

**Land at Boxworth End
Swavesey
Cambridgeshire**

Flood Risk Feasibility Note

February 2017





Document History

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Unit 23
The Maltings
Stanstead Abbots
Hertfordshire SG12 8HG



14b Fieldgate Lane
Kenilworth
Warwickshire
CV8 1BT

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1 Introduction

- 1.1 Initial flood risk investigations were carried out by EAS to inform the proposed development at land off Boxworth End, Swavesey, Cambridgeshire CB24 4RA. The location plan is included in **Appendix A**.
- 1.2 The site is shown to be in Flood Zone 1 on the EA Floodmap for Planning. This indicates 'low' risk of flooding from rivers and the sea. However, there is a minor watercourse/ditch adjacent to the access, which then follows the western site boundary. This watercourse is considered to be an 'ordinary watercourse' and since it is very small, it has not been modelled. Therefore, no fluvial flood extents or levels are available for this minor watercourse, which means it does not show on the Floodmap for Planning, and the fluvial risk is unknown.
- 1.3 The EA surface water flood map however suggests there is a risk of flooding from this minor watercourse which would need to be considered. In particular, the only access point to the site could become flooded and this would need to be resolved before the site can be developed.
- 1.4 The following tasks were carried out to investigate the flood risk at the site:
 - Consultation with the Local Authority and the Internal Drainage Board (IDB);
 - Determine the requirements when developing on, over or near to an ordinary watercourse. Specifically, find out any restrictions on culverting or bridging an ordinary watercourse.
 - Find out the implications of culverting or bridging an ordinary watercourse with reference to the Water Framework Directive.
 - Obtain local sewer records to establish whether there are any nearby surface water or foul sewers to which the proposed development can drain.
- 1.5 With the above information, it is possible to determine the best way to proceed.

2 Flood Mechanism

- 2.1 The site is in Flood Zone 1 on the EA Floodmap for Planning, as shown on the extract in Figure 1. The flood data held by the EA is enclosed in **Appendix B**.

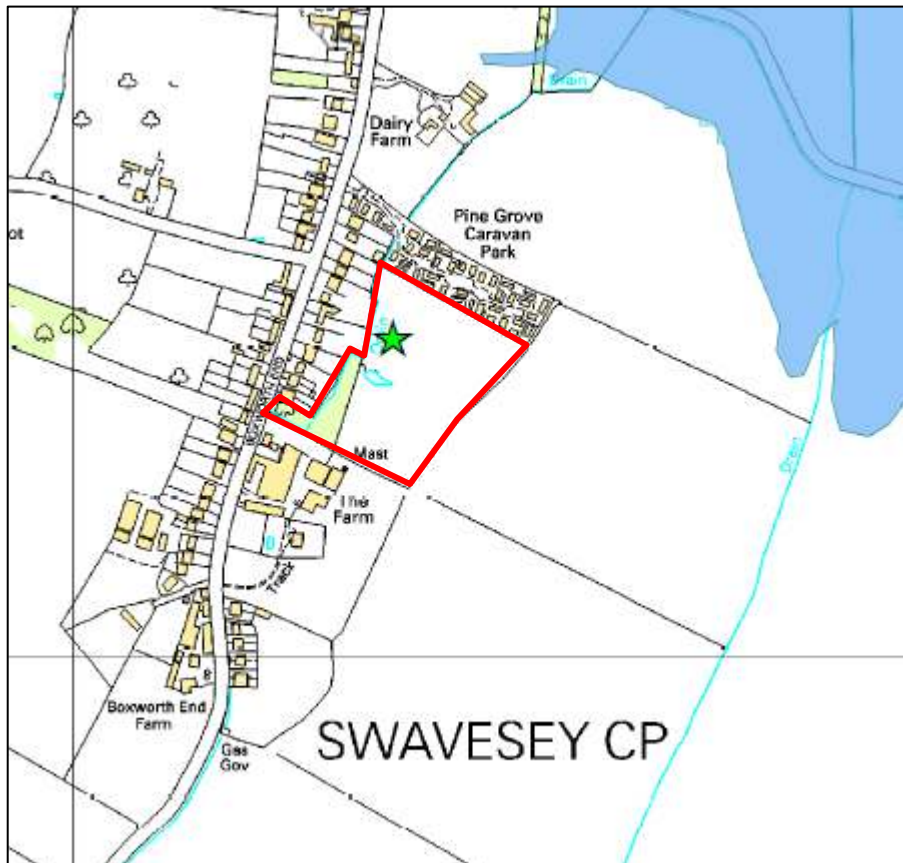


Figure 1: EA Floodmap for Planning (EA data in **Appendix B**)

- 2.2 The data held by the EA shows that the watercourse has not been modelled, and the site was not flooded in any historic events. This isn't to say that the minor watercourse doesn't pose a flood risk, only that it has not been modelled.
- 2.3 The EA surface water mapping (also enclosed in **Appendix B**) shows a more likely flood extent as a result of the minor watercourse. An extract of this has been included in Figure 2.

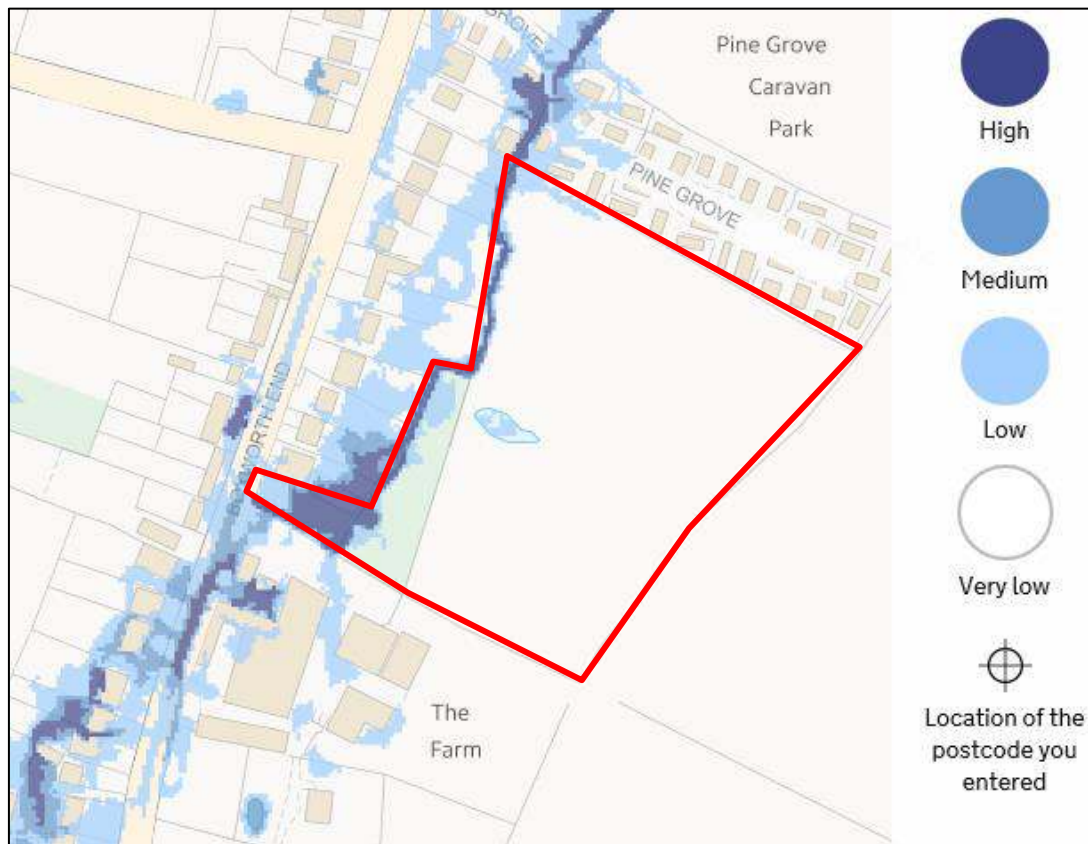


Figure 2: Surface Water Flood Map (EA Data in **Appendix B**)

