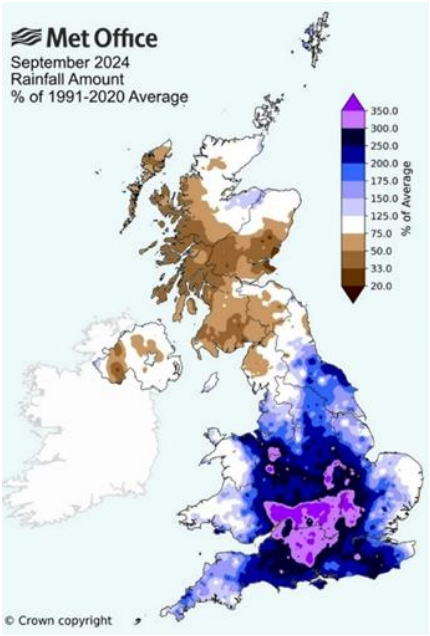
One area which requires clarification relates to Trash Screens and whether these are the responsibility of the District Council or the Environment Agency. This varies across the districts in Gloucestershire.

The Life Cycle

Creation/Acquisition: Acquisition of drainage assets is normally associated with the taking up of maintenance responsibilities following new developments through the adoption process. The development control team using Section 38 or 106 legal agreements normally manage this process
Operations/Maintenance – Operate and maintain the drainage assets on a routine basis
Upgrade or Renew: - The constant improvement of the Highway Network, particularly regarding adequate serviceability of carriageways, means drainage assets are upgraded or renewed on a regular basis.
Disposal/Decommission: Drainage assets very rarely become redundant except when there is upgrading works. This is normally considered in association with renewal and replacement. Existing drainage provision is seldom removed and is either utilised as part of the new design or disconnected.

Deterioration
As soon as a drainage asset is constructed and brought into use it starts to deteriorate. There is a real need to consider climate change and the impact on the existing drainage system. The combination of higher winter (and summer) rainfall and greater storm activity has increased the likelihood of flooding with potentially severe impacts on the rivers and low-lying areas (see Met Office example right relating to September 2024 where Gloucestershire experienced between 300-350% of its average monthly rainfall compared to Septembers between1991-2020). Consequences leading to the deterioration of the asset include:

- Insufficient capacity in the drainage system.
- Joint and/or pipe failure.
- Collapse of drainage structures.
- Insufficient ditch clearance (particularly by land owners).
- Soakaway failures.



Standstill and Backlog Costs
Various models exist to determine the Standstill and Backlog costs. The Standstill cost is how much needs to be spent every year in order to maintain the asset in the condition it's in today (plus inflation). The Backlog cost is how much you would need to spend to return the whole asset to very good condition. The following figures represent the latest data for drainage assets:

- Standstill - £1M Capital
- Backlog - £4M Capital

Funding from the revenue budget for Reactive/Cyclical repairs/Maintenance of the asset is around £3M per year.

Approach
The recent approach has meant that drainage has received only about 50% of its capital standstill funding, however this is likely to be increased given the recent impact of the winter storms in 2024/25. The impact of climate change has also had a major impact on Geotechnical assets, which are detailed at Appendix 2H.

Flooding
Gloucestershire County Council is the Lead Local Flood Authority (LLFA) for Gloucestershire and has responsibilities and powers to manage flooding from surface water, groundwater and from ordinary watercourses.

Ordinary watercourses are those not classified as 'Main River' by the Environment Agency. The Environment Agency provides a map of main rivers. If the watercourse is not visible on this map it is an ordinary watercourse.

It is also the Highway Authority that has responsibility for managing floods to and from public highways.

In addition, the Council's Flood Team manages the administration of a number of strategic member and officer flood related groups and information is available at: https://www.gloucestershire.gov.uk/planning-and-environment/flood-risk-management/ .

Emergency responses to highway flooding
Where flooding occurs, causing hazardous conditions, the appropriate warning signs are placed in position as quickly as possible. Flooding issues can be reported online via FixMyStreet or via the Highways Contact Form.

Emergency or urgent highways flooding issues should be reported by telephoneing 08000 514514.