

Surface Flooding and Drainage Investigation and Options Appraisal Report 2021

Introduction

Reports were received by the Parish Council from residents on Orchard Lane and Westgate Street in January 2021 of surface flooding and associated stoppage of wastewater system. This is a regular occurrence but the frequency over the winter of 2020/21 with 5 events by the end of January along with the additional factor this time that the flood water was carrying effluent from the pig farming activity taking place on the field above Shouldham to the South and West, leaving heavy silt and foul residue.

This Reporting followed a report of flooding on Fairstead Drove in Dec where a lady had walked into an open ditch at the driveway leading to the rear of 81 Westgate Street due to the complete flooding of the road/Footpath. This had been reported by the clerk to NCC and a highways technician had reported a pipe under the driveway entrance as being three quarter blocked with silt and the cause of the extensive flooding of Fairstead Drove. This was also explained as not a NCC responsibility to clear as it was private land and subject to riparian rights¹.

Immediate Action Taken

The clerk and Cllr Hipperson surveyed the village from Fairstead Drove to the Shouldham Thorpe junction on Mill Rd, following the ditches and pipe runs. The resultant findings were communicated to Highways (Mill Road flooding), the Stow Estate Manger (heavy run-off overwhelming ditches – with a request for assistance to see if water could be diverted or drains cleared to alleviate the flooding lower down). Residents requested to report the flooding of their property on the NCC reporting system. Flood barrier and recovery information was also collated by the clerk and communicated to residents directly affected and on the website for wider information for other residents.

Initial survey findings

Conducted on 13th Jan by Cllr Hipperson and the Clerk with 3 residents of Orchard Lane and Westgate Street. Diagram 1 shows the area and various drains.

The driveway pipe blockage was noted as still causing flooding although the water flow was fast the pipe being blocked reduced mass flow capacity. Other small partial blockages where filters and traps were installed were observed along the run to 81 Westgate St rear garden but not considered significant and water was running.

At the rear of Orchard Lane, the surface flooding was extensive and on following footpath (Shouldham FP7) up to Mill Drove (Shouldham FP 3) it was evident that there was a significant flow of water down the sloped field and that the field was in use for pig farming. Cllr Hipperson explained the impact that pigs have on drainage of land, the treading causing the surface to become impermeable and that this was the source of the pig effluent reported. There were no drains to intercept this surface run off.

On reaching the intersection of FP7 and FP 3 it was observed that the fields west of Mill Drove (FP3) were also in use for pig farming and that there was significant surface run off coming off those fields and running across the FP and down the field, adding to the runoff from that field. There is no drainage ditch in that area until approximately 150m from the junction with Mill Road to the south (near the planned Community Orchard/Poors Allotments land). The ditch that starts there at that point has a pipe under the footpath and leads to a drainage ditch heading east, this was seen to be overgrown with brambles and vegetation but still appeared to be running well and not considered to be a problem.

The ditch on the north side of Mill Rd had grips recently cut and apart from a couple of bits of litter was running fast and unobstructed. At the junction of Mill Road to Shouldham Thorpe the ditch on the west corner, that runs west before going through a small pipe under the road to change direction and run down the Mill Road drain to FP 3 drain, was seen to be overflowing with a considerable flow of water across the road and running down until entering the ditch via grips. The Ditch to the east of Shouldham Thorpe Road that runs down the southside ditch and pipe system along Lynn Road was at a significantly lower water

¹ Landowners responsibility to maintain watercourses including drains so that properties up and down stream are not adversely affected.

level and the flooding of Lynn Road down to Ryes Close evident in the past was not evident, the work done has been effective albeit lower down it was seen that it was reaching capacity.

Second Survey findings (see Diagram 2)

On Sunday 24th Jan a group of Parish Cllrs and the Clerk surveyed the route from the Bowls Club along Fairstead Drove (Shouldham FP6) along to the intersection of FP3, along the entirety of FP3, up to Shouldham Thorpe junction and back down Lynn Road and Westgate Street.