- 2.4 The 'high' surface water risk at the only access point to the site would need to be resolved before the site is developable. With reference to the online EA surface water mapping, flood depths in this area could be between 300mm and 900mm.
- 2.5 A topographic survey was carried out to understand the levels across the site. The survey is contained in **Appendix C**. The higher levels (around 11.50m AOD) are in the southeast corner, and the site falls to the northwest. There is also a low point at the end of the access road, where the minor watercourse bends at a right angle, and flows to the north. This sharp bend in the channel and the lower land around here (which is around 9.50m AOD) will result in water pooling in this area. The levels to the east of the watercourse at the access point bend are around 0.5m higher than the river banks, suggesting the water from the channel would be unlikely to extend too far onto the land to the east.
- 2.6 The flood mechanism from this watercourse has been considered as a surface water risk in the mapping in Figure 2. Whereas fluvial flooding occurs when water levels in a channel increase and spill over the bank, surface water flooding occurs when surface water runoff from surrounding areas flows into the low points (in this case, the channel) and pools to cause a risk. In reality, flooding would arise from both fluvial and surface water mechanisms. It is likely that the channel acts like a fluvial watercourse during wet weather when runoff from the upstream catchment increases, and like a surface water source when runoff from the surrounding land flows towards it.

- 2.7 It is understood that the channel is culverted immediately outside the site in Boxworth End. Anglian Water sewer records were obtained for the area (**Appendix D**), and showed only foul sewers in Boxworth End. As there were no surface water sewers in the local area, it is possible that surface water from the road and houses drain to the culverted watercourse. Therefore, during periods of heavy rainfall, the surface water risk could increase and a flood extent similar to that in Figure 2 could arise.
- 2.8 The proposed houses will be located to the east of the watercourse, away from the flood extent, so no flood risk mitigation measures are considered necessary for the houses.

3 Responsibilities and Consenting

- 3.1 Given the high risk of flooding at the access point to the site, it is likely that some works to either bridge or culvert the channel would be needed. It is therefore necessary to establish who needs to be consulted on these works, and what their requirements would be.

Swavesey Internal Drainage Board (IDB)

- 3.2 The Swavesey Internal Drainage Board (IDB) were consulted to determine whether they are responsible for maintaining the channel. The section of the watercourse immediately downstream of the site (watercourse 16) is within the boundary of the IDB; this is shown in Figure 3.

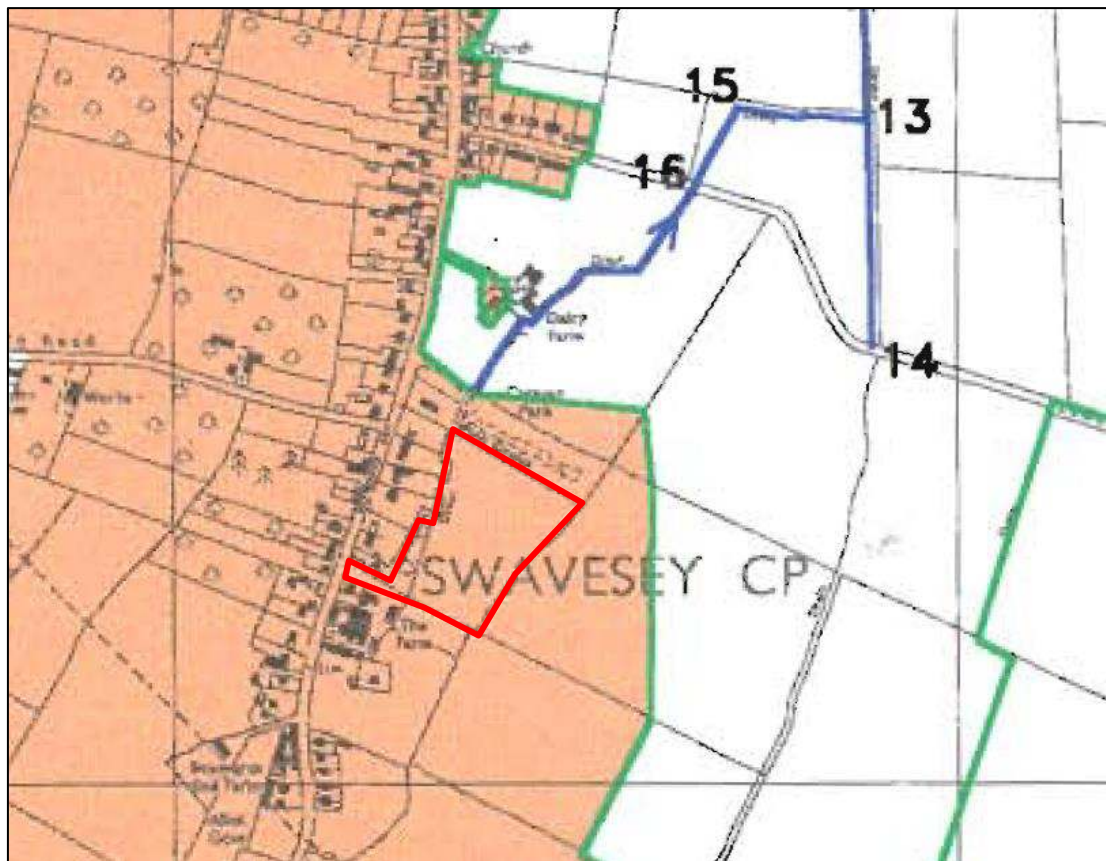


Figure 3: Swavesey IDB Boundary

- 3.3 A telephone conversation with Leigh Middleton of the Middle Level Commissioners (Swavesey IDB) confirmed that the site does not lie within the boundary of the IDB, and the section of the watercourse crossing the site is not maintained by the IDB. For any planning matters, such as building adjacent to or over the watercourse, the Local Authority would need to be consulted. For any matters which would change the flow within the watercourse, and ultimately the volume and flow of water in the downstream



IDB catchment, the Swavesey IDB would need to be consulted. Therefore, potentially discharging the surface water runoff from the new development into the watercourse would need to be restricted and the IDB would need to be consulted on the drainage strategy. In this instance, it may be useful to consult the IDB, although this is not yet necessary.

- 3.4 The means of bridging or culverting the minor watercourse is the jurisdiction of the Local Authority, therefore both South Cambridgeshire District Council and Cambridgeshire County Council were consulted.

South Cambridgeshire District Council

- 3.5 South Cambridgeshire District Council will make decisions on the planning aspects of the bridge or culvert. Rob Mungovan, South Cambs Watercourse Supervisor and Ecologist provided some details on the planning aspects of the development. He stated that the bridge/culvert would need to have planning permission, and this could either be a separate permission or as part of the wider application. This is clearly an important aspect of developing the site as the scheme could not progress without the watercourse crossing.
- 3.6 A discussion with the South Cambridgeshire Duty Officer set out the information required for this planning permission. While they were unable to offer technical advice on the requirements for the bridge/culvert, they said that existing and proposed sections of the watercourse would be needed to inform the application. South Cambridgeshire could offer technical advice on planning as part of a pre-application charged advice service. The Duty Officer suggested that a written advice would be suitable, to ensure all the necessary information has been included.
- 3.7 It should also be noted that a simple ecological appraisal may be necessary for the watercourse, to ensure there are no protected species that could be affected by the construction of the bridge/watercourse.

