



# **Norfolk** County Council

## Flood Investigation Report

Report Title:

Broadland

Norwich Road, Strumpshaw

Report Reference: Y/5/14/000467

29 April 2015

Report Status: Approved Report

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Prepared by the Flood Risk Officers on behalf of the  
Flood and Water Management Team

# Contents

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<b>1. Reason for Flood Investigation .....</b>	<b>3</b>
<b>2. Location of flooding incident.....</b>	<b>3</b>
<b>3. Flood Incident as reported.....</b>	<b>3</b>
<b>4 Desk Study .....</b>	<b>4</b>
<b>5 Summary of site investigation and information received .....</b>	<b>4</b>
<b>6 Summary of impacts .....</b>	<b>5</b>
<b>7 Investigation findings.....</b>	<b>5</b>
<b>8 Recommendations.....</b>	<b>7</b>
<b>9 Disclaimer.....</b>	<b>9</b>
<b>10 Annotated Map.....</b>	<b>10</b>

# **Flood Investigation Report**

## **1. Reason for Flood Investigation**

It was deemed necessary to complete a formal investigation into the flood incident at Norwich Road, Strumpshaw which occurred on 7 February 2014 as;

- a) A property flooded internally from surface run-off and from sewage.

This met Norfolk County Council's threshold for triggering the undertaking of a formal flood investigation.

## **2. Location of flooding incident**

- 2.1 Strumpshaw is located approximately 10 miles east of Norwich. The area of reported flooding is situated on Norwich Road, Strumpshaw. The flooded area included the property and the public highway.

## **3. Flood Incident as reported**

- 3.1 The flooding that occurred on 7 February 2014 was first reported to Norfolk County Council Flood and Water Management Team by the resident on 7 February 2014. The resident had previously contacted the Flood and Water Management Team on the day before to highlight the risk of flooding to his property. The report of flooding by the resident was supported by appropriate evidence of the event.

In addition during the course of drafting the flood investigation report further internal flooding of this property occurred on 14 July 2014. This further incident has enabled all Risk Management Authorities to highlight and agree the multiple and complex causes of flooding at this location. These are detailed in the report below.

Norfolk County Council Highways also received a number of reports of flooding to the property and highway which are detailed below:

- 3 Jan & 24 Sept 2012,
- 9, 11, 15 March & 10 Oct 2013,
- 3, 11, 14 Feb, 27 May, 14, 16 July ,14, 26 Aug 2014

Anglian Water received a number of reports of flooding to the property and highway which are detailed below:

- 9 Feb 2006
- 27 May 2007
- 24 & 25 Sept 2012

- 9 Mar 2013
- 1, 7, Feb, 27 May, 27 June, 13 July, 14 Aug, 8 & 9 Oct 2014

## **4 Desk Study**

### 4.1 The location of the flooding:

- Lies within the local catchment of an unnamed tributary of Run Dike. Run Dike flows into Lackford Run which in turn is a tributary of the River Yare
- Is sited within an area of geology likely to have low rates of filtration.
- Is located within Broadland District Council's administrative area.
- Is located within the Environment Agency Essex, Norfolk & Suffolk Administrative and Water Management areas.
- Lies within a significant surface water overland flow path that flows from the South East to the North West which eventually outfalls into the River Yare.
- Does not lie within Flood Zone 2 or Flood Zone 3
- Is not within 2.5km of a registered rain gauge and no known flow data exists for the local drainage system.
- Is shown by Anglian Water records to only be served by foul water sewers.
- Historically was near to several wells which may indicate close proximity to a high water table.
- Has not been mentioned within existing flood risk management publications (i.e. Strategic Flood Risk Assessments).
- The Highway is publically maintainable and there are drainage gullies evident within the carriageway.

## **5 Summary of site investigation and information received**

- ### 5.1
- NCC Flood and Water Management Team visited the site on the 6 February, 27 May (Anglian Water also in attendance) and 22 July (NCC Highways also in attendance) 2014.
  - Anglian Water has investigated its foul water system and identified a number of surface water connections into the public sewer including surface water connections from the affected property.
  - Anglian Water identified a collapsed manhole on the junction of Norwich Road & Hemblington Rd during December 2014.

Please see the annotated Map attached to this report summarising the information received by third parties and through on-site investigations.