The flooding on Fairstead Drove had subsided and the blocked pipe under the driveway was more evident. There are no drains at the side of the FP road until about halfway along, a very slow running and not very deep drain runs on the northside to the junction of FP3 and has a pipe under the drove to connect with a ditch running freely and with at a not very full that heads north towards the Warren alongside FP5. Turning uphill along FP3 (Mill Drove) the FP was very muddy with deep tractor tyre tracks acting as drains. The footpath was impassable in places and the group had to walk at the extremities. It was evident that the area would benefit from a drain dug on the west of the FP to clear surface run off from the fields above to the west down to the ditch at Fairstead Drove.

The FP remained extremely waterlogged with some surface flowing across and down the fields toward the rear of Orchard Lane and Westgate Street (nos 83-63), even though it had not rained for 36 hours and there was a dusting of snow with the temperature still around 1 deg C.

The flooding at Mill Road junction with Shouldham Thorpe Rd was still significant although not as bad as the previous survey, this despite the break in rainfall was considered to be a surprising flow.

Third Survey Findings

Cllr Walsh conducted an assessment of the drainage specifically around the rear of Orchard Lane and the drain run to 67 Westgate Street followed up the clerk with the residents and Chairman on 02 Feb 21. Mr Chapman showed the ditch that runs from the corner where it is joined by the 2 drains from Lynn Rd and FP3, it was full and slow moving. He explained the pipe structure under his property and that he has installed 2 rail sleepers a couple of metres in front of his pipe to act as a silt trap, this was done a few years ago and he clears it out regularly. The pipe runs to a manhole cover at the junction with the pipe that runs down Orchard Lane. His pipe is a smaller bore than the Orchard Lane pipe and the pipe that then goes under the driveway of No 6. Mr Chapman and Mr Rose-Land of nos 7 and 6 respectively had investigated the pipe for blockages the previous day when the water level was lower; the Orchard Lane pipe and pipe under the driveway could be seen clearly and were approx. half full of silt. The pipe under no 7 leading from the main run to the south and west could not be seen as it is a smaller bore (thought to be 450mm). Mr Chapman had run a drain dye through that pipe and it had taken approx. 5 minutes to travel the 55m (not fast). He rodded the pipe from a junction manhole in his garden 21m up from the driveway manhole and on pushing through the water flow became noticeably faster, now causing turbulence where it met the opposing drain flow, and the water was extremely clouded with silt. Mr Chapman explained that a few years ago Highways had sucked silt from the Orchard Lane pipe in connection with a highways drainage issue on Westgate Street it was assumed. The Chairman asked the clerk to ascertain if there was a maintenance schedule for de-silting the highways drains? The Clerk also undertook to contact highways to get a copy of a map of their drainage system for the area to see if there was a connection. Mr Chapman stated that he was reluctant to clear silt from these pipes at this juncture as it may exacerbate the flooding further downstream until the lower restrictions and choke points are cleared.

The pipe under No6 continues under the garden and emerges in a well maintained (lined) ditch to the rear of 65 Westgate St. extra banking installed here keeps the ditch contained but appears to have caused garden to drain poorly when the ditch is full. That then continues between the rear garden and paddocks of 67 Westgate St, where Mr Bland escorted the clerk and showed him the various aspects and issues. The drain has a couple of short piped runs under access to the paddocks but the flow did not appear to be restricted, it was at the same level and slow flow rate through the entire run on his property. At the end of the ditch on his property it was possible to see a grass bank crossing the ditch with what is reportedly a very small bore pipe connecting it to the continuation of the ditch. Although during this survey it appeared that the water level on the downstream side was notably lower than upstream, indicating a restriction in flow. This was later found not to be the case, the pipe is 400mm, similar to other pipes in the system and had minimal silt deposits; It may still act as a slight choke under severe conditions.

Diagram 1.