Cambridgeshire County Council

- 3.8 Cambridgeshire County Council will make decisions on the land drainage aspects of the bridge or culvert, and would be responsible for granting a land drainage consent. This is to ensure that the proposed works to the ordinary watercourse do not result in changes to the flow of the watercourse and increase the flood risk downstream.
- 3.9 Brian Heffernan, Senior Flood Risk Officer at Cambridgeshire County Council, set out in the email in **Appendix E** the considerations when altering or constructing near an ordinary watercourse.
- 3.10 Culverting a watercourse is typically opposed to, due to a number of reasons. In the case of the site, culverting part or all of the watercourse could increase the risk of flooding further downstream (due to limited capacity in the culvert), and would increase the risk of blockage and maintenance necessary to ensure the culvert remains clear. There are also environmental factors to consider, such as loss of habitat and geomorphological features in the channel. However, in some cases a culvert may be necessary and



so Cambridgeshire has developed a Culverting Policy, which is attached at **Appendix F**. It may be possible to install a temporary culvert during the construction phase, and replace this to with a permanent bridge once the proposed development has been built. This should be discussed with Cambridgeshire County Council during a pre-application meeting.

- 3.11 Bridging an ordinary watercourse is a more acceptable solution, as it would provide site access and not impede the flow or cause changes to the channel. The EA have published an Advice Note on the consenting process when bridging or culverting an ordinary watercourse, which is contained in **Appendix G**. The EA used to be the regulatory body for consenting to works to ordinary watercourses, but now these decisions have fallen to the Lead Local Flood Authority. Appendix 2 of the advice note outlines some of the activities that the EA consider to require a consent. A clear span bridge or a bridge with abutments not reducing the flow area or width would not necessarily require a consent. Appendix 2 of the advice note has also been included in **Appendix G**.
- 3.12 Brian Heffernan did not highlight any particular requirements when bridging an ordinary watercourse, such as needing to know the flood level or extent. Instead, he recommended that the Client enters into a pre-development discussion with the County Council and submits the plans for the proposed structure, so that the Council can be involved from the beginning of the planning process. He also suggested that a member of the Council's flood risk team meets the Client on site to discuss the scheme and make recommendations. As all watercourses and structures are individual, he said there is not a typical requirement for a bridge or structure and it would be judged on a case-by-case basis.
- 3.13 It will also be necessary to determine the required 'buffer' zone from the ordinary watercourse within which any of the development can be located. Usually, this buffer zone is 5m, however, we would recommend leaving a buffer of 8m at this stage when preparing plans. This should be something that the County Council can advise on during the pre-application enquiry.

Water Framework Directive Assessment

- 3.14 The Water Framework Directive (WFD) is a European Union directive which commits member states to achieve good qualitative and quantitative status of all water bodies. The ecological and chemical status of surface waters are assessed according to the following criteria:
- Biological quality (fish, invertebrates, aquatic flora);
 - Hydromorphological quality (such as river bank structure, river continuity or substrate of the river bend);
 - Physical-chemical quality such as temperature, oxygenation and nutrient conditions;
 - Chemical quality that refers to environmental quality standards for river basin specific pollutants.
- 3.15 The EA requires all 'main rivers' to reach 'good' status, so any activity which could change the above criteria would need to be assessed in a WFD Assessment.



- 3.16 For an ordinary watercourse, the Advice Note contained in **Appendix G** states on page 3 that “A consent application will need to be screened by the LLFA to establish if the applicant needs to submit a WFD assessment as part of their application. If a WFD assessment is needed and has not been undertaken, the consent should be refused on WFD grounds.”
- 3.17 The bridging or culverting of the ordinary watercourse could potentially result in the deterioration of the hydromorphological quality and the biological quality of the watercourse. Cambridgeshire County Council (who act as the Lead Local Flood Authority) would need to decide whether the proposed structure would need a WFD Assessment. If a WFD Assessment is needed, the consultant carrying out the assessment should be able to recommend measures to prevent deterioration of the watercourse and maintain or achieve ‘good’ status.



4 Recommended Way to Proceed

4.1 Following the flood risk investigations above, we would make the following recommendations on how to proceed:

1. Consult Cambridgeshire County Council on the land drainage aspects of the bridge/culvert, and potentially the surface water drainage if necessary. This would be through their pre-application charged advice service, the details and fees of which are on the website here: http://www.cambridgeshire.gov.uk/info/20099/planning_and_development/49/water_minerals_and_waste/4

We would strongly recommend that the Client and/or EAS meets a member of Cambridgeshire County Council's flood risk team on site to discuss the culverting/bridging of the watercourse.

2. Following the meeting and pre-application discussions, it will be possible to draw up a structure to cross the watercourse and have Cambridgeshire CC's flood team review this. From the conversation with Brian Heffernan, it is unlikely that the watercourse would need to be modelled to design the bridge. However, should there be a requirement to do so following the site meeting with the flood team, it may be necessary to prepare a simple flood model to determine the likely flood levels and extents which may arise on site. In this instance, we would be happy to provide a fee proposal for modelling the watercourse.
3. If the structure requires a consent, the drawings (sections, plans etc.) of the bridge/culvert will need to be submitted to Cambridgeshire County Council and the consent will cost £50 per structure. Please note there is a two month statutory consultation period for an ordinary watercourse consent, and works on site cannot begin until this consent has been issued.
4. We would advise consulting South Cambridgeshire District Council on the planning aspects of the whole scheme, including the bridging of the watercourse. This would be through their pre-application charged advice service, and will ensure South Cambridgeshire agree to the bridging/culverting. We would recommend obtaining planning permission for the bridge/culvert at the same time as the wider scheme.
5. The drainage requirements of the proposed development should also be considered through submission of a Flood Risk and Drainage Assessment. It is likely that the proposed buildings and hardstandings will drain to the ordinary watercourse at greenfield rate. As noted previously, draining the site to the ordinary watercourse may require consultation with the IDB as well as Cambridgeshire County Council, so it may be necessary at this stage to arrange an IDB review of the proposed drainage strategy.



Appendices

- Appendix: A Location Plan
- Appendix: B EA Flood Data
- Appendix: C Topographic Survey
- Appendix: D Anglian Water Sewer Records
- Appendix: E Cambridgeshire County Council Flood Team Email
- Appendix: F Cambridgeshire Culverting Policy
- Appendix: G EA Ordinary Watercourse Advice Note and Appendix 2



Appendix: A

LOCATION PLAN

Land off Boxworth End, Swavesey, Cambridgeshire CB24 4RA





Appendix: B

EA FLOOD DATA

Ms Louisa Wade
EAS
I

Our ref EAn/2017/34766
Date 07 February 2017

Dear Ms Wade

Provision of Product 1 for Land at Boxworth End, Swavesey, Cambridgeshire CB24 4RA

Thank you for your request of 13 January 2017 to use Environment Agency data in the development of the above site.

The information that we hold can be found below and attached to my email.

The information on Flood Zones in the area relating to this address is as follows:

The property is in an area located within Flood Zone 1 shown on our Flood Map for Planning (Rivers and Sea).

Note - This information relates to the area that the above named property is in and is not specific to the property itself.

Please find attached a copy of the Flood Map for Planning (Rivers and Sea) for the area relating to your address.

This information is provided subject to the Open Government Licence available here: www.nationalarchives.gov.uk/doc/open-government-licence/version/3/, which you should read.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004. Please get in touch if you have any further queries or contact us within two months if you would like us to review the information we have sent.

Further details about the Environment Agency information supplied can be found on our website: <http://www.environment-agency.gov.uk/homeandleisure/floods/default.aspx>

Further guidance

If you have requested this information to help inform a development planning proposal, then you should view the government guidance on whether a Flood Risk Assessment is required using the [FRA Guidance Note](#), the [Flood Risk and Coastal Change](#) planning guidance and read our attached guidance on the requirements for a Flood Risk Assessment entitled Flood Zone 3 Factsheet.

East Anglia Area

Ipswich Office, Icen House, Cobham Road, Ipswich, Suffolk, IP3 9JD
Brampton Office, Bromholme Lane, Brampton, Huntingdon, PE28 4NE
General Enquiries:

Calls to 03 numbers cost no more than a national rate call to an 01 or 02 number and must count towards any inclusive minutes in the same way as 01 and 02 calls. These rules apply to calls from any type of line including mobile, BT, other fixed line or payphone.

