

Ordinary Watercourse Consent Protocol

Norfolk County Council (NCC) as Lead Local Flood Authority (LLFA) is responsible for the consenting of works that affect the flow of ordinary watercourses outside of Internal Drainage Board (IDB) Internal Drainage Districts (IDDs). This means Norfolk County Council's consenting function covers 80% of the County. The requirement for this County Council function was established in April 2012 under changes to the Land Drainage Act 1991 brought about by the Flood and Water Management Act 2010.

I Introduction

This document is provided in the context of specific requirements arising from the [Flood and Water Management Act 2010](#) and the [Land Drainage Act 1991](#)

The Flood and Water Management Act 2010 has introduced a new role of Lead Local Flood Authority (LLFA) for the County Council. This role is fulfilled by the authority's Flood and Water Management Team.

This protocol has been adapted from best practice identified within local authorities in England. It is intended for use by Risk Management Authorities, developers and landowners.

2 Consenting Process

It is recommended that initial advice is sought from the Lead Local Flood Authority before making an application for consent to ensure that there are no delays in getting approval. The Lead Local Flood Authority will, if necessary reject an application, if there is a lack of information provided. The consent application form and guidance is available at; www.norfolk.gov.uk/watermanagement

On receipt of an application for consent to alter an ordinary watercourse the Lead Local Flood Authority has two months to determine the application. As part of the process the Lead Local Flood Authority may consult a number of organisations including other local authorities, Norfolk County Council Highways, Environment Agency, Natural England or others, as appropriate.

The Lead Local Flood Authority will determine the application, inform the applicant of approval or rejection and provide a copy of the consent, along with any appropriate conditions and information.

In line with good practice, the Lead Local Flood Authority will only approve an application to culvert a watercourse if there is no reasonably practicable alternative or if the detrimental effects of culverting would be so minor that they would not justify a more costly alternative.

The applicant has the responsibility to prove that any proposal would not cause a nuisance or increase flood risk.

In all cases, where it is appropriate to do so, adequate mitigation must be provided for damage caused to the watercourse. Wherever practical the Lead Local Flood Authority will seek to have culverted watercourses restored to open channels.

The Lead Local Flood Authority will be minded to reject applications for culverting in areas identified as being in Flood Zone 2 or 3a/3b and/or in an area of surface water flooding identified within the EA Flood maps for surface water & subsequent updates, due to the potential of proposed works increasing flood risk. Exceptions to this policy will only be considered if the applicant is able to demonstrate that, on the balance of probabilities, the proposed development would not increase flood risk. Where the Lead Local Flood Authority is made aware of breaches to other legislation then it will make the appropriate organisation aware of this.

The local Borough, District or City Council or unitary authority has the 'power to require culverting of watercourses and ditches where building operations (are) in prospect' as conferred by Section 262 of the Public Health Act 1936. This would require the local Council to apply to the Lead Local Flood Authority for consent, after which the Lead Local Flood Authority would determine the application as per the requirements of this protocol.



3 Check - do your works require consent?

The following works require consent from the relevant drainage authority under Section 23 of the Land Drainage Act 1991: to;

- a) erect any mill dam, weir or other like obstruction to the flow of any ordinary watercourse or raise or otherwise alter any such obstruction; or
- b) erect a culvert in an ordinary watercourse, or
- c) alter a culvert in a manner that would be likely to affect the flow of an ordinary watercourse.

4 Check - which organisation should consent your works?

For works affecting a watercourse that falls within an Internal Drainage District (IDD) you will need to apply directly to the Internal Drainage Board (IDB) responsible for that area and not Norfolk County Council as the Lead Local Flood Authority.

For works affecting **Main Rivers** the prior written consent of the Environment Agency is required for the erection of any structure in, over or under a main river. Consent for building over a culvert will usually be refused. In exceptional circumstances, consent may be granted subject to site-specific requirements. Phone 03708 506 506 or visit www.environment-agency.gov.uk for further information.

To find out whether your watercourse falls within a main river or Internal Drainage District, visit www.norfolk.gov.uk/watermanagement for further information. This will provide you with contact details for the relevant Internal Drainage Board in your area.

5 Justification for consenting protocol

The Lead Local Flood Authority considers it beneficial for watercourses to remain open wherever possible for both flood defence and environmental purposes. Any works that may restrict/alter the flow of an ordinary watercourse can exacerbate the risk of flooding, increase maintenance requirements and create difficulty in pollution detection. It also destroys wildlife habitats, damages a natural amenity and interrupts the continuity of a watercourse.