Key







-  Drain from Shouldham Thorpe under the Mill Rd diverting surface water from Shouldham Thorpe.
-  Dyke and pipe drain on south side of Lynn Rd, runs north under the road near 30 Lynn Rd and joins the Mill Rd/FP3 drain.
-  Pig Farms – Pigs are known to tread down the surface creating impermeable ground and more surface run-off rather than the ground being a natural soakaway.
-  Run off with no ditches, washing silt (and currently pig effluent) from fields into drains lower down the fall.
-  Possible solution is a relief ditch/pipe from Fairstead Drove to existing dyke towards the Warren downstream of choke points.
-  Possible solution a new drain to divert higher field run off directly to Fairstead Drove and into existing drain that avoids the lower reaches of the blue system to the Fairstead Drove drain.

Diagram 2.

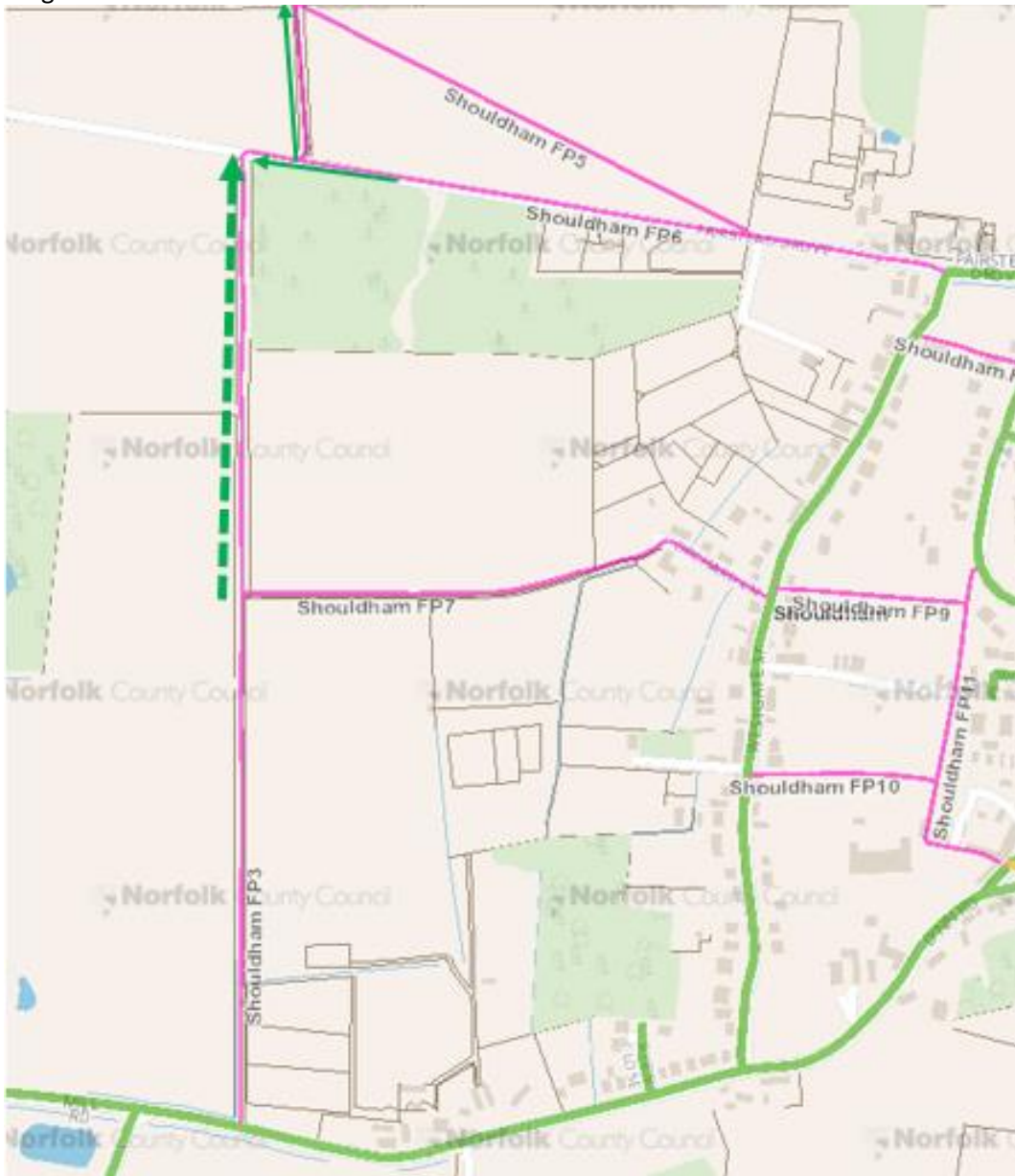


Photo 1.



