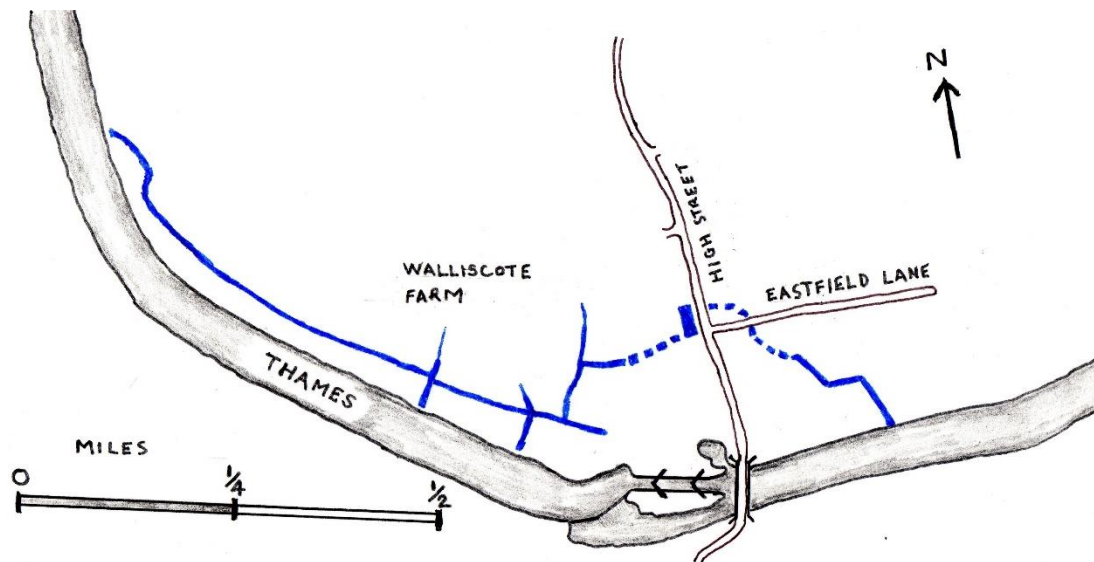


# Various notes about flooding in Whitchurch-on-Thames

## The village watercourse & other items



John Southey

March 2022

Unfinished draft

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## Acknowledgments

This has been collated by two long-term village residents, John Southey and Richard Wingfield from input by many individuals who have kindly provided their observations, including photographs, maps and access to their property. Operatives from OPC, (OCC and SODC's drainage contractor), have made valuable contributions of what lies underground during their visits in 2014, and in 2020.

Information on river levels is courtesy of the Environment Agency

## Preface

Miscellaneous data related to the two flood specific reports, now on the Whitchurch-on-Thames website:-

### 2014 event - (Thames flood)

<http://whitchurchonthames.com/FloodingReport2020a.pdf>

### 2020 event - (flash flood)

<http://whitchurchonthames.com/FloodJune20.pdf>

The village has two manmade earthworks, both of which affect the locale during a high probability flooding, (a 5 year or 20% chance probability of a Thames flood event).

- The village watercourse
- A raised section of the High Street.

Their interrelationship is relevant to both the above reports. However these earthworks will be overwhelmed during a major or 1% probability event, such as the Thames floods of 1894 or 1947. So in those scenarios are no longer of significance.

## Whitchurch-on-Thames

The village lies at the foot of the Chilterns on a bend in the Thames with a lock and weir at the bend's apex, (a weir and mill are mentioned in the Domesday Book (1068). Properties close to the river are at risk when the Thames is in flood.

North of the bend, running east – west, is a shallow depression of an earlier Thames channel. The effect of this shallow depression is that some properties closer to the Chiltern escarpment are no higher than the lock keeper's cottage. (A depression termed the "Greyhound bowl"). This depression also carries part of a man made watercourse, some sections of which could be pre Roman, (see Appendix D). Today, a length of this watercourse now runs out of sight in underground culverts.

The High Street, a north – south road running through the village, descends some 90 metres from Whitchurch Hill. The result is that lower areas of the village, especially in the vicinity of "The Greyhound bowl" is vulnerable to flash flooding if the roadside drains cannot cope.

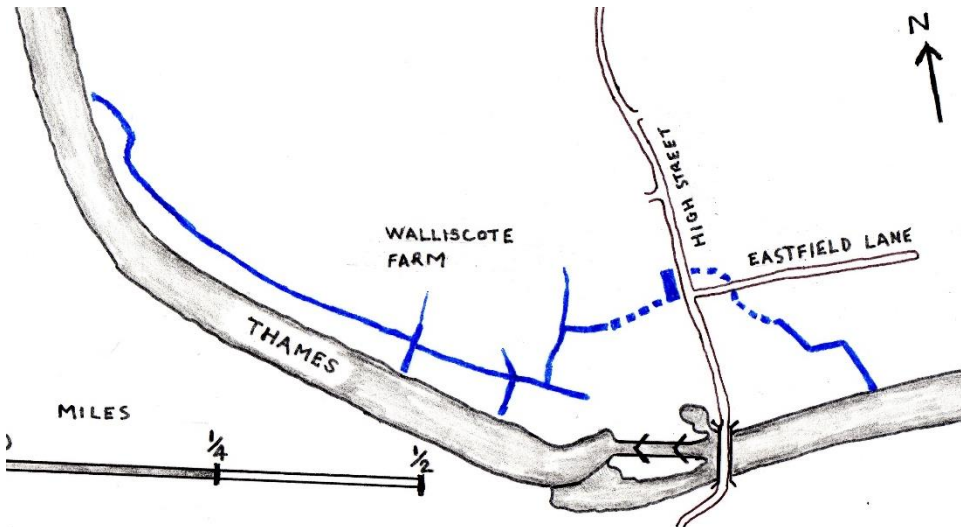
A significant area of the High Street, essentially from north of The Greyhound to the Ferryboat Inn was artificially raised after the 1894 flood using chalk from the cutting made to relive the gradient between the war memorial and the top of Whitchurch hill. This had unintended consequences regards flash flooding.

# 1a – Introduction to the village watercourse

## Synopsis

For more than a mile is a manmade watercourse that bypasses the 1 metre high weir, (a gradient of circa 1 metre / km).

This is a significant earthwork, sections of which may date from pre Roman times as a defensive measure, see Appendix D.



There is some evidence<sup>1</sup> that the northern loop, where it crosses under the High Street at the Greyhound), is a relatively modern addition made in order to provide running water to stables, forges, and kitchen gardens, whereas a much shorter leg of the watercourse nearer the weir could have defended the high ground where the church and (much later), Thames Bank were built.