6 Loss of environmental features

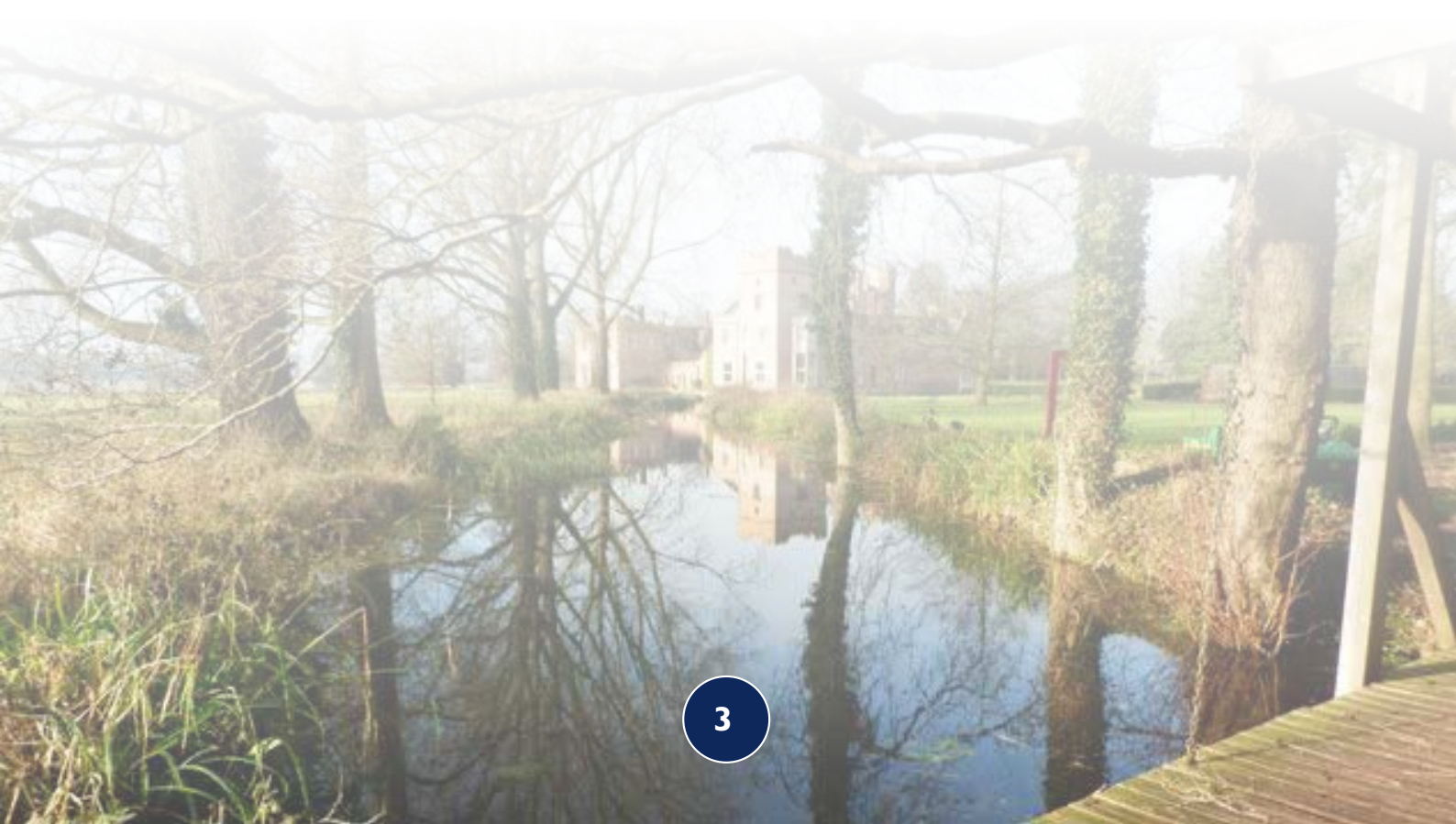
Culverting has a detrimental impact on the environment, resulting in a complete loss of features within a watercourse. The continuity of the river corridor is broken, adversely affecting the landscape and ecological value of the watercourse for migrating species. An existing or potential amenity is also lost for present and future generations.

