

Lead Local Flood Authority
Section 19 - Flood & Water Management Act
2010
Flood Investigation Report

Report Title:

Velda Close and Aldwyck Way
Lowestoft

Report Reference(s):

FW2019-1216	FW2019-1223
FW2019-1220	FW2019-1224
FW2019-1222	FW2019-1226

	Name	Date
Lead Officer:	Steven Halls	
Created by:	Steven Halls	22 October 2019
Checked by:	Matt Hullis	02 December 2019
RMA Review:	Anglian Water, Waveney District Council & Suffolk County Council	28 November 2019
Approved by:	Sue Roper	02 December 2019
Date Published		12 December 2019

1.0 Suffolk County Council (SCC) as a Lead Local Flood Authority (LLFA) has determined that in accordance with criteria, it considered it necessary or appropriate to carry out an investigation into this flood event in accordance with Section 19 (1) of the Flood and Water Management Act 2010, and in accordance with Section 19 (2) of the Flood and Water Management Act 2010, to publish the results and notify the relevant risk management authorities (RMAs).

2.0 Incident Logs: FW2019 -1216,1220, 1222,1223,1224,1226

2.1 Location: Velda Close & Aldwyck Way, Lowestoft

2.2 Flood Event Date: 6th October 2019

2.3 Reported to SCC Date: 6/7th October 2019

2.4 Investigation Commencement Date: 7th October 2019

2.5 Criteria for investigation:

Criteria for an investigation (as per Appendix D of the Suffolk Flood Risk Management Strategy):	✓/X
There was a risk to life as a result of flooding?	
Internal flooding of one property (domestic or business) has been experienced on more than one occasion?	✓
Internal flooding of five properties has been experienced during one single flood incident	✓
Where a major transport route was closed for more than 10 hours as a result of flooding	
Critical infrastructure was affected by flooding	
There is ambiguity surrounding the source or responsibility of a flood incident	



2.6 OS Grid Reference: TM 52560 90690

2.7 Extent of flooding: A total of 18 domestic properties flooded internally with further reports of inundation to outbuildings and gardens. Aldwyck Way (highway) flooded for approx. 100m to an approx. max depth 450mm at its lowest point. Anglian Water stormwater sewer and highway drainage system both surcharged. Total affected area 0.7Ha (7000m²)

2.8 Effect of flooding: Properties internally flooded to a depth of 400mm and the public highway flooded to 450mm.

2.9 History: Residents have provided reports of flooding from September 2002 (internal depth of 300mm), September/October 2006 & 2013 (internal depth of 25mm) and July 2015 (300mm deep).

2.10 Flooding Source: Capacity of both fluvial (Kirkley Stream) and surface water drainage systems (highway drainage and the public sewer) exceeded due to intense storm event.

2.11 Causes:

- Substantial amount of rainfall over a short duration (60mm total rainfall in 10hrs) – storm was however double peaked with bulk of total rainfall (50mm)

in the first 7hrs equating to a 20yr storm (5% AEP), a second peak of 9mm occurred over 1hr (2yr return period). The collective storm had a return period of 25 years (4% AEP*).

(*return periods based on data collected from Environment Agency rain gauges and FEH13 Depth Duration Frequency curves).

- Storm exceeded the design capacity of the surface water drainage systems – both SCC Highway drainage & Anglian Water stormwater sewer.
- Kirkley stream overtopped its bank(s) adjacent to Velda Close/Aldwyck Way and gardens along Long Rd and Birds Lane.
- Further issue with some afflux (surcharging) at Blackheath box culvert where rack marks on structure indicate small head loss downstream.

Mechanism:

- The underground stormwater system (Anglian Water) in Aldwyck Way currently outfalls into Kirkley stream at bed level, however because the site resides on low lying ground, the system suffers from fluvial locking (surcharged outfalls). Because there is no non-return valve, the Kirkley Stream can reverse flow back into Aldwyck Way when in flood conditions, eventually the system is totally “drowned out” hence the river pushes out of gullies and manholes. This also prevents any positive discharge from the public sewer (stormwater) system into Kirkley Stream, thus any surface water runoff can’t drain away which adds to initial localised flooding.
- Subsequently, if significant rainfall is sustained over the catchment, the Kirkley Stream rises further until it overtops its western bank which then starts to flood a more extensive area of the site including Velda Close.
- Once the storm passes and water levels recede in the Kirkley, the stormwater system regains a positive hydraulic gradient such that floodwater gradually drains back into the Kirkley Stream.