It is tempting to join the two legs together which could have had a defensive purpose against cattle rustling for example as part of this is bounded by hollies,

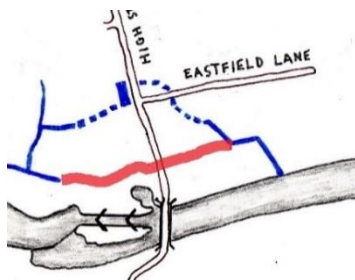


Fig 5 speculative route of a pre Christian enclosure (in red)

<sup>1</sup> See Appendix D

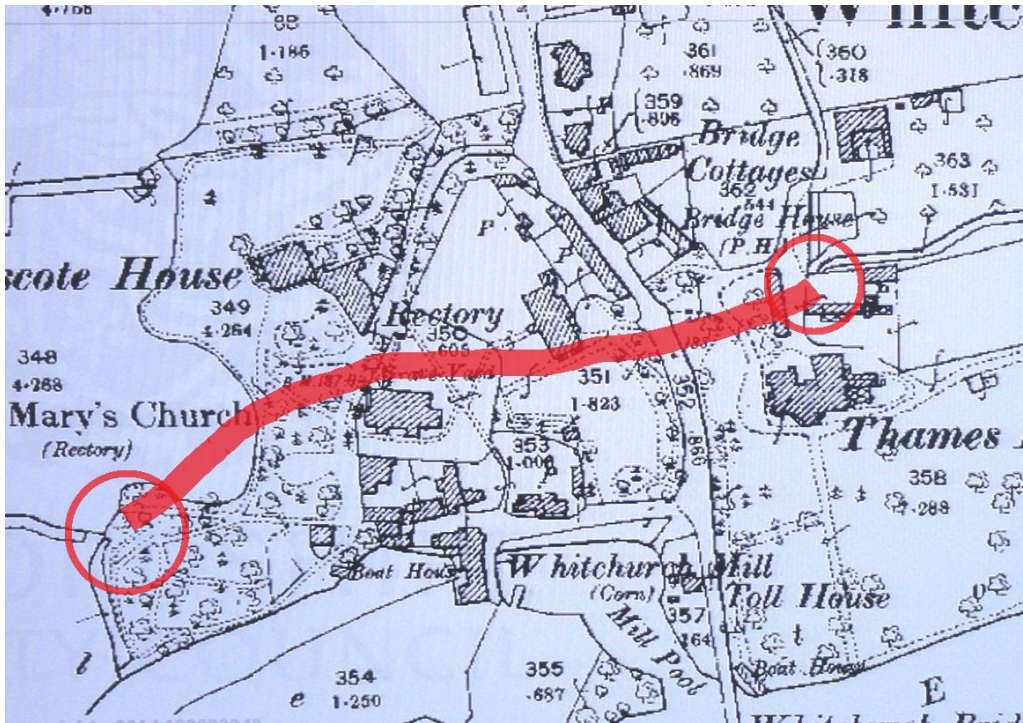


Figure 6 unusual ditch shapes?

**Note**

- Since new road drains were installed post 1960 the village watercourse was no longer used for road drainage of the High Street or drained “The Greyhound bowl” area
- Water in its culverts, a pond, and chambers, reflect the prevailing ground water table.
- Only a recent section, south of Eastfield Lane, has ever given problems
- The final culvert’s exit is lower than the local water table for much of the year due to lack of downstream ditch maintenance.
- The watercourse now only flows when the river’s upstream bank is overtopped, 8% probability

Only a small segment of the watercourse is visible to the public and some parts are underground in culverts, some of which are century’s old, though only two sections, installed in the last 20 years, have been the cause of flooding.

The watercourse follows a silted up alternative Thames channel, which is itself intersected at right angles by the locally raised High Street, (raised following the 1894 flood with chalk from reducing the cutting at the top the village.)

Looking at its current route, there is speculation that before the development of stabling / forges / fire station / kitchen gardens etc. nearer the centre of the village, (The Greyhound), the watercourse enclosed a naturally higher spur of land on which now stands the church and Thames Bank. See suggested route in red below. The temptation to think the two ditch stubs were once continuous is too great, especially given the unusual “kink” shown on the 1899 OS map, ringed.

The watercourse is a conduit for water from upstream of the weir and if obstructed could cause localised flooding if the vicinity is lower than the upstream Thames.

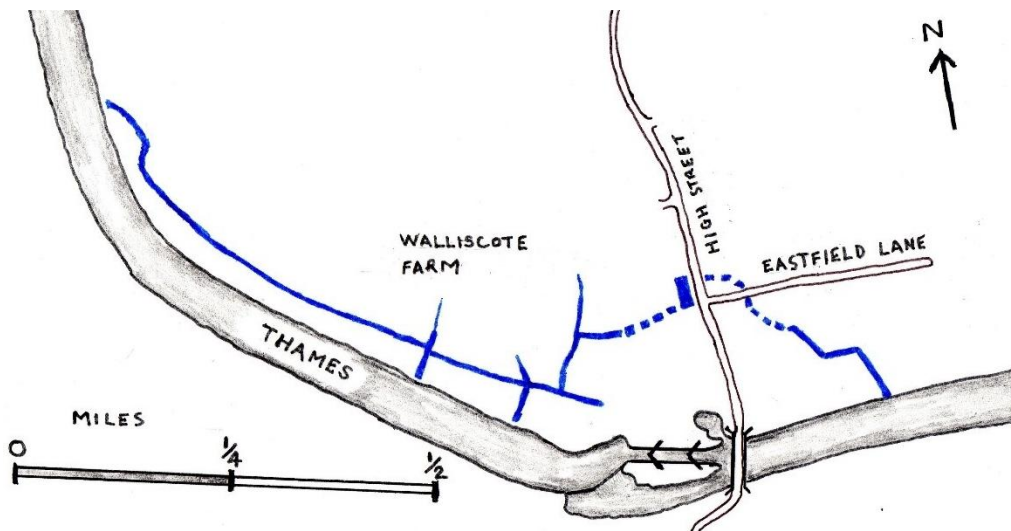
Today it no longer serves an agricultural or equine purpose and the upstream sluice gates have not opened for many decades, though it does carry a modest amount of road drainage from Eastfield Lane to the Thames and helps drain a depression in Walliscote farm which forms a small lake whenever the Thames upstream of the weir overtops its banks above the weir. Thanks to the more impervious<sup>2</sup> clay in

<sup>2</sup> Perhaps due to many centuries of cattle puddling the clay subsoil?

Walliscote farm, the floodwater is retained in the depression after the Thames returns to normal, taking several weeks to drain away via the village watercourses channel.

## 1b –Features before it crosses to Eastfield Lane

Ditches in Walliscote farm to the first underground section (Culvert A)



The large scale of the ditch is evident in the photo below



Figure 1 The large scale of the watercourse, in Walliscote farm

Upstream of the weir the watercourse runs through the water meadows of Walliscote farm as open ditches thence enters a culvert taking it the sump or pond of the former Walliscote house's walled garden, (now in The Walled Garden House's garden and can be glimpsed today from the High Street via the iron wicket gate opposite The Greyhound).