Email: enquiries@environment-agency.gov.uk

Website: <https://www.gov.uk/government/organisations/environment-agency>

Please be aware that we now charge for planning advice provided to developers, agents and landowners. If you would like advice to inform a future planning application for this site then please complete our [pre-application enquiry form](#) and [email](#) it to our Sustainable Places team. We will initially provide you with a free response identifying the following:

- the environmental constraints affecting the proposal;
- the environmental issues raised by the proposal;
- the information we need for the subsequent planning application to address the issues identified and demonstrate an acceptable development;
- any required environmental permits.

If you require any further information from us (for example, a meeting or the detailed review of a technical document) we will need to set up a charging agreement. Further information can be found on our [website](#).

Please note we have published revised climate change allowances, which are available online. These new allowances will need to be reflected in your Flood Risk Assessment. If you want to discuss this please call our Sustainable Places team.

Yours sincerely

Teresa Chapman
Customers and Engagement Officer

East Anglia Area

Ipswich Office, Icen House, Cobham Road, Ipswich, Suffolk, IP3 9JD
Brampton Office, Bromholme Lane, Brampton, Huntingdon, PE28 4NE

Calls to 03 numbers cost no more than a national rate call to an 01 or 02 number and must count towards any inclusive minutes in the same way as 01 and 02 calls. These rules apply to calls from any type of line including mobile, BT, other fixed line or payphone.

Email: enquiries@environment-agency.gov.uk

Website: <https://www.gov.uk/government/organisations/environment-agency>








Flood Map for Planning (Rivers and Sea) centred on Land at Boxworth End, Swavesey, Cambridgeshire CB24 4RA. NGR TL3636667364. Ref 34766. Created on 30 January 2017.



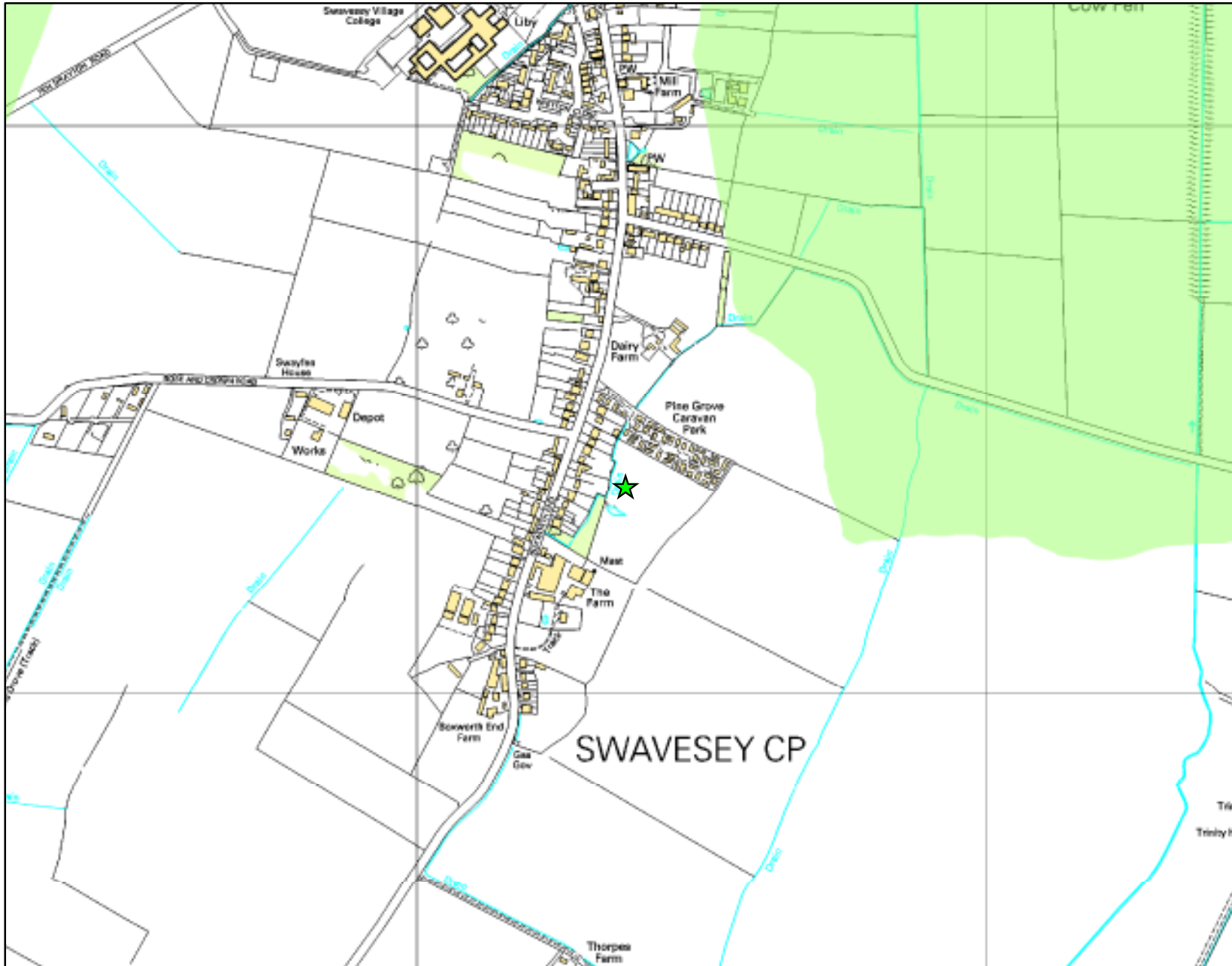
Scale 1:10,000



Legend

-  Main River
-  Flood Map Defences
-  Areas Benefiting From Defences
-  Flood Map - Flood Storage Areas
-  Flood Zone 3
-  Flood Zone 2
-  Site



Recorded Flood Locations centred on Land at Boxworth End, Swavesey, Cambridgeshire, CB24 4RA. NGR TL3636667364. Ref 34766. Created on 30 January 2017.



Scale 1:10,000



Legend

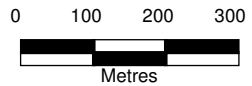
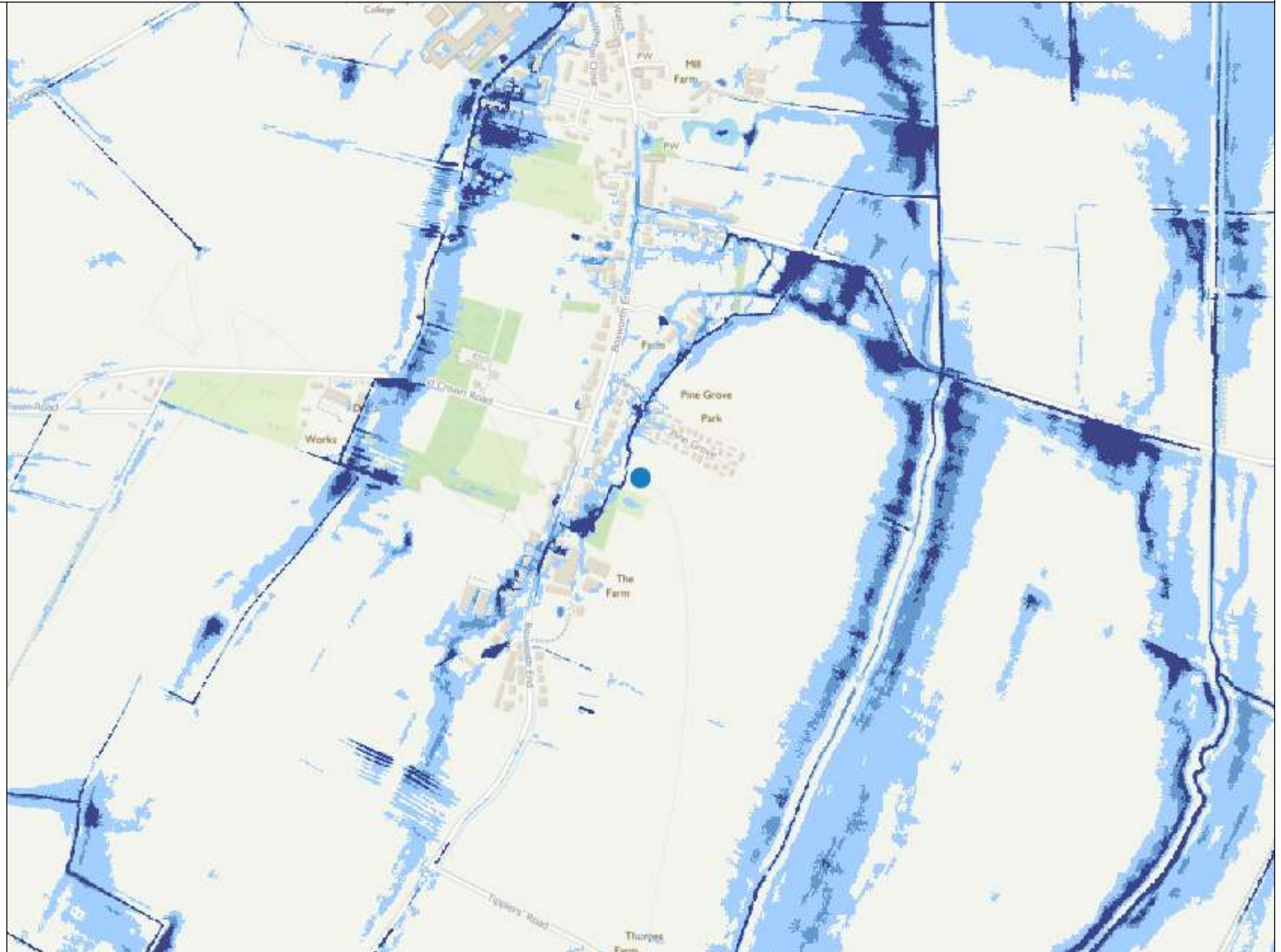
-  Historic Flood Outline March 1947
-  Site