Photo taken from NW corner of 67 Westgate Street looking at the piped grass bank at the bottom of the garden at 79 Westgate St.

Water level before the pipe looked higher than downstream (albeit the photo does not make that clear). Further investigation and resident reports that the levels when viewed more closely on a regular basis hasn't been noted as having a differential.

Diagram 3.



- 1 Sleeper silt trap before pipe inlet
- 2 Manhole cover at 3 way junction – approx. 50% silted pipes
- 3 Open ditch runs through a 400mm pipe under grass bridge at rear of 79 Westgate St. May cause a slight choke effect under severe conditions.
- 4 Large bore pipe under roadway, $\frac{3}{4}$ silted, requires clearing and silt trap step dug before inlet.

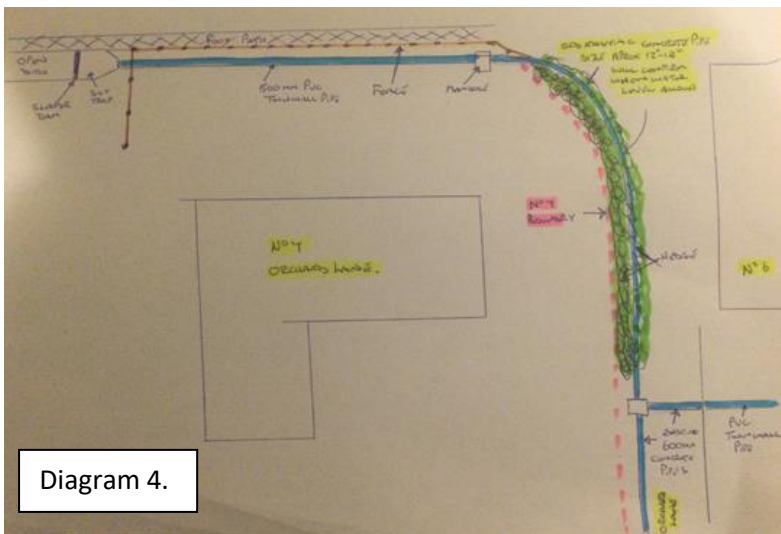


Diagram 4.

From the open ditch to the manhole within boundaries of no7 there is a 500 mm pvc twin wall pipe, from the manhole there is an existing concrete pipe, believed to be smaller than 500mm, probably an old 18inch pipe (TBC when water level drops) that runs either under the hedge or just No6's side of the hedge. Not sure who installed this old pipe? Possibly Council, but it was before 1989 when Mr Chapman purchased No7 building plot.

4 Feb 21 - The 500mm pvc twin wall pipe running through No7 has a small amount of silt in it and a bit of a build-up of silt at ditch end, but this will be cleared when water level drops. Mr Chapman clears silt at the open ditch end where he formed a sleeper dam/sump several times a year and also rods out the 500mm pipe run.