## The Walled Garden House to The Greyhound and beyond

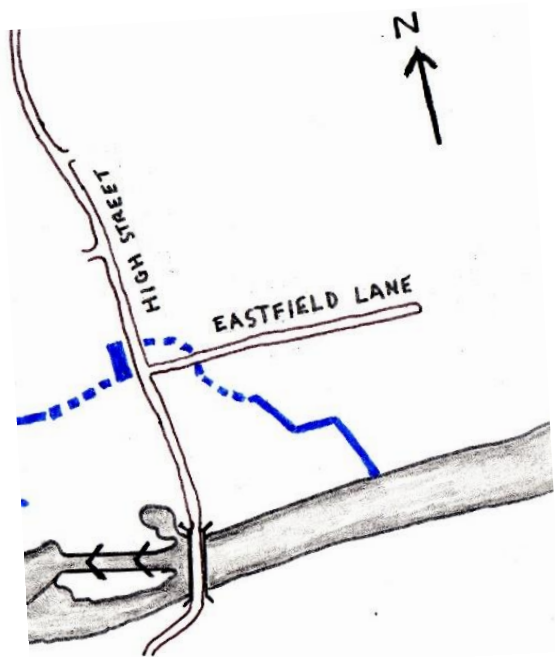


Figure 2 the pond in The Walled Garden House, showing the arched exit that crosses beneath the High Street. The chimneys of The Greyhound can be seen behind

After crossing under the High Street it enters a significant chamber in front of and under the old fire station, (beside The Greyhound), from where on it used to run as an open ditch. This provided running water to nearby stables, forges and coach houses. Further downstream it provided water for the stables, coach house and walled garden of the 1770's estate of Thames Bank itself. Interestingly it was diverted circa 1905 to a more easterly route, avoiding the aforementioned stables, (and recently built) coach house along with the kitchen garden of Thames Bank.

1



## c - Underground sections in detail

### Synopsis

Reference is often made to “the culvert”, but which of the 13 culverts is being referred to?

Further, who is responsible for their maintenance?

(See Appendix B for information on riparian responsibilities.)

The culverts (and the open ditch system) now only flow when the river overtops its banks upstream of the weir, (2003 / 2007 / 2014 / 2021).

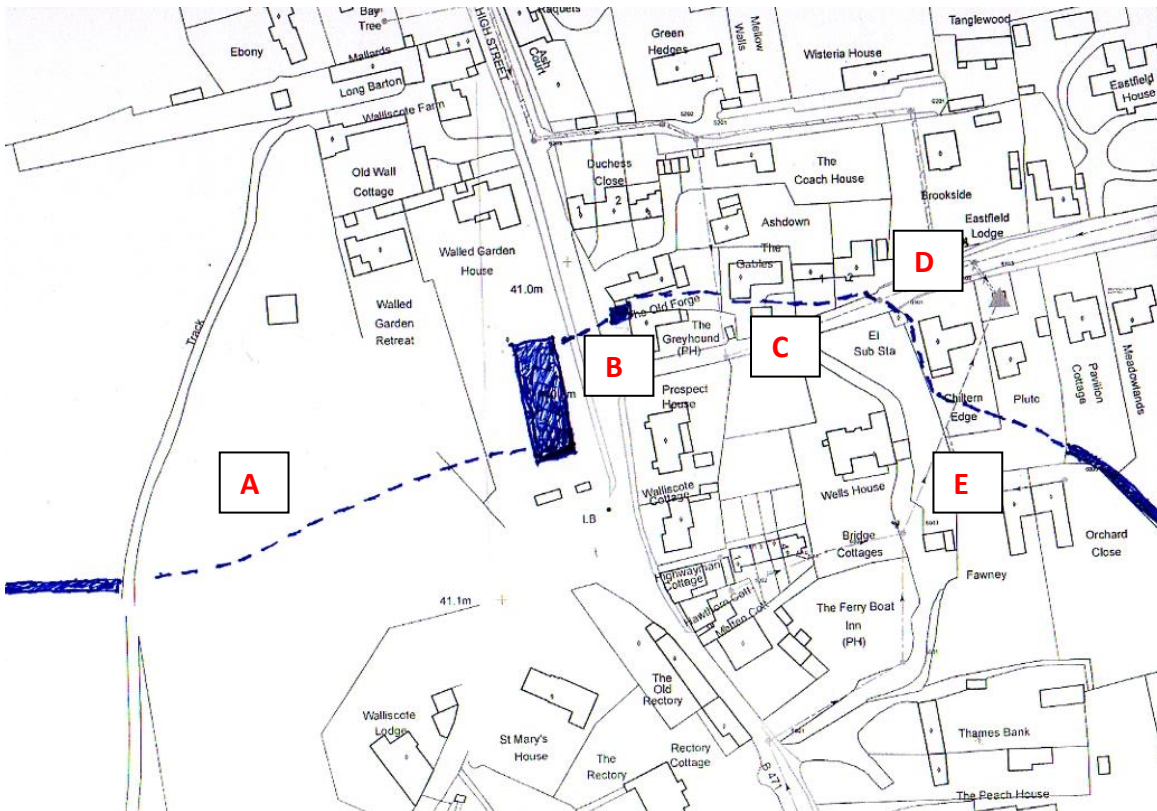


Figure 3 Village watercourse - culverted sections shown as dashes. Open water is solid fill

### i) Culvert A – Across Walliscote farm to The Walled Garden House pond.

The first culvert starts in Walliscote farm where the flow is weir controlled at its entrance in order to retain water in the farm’s ditch system. It goes underground via The Walled Garden Retreat to The Walled Garden House where it enters the south west corner of a large pond or cistern that was once part of the walled garden of Walliscote House, see fig 3

Responsible owners  
Walliscote farm  
The Walled Garden Retreat  
The Walled Garden House

ii) Culvert B - under the High Street to the chamber beneath the old fire station

From the north eastern corner of the pond in the garden of The Walled Garden House it goes under the High Street to re-appear at the western wall of the large chamber beneath the old fire station. See fig XXX  
Its precise route across the High Street is not known as its start and finish points don't align, so it is possibly diagonal?

Responsible owners

OCC

The Greyhound

## The chamber beneath the old fire station

Mentioned in the 2014 flood report and 2020 flash flood report  
To re-cap

Pre-dating, and in front of and extending underneath the old fire station, is a large chamber approximately 2 m deep x 4 m long x 2 m wide, (16 cubic metres). See the photos in Figures 10 and 11.



Figure 4 – the large chamber in front of and beneath the old fire station

In 2007 an unsuccessful attempt was made to empty the chamber after flash flooding of The Greyhound area in the erroneous belief that the village watercourse accepted surface water drainage from the High Street and this chamber was a silt trap. It later transpired this was wrong on both points, though a significant amount of silt was removed.