Risk of Surface Water Flooding. NGR TL3636667364. REF 34766.



Legend

- High ($\geq 3.3\%$)
- Medium (3.3% - 1%)
- Low (1% - 0.1%)





Appendix: C

TOPOGRAPHIC SURVEY



Appendix: D

**ANGLIAN WATER SEWER
RECORDS**



(c) Crown copyright and database rights 2017 Ordnance Survey 100022432 Date: 23/01/17 Scale: 1:1250 Map Centre: 536303,267388 Data updated: 05/01/17 Our Ref: 210867 - 1 Wastewater Plan A1

This plan is provided by Anglian Water pursuant to its obligations under the Water Industry Act 1991 sections 198 or 199. It must be used in conjunction with any search results attached. The information on this plan is based on data currently recorded but position must be regarded as approximate. Service pipes, private sewers and drains are generally not shown. Users of this map are strongly advised to commission their own survey of the area shown on the plan before carrying out any works. The actual position of all apparatus MUST be established by trial holes. No liability whatsoever, including liability for negligence, is accepted by Anglian Water for any error or inaccuracy or omission, including the failure to accurately record, or record at all, the location of any water main, discharge pipe, sewer or disposal main or any item of apparatus. This information is valid for the date printed. This plan is produced by Anglian Water Services Limited (c) Crown copyright and database rights 2017 Ordnance Survey 100022432. This map is to be used for the purposes of viewing the location of Anglian Water plant only. Any other uses of the map data or further copies is not permitted. This notice is not intended to exclude or restrict liability for death or personal injury resulting from negligence.

- | | | | |
|----------------------|--|------------------------|--|
| Foul Sewer | | Outfall | |
| Surface Sewer | | Inlet | |
| Combined Sewer | | Manhole | |
| Final Effluent | | Sewage Treatment Works | |
| Rising Main | | Pumping Station | |
| Private Sewer | | | |
| Decommissioned Sewer | | | |

	Boxworth End





Appendix: E

**CAMBRIDGESHIRE COUNTY
COUNCIL FLOOD TEAM EMAIL**

From: 09 February 2017 15:08
Sent:
To: Ordinary watercourse land drainage consent Swavesey
Subject: Cambridgeshire's Culvert Policy.pdf
Attachments:

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Louisa,

I refer to our telephone conversation of earlier today. I explained you should be aware that constructions or alterations within an ordinary watercourse (temporary or permanent) require consent from our team at Cambridgeshire County Council under the Land Drainage Act 1991. Ordinary watercourses include every river, drain, stream, ditch, dyke, sewer (other than public sewer) and passage through which water flows that do not form part of Main Rivers (Main Rivers are regulated by the Environment Agency). Please note the council does not regulate ordinary watercourses in Internal Drainage Board areas.

We strongly encourage pre-application discussions and potentially site visits to discuss the appropriateness of your proposed plans and to ensure that everything you need to submit is provided when the application is made. Please see the pre-application advice charging schedule on our website:

http://www.cambridgeshire.gov.uk/info/20099/planning_and_development/49/water_minerals_and_waste/4

Please note there is a two month statutory consultation period and a £50 fee per structure when an Ordinary Watercourse Consent application is made. Works shall not start until the relevant permission has been successfully obtained and consent granted in writing from the county council. Attached to this e-mail please find the application form and guidance document for Ordinary Watercourse Consent. I have also attached Cambridgeshire's Culvert Policy and any culvert applications need to be in line with this guidance. I encourage you to read through these documents and contact me if you have any queries.

You will need to speak to a drainage engineer/consultant to find out what size pipe would be appropriate for the ditch in question. Generally we would not permit a pipe size under 450mm in diameter as an allowance should be made for climate change and future flows. Best practice indicates that all pipes should be placed up to one quarter of the diameter below hard bed level to allow for future re-grading. Culverts should not restrict the potential flow of the ditch. All culvert applications should be in line with Cambridgeshire's Culvert Policy, therefore if there is an alternative to culverting, we would advise you look into this.

For payment, you can pay online or by cheque. Cheques should be made payable to 'Cambridgeshire County Council'. On the reverse side of the cheque please write 'Ordinary Watercourse Consent' and location details. Alternatively you can go to the website below to pay online:

http://www.cambridgeshire.gov.uk/info/20099/planning_and_development/49/water_minerals_and_waste/4

I hope this information is of some assistance and if you have any further queries in respect of this matter, please contact me.

Yours faithfully,

Brian Heffernan
Senior Officer Flood Risk
Box No: SH1315
Shire Hall

Castle Hill
Cambridge
CB3 0AP

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Appendix: F

**CAMBRIDGESHIRE CULVERTING
POLICY**

Cambridgeshire's Culvert Policy

An explanation of our policy regarding applications to
culvert ordinary watercourses.

Document History

Document history	Details	By	Current Version	Date
	Initial draft	RH	v0.2	29/08/2013
	Revisions following consultation	RH	v0.3	24/09/2013
	Revisions before cabinet	RH	V1.0	26/11/2013
Authorisation	Title		Signature	Date
	Graham Hughes	GH		17/10/2013
	Cllr Bates on behalf of CFRMP	Cllr Ian Bates		29/11/2013
	Cabinet (no amendments)	NC		26/11/2013

1. Purpose and legislative framework

Cambridgeshire County Council, as the Lead Local Flood Authority (LLFA), became responsible for ordinary watercourse consent applications under Section 23 of the Land Drainage Act 1991 on 06th April 2012. Any culverting of an ordinary watercourse, or the alteration of an existing culvert in Cambridgeshire outside of Internal Drainage Board (IDB) areas, requires our prior consent.

Consenting under Section 23 had previously been dealt with by the Environment Agency; as such they created extensive guidance on culverts. We have therefore adopted many of the principles that the Environment Agency had already been working to, which is detailed within this document.

This policy has been produced with reference to the Environment Agency's 'Culvert Policy' documents and provides our view on applications to culvert ordinary watercourses. Many IDB's within Cambridgeshire have similar guidance or policies on applications to culvert watercourses and therefore we are following a consistent approach across Cambridgeshire.