Recommendations

- Request ditches dug to a depth of 6 inches deeper than pipes and pipes de-silted by landowners (81 Westgate St? TBC) with riparian responsibilities for the pipe and drain under the access road to the gate near the point where the drain meets Fairstead Drove and others further along the Fairstead Drove run to New Road. Additionally, request an inspection and clearing schedule is instated at an appropriate time to maintain it.
- Inspection and rodding of the pipe at rear of 79 Westgate Street and measurement of the pipe proved this not to be an area of concern, although the owner of 79 Westgate Street stressed the importance of all parties clearing vegetation from the ditch on a regular basis. Neighbour dialogue on an agreed mutual beneficial approach is ongoing.
- Request that the Mill Rd drainpipe under the road is un-blocked and assess whether larger bore or augmentation by second pipe is required to ensure overflowing at the junction is prevented in future (already reported to Highways as overflowing).
- Check if agricultural landowners have an annual ditch clearing schedule and if not then request they implement one.
- Drain at New Road appears choked, a check for silt/blockage of the pipe under the road and 'Mirador' residence should be carried out.
- Review Highways Drain map for possible solutions or impacts.
- Ascertain if Highways have a drain clearing schedule for de-silting.
- Request a report from Anglian Water as to the impact of the anecdotally high quantities of silt and causes of the 6 reported failures of the sewage system between 24 Dec 20 -01 Feb 21
- Report the flooding issues to the NCC Lead Local Flood Authority to express concern at the impact of climate change and to request a survey to provide a report to use to take effective and appropriate action and inform a Parish Council Action Plan. Discuss PC identified relief options with LLFA.
- Create a Parish Council Flood Plan. Including a risk assessment of various aspects, flood prevention and mitigation advice on how to prepare to limit water ingress and damage, emergency contacts appropriate to situations.
- Engage LLFA and or EA for expert advice on the relief of the surface water from the top field west of the village via a new drainage ditch to run to the west end of the Fairstead Drove where Shouldham FP 3 intersects, at which point it could join the existing drain going North to the Warren and avoid Shouldham.

Report produced in association with residents by
Mr M Inder
Clerk to Shouldham Parish Council

Photos – 6 Feb 21 – 67 Westgate Street



Photos – 6 Feb 21 – West of Orchard Lane – lower field



West of Mill Drove – tracking down to the lower field pictured above.



Shouldham Thorpe field above Mill Road feeding drain and down to Shouldham.



Photos – Orchard Lane

No6 Driveway



No 7 Rear Garden



Bottom of lower field with pigs in behind No6 & 7



Rear of no 7 Ditch runs to pipe at 2nd panel. Footpath left of bollard.



Fairstead Drove drain opposite Playing field. 24 Feb 21
Heavily silted and water depth approx. 5 inches.




Pipe entry circa 7/8ths silted at inlet.



Photos rear of no 7 Orchard Lane 23 Feb – Silt to top of dam sleeper.



Land Registry Plans for Fairstead Drive.

 Highlighted area where the partially blocked pipe goes under the driveway entrance to 81 Westgate Street is outside of the title plan boundary of both 81 Westgate Street and Warren Oak, Fairstead Drive. Application to HMLR to request search for registered owner to be submitted, this search is a low priority for HMLR processing during COVID-19 pandemic and estimate for a response is ‘months’. Furthermore, it is highly likely this request will not return a registered owner according to advice of Highways and Countryside Access Officer and resident’s local knowledge. So, advice on riparian responsibilities for that pipe and ditch alongside Fairstead Drive is required.



Action Plan

Date	Action	Comment/Response	Review Date
28 Jan 21	Messers Chapman, Rose-Land and Bland emailed reporting further flooding, asked to report to NCC via website.	Residents confirmed reported ref nos NCC787264, NCC787276, NCC787266.	Closed
28 Jan 21	Email to Cty Cllr G Middleton outlining the issue and putting him on notice that Shouldham PC would be requesting his support, with reference nos of NCC reports to follow.	Nil response 24 Feb – still nil response after hastener on 23 Feb. Cllr Howland has also spoken to him F2F and asked him to respond. Cross Ref entry dated 4 Feb.	Closed
28 Jan 21	Stowe Estates Manager – William Esse contacted to ask for further assistance and a copy of maps and initial findings emailed to him to highlight specifics	work carried out mid Jan when requested (Mill Road drain dug out – now flowing better through the pipe)	Closed
01 Feb 21	NCC response to Mr Chapman Ref:FWF/21/4005 forwarded to clerk. Report states that the report did not meet the criteria to warrant a flood survey by the LLFA.	Instigates PC correspondence to the NCC requesting survey and to Cllr Middleton for support.	Closed
02 Feb 21	Clerk contacted Anglian Water to explain issues and to request information as to whether the engineers attending what has been 6 callouts since 24 Dec 20 for failure of the sewage system had identified any unusual causes or excessive silting of the system.	Anglian Water stated they would carry out a CCTV survey of the system ref 58510563. Update 4 Feb – text from AW Engineering stating that due to priorities and high-water levels the survey would not be carried out in the immediate future.	Ongoing
02 Feb 21	Email sent to Andy Wallace – Area Highways Engineer to obtain a copy of the surface drainage maps that are under highways responsibility.	15 Feb - Telecon Clerk/A Wallace – A copy will be sent when access to the office computer systems next allows (COVID – WFH). Product required not available. Closed	Closed
04 Feb 21	Email sent to NCC LLFA requesting Survey & to C Cllr Middleton requesting support for survey.	23 Feb – no response from County Council nor Cllr GM. Further hastener to Cllr GM sent. 2 Mar – NCC Water management LLFA responded, they apologise for delay due to having 389 reports with flooding entering properties. They have added Shouldham to their visit list and will look to arrange a site meeting with the PC. – Hastened 15 June – No resources for site visit but will review action plan in the interim. 5 Mar – Cllr Hipperson has spoken with Cllr Middleton with a view to a site visit; this request has been overtaken by events with NCC now responding and in a positive vein.	Ongoing