We now know that the chamber (and its water level) is a continuation of the large pond in The Walled Garden House, opposite on the west of the High Street. This includes the substantial volume of water in the culvert under the High Street itself as well as the circa 200 metre run of culverts downstream to where at the boundary of Pluto House and Pavilion Cottage it meets an open ditch, the culvert exit being below the local ground table for most of the year. So in the above photo, fig 4, OPC staff were trying to drain a body of water some 300 metres long, by circa 300 mm wide that was below the local ground table)

Further proof of the large surface area of water can be seen in photo, fig 5, taken in July 2020 following a similarly misguided attempt to lower the chamber's water level. After removing circa 8,000 litres, notionally half the chamber's volume, all that was achieved is some duckweed that has drifted in from the pond the other side of the road and the level in the chamber had hardly dropped.

Other features of note in this photo. (fig 5)

- The large size of arch of the culvert that runs under the High Street
- The 12" salt glazed pipe entering the (then running) village watercourse but became redundant circa 1960 when a 350 dia concrete pipe was laid under the western side of the High Street to the slipway abutment via an intercept chamber at Mill Drive. (Through the middle of that intercept chamber is a 100 mm dia foul sewer.)
- The water level in July 2020 which we now know represents the level of the ground table



Figure 5 July 2020 photo of the chamber beneath the old fire station looking west, showing the arch of the culvert that crosses the High Street. Note the duck weed from the pond the other side of the road.

As the chamber beneath the old fire station connects directly to the pond in The Walled House it precludes a CCTV investigation unless the section under the road isolated and drained.



Figure 6 The 2 metre drain rod at the chamber's base. Compare the high water level in 2014 (ground water table to that of 2020 in fig 5)

### iii) Culvert C The Greyhound to Eastfield Lane, (the lost culvert)

#### Synopsis

This does not appear in public records. Its route and sequence of being laid from 1900 to 1910 can be traced from OS map revisions.

Its route:-

- The old fire station chamber
  - Possible leg to the Old Forge, (OS maps indicate this)
  - Northern boundary of The Greyhound's beer garden, (possibly forms a shared boundary with adjoining northern properties sharing responsibility)
- The Gables, (appears to run between the detached garage and house)
- No 1 Eastfield Lane – front garden
- No 2 Eastfield Lane – front garden

Development has been granted on two occasions without reference to this watercourse, likewise it has not come up during searches for property sales. There are no access points enroute and it remains flooded throughout the year making a CCTV survey difficult.

Pre 1890, this part of the village watercourse was an open ditch. It ran from north of the old fire station (next to what is now The Greyhound), going under Eastfield Lane between what is today No.2 Eastfield Lane and Chiltern Edge.

About 100 years ago, development along its route caused the original ditch to be placed in a culvert.

Note. The culverted section from The Greyhound to Eastfield Lane did not cause a flood problem in either 2003 or 2014.

#### Points

- Its precise location and condition are unknown.
- The culvert's existence didn't show up in recent conveyancing searches.
- SODC have granted planning applications on two occasions for houses to be built on land where it passes underneath without making reference to it<sup>3</sup>.
- It may not be maintainable as it doesn't appear to have access points.

The sequence of it becoming a culvert can be traced from OS maps.

Pre 1899 – The map's date is not known but was published before the corn mill became a DC power station, shown as "electricity works" on later maps. This is before the building of Nos 1&2 Eastfield Lane. The village watercourse is shown as an open ditch before it goes under what is now Eastfield Lane.

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<sup>3</sup> P60/H0732 Outline application with little detail. (This is the only time the word "culvert" appears in any of the following applications or approvals. It could refer to the village watercourse, culvert from 1900, or that for the roadside drain that any traffic to the site must pass over. The requirement to deal with this in the approval is rather bland)

P61/H0061 Detailed application for a bungalow, unlikely that this was built, see P65/H0240

P62/H0383 Approval for a garage

P65/H0240 Approval for an even larger bungalow

P87/S0376 Approval (after some objections to the scale of development) for the existing two storey house and separate brick garage. The line of the 1900 culvert from OS maps seems to lie between the garage and house

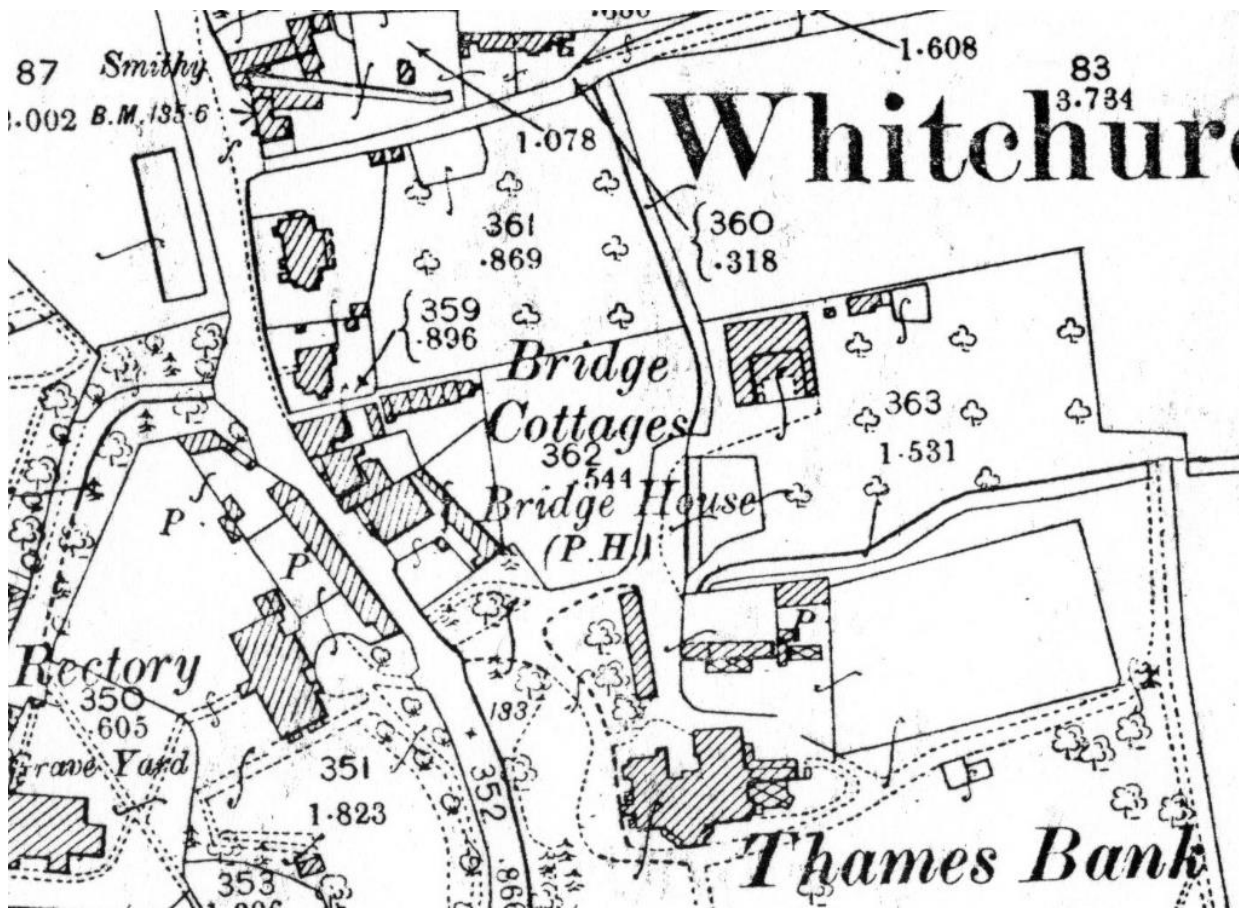
Note, the western end of the ditch is shown starting from the “Smithy”, not from the old fire station (bench mark arrow) below which there is a substantial chamber (2 x 2 x 4 metres). See section “old fire station chamber”).