## **6 Summary of impacts**

- 6.1 Information relating to the impacts experienced at the flood location are detailed below; *(Please see Annex 6 within the PFRA Annexes to the final guidance for the classification of property types to be used in filling in the section below).*

**Risk to life:** None

**Internal Flooding:** Yes

**External Flooding:** Yes

**Critical services:** None

**Priority Gritting Routes:** Yes

**Obstruction of Access:** Yes (to the affected property)

## **7 Investigation findings**

### **7.1 What caused the flooding?**

- 7.1.1 Please see the annotated Map attached to this report summarising the information received by third parties and through on-site investigations.

### **7.2 Who has responsibilities to manage the cause(s) of the flood?**

- 7.2.1 With reference to the above factors, responsibility to manage the causes of the flood are identified below:

- Property owners
- Norfolk County Council (NCC) Highways
- Adjacent landowners
- Anglian Water

### **7.3 What was their response in relation to the cause of the flood?**

- 7.3.1 In response to the internally flooding that occurred in early February and July 2014 the affected resident/business closed their premises.

- 7.3.2 In response to past events the property owner has:

- installed a soakaway within their curtilage. In addition the property owner paid for a tanker to pump out water within the curtilage of their property in response to flooding on the 15 March 2013.
- Removed the identified surface water connections to the foul sewer

7.3.3 As previously stated and, in response to the more recent flood events, Norfolk County Council Highways sent out a tanker to pump water out of the ditch on the following dates: 11 & 14 February 2014, 27 May 2014 and 16 July 2014.

In addition the NCC Highways Engineer has completed the following works to:

- Clean (and where possible widen or deepen) the ditch including more extensive hand excavation at the low point of the ditch where it runs alongside a Public Right of Way.
- Install new additional and/or improve the existing baffle walls to both increase capacity of the back ditch and to trap water in the top end of the ditch.

NCC Highways are also considering the trial and installation of non-return valves on the three closest road gullies to the property. The benefit would be the ditch could contain a greater volume and would prevent water from escaping from the ditch when full up to the outfall pipes. In addition NCC Highways will ensure that the system is clean and continue to clean all associated gullies as part of the highway maintenance regime.

7.3.4 The design standard for existing highways drainage systems cannot cope with rainfall during exceptionally heavy downpours. These systems are not designed to provide protection for third party land or assets. This means in any given year there is a residual risk of flooding.

7.3.5 In response to past flood events NCC Highways have reacted as soon as notified in a timely fashion to alleviate the severity of the flooding. This has involved providing sand bags to prevent egress of surface water, suction tankers to remove surface water, jetting and emptying of road gullies (as well as proactive cleansing). NCC Highways response to flood events in relation to the property affected are as described below:

- On the 4 October 2012 NCC Highway Contractors visited the site and carried out works. This included jetting and emptying the gullies.
- On the 10 October 2012 NCC Highways responded to a report of flooding and issued 25 sand bags to the resident/business

- On the 2 February 2014 NCC Highways provided flood boards, sand bags and jetted out the system.

7.3.6 Anglian Water responded on the following dates to investigate the flooding at this location:

- 9 February 2006
- 27 May 2007
- 24 & 25 September, 28 December 2012,
- 9 March and 30 August 2013
- 1, 7, February, 27 May, 27 June, 13 July, 14 August, 8 & 9 October 2014

7.3.7 Anglian Water investigated the main public foul sewer and the private connection from the affected property, on the above dates, and found that there was no blockage in the main sewer.

7.3.8 Anglian Water subsequently identified and completed repairs on a collapsed manhole cover which is situated on the junction of Norwich Road & Hemblington Rd during December 2014. The base of the manhole had collapsed and this was reconstructed to align with the incoming sewers.

## **8 Recommendations**

8.1 The recommendations highlighted below are referenced against the factors detailed above and should not be considered in isolation.

8.1.1 The property owner should take appropriate measures to protect their property. To support the resident NCC Flood and Water Management Team, NCC Highways and Anglian Water will provide some information on what measures can be taken.

8.1.2 The property owner could investigate and confirm, where possible, the existence of on site surface water drainage. As part of this process it should be confirmed whether the drainage ditch adjacent to his property connects to a wider drainage network across his property as this currently is unknown.