7 Increased likelihood of flooding due to blockages

Compared with an open channel there is an increased risk of blockage once a culvert is installed. If the blockage occurs within the culvert, there is much greater difficulty in removing it.

It is sometimes argued that culverting may reduce the problem of open channels subject to litter and fly-tipping. Such short-term advantages are outweighed by the overall disadvantages and alternative means should be pursued to address waste problems. Flooding is more likely to result from culverts when they become obstructed and culverted channels provide less flood storage than open ones. There have been cases of serious flooding caused by culverts collapsing due to root damage from vegetation or the weight of development above them.

Culverting will create a less permeable bed to a watercourse and can often increase the speed of water flow, possibly increasing flood risk downstream and potentially preventing local recharge of groundwater



8 Increased difficulty in providing new drainage connections and the repair, maintenance and replacement of culverts.

Drainage connections are more easily made to open watercourses where the performance of drainage systems can be visually monitored. Outfalls within culverts are prone to blockage or, in the case of flapped outfalls, the flap can seize. Maintenance of these outfalls is considerably easier in open channels.

Culverts conceal the presence of a watercourse and can lead to development or unacceptable land-use above or near them. In many urban areas buildings have been constructed above or adjacent to culverts. This means that improving standards of flood protection or accommodating run-off from future developments could be impossible or uneconomic due to the cost of replacing or enlarging existing culverts.

The responsibility for the condition and maintenance of a culvert lies with the landowner or the owner of the culvert, unless other agreements are in place. The responsible party must therefore ensure that the culvert remains in good condition and free from obstructions. Failure to do so could result in liability for any damage caused by flooding. Access to culverts is generally safe only through the use of special procedures and equipment, making inspection and maintenance both difficult and costly.



9 Health and safety hazards

There are dangers associated with natural open watercourses but culverted watercourses can also be dangerous. Culverting does not remove the risk of drowning or injury and there have been incidents where children, for example, have entered a culvert and suffered injury.

10 Pollution and effect on water quality

Culverting a watercourse makes the early detection and tracing of pollution sources more difficult, resulting in the adverse impacts being more serious.

There is further impact on water quality due to the loss of the biological processes which are essential for river purification, and there is normally a reduction in oxygenation of water passing through a culvert. Culverting may also result in stagnant water problems, particularly if culvert levels are badly planned or constructed.

11 Guiding principles

In considering any development proposals, our objective is to retain open watercourses with a corridor of open land on both sides. This maintains a flood channel and creates a valuable environmental feature, which can enhance the site and be more easily maintained. We will encourage developers to incorporate existing open watercourses, or create new ones, within their site design. Such features are of particular importance to wildlife by providing valuable open land in developed areas. Where possible, the removal of culverts will be encouraged to restore a more natural river environment

Those proposing to culvert a watercourse are encouraged to find alternatives which retain the open watercourse as a feature. Examples include:

- open clear span bridges with existing banks and bed retained;
- consideration of the site layout to incorporate an open watercourse as a feature;
- diversion of the watercourse into an environmentally sympathetic channel and corridor.

In some case culverting may be unavoidable for example, short lengths for access purposes or where highways cross watercourses. Where an application for a culvert for vehicular access is applied for, the applicant will also need to apply for permission through Norfolk County Council's Highways service. In such cases the length of culvert involved should be restricted to a minimum and appropriate designs will need to be submitted.

When applying for consent to culvert, the applicant is advised to seek expert advice before submitting any designs and should consider the following;

- The proposed work must not increase the risk of flooding and should not prevent maintenance of the adjacent open watercourse.
- All culverts should be designed and constructed so as not to cause restriction and should accommodate flood flows within the watercourse for the specified location.



12 Environmental considerations

Environmental mitigation for larger culverts;

- Provide ledges running through the culvert (approximately 500 mm wide and 300 mm above normal water level) to allow for the passage of mammals. Alternatively, make provision for appropriately located mammal underpasses close to the culvert.
- The height of the invert should not pose an obstruction to fish movement.

Environmental mitigation for smaller culverts:

- Propose suitable environmental enhancements, for example opening up a length of previously culverted watercourse elsewhere on the site, enhancing other lengths of the watercourse, creating a pond or marshy area, and/or scrub and hedge planting.
- Construct headwalls and wingwalls in 'soft-engineering' or natural materials in keeping with the natural channel.



13 Planning Considerations

Any consent is independent of the need for planning permission and the granting of planning permission does not necessarily imply that drainage consent will be granted by the relevant drainage authority.