1899

After the building of Nos. 1 & 2 Eastfield Lane the open ditch is no longer shown across those two properties, so is assumed to run in a culvert beneath their front gardens, following the line of the original ditch.





1910

The ditch south of Eastfield Lane has been diverted to a new channel to the east of Thames Bank's newly built coach house (now Fawney and Orchard Close).

The skewed northern boundary of The Greyhound's beer garden appears to follow the route of the original ditch



Responsible owners

The Greyhound, and if a shared boundary, the adjacent northern properties

The Gables

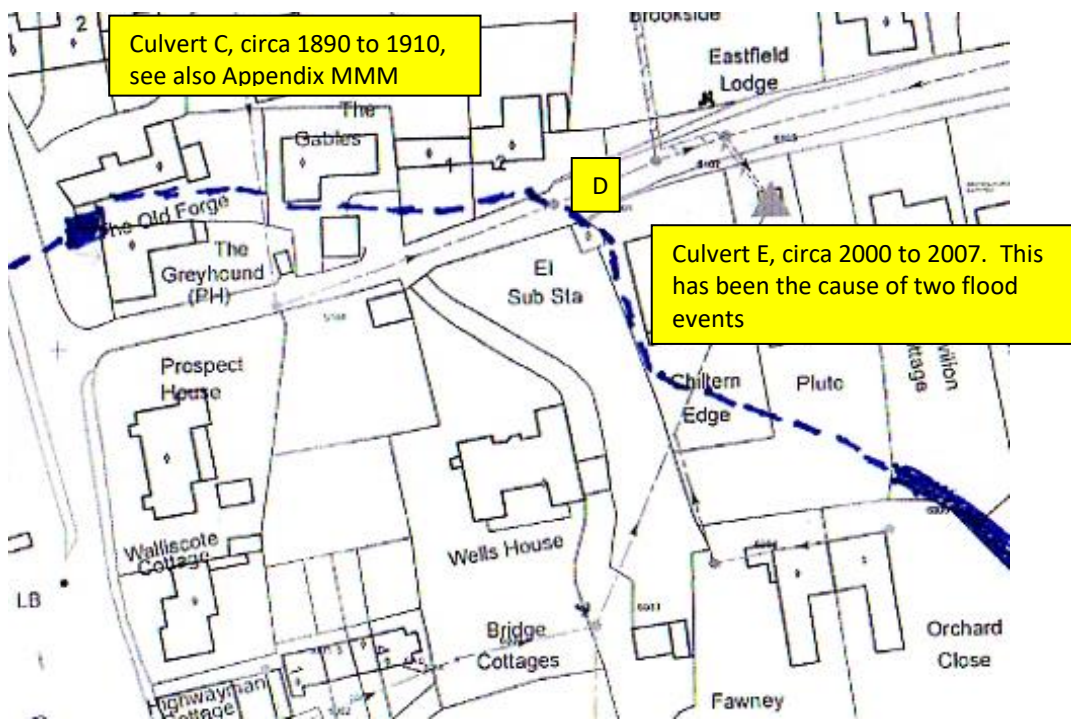
Nos 1 & 2 Eastfield Lane

iv) Culvert D - (under Eastfield Lane)

Responsible owner

OCC Highways

*RMW revised text follows – see if this can replace other descriptions*



The village watercourse, **east** of the High Street is **considered here as two separate items:**

- 1) **North**, The old fire station, (The Greyhound), to Eastfield Lane, (culvert C)
- 2) **South** of Eastfield Lane, (culvert E)

### Summary

Before 1890, **the village watercourse** east of the High Street from The Greyhound / old fire station was entirely an open ditch. It crossed Eastfield Lane between what is today No.2 Eastfield Lane and Chiltern Edge where it then continued as an open ditch to the Thames some 300 metres away. See map above.

Piecemeal development along its route, has resulted in all of the original ditch north of Eastfield Lane pre 1910 now running in a likely **brick** culvert, whose precise location is not in the public record, to the detriment of developers and purchasers along its route. see Appendix AAA, (the lost culvert)

The first part of the ditch south of Eastfield Lane was **converted to a pipeline in around 2000, and after the 2003 flood was relaid with a larger diameter in 2004 by SODC and subsequently extended privately in 2007.**

### Note

The circa 200m pre WW1 culvert **north** of Eastfield Lane :-

- **Was not the cause of flooding in 2014, nor in 2003.**
- Its precise route and condition are not known, (Appendix AAA).
- SODC have granted planning applications for two **buildings in succession (Syringa and The Gables) on one area of land through which it runs,** without comment on its existence. (see Appendix AAA)
- There are no known access points for maintenance.

## 1d – Culvert E – South of Eastfield Lane to Pavilion Cottage



### *Synopsis*

Culverts installed here less than 25 years ago have been the cause of two preventable flood events during Thames floods. Both were due to restrictive underground sections that caused water at above weir height to eject from a roadside drain in Eastfield Lane outside what is now Chiltern Edge (this drain would normally accept surface water and pass it via the village watercourse to the Thames)

- 1) 2003 flooding of the High Street (and flooding of The Greyhound)<sup>4</sup>. Sufficient water was ejected to enable the flow to crest the watershed outside The Gables and reach the High Street .see photo below taken after the peak. Hiding in plain sight is the failure of the High Street drains. (Was not investigated until 2021).



- 2) Eastfield Lane in 2014).

