

West Sussex LLFA Culvert Policy



Culvert¹ Policy – intended for use by Council officers, landowners and developers.

This document is an explanation of the agreed West Sussex County Council (LLFA) and District and Borough Council policy regarding the culverting of ordinary watercourses, and a guide to good practice and design principles.

Culverting of a watercourse, or the alteration of an existing ordinary watercourse, requires land drainage consent under Section 23 of the Land Drainage Act 1991 (and as amended). The District and Borough Councils under powers from the LLFA are responsible for processing ordinary watercourse consent applications.

The Environment Agency now regulates permits for works in / around watercourses designated as 'Main River' under the Environmental Permitting Regulations 2010 (EPR2010).

The following works require consent from District and Borough Authorities:

- Construction of any mill dam, weir or other similar obstruction to the flow of any ordinary watercourse or raising or otherwise altering any such obstruction;
- Installation of a culvert in any ordinary watercourse;
- Alteration of a culvert in a manner that would be likely to affect the flow of an ordinary watercourse;
- Installation of a structure within the watercourse that would be likely to affect the flow of said watercourse;
- Removal of a culvert within an ordinary watercourse;
- Diversion or filling of any ordinary watercourse;

The above list should not be considered exhaustive. If you are not sure if the work you are proposing requires a consent / permit please contact your local District or Borough Authority, EA office or Lead Local Flood Authority (LLFA).

1.0 Local Authority Policy

Watercourses fulfil many roles in today's environment. They provide drainage for developed and agricultural land and are vital water resources. They are important features of the landscape and provide habitats for a wide variety of wildlife. It is therefore important that watercourses and their associated habitats are protected and enhanced for the benefit of future generations. A watercourse includes all; rivers, streams, ditches, drains, cuts, dykes, culverts, sluices,

1. A culvert is a structure that allows water to flow under a road, railroad, trail, or similar obstruction from one side to the other side. Typically embedded so as to be surrounded by concrete, granular material, soil etc., a culvert may be made from a pipe, reinforced concrete or other material.

sewers (other than public sewers within the meaning of the Water Industry Act 1991) and passages through which water flows.

West Sussex Local Authorities are in general opposed to the culverting of watercourses because of the potential for adverse effect on flood risk and ecology. The Competent Authority will therefore adopt a precautionary principle and only approve an application to culvert an ordinary watercourse if there is no reasonably practicable alternative or if the potential negative impact of culverting would be so minor that they would not justify a more costly alternative.

However, a culvert will not be considered until alternatives have been considered, for example:

- Clear span bridges;
- Revision of the site layout to incorporate an open watercourse that can be easily maintained; or
- Diverting the watercourse without loss of its hydraulic flow characteristics.

In all cases and where it is appropriate to do so, compensation in full is to be provided for any loss in storage capacity or habitat.

2.0 Deculverting Policy

There are many benefits to deculverting, which include; the provision of valuable wetland habitat, increased storage capacity, educational opportunities, reduction of maintenance costs and ease of inspection

Deculverting requires consent as the removal of a culvert which previously constrained flow could increase the downstream flood risk; modelling should therefore be employed (where necessary) to ensure there is no adverse flood risk as a consequence of a particular activity. Some culverts may be formally listed or scheduled for their historic importance, therefore careful consideration is required. Appropriate ecological surveys should be provided in support of any deculverting activity.

The removal of culverts is actively encouraged by the council when:

- Removing the culvert is physically possible, and no ecological or historical damage will result;
- Flood risk may be reduced and a more natural flow regime restored; or
- The local environment would be enhanced significantly.

3.0 Impacts of Culverting

The Council's general opposition to culverting is a result of the legal requirements of the Water Framework Directive (2003) that the quality of a watercourse should not be reduced. Therefore, opposition is based on the detrimental effects that are likely to arise; these may include:

- Loss of environmental features; the continuity of the watercourse corridor is broken, causing an adverse impact on the ecological value of the watercourse, loss of habitat and inhibiting the migration of some species.
- Increased likelihood of blockages; the culvert itself or screens have an increased risk of blockage and require frequent maintenance.
- Loss of floodwater storage; open channels generally provide more storage capacity than culverts.
- Impact of flooding; increased overland flooding as a result of a culvert exceeding its capacity.
- Greater difficulties in providing for drainage connections; it is more difficult to provide for the addition of connections within a culvert; outfalls within culverts are prone to blockage.
- Difficulties in the repair, maintenance and replacement of culverts; the landowner or owner of the culvert is responsible for the condition and maintenance of a culvert. They must therefore ensure they are in good condition and free from obstructions. Failure to do so could result in the liability for any damage caused by flooding. Access into culverts is restricted and in some cases is classified as a confined space which requires trained operatives and specialist equipment.
- Development above or near a culvert; the presence of a watercourse is concealed by a culvert; this can lead to inappropriate land use above or near them, and could lead to structural failures, difficulties in future access for maintenance, etc.
- Culverts in urban areas are susceptible to pollution as a result of misconnected foul sewers, overflows from blocked sewers or discharge of contaminated surface water.
- Increase in erosion to the banks and beds of a watercourse where adjacent to a culvert entrance.

4.0 Culvert Design Requirements

Where culverting is unavoidable it is necessary to seek land drainage consent from the relevant District or Borough Council. It needs to be shown that steps have been taken to reduce the risk of flooding and to reduce or mitigate environmental degradation. Detailed guidance on the design of culverts can be found in Culvert Design and Operation Guide (CIRIA C689).