		17 Jun 21 – Response from Mr Nathan Harris at NCC LLFA – Informs PC that there are c350 other flood events that are a higher priority, offered to review the report when resources permitted. Nothing further received.	
06 Feb 21	Further flooding reported and photos provided showing extent to silt and the route that it has flowed from. Underpins the effect of the pig land.	Photos emailed to Mr William Esse, Stowe Estate, to show the effect and query what follow up is planned based on the draft report sent. 8 Feb – Telecon – Inder-Esse – further review of land west of Orchard lane will be carried out by Mr Esse to see if dam/ditch option would be suitable to prevent that flow. 24 Feb – update email from Mr Esse: I have surveyed the area as promised and I have had my staff subsoil the area of the field closest to the ditch in order that the field will soak up further rain. The pigs are being moved away from the trackside of the field west of Mill Drove. Once this is completed we will work the field against the track to minimise any runoff from that field. In the longer term we will look at digging a dyke on that field against the Mill Drove to stop future heavy rain flowing off the field and down along the footpath. Update 15 June – Mr Chapman reports no work carried out on the pig land and pigs still on the land. No sign of any ditch digging have started.	Closed
07 Feb 21	Contact the NCC Countryside Access (Footpaths) Officer to ascertain land ownership of Mill Drove and Fairstead Drove and their status as Footpaths and the regularised use as ‘unadopted carriageways’	Land Ownership not known by NCC. Advice is that in Common Law the neighbouring landowner would likely own the track as well.	Closed
08 Feb 21	Pipe under Warren/New Road and Mirador (No 2 Warren Rd) appears to be choked. Further investigation required. Highways?	15 Feb - Telecon Clerk/A Wallace Confirmed as the pipe under the road is Highways and it will be investigated in the spring when the water level subsides to make flushing viable. Update 01 Jun – being scheduled before autumn. Update 25 Jan 23 – reported by NCC as completed by IDB, Clerk disputes this as still 50% covered at the inlet	1 Apr 24