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<sup>4</sup> This event triggered action by SODC to replace the privately installed underground section in 2004/5 – see Section 6



## Brief history of the culvert south of Eastfield Lane

*Needs sorting – lots of repeat and overlap*

- The plot immediately south of Eastfield Lane developed from a small church hall to a large bungalow “The Chevin), see Appendix XXX for details (the plot was redeveloped in XXX and is now known as “Chiltern Edge”), The then owner of “The Chevin”, a Mr Burningham, replaced the original open ditch, without planning permission, by a grossly undersized culvert. Referred to at the time as a “pipe”.

This was replaced by SODC after the 2003 flood using their delegated powers, (Mr Burningham was terminally ill at the time and it is not known if SODC attempted to recover their costs of the work). SODC installed a properly engineered 450 mm bore culvert, along three inspection / rodding chambers.

Insert scan of Chiltern Edge showing route and chambers

In 2007 the adjoining property, Pluto House installed a continuation of the 450 mm bore culvert, but without inspection chambers / access points. A partial blockage of this section caused flooding of Eastfield Lane in 2014 due to back pressure (same reason as 2003) though in 2014 the floodwater being ejected was insufficient volume to overcome the watershed outside The Gables so didn’t reach The Greyhound) - see Appendix YYY for full details

*Insert .ppt sketch of the watershed*

As the village developed, the watercourse immediately south of Eastfield Lane went from being an open ditch possibly over 1000 years old, to be hidden underground in a series of plastic culverts installed during the last 20 years, before reverting to an open channel again, all the way to the Thames some 300 metres further downstream. (part of which itself was re-routed 120 years ago)

Due to the poor installation / maintenance of these modern culverts, they have been the direct cause of two preventable floods, (2003 and 2014). One of which resulted in property damage.

Lack of maintenance of the open ditch downstream of the new culverts did not cause flooding in 2003 or 2014, (as the ditch at that time was part of the Mapledurham / Pangbourne flood plain).

The culverted section south of Eastfield Lane

- A pipe (understood to be only 100 mm dia), was installed without consent<sup>5</sup> circa 2000 by the landowner of "The Chevin", to replace the ditch, ("The Chevin" was a bungalow immediately south of Eastfield Lane on the site of the church hall, now redeveloped as "Chiltern Edge"). (see Appendix FF for the history of the development of this plot)
- This undersized pipe installed by Mr Burningham, was unable to cope with the full flow from Walliscote farm that happens whenever the farm's upstream bank is overtopped during a Thames flood, (a notionally 10% probability event). A culvert restriction south of Eastfield Lane will then cause upstream height floodwater to back up into the road via the roadside gullies that connect to it. This was the likely cause of the significant flooding in Eastfield Lane during the 2003 event, (sufficient floodwater at upstream height coming from the roadside drains was enough to cross the watershed outside "The Gables" to flood the High Street and The Greyhound which is below road level).

*Insert sketch of the watershed*

(the 2003 flooding of The Greyhound could have been averted if the roadside drains outside the pub were functioning. - this situation was rectified in 2021. Photo below of 2003 clearly shows these 4 drains were not functioning

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<sup>5</sup> Any alteration of a watercourse requires consent of either SODC or the EA, or both

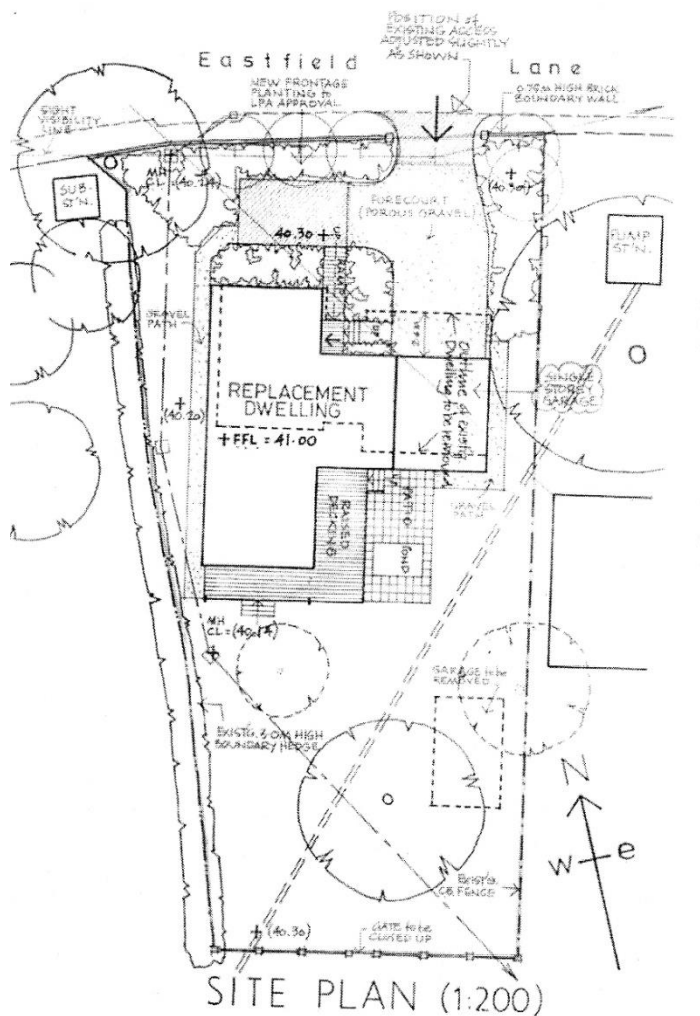


Insert 2020 photos ??

- SODC's professionally installed replacement of Mr Burningham's "pipe", circa 2004, was approx 70 metres of 450 mm dia pipe and included three manhole access points.

*Insert sketch from Chiltern Edge planning*

- The ditch across the rear garden of "Pluto House" was subsequently culverted by continuing with a similar section for roughly another 70 m, terminating at a headwall at the boundary of Pavilion Cottage. The section across Pluto House's garden is without access manholes. A partial blockage somewhere downstream of the last manhole in "Chiltern Edge" (see below) caused similar flooding of Eastfield Lane in 2014.



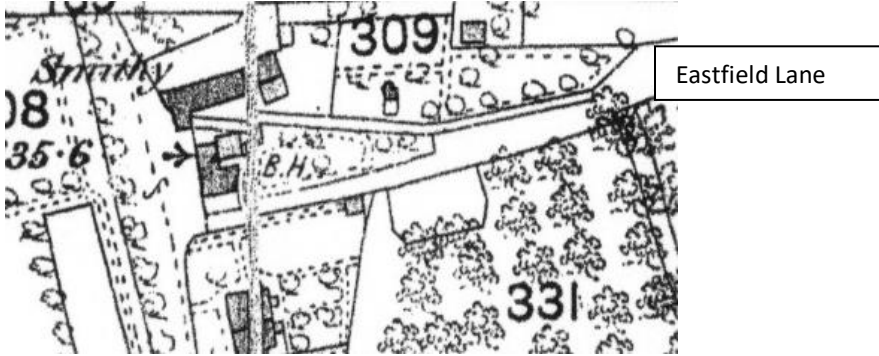
Insert ske

tch map of the SODC and Pluto Hse run

- A piece of chestnut paling fence was found jammed in the culvert circa 2 metres **upstream of its outlet** and removed in 2015 when the water table had dropped sufficiently to allow access from the adjoining property. (see appendix ccc, photo ??) The 2020 flood event whose flodwaters overtopped the levee at Walliscote farm passed without incident, suggesting the 2014 flooding of Eastfield Lasne was caused by this piece of chestnut fencing.