It is the applicant's responsibility to ensure that their proposal is consistent with other permissions or consents that they require for the development. The Lead Local Flood Authority will also consult with the relevant authorities to ensure that drainage proposals are consistent with other approved designs. If the Lead Local Flood Authority is made aware of any inconsistencies the Lead Local Flood Authority will inform the applicant and the appropriate authorities.

The Lead Local Flood Authority would normally object to a planning application and refuse land drainage consent in the following circumstances:

- for any building over a culvert as the culvert may, in the future, need to be repaired, replaced or upgraded if conditions in the catchment change. There is also the need to maintain an overland flow route if the culvert is blocked or its capacity exceeded.
- on conservation grounds for a development which proposes a culvert where there are reasonable alternatives. Such alternative solutions might include a revised site layout or an ecologically acceptable diversion of an open channel.



14 Technical requirements

Design and Method Statement

Detailed design plans and a method statement for construction works are required to be submitted with your consent application.

The Lead Local Flood Authority will reject an application where there is insufficient information provided.

Maintenance

Details of those responsible for maintenance and a formal maintenance regime must be included with the application for consent.. The responsibility for the maintenance of a culvert lies with the landowner or the person who owns the culvert unless otherwise arranged.

Suitable access arrangements for maintenance should be included in the design. Access chambers must be provided at each change of direction if the culverting does not follow a straight route. Sharp bends should be avoided. The maximum spacing between access chambers should not exceed 100 metres.

Size Requirements

The minimum recommended culvert size would be 600mm diameter but will vary according to the size of the watercourse. Recommendations would always require the maximum culvert size permissible. Culverts smaller than a 450 mm diameter pipe or equivalent are particularly prone to blockage and their use should be avoided. For longer culverts under embankments or similar structures, culverts with at least 1050 mm of headroom above bed level should be used to facilitate access for inspection and maintenance.



15 Technical guidance

To ensure that the flow of the watercourse is not impeded or altered the following should be taken into account;

- The shape of the culvert and the materials used for construction should be chosen to satisfy site-specific requirements in terms of channel hydraulics, strength and durability, and should be appropriate to the local environment.
- The use of differently shaped pipes or different cross-sectional details within a culvert length should be avoided unless adequate hydraulic transitions are incorporated into the design. Such transitions are also essential where works to extend an existing culvert are proposed.
- Appropriate inlet and outlet structures should be provided in order
- to ensure 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.
- Over-sized pipes or box culverts should be used wherever possible to maximise the cross-section and capacity. Allowance should be made in the hydraulic design for freeboard.
- Provision of an overland flood flow route should be made to cater for situations where the capacity of the culvert is exceeded due to blockages etc.
- Multiple culverts should be avoided wherever possible. Multiple small culvert arrangements are prone to blockage by accumulation of waterborne debris at the inlet. The Lead Local Flood Authority does recognise, however, that site conditions may prevent a single-pipe or box-culvert option being practical, in which case a single-span bridge design is recommended. Where multiple culverts are unavoidable, a minimum number of culverts should be used and cutwaters should be provided between pipes at the culvert inlet. The design should also incorporate;

- Depression of the invert of one culvert to carry low flows;
- Facilities to enable temporary diversion of flows to allow inspection or maintenance of each culvert;
- Inlet and outlet screens may be appropriate to prevent debris entering the culvert and causing clogging, or where there is a danger to public safety. If screens are included, they need to be sized and designed to reduce the risks of blocking and make provision for adequate cleansing and maintenance. Phone 03708 506 506 or visit www.environment-agency.gov.uk for further information.

Siphons are a source of continual maintenance problems and should be avoided.

To mitigate against the potential for erosion of the watercourse;

- Culverts and outfall structures should be designed so that the exit velocities do not create erosion problems at the outlet and downstream.
- Watercourses subject to severe erosion and siltation problems should be considered for the provision of silt traps upstream of the culvert.
- Services (for example sewers, water mains etc) should not impinge into the cross-section of the culvert.

Clear and concise guidelines for the hydraulic design of culverts are contained within the publication CIRIA Report c689 - Culvert Design and Operation Guide - Visit www.ciria.org to download a copy.



If you need this document in large print, audio, Braille, alternative format or in a different language please contact 0344 800 8020 or 0344 800 8011 (textphone) and we will do our best to help.