		when it was last visible. Review again when levels recede.	
09 Feb 21	Letter to 79 Westgate highlighting potential choke point at the piped bank.	Mrs Simpson called to discuss. She explained the shared ownership and her maintenance regime, which is usually 4 times year, happy to have joint effort to clear mechanically when the ground is suitable. Also content for assistance with rodding the pipe. Clerk to request assistance from Mr Chapman as discussed. 12 Feb – Pipe measured at 400mm, not now considered ‘narrow’ in relation to other pipes in the system. Rodding disturbed only a small amount of silt in the pipes which flowed away. Only 40-50mm of silt at the bottom of the ditch either side of the piped section. Now thought unlikely to be a choke point apart from under the greatest surface water flow conditions.	Closed
09 Feb 21	Letter to 81 Westgate highlighting potential choke point at the piped road on Fairstead Drove.	13 Feb – Telecon Mrs Johnson/Clerk. Mrs Johnson explained that the ownership of the land was uncertain and her husband’s work to repair aspects of Fairstead Drove was purely community spirited and to alleviate issues that others had not taken ownership of. Further research into ownership, as with whole of Fairstead Drove and Mill Drove is required. She was also unsure as to what action can be taken, how and when to go about it. The Clerk undertook to research the options for pipe clearance and report back. 23 Feb update – HMLR Title plan searches carried out, and pipe and ditch falls outside of the boundary of adjacent properties as seen on page 17.	Closed
23 Feb 21	Email from Mr Chapman with photos of silt up to top of silt trap in ditch to rear of Orchard Lane. Request for mechanical assistance to dig out the silt to restore resilience of ditch and prevent further silt overflowing.	23 Feb – Email to Mr Esse requesting mechanical assistance to dig out the silt – 24 Feb – Response from Mr Esse: I will ask the manager of the pig enterprise to come and slub out the ditch from the corner to the sump. Hopefully they will be there in the next couple of weeks. 15 Jun – No work done, Email to Cllr GH to see if he can assist	Closed

		Update 8 Jul – Cllr GH arranged the start of the digging out of the ditch and 20ft completed. Amount of vegetation means it will take several visits.	
8 Jul 21	Fairstead drain relief pipe under the KG V PF inspection chamber opp Abbey farm located and inspected by clerk and Mr Chapman. The chamber acts as a silt trap and had approx. 4 feet of water and a foot of silt, the outflow pipe was above the water level. This indicates the pipe is relatively silt free and not a concern.	No Further action required.	Closed
8 Jul 21	Report from 45 Westgate St regarding concerns of overgrown ditch along the read of the property. That is known to run into a pipe that runs to the Orchard Lane junction adj no 8, which has been seen to run freely.	Clerk to contact Cllr GH for advice on ownership of the ditch. No further reports at 25 Jan 23.	Closed
8 Jul 21	Resident from 29 Norwich Rd raised concerns regarding maintenance of the ditch, which appeared to be overgrown at the rear of her property.	Clerk visited: The water level low and flowing, the overgrown vegetation at the field edge (thought to belong to Mrs Pearce TBC) does prevent access to the ditch and may cause blockages in the future. Ownership confirmed and clearance of vegetation to be requested.	Closed
5 Jan 23	Reports of Mill Road flooding at Shouldham Thorpe Junction investigated by the Clerk. Confirmed as overflowing the corner of the drain and coming up through the gulley drain cover.	Site meeting arranged with CCllr Moriarty and Highways Eng Andy Wallace on 25 Jan. Suspect drain under Mill Road silted up, NCC to clear and investigate slubbing out of the ditch to improve flow to stop corner choke point overflow. Update – monitored and on several occasions after heavy/sustained rainfall the ditch is overtopping on the corner. Raise with Highways for further investigation and improvement.	1 Apr 24
7 Jan 24	Several reports following storm in early January of flooding on a worse scale than seen in Dec 20/Jan 21.	Assistance to Orchard Lane provided by Cllr GH with a pump. Clerk consolidating report references with a view to raising with Highways as appropriate regarding Lynn Road and Shouldham Thorpe Mill Road junction. Drainage Report 2021 review – The clerk has contacted a commercial water management company to obtain a quote for a high-level report on the flood modelling and to review the proposals within the PC report to	29 Jan 24

		<p>either support them or offer alternatives. An approx cost of c£5-6k is anticipated and that will be submitted for CIL Community Fun grant in the 2024/1 window. Alternatively, the EA could be approached for comment along with giving the LLFA a reminder.</p>	
15 Jul 23	CPRE advice sought with copy of PC report sent.	<p>A trustee responded on 25 Jul with information on similar issue in Hempnall, a copy of their report and actions was received and there are ideas that may augment the flood mitigation proposals but are not thought to be off a nature to provide a long term solution and would require further research and co-operation of landowners, so it was thought best to include in actions once the main proposal is either supported or dismissed.</p>	1 Apr 24