Pre 1899, the open ditch ran from north of the old fire station to Eastfield Lane



#### Notes

A bench mark (height above sea level), is shown by the arrow on the old fire station, see photo - fig ???

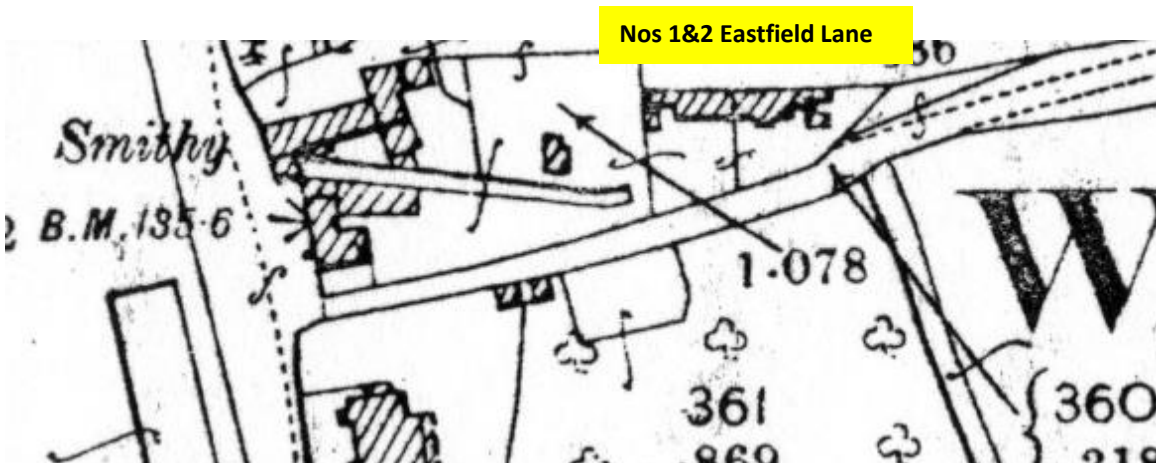
The open ditch, (east of the High Street), starts north of the old fire station with its headwall close to the High Street.

The ornamental pond (forming part of the watercourse's route) in what is now "The Walled Garden House", west of the High Street, is shown – the exit of which, (see photo – fig XXX), may cross the High Street diagonally northwards into what has been termed a silt trap, an unusually large chamber in front of and beneath the old fire station. The pond level seems to be weir controlled

East of the High Street it's shown as two straight lines, the easternmost part running parallel with Eastfield Lane, and its western leg aligns with the skewed northern boundary of "The Greyhound's " beer garden.

#### 1899 map

Following the building of 1 & 2 Eastfield Lane circa 1890, (Can they be labelled on the map?) the ditch became a culvert beneath their front gardens before crossing under Eastfield Lane to re-appear as an open ditch. see map below



The village watercourse, east of the High Street is considered here as two separate items:

- 1) North, The old fire station, (The Greyhound), to Eastfield Lane
- 2) South of Eastfield Lane

#### Summary

Before 1890, the village watercourse was entirely an open ditch, from east of the High Street just north of the old fire station, (identified from the benchmark). It crosses Eastfield Lane between what is today No.2 Eastfield Lane and Chiltern Edge where it continued as an open ditch.

Piecemeal development along its route has resulted in all of the original ditch north of Eastfield Lane since before 1910 now running in a likely brick culvert. The first part south of Eastfield Lane was converted from ditch to pipeline in around 2000, and relaid with a larger diameter in 2007.

The pre WW1 culvert **north** of Eastfield Lane :-

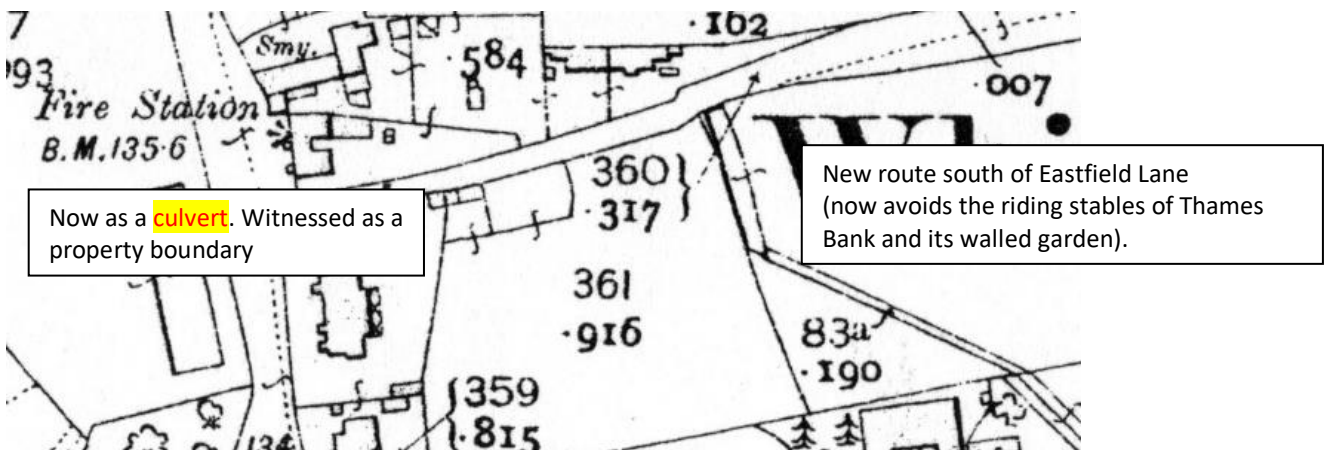
- Was not the cause of flooding in 2014, nor in 2003.
- Its precise route and condition are not known. Its length is around 200m.
- It hasn't shown up in conveyancing searches and riparian land owners along its route may not be aware of it.
- SODC have granted planning applications for two buildings in succession (Syringa and The Gables) on one area of land through which it runs, without comment on its existence.
- There are no known access points for maintenance.