1. A detailed design will need to be submitted with your formal application for consent. Hydraulic calculations are to be submitted and include an allowance for climate change over the life time of the activity or development.
2. The environmental implications of all options of the works should be considered in order to determine the least environmentally damaging solution supported with evidence.
3. Culvert length should be kept as short as possible and diameter as large as possible. Depending on local circumstances, we require a minimum culvert diameter of 450mm or as agreed with the local authority depending on watercourse size and flow.
4. The design of the culvert should consider any impact on flood flow. They must not increase flood risk to property. Consideration should also be given to the alternative flow paths in the event of a culvert becoming obstructed.
5. The shape of the culvert and the materials used should be chosen to satisfy hydraulic requirements and have a design life exceeding that of the structure.
6. Pipes should be of a consistent cross-section within the culvert length unless adequate hydraulic transitions are incorporated into the design, this will be necessary when extending an existing culvert.
7. Appropriate inlet and outlet structures should be provided to ensure a smooth hydraulic transition and avoid erosion. Headwall arrangements at the upstream and downstream ends of a culvert should be suitably keyed into the bed and banks of the watercourse, and should be appropriate to the local environment.
8. Where there are safety concerns, headwalls will need to be fitted with safe guarding measures ie. handrails, etc.
9. Details should be stated of future maintenance and clearance arrangements, including access considerations. The responsibility for the maintenance of a culvert lies with the landowner or the person or management company who owns the culvert.
10. Sharp bends should be avoided and suitable access chambers provided at each change of direction in the culvert.
11. Inlet and outlet screens may be required to prevent debris entering the culvert and causing clogging, or where there is a danger to public safety. Screens need to be sized and designed to reduce the risk of blocking and provision made for clearing and maintenance, including allowance for a removable front section (fitted with a padlock); wing walls should be sufficiently high to prevent bank erosion in the event of a blockage; flat screens should be avoided as these are prone to blockage. Further guidance can be found in the Environment Agency Trash Screen and Security Screen Guide, 2009
<https://www.gov.uk/government/publications/trash-and-security-screen-guide-2009>



Figure 1-Culvert with Wingwalls and Trash Screen

12. Most culverts should be set so that the inlet/outlet is at the true bed level.
13. Applications with multiple small diameter culverts will generally be refused, only in exceptional circumstances where site constraints prevent a single pipe or box-culvert option being practical, will they be considered. This is a result of multiple culverts being more prone to blockage at the inlet.
14. Syphons are generally not acceptable.
15. Where watercourses are subject to severe erosion and siltation problems, consideration should therefore be given to the provision of silt traps upstream of the culvert.
16. Services (for example sewers, gas pipes, water mains, etc.) should not impinge into the cross-section of the culvert.
17. Vehicular loading needs to be considered where the culvert is located in trafficked areas and therefore suitable protection may be required.

5.0 Environmental Considerations

Each application for consent will be considered on its own benefits / disbenefits. Mitigation to reduce the impact to the natural environment will be taken into consideration when determining an application for culverting.

5.1 Environmental Mitigation:

- Increase the culvert diameter to slightly greater than that needed to accommodate the design flow and position the invert level at the true bed

level of the watercourse. This enables more natural bed features to form over time.

- Provide ledges above the water level in large culverts to allow for the passage of mammals. Or make provision for appropriately located animal underpasses close to the culvert.



Figure 2- Culvert with Ledges for Mammal Passage

- The invert level should not pose an obstruction to fish passage.
- Propose suitable environmental enhancements, for example opening up a length of previously culverted watercourse elsewhere on site, enhancing other lengths of watercourse, creation of ponds/marshy areas/ bays.
- Construct headwalls and wingwalls in 'soft-engineering' or natural materials in keeping with the natural channel without reducing the design life of the structure.

6.0 Consent Procedure

Advice should be sought as early as possible on any proposal, allowing sufficient time before the intended start date, so as to minimise any delays. The consent application form and details on how to apply and pay the appropriate fee are available on the West Sussex LLFA website;

<https://www.westsussex.gov.uk/fire-emergencies-and-crime/dealing-with-extreme-weather/dealing-with-flooding/flood-risk-management/ordinary-watercourse-land-drainage-consent>.

As part of the consent procedure we will consult where appropriate with the Environment Agency, Highway Authorities and Natural England.

7.0 Planning Application and Building Control Considerations

- The requirement for ordinary watercourse land drainage consent is independent of the need for planning permission and the granting of planning permission does not imply or guarantee that Land Drainage consent will be granted.
- Consideration must be given to any relevant planning conditions.
- Buildings and structure must not be sited within 5 metres from the outer edge of new or existing culverts/ watercourses.
- Any works must comply with the local council land drainage byelaws, if present.

A representative from the Council will inspect the culvert on completion of works to ensure that it has been installed as per the approved design.

8.0 Enforcement

When unconsented works are identified by a District or Borough Council, and they constitute a contravention of the Land Drainage Act (1991), enforcement action will be pursued. This will include site investigations and informal contact with the land owner to try to resolve the issue. If the obstruction is not removed or there is a failure to submit a consent application within the set period a legal notice will be issued. If the notice is not complied with, then the due legal process will be initiated. This could result in the Council carrying out work by default and recovering all associated costs including an administrative on-cost.