8.1.3 Where it is determined that there is insufficient capacity in the public foul sewer system due to the inappropriate connection of surface water drainage and/or there is an interruption in the surface water system the relevant organisations (such as Anglian Water and the Lead Local Flood Authority) could work together with other RMAs, organisations and residents to mitigate these issues. This work could include feasibility studies that identify possible improvements into existing systems and identify the removal of surface water to alternative points of discharge. This could include a range of mechanisms both within the private

property and externally.

8.1.4 Norfolk County Council Highway could carry out works to minimise the water entering the ditch as described in section 7.3.3.

8.1.5 Norfolk County Council will work with the Environment Agency to identify the possibility of securing funding to mitigate flood risk in this community where it is necessary beyond the individual property level protection. This recommendation will be subject to priorities and availability of resources.

8.1.6 Where structures or features are associated with significant flood risk these will be included on a public register. This will provide transparency for residents as to ownership and condition.

8.1.7 The adjacent landowner(s) could:

- implement appropriate land management techniques to reduce the surface water run-off.
- Increase the attenuation of surface water run-off

8.1.8 Norfolk County Council as Lead Local Flood Authority could work with the property owner and adjacent landowners to identify the potential for providing or increasing attenuation to reduce the amount of surface water entering drainage systems.

8.1.9 Local Planning Authorities should:

- note that there is an automatic right to connect to the public sewer and despite Anglian Water not being a statutory consultee to the planning process LPAs should include Anglian Water in discussions to ensure approvals incorporate appropriate mitigation
- seek potential drainage improvements through the approval of planning applications within the local catchment. The evidence and lessons learnt from past flooding and drainage surveys need to be incorporated into any possible drainage strategy identified for the proposed development. These will, where appropriate, be provided by the relevant RMA (e.g. Environment Agency) as part of the planning application consultation process and through more detailed discussions between RMAs and developers.



## **9 Disclaimer**

Although every effort has been taken to ensure the accuracy of the information contained within the pages of the report, we cannot guarantee that the contents will always be current, accurate, or complete.

This report has been prepared as part of Norfolk County Council's responsibilities under the Flood and Water Management Act 2010. It is intended to provide context and information to support the delivery of the local flood risk management strategy and should not be used for any other purpose.