2. Policy and Aims

2.1 Our Policy

Cambridgeshire County Council is generally opposed to culverting of a watercourse due to the adverse ecological, flood risk, human safety and aesthetic impacts as well as other effects which are likely to arise as described in this document.

We will consider each application to culvert a watercourse on its own merits but we will only approve a culvert if there is no reasonably practicable alternative or if we think the detrimental effects would be so minor that a more costly alternative would not be justified. In all cases where it is appropriate to do so, applicants must provide adequate mitigation measures.

Where culverting is proposed as part of a scheme to build over a watercourse, we would generally be opposed to the proposal because of health and safety considerations, increased maintenance costs and because this would preclude future options to restore the watercourse

2.2 Our culvert policy aims to:

- Clarify our approach to assessing permissions for culverts;
- Ensure a consistent approach to culverting approvals; and
- Demonstrate how we will take action to protect the continuity and integrity of watercourses within the county.

3. Reasons for policy

3.1 Loss of environmental features and wildlife habitats

Installation of a culvert results in complete loss of environmental, geomorphological and habitat features within that section of watercourse. The continuity of the water corridor is broken which affects the landscape and ecological value of the watercourse and in some cases prevents the migration of fish species. Even seasonably dry watercourses provide habitats for many species of amphibians and invertebrates. This amenity will be lost for present and future generations.

3.2 Increased likelihood of flooding due to blockages

Compared to an open channel there is an increased risk of blockage once a culvert is installed. When blockages occur they cannot be easily identified and in many cases only become apparent after heavy rainfall when flooding begins, this can be difficult to remedy at the time if it is not safe to do so or without special equipment.

One argument is that culverting prevents flytipping and litter dropping within open channels, however these advantages are only short term and the overall disadvantages of culverting outweigh an issue which can be reduced using other measures.

3.3 Increased impact of flooding

The effect of the overland flooding that will occur when a culvert cannot cope with all the flow reaching it can be more serious than flooding from an open watercourse. Flooding may also affect open sections of a watercourse further upstream from the culvert, which previously may not have been the first location to experience flooding. This is often the case where flooding has occurred because of a blockage.

3.4 Loss of floodwater storage

Open watercourses generally provide more storage capacity than a culvert with the impact being greater over longer lengths. They also provide an open area for water to be channeled into during overland flow and allow natural processes such as evaporation, infiltration and groundwater recharge to take place. The natural roughness of the channel bed is also lost through culverting which can increase the speed water travels downstream further exacerbating flooding or creating erosion problems.

3.5 Increased difficulties for providing for drainage connections

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

3.6 Difficulty in the repair, maintenance and replacement of culverts

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 runoff from future developments could be impossible or uneconomic due to the cost of replacing or enlarging culverts. There have been cases of serious flooding caused by culverts collapsing due to large amounts of material stockpiled above them.

The responsibility for the condition and maintenance of a culvert lies with the landowner or owner of the culvert unless other agreements are in place. The responsible party must therefore ensure 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 with the use of special procedures and equipment, making inspection and maintenance both difficult and costly.

3.7 Increased health and safety hazards

Culverting does not remove the risk of drowning or injury. There have been many cases in the past where children have died or suffered injury after entering culverts representing a considerable safety hazard. Water levels can rise suddenly and without notice, or there can be a lack of oxygen or build up of potentially toxic or explosive gases in culverts. These hazards are a danger to the public as well as those who maintain the structure.

3.8 Pollution and effect on water quality

Culverting increases the difficulty in detecting the origins of pollution and in monitoring water quality, increasing any adverse impacts as a result of pollution. There is also a loss of biological processes which are essential for water 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.

4. Exceptions to policy

It is recognised that there are situations in which culverting is unavoidable such as short lengths for access or where highways cross watercourses. In such cases alternatives such as open span bridges or diversion of the watercourse must have been considered, the length of the culvert restricted to the minimum length necessary to meet each applicants objectives and where appropriate, mitigating environmental enhancements included in the proposal. Options to culvert will not be considered lightly so applicants must have strong justification for taking this route.

Applicants will be required to prove why culverting is both necessary and the only reasonable practicable alternative, this can include where alternatives are unreasonably costly to install. The applicant must still provide information to show that it will not have a detrimental effect on flood risk and the habitat(s) and species present, or that mitigation measures can be put in place to reduce these effects.

The proposal must include appropriate assessment of flood risk and environmental impact. The applicant should take into account the possible effects of climate change and future development in the catchment on the watercourse when calculating the capacity of the culvert.

Alternatives to culvert which can be considered include:

- Construction of a bridge
- Constructing infrastructure elsewhere
- Diverting the watercourse
- Constructing a ford in small streams for non critical infrastructure

5. Consent procedures

Landowners and developers should seek the County Councils advice as early as possible on any proposal, allowing sufficient time before work is to start. Identifying and resolving potential problems before plans reach an advanced stage will minimise costs to all parties and will reduce the time taken for us to assess the consent application when it is received. In addition opportunities for environmental enhancements can be identified which may not necessarily entail significant additional costs.

Detailed guidance on applying for consent can be found on the county council web pages under 'Flood and Water Management'. Where alternatives to culverting are not possible applicants should refer to the most up to date industry guidance on designing culverts such as the CIRIA Culvert Design and Operation Guide (C689).

Failure to seek our consent prior to carrying out any new culverting or culvert alterations can lead to enforcement action being taken against the relevant party as prescribed within the accompanying enforcement policy.

Applicants should be aware that Byelaw consent will also be required from South Cambridgeshire District Council where a proposal will impact on one of the districts award drains.

Definitions

Ordinary watercourse - As defined in the Land Drainage Act 1991 is a watercourse that does not form part of a main river, and includes all ditches, drains, cuts, culverts, dykes sluices, sewers (other than public sewers within the meaning of the Water Industry Act 1991) and passages, through which water flows.

Bridge - An open span structure that carries something such as a road, footpath or railway over a watercourse.

Culvert - A covered channel or pipe which is used to continue a watercourse or drainage path under an artificial obstruction

Internal Drainage Board - A board elected by ratepayers and established for designated, particularly low lying, areas of England and Wales where flood protection and land drainage are necessary to sustain agricultural and developed land use.

Main River - All watercourses shown on the statutory main river maps held by the Environment Agency. Main river can include any structure or appliance for controlling or regulating the flow of water in or out of a river.



Appendix: G

**EA ORDINARY WATERCOURSE
ADVICE NOTE AND APPENDIX 2**

Advice Note

Ordinary Watercourse Regulation - Consenting

February 2012

This advice note aims to assist the transfer of ordinary watercourse consenting Powers from the Environment Agency to Local Authorities as required in the Flood and Water Management Act (FWMA) 2010 in England only.

Introduction

Local Authorities will lead on ordinary watercourse consenting and enforcement unless it is in an Internal Drainage District where Internal Drainage Boards (IDBs) will retain their existing powers. The Land Drainage Act 1991 will underpin ordinary watercourse regulation undertaken by Local Authorities. This will occur following commencement of paragraphs 32-34 of Schedule 2 of the Flood and Water Management Act 2010.

- Changes to ordinary watercourse management have been made by the Flood and Water Management Act 2010 [FWMA]. In particular paragraph 32 (principally) of Schedule 2 of the FWMA amends section 23 of the Land Drainage Act 1991 (LDA1991).
- This note covers the transfer of regulatory powers (consenting and enforcement) on Ordinary Watercourses from the Environment Agency to Lead Local Flood Authorities (LLFAs). Together ordinary watercourse consenting and enforcement are referred to as regulation.
- The purpose of ordinary watercourse regulation is to control certain activities that might have an adverse flooding impact.
- Defra and Welsh Government may choose, separately or jointly, to produce further documentation on the transfer of ordinary watercourse consenting.
- Currently ordinary watercourse consenting and enforcement, other than in an “internal drainage district” is undertaken by the Environment Agency, however Local Authorities already have enforcement powers under s25 of the Land Drainage Act 1991.
- This note is to assist Environment Agency Area Development and Flood Risk and Asset System Management Teams in consistently sharing their expertise in these two roles (consenting and enforcement, together described as regulation) with Lead Local Flood Authorities, and for ongoing reference by LLFAs.
- Ordinary watercourse regulation within internal drainage districts is undertaken by internal drainage boards (IDBs). IDBs can operate as either:
 - “stand alone”;
 - more than one internal drainage board working together as a “consortium”;
 - internal drainage boards operated by the Environment Agency.