N.B. the absence of a non-return valve does not increase local flood risk, it only affects the timing of the flood and source of floodwater.

2.12 Additional Information:

- The flooded properties are in an existing area prone to fluvial (Flood Zone 3) and pluvial flood risk.
- Levels of aquatic and bankside vegetation normal, asset inspectors highlighted the amount of loose debris removed against solid structures minimal.

- Evidence of partial blockage in Kirkley Stream just upstream of Blackheath Crossroad where large branch fallen into channel. Potential fly-tipped and/or garden waste material washed down stream contributing to partial blockage. But rack marks indicate water levels either side of partial blockage are the same, thus flow able to pass forward uninhibited.
- Anglian Water were on site from 9am on the 6th Oct, checking and clearing trash screens at Fen Park. Remained on site for almost 24 hours inspecting structures and assets along the Kirkley stream.
- The Anglian Water screw pumps lifted water into Lake Lothing and were operational and working within capacity over the 6th and 7th October 2019. (Two screw pumps utilised on the 6th for approx. 12hrs).
- Some properties (owned by Cotman Housing Association) had property level resilience measures fitted, however these non-passive structures failed to prevent water entering the properties.
- Aldwyck Way has an audible early warning system owned by Cotman Housing Association; we have no evidence that this was active.
- We have no evidence of the Highways attenuation basins overtopping.
- We have no evidence of the flood storage area failed to take excess water from Kirkley Stream during the event.
- As part of the Lowestoft Flood Risk Management Project (LFRMP), a capital scheme has been commissioned for this area with a view to construction to construction in the first half of 2020. This will enable a reduction in the flood risk from both fluvial and pluvial sources.
- Anglian Water and Suffolk County Council Highways have provided the investigation with asset and maintenance information.

3.0 Risk Management Authority with Relevant Flood Risk Function

- Anglian Water: Surface water drainage maintenance, regulator & asset owner
- Suffolk County Council: Public highway maintenance, land & asset owner
- East Suffolk Council: Planning Authority + public open space maintenance.

4.0 Recommendations:

1. Continued maintenance activities along the whole of Kirkley Stream by Anglian Water and Suffolk County Council, including drainage assets. Maintenance schedule to be reviewed in line with environmental constraints and linked to the wider Lowestoft Flood Risk Management project (LFRMP).
2. LFRMP to deliver capital scheme which will increase standard of protection at Velda/Aldwyck Way to 1:100yr. If property owners wish they can also add further resilience measures such as passive PLR to increase their protection.
3. Suffolk County Council Highways to monitor and review capacity of highway culverts at Blackheath Rd and Birds Lane. Suggest adding telemetry to monitor water levels and flow rates on both sides on SCC culverts.

4. Review access arrangements for inspection and maintenance along Kirkley on a yearly basis. A two-stage channel would improve ease of access, but do little to reduce flood risk and has been discounted as not cost beneficial.
5. Suffolk Joint Emergency Planning Unit will support volunteer Community Emergency Planning (CEP) Groups and continue development of their Community Emergency Plans.
6. Continued consideration to be given to the creation of further attenuation areas in Carlton Colville for any existing or new discharges into the Kirkley Stream going forward. Thereby reducing the potential impacts of future development. Suffolk County Council, Waveney District Council (as planning authority), Anglian Water and the Environment Agency to consider this proposal and make recommendation to Suffolk Flood Risk Management Partnership.

4.1 Recommended Actions:

Action	Responsible Authority	Timescale for response	Latest Progress Update for Actions
LFRMP to deliver capital scheme to raise Standard of Protection along Velda/Aldwyck Way reach.	East Suffolk Council & Suffolk County Council	Complete	Construction start date June 2020
Review ongoing maintenance procedures and responsibilities. Including access arrangements for inspection.	Anglian Water & Suffolk County Council Highways	Ongoing	Still carry out two cuts a year with emergency summer cuts where necessary.
Suffolk County Council Highways to consider suitability for a telemetry system on highway culverts	Suffolk County Council Highways	Complete	Not possible
AW to review effectiveness of screw pumps and their ability to draw down levels upstream i.e. near Aldwyck Way (should ignore future flood schemes).	Anglian Water	3 months	Ongoing
To limit any new discharges into Kirkley Stream related to new development.	SCC, AW, ESC, EA	Ongoing	Ongoing