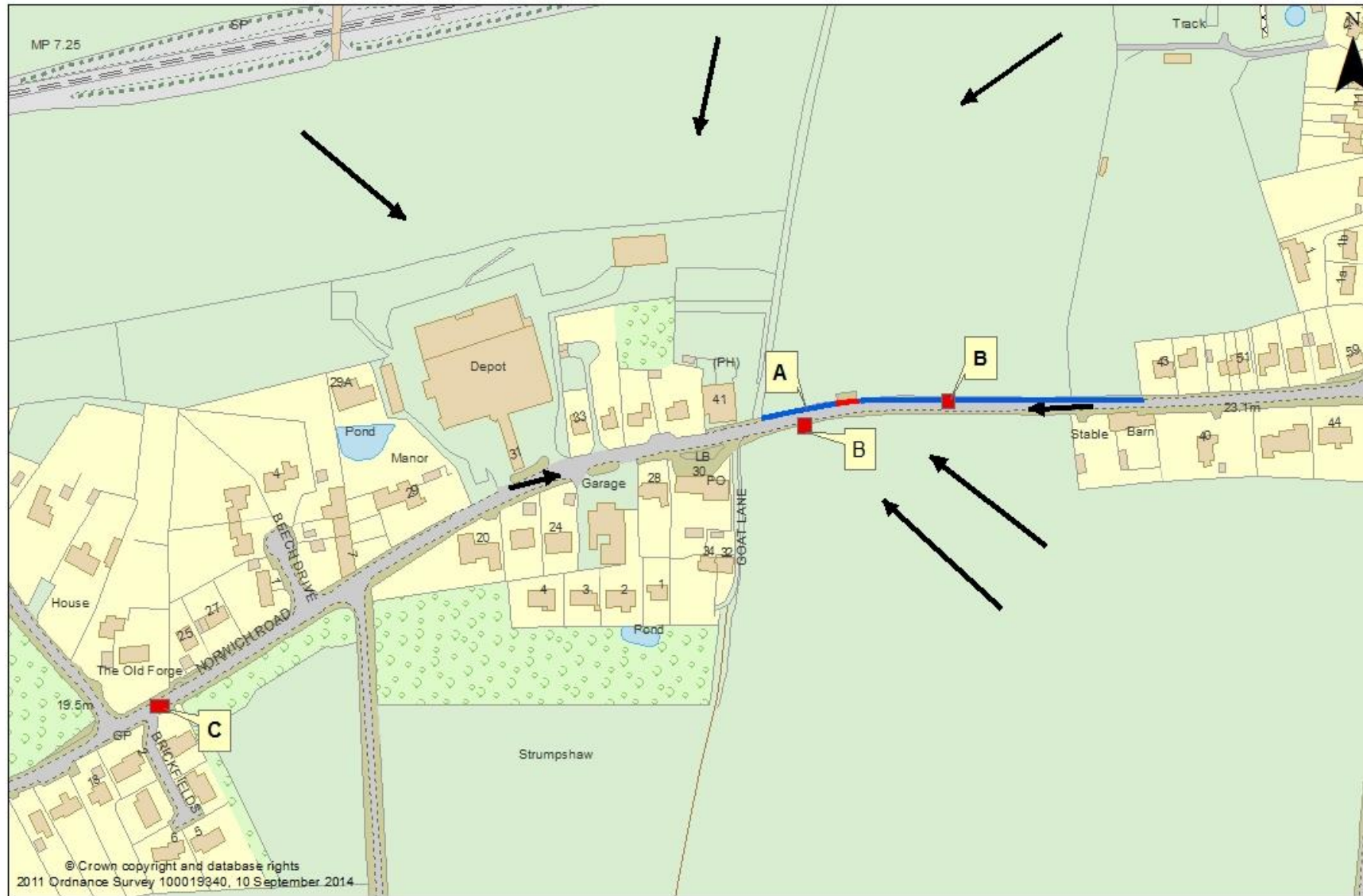
The findings of the report are based on a subjective assessment of the information available by those undertaking the investigation and therefore may not include all relevant information. As such it should not be considered as a definitive assessment of all factors that may have triggered or contributed to the flood event.

The opinions, conclusions and any recommendations in this Report are based on assumptions made by Norfolk County Council when preparing this report, including, but not limited to those key assumptions noted in the Report, including reliance on information provided by third parties.

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Norwich Road, Strumpshaw

Norfolk County Council  
1:2,500

## Annotated Map

Flood Investigation Report: Norwich Road, Strumpshaw

It should be noted that the order in which these are listed does not reflect the significance of the issue and may require more detailed analysis or surveying to ascertain their level of influence over the incidents experienced at this location.

The property is situated in a low spot and lies on a significant surface water overland flow path. This flow path conveys water in times of heavy rain from the South East to the North West.

A There is an open highway drainage ditch that is close to the property and parallel to Norwich Rd. This ditch was excavated a number of years ago following the construction of a new footway on the line of the previous ditch. The ditch was purposely designed to contain the highway water from Norwich Road and to allow it to naturally disperse into the surrounding subsoil. It is not known whether a positive outfall exists and there are no records nor any onsite evidence of a positive outfall. Soakage ditches are common place within the County.

In times of heavy rain and, when the surrounding land is saturated, water is directed along the road. Some of this water also makes its way into the ditch. The saturation of the land and flows from the large surrounding catchment contributes to the ditches capacity being exceeded. This additional water pools in the low point adjacent to Norwich Road.

B The capacity of the foul sewer was exceeded due in part to constraints in the network (a collapsed manhole further downstream - as described in C below) as well as from increased surface water flows being directed into the network (likely to be from ingress through unsealed access points as well as from domestic properties including the affected property). This led to the affected property experiencing flooding from foul water.

C A collapsed manhole contributed to the overloading of the foul system.

In times of heavy rain, water pools on the highway adjacent to the property. Once the highway is flooded vehicles driving through the flood create a wave, which pushes the water into the affected property. There is a limited threshold from the highway leading to the property and there is no kerb line across the access to the property both of which if present could lessen the impacts of this type of flooding.

Based on anecdotal information from local residents it is believed that a pond existed some years ago at the low point of the field adjacent to this ditch, which is now no longer evident.

### Key

→ Direction of flow

— Ditch