- The responsibilities for ordinary watercourse regulation in internal drainage districts are not affected by the FWMA. Internal drainage districts only cover approximately 10% of England and Wales by area.
- In some areas the Environment Agency has assumed delegated responsibility for the IDBs. Where this is the case, the Environment Agency, acting as an internal drainage board, will continue to undertake ordinary watercourse regulation. All other ordinary watercourse regulation undertaken by the Environment Agency is intended to transfer to LLFAs.
- These changes result from recommendations contained in Sir Michael Pitt's independent review of the 2007 summer floods.

Geographical Coverage

The advice covers the whole of England.

Existing Environment Agency Consenting Approach

- The Environment Agency takes a risk based and proportionate approach in undertaking these activities. Information on the numbers of ordinary watercourse consents we currently determine is shown in Appendix 1.
- The Environment Agency uses certain procedures, including internal guidance notes, in determining ordinary watercourse consents and considering enforcement action. Appendix 2 is presented as a series of simple cross sections which represent those activities the Environment Agency considers to require consent and those which do not.
- The Environment Agency has always encouraged early discussions in advance of consent application and always seeks first to resolve enforcement issues by negotiation. Pre-application discussions may be able to identify an alternative approach that does not require consent because it will present no risk to flood risk management.
- A Consent application requires the payment of a fee. Consent application fees are fixed in Statute and to change them requires a Ministerial Order.
- Appendix 3 includes an example template for a consent application form and associated notes. A LLFA does not have to use this template but it provides guidance on the information that the Environment Agency has found to be necessary.
- To avoid confusion, it is suggested that if an application form is used for consenting on ordinary watercourses that it should be clearly distinguishable from Main River consents.
- Appendix 3 also includes standard letters and a consent document for granting ordinary watercourse consent. Following the transfer it will be possible to attach reasonable conditions to a Consent such as relating to timing and manner of the works.

- Appendix 4 includes a non-exhaustive list of issues that could support conditions and informatives based upon the Environment Agency's experience on main river permits.
- In determining applications it is necessary to consider other Legislation including, but not exclusively: The Environment Act; the Habitats Regulations; the Water Framework Directive (WFD); the Countryside and Rights of Way Act; the Salmon and Freshwater Fisheries Act; the Eel Regulations.
- In undertaking other activities LLFAs will need to have regard to their general obligations and these regulations in particular. Information on these is provided in [Appendix 6](#). From the Environment Agency other permits that may be required by the applicant include environmental permits (previously abstraction, impoundment and discharge consents) and consents may also be required from Natural England and the Countryside Council for Wales. If the application has the potential to affect a main river or sea defences the LLFA must consult the Environment Agency to ensure a partnership approach. The Environment Agency anticipates that the two bodies would discuss issues and work together.
- Permissions may be required for works in relation to designated sites (SSSIs, SACs, SPAs) and/or protected species. Currently, where a third party seeks consent for works, the Environment Agency undertakes to consult with Natural England or CCW on potential impacts on designated sites. The third party is not required to apply directly to Natural England or CCW for consent under the designated sites legislation. However, where protected species may be affected by works, the third party must contact Natural England or CCW directly in case works need to be licensed under the protected species legislation. Further detail is provided in [Appendix 6](#).
- A Consent application will need to be screened by the LLFA to establish if the applicant needs to submit a WFD assessment as part of their application. If a WFD assessment is needed and has not been undertaken, the consent should be refused on WFD grounds. If you issue consent for a proposal which causes a water body to deteriorate or prevents the objectives of the WFD from being met, this will be reported to the European Union. This could result in the UK Government facing infraction (financial penalties) from the European Union. Further detail is provided in [Appendix 7](#).
- The LLFA should be aware of the implications of the latest Construction (Design and Management) Regulations. It is recommended that LLFAs make it clear to applicants that the LLFA is not designing the work and that it is for the applicant to ensure that the current requirements of the CDM Regulations are complied with.

The way that the FWMA will operate

Section 23 of the Land Drainage Act 1991 will be amended by the Flood and Water Management Act 2010 to say:-

23 Prohibition on obstructions etc. in watercourses

(1) No person shall—

(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,

without the consent in writing of the drainage board concerned.

(1A) Consent under this section may be given subject to reasonable conditions.

(1B) An internal drainage board or lead local flood authority must consult the Environment Agency before carrying out work within subsection (1)(a), (b) or (c) if the board or authority is “the drainage board concerned” for the purposes of this section.

(1C) The drainage board concerned must have regard to any guidance issued by the Environment Agency about the exercise of the board’s functions under this section.

- Consent post transfer will be required for the erection of any culvert and any alteration likely to affect the flow in an ordinary watercourse; this is more widely drawn than pre transfer.
- Post transfer, consent may be given subject to reasonable conditions. [Appendix 4](#) includes some suggested topics and wording for conditions and informatives. LLFAs may wish to use a condition to time limit the proposed works to ensure a consent is implemented within a given timescale.
- After transfer, where a LLFA intends to undertake works on an ordinary watercourse for which it has regulatory responsibility, it must consult the Environment Agency. However where an LLFA is doing work for FCRM purposes, they do not need to consult the Environment Agency, provided there is a local FRM strategy published for the area the work is within and the works are consistent with it. Until the local FRM strategy is published, LLFAs will need to consult the Environment Agency.
- Conversely when the Environment Agency no longer holds powers relating to works on ordinary watercourses, it will have to apply for consent from the Local Authority.
- The LLFA is also likely to become the SuDS Approving Body (SAB) under the FWMA and there may be some overlap between SuDS activities and ordinary watercourse consenting.

Transitional arrangements

- Any application in England received before 6th April 2012 will be considered by the Environment Agency and the Environment Agency's responsibility for such applications will end when the consent or refusal letter is issued. The Environment Agency will be responsible for any appeals for these refusals.
- If, on or after 6th April 2012, a Consent application for works on an ordinary watercourse for which the LLFA will have regulatory responsibility is received by the Environment Agency it will be returned to the applicant with a covering letter. This letter will be copied to the LLFA for information.
- Works that the Environment Agency have already consented will not be required to seek consent anew from the LLFA and conversely structures that do not have consent prior to 6th April 2012 will continue to be without consent from 6th April onwards.
- LLFAs should be responsible for (new) enforcement activities from 6th April 2012 even if the works took place before the LLFA took responsibility for section 23 consents on ordinary watercourses. Where enforcement procedures have been commenced prior to 6th April 2012 the Environment Agency will be responsible for concluding these.

Environment Agency historical records

The Environment Agency holds records of ordinary watercourse consents and enforcements. It is likely that the Environment Agency will provide the LLFA with a list of its records for the period covered by the Environment Agency's retention schedule. Individual records will be provided where necessary but, where required upon legal advice; certain parts of records may be redacted.

Definitions

The following table defines terms set out in the Flood and Water Management Act 2010

Term	Definition	Source
ordinary watercourse	a “watercourse” that does not form part of a “main river”	Flood and Water Management Act 2010
watercourse	includes all rivers and streams and all ditches, drains, cuts, culverts, dikes, sluices, sewers (other than public sewers within the meaning of the Water Industry Act 1991) and passages, through which water flows.	Land Drainage Act 1991 [section 72(1)]
main river	watercourse shown as such on a main river map. Main river maps are held by Defra and Welsh Government and copies are available to LLFAs as a GIS layer on GEOSTORE.	Water Resources Act 1991 [section 113]
public sewer	a sewer for the time being vested in a sewerage undertaker etc	Water Industry Act 1991
culvert	a covered channel or pipe designed to prevent the obstruction of a watercourse or drainage path by an artificial construction. There is no definition in current legislation. This definition will be added to Section 72 of the Land Drainage Act	Flood and Water Management Act 2010 Paragraph 39

Sources of Information

- The Defra / Welsh Government “main river” map is available to LLFAs as a GIS layer on GEOSTORE.
- LLFAs will be able to use this, along with their own mapping showing “watercourses” and application of the definitions above to identify “ordinary watercourses” within their individual authority areas.
- A number of bodies will be responsible for ordinary watercourse consenting post transfer.
- The Environment Agency has a mapping layer showing the boundaries of LLFAs.
- The Environment Agency also has a mapping layer showing the boundaries of internal drainage districts, however this is out of date and a revised layer will be published in due course.
- These layers will be used to produce, mainly for the use of the Environment Agency National Customer Contact Centre (NCCC), a composite map that will show the boundaries of authorities who will be responsible for ordinary watercourse regulation.
- With regard to information on locations of features such as designated sites. LLFAs are likely to have such information because of the other responsibilities of their authorities, including planning (policy and development control) purposes. If they have not, GIS mapping layers for designated sites (SSSIs, SACs, SPAs) can be downloaded from the NE website at:
http://www.gis.naturalengland.org.uk/pubs/gis/gis_register.asp
- Countryside Council for Wales provides a similar service:
<http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/gis-download---welcome/gis-boundary-downloads.aspx>
- Technical documents and guidance that may also be of use include:
[‘Living on the Edge’ – Riparian owners guide](#)
[The fluvial design guide;](#)
[Building a better environment - a guide for developers;](#)
[Culvert design and operation guide](#)
[Hydropower good practice guide.](#)

Advice Note

Ordinary Watercourse Regulation - Enforcement February 2012

This advice note aims to assist the transfer of ordinary watercourse enforcement Powers from the Environment Agency to Local Authorities as required in the Flood and Water Management Act (FWMA) 2010.

Local Authorities will lead on ordinary watercourse enforcement unless it is in an Internal Drainage District where Internal Drainage Boards (IDBs) will retain their existing powers. The Land Drainage Act 1991 will underpin the enforcement actions undertaken by Local Authorities. This will occur following commencement of paragraphs 32-34 of Schedule 2 of the Flood and Water Management Act 2010.

Local Authorities may also be able to consider enforcement for some activities under Town and Country Planning Law. The Environment Agency will continue to lead enforcement on main rivers and tidal flood defences.

Enforcement Actions

The aims of enforcement in flood risk management are to ensure the proper flow of water in a watercourse and over the floodplain; the control of water levels and the security of existing assets. To achieve these aims, enforcement action is used to rectify unlawful and damaging or potentially damaging work, always using a risk based approach.

Enforcement action (not necessarily criminal sanction) may be taken where damaging or potentially damaging works have been undertaken without consent or are in contravention to an issued consent.

Some incidents are so serious that immediate action is required to mitigate the risk. Other incidents may only require a letter to the offender so that the requirements are clear.

Methods of undertaking enforcement include:

- site visits and face to face meetings with perpetrator;
- sending advisory letters
- sending warning letters;
- using notices to enforce, prohibit or carry out works;
- prosecution and reclaiming costs of prosecution;
- direct remedial action plus recharge of costs of remedial action

Appendix 5 includes offence summaries, sample letters and notices to assist.

Ordinary Watercourse Enforcement Activities

The table below outlines the typical steps in an ordinary watercourse enforcement case. The individual circumstances of each case, both legal and factual, will inform and determine which step in the enforcement process is applicable at any one time.

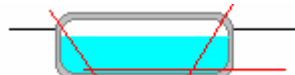
Activity	Description	Suggested Action
Legislation	The Land Drainage Act 1991, as amended by the Flood and Water Management Act 2010, underpins regulation of ordinary watercourses.	Familiarise yourself with The Land Drainage Act 1991 (particularly section 23) and Flood and Water Management Act 2010 (principally paragraph 32 of schedule 2).
Training prior to carrying out enforcement	Persons undertaking an enforcement role should be trained and authorised in writing to do so. This will ensure that the required enforcement tasks are carried out safely and legally and that they have the right to lawfully enter land.	Receive training and ensure necessary authorisations in place prior to undertaking enforcement work.
Establish if an offence has been committed	A report or visual inspection of an asset may identify a problem which could be deemed an enforcement case.	Keep a record of any enforcement action taken including all relevant correspondence and telephone calls. - Seek advice from other colleagues or stakeholders with an interest in the case; - Assess whether consent has or may have been issued for problem; - Collect further information e.g. initial site visit to understand issues involved and extent of damage.
Classify risk and decide appropriate response	Carry out an initial assessment on whether the issue could cause a risk to life and property. Consider: - criticality of location (e.g. proximity to critical assets e.g. culverts); - visible extent of damage to any assets or any water escape; - potential consequence of a failure - forecast weather conditions	If damage is considered high risk consider compiling a recommendations record. The final version forms part of any case file. Prepare for undertaking site specific enforcement action. If damage is considered low risk consider sending a warning letter with future monitoring to measure change.
Investigate and gather evidence	Evidence is collected for a case.	Consider requirements for setting up an investigation, collecting evidence and bringing a matter before the courts, including preparation of a case file.
Choose and apply response to offence	If you intend to issue a letter or legal notice you should give: - written explanation of problem; - outline of what needs to be done and by when. Where time permits, aim to serve a notice to give the offender an opportunity to rectify the problem without needing to go to court.	Consider issuing appropriate Notice or letter. ! Important cases for prosecution must be presented within 6 months of the Notice lapsing. Within this period you must leave sufficient time to prepare a case. A delay could lead to a situation where no prosecution can be commenced.
Review	Ongoing monitoring and review is important feedback to inform future approach and work effectively with customers.	Consider raising public awareness by: - door to door visits; - letter and booklet drops; - speaking to Parish Councils or other community groups.

Appendix 2

Cross sections of consentable activities



Pipe Culvert (including extension and removal of)- Consent Required under Section 23 (1)(b).



Oversized Box Culvert (including extension and removal of)- Consent Required under Section 23 (1)(b).



Trash Screens - Consent Required as it is an alteration to a culvert and has the potential to obstruct flow under Section 23 (1)(c)



Bank Protection Works - Not Consentable under LDA 91, (Temporary works may require consent).



Pipe Crossing (in channel) - Consent Required under Section 23 1(a) if placed on bed and under Section 23 (1)(b) if above bed



Pipe Crossing (above bank) - Not Consentable under LDA 91 as it does not affect the watercourse.



Pipe Crossing (below bed) - Not Consentable under LDA 91 as it does not affect the watercourse – Potential temporary works consent.



Protruding Pipe Outfall - Not Consentable under LDA 91 as it will not act like a dam/weir or like obstruction.



Outfall within Bank profile - Not Consentable under LDA 91 as it does not act like a mill dam or weir.



Weir/Dam or impoundment or temporary works that obstruct flow - Consent Required under Section 23 1(a)



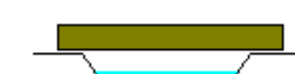
Bridge (where soffit level is below bank top level) - Consent Required under Section 23 1(b) as it acts like a culvert.



Bridge (abutments not reducing flow area/width) - Not Consentable under LDA 91 as does not interfere with flow.



Bridge (Abutments restricting flow) - Consent Required under Section 23 1(b) as it acts like a culvert



Clear span bridge - Not Consentable as it does not affect the watercourse



Bridge with support in channel - Not Consentable under LDA 91 as it will not act like a dam/weir or like obstruction Need to consider size of pier against size of watercourse, but would want to discourage the use of a pier in the watercourse.

Note: This is based upon Environment Agency interpretation of legislation and “flow” should be determined as bank full flow conditions