The culverted section **south** of Eastfield Lane

- A pipe (understood to be only 100 mm dia), installed circa 2000 by the landowner of "The Chevin", to replace the ditch, ("The Chevin" was immediately south of Eastfield Lane, where now stands a new property, "Chiltern Edge"). This undersized pipe, unable to cope with the full flow, would have backed up into the road via the roadside gullies that connect to it, so was the likely cause of the significant flooding in Eastfield Lane during the 2003 event, and summer flash flooding of "The Greyhound" in 2007.
- Its professionally installed replacement, circa 2007, used approx 70 metres of 450 mm dia pipe, including three manhole access points. The ditch across the rear garden of "Pluto House" was culverted shortly afterwards by extending with a similar section for roughly another 70 m. A partial blockage downstream of the last manhole in "Chiltern Edge" (see below) caused similar flooding of Eastfield Lane in 2014.
- A piece of chestnut paling fence found jammed in the culvert circa 2 metres upstream of its outlet was removed in 2015 when the water table had dropped sufficiently to allow access from the adjoining property. (photo ??)

## 1910 map revision

North of Eastfield Lane the ditch is shown fully culverted. (and is shown as the northern boundary of the Greyhound's garden). Further south of Eastfield Lane the ditch's route has also changed.



Brief history.

- The plot immediately south of Eastfield Lane developed from a small church hall to a large bungalow "The Chevin), see Appendix XXX for details (the plot was redeveloped in 2007 and is now known as "Chiltern Edge", The then owner of "The Chevin", a Mr Burningham, replaced the original open ditch, without planning permission, by a grossly undersized culvert. Referred to at the time as a "pipe".

This was replaced by SODC after the 2003 flood using their delegated powers, (Mr Burningham was terminally ill at the time and it is not known if SODC attempted to recover their costs of the work). SODC installed a properly engineered 450 mm bore culvert, along with three inspection / rodding chambers.

Insert scan of Chiltern Edge showing route and chambers

In 2007 the adjoining property, Pluto House installed a continuation of the 450 mm bore culvert, but without inspection chambers / access points. A partial blockage of this section caused flooding of Eastfield Lane in 2014 due to back pressure (same reason as 2003) though in 2014 the floodwater being ejected was of insufficient volume to overcome the watershed outside The Gables so didn't reach The Greyhound) - see Appendix YYY for full details

*Insert .ppt sketch of the watershed*

As the village developed, the watercourse immediately south of Eastfield Lane went from being an open ditch possibly over 1000 years old, to be hidden underground in a series of plastic culverts installed during the last 20 years, before reverting to an open channel again, all the way to the Thames some 300 metres further downstream. (Part of which itself was re-routed 120 years ago)

Due to the poor installation / maintenance of these modern culverts, they have been the direct cause of two preventable floods, (2003 and 2014). One of which resulted in property damage.

Lack of maintenance of the open ditch downstream of the new culverts did not cause flooding in 2003 or 2014 for the simple reason that as the Thames rises and floods gardens downstream of Pluto House the ditch ceases to exist as it becomes part of the Mapledurham / Pangbourne flood plain).

The potted history below is an attempt to put the record straight.

- From perhaps as far back as pre Roman to 1905, there was a continuous wide ditch south of Eastfield Lane that could have been defensive in nature and of similar wide section to other parts of the village watercourse (see photos in figs YY XX).

*Insert photo of line of hollies*

The section south of Eastfield Lane that went from Eastfield Lane via the (then) riding stables of Thames Bank, built circa 1790, (now Thames Bank Cottage), to the Thames. See photos showing the size of the original ditch figs YYY XXX

*Insert map*

- Between 1905 and 1910 the ditch was diverted away from the riding stables and walled garden of Thames Bank to run diagonally to the east of its coach house, dray stabling and forge (now Fawney and Orchard Close) which were built on a raised chalk mound post the 1894 flood (ref OS maps etc).

Insert note referring 1905 diversion

The new channel was significantly narrower and re-joined the east – west leg of the earlier wide ditch at the eastern end of Thames Bank's walled garden. A short, north – south section immediately south of Eastfield Lane remained of the original width. This then formed the western boundary of a plot, where Chiltern Edge now stands. See fig AAA below

*Insert map*

- Pre WW2 this plot, now "Chiltern Edge", formerly "The Chevin", was home to a modest wooden hall owned by the church, which doubled as the village hall and scout hut, but left ample space to the west for the open ditch.

*Insert map from the Land Registry*

- The church hall was extended in 1951, but still left a generous space to the west for the original ditch. See extract from the planning application below

*Insert map from P51/H0121 (but rotate 180 deg to put north to the top)*

- In 1969 the site was sold, the church hut demolished and replaced by a large bungalow, "The Chevin". This maximised the area of the site leaving much less room for the open ditch.

*Insert map from P69/H0315*

- Circa 1999, the owner of The Chevin, Mr Burningham, apparently replaced the ditch with what has been described as a "pipe". It appears he was advised this was undersized, but the matter was not taken further.

*With the gift of hindsight, any alteration to a watercourse requires planning consent and the parish council should have taken it up with the relevant authority, today being the Environment Agency / SODC land drainage dept.*

- January 2003, during a 20% probability flood event, the Thames overtopped its levee upstream of the weir, flooding a large depression in Walliscote Farm causing the village watercourse to flow. In doing so the flow transferred an upstream head of water from land west of the artificially raised High Street via culverts installed a century earlier from The Greyhound to Mr Burningham's restrictive "pipe" downstream of Eastfield Lane.

The severe restriction underground at The Chevin resulted in water erupting upstream wherever it could along the line of the culvert from west of the High Street:- via the old fire station beside The Greyhound, and especially from the open roadside drain outside The Chevin which connects directly to the village watercourse, (now Mr Burningham's "pipe"). (The water pressure could even have dislodged the lightweight inspection pit cover outside the old fire station, see fig)

*Insert photo of OPC lifting this cover in 2014*

There was sufficient volume of water erupting from the roadside drain to extensively flood Eastfield Lane such that the floodwater crested the watershed in Eastfield Lane outside The Gables and flowed towards the High Street.

Insert ppt sketch of the watershed

*Insert 2003 GW photo of outside the Chevin*

From the watershed outside The Gables the 2003 floodwater then ran westwards to the High Street where it collected at the low point of the High Street outside The Greyhound where it could have met upstream head floodwater from a dislodged inspection pit cover. Either way, there was a lot of water outside the Greyhound.

*Insert 2003 GW photo outside the Greyhound*

The four roadside drains outside The Greyhound should have transferred this floodwater under the High Street to the main road drainage channel installed circa 1960 thence to the Thames, but due to faults in the system taking it across the road, the floodwater built up and flooded The Greyhound.

*Refer to various photos, (it was not until a camera survey attempt some 17 years later following similar flooding of The Greyhound in June 2020 from heavy rainfall, that the blockages under the High Street were identified. These are now subject to action by OCC).*

- 2004. Following the 2003 flooding of The Greyhound, SODC used their statutory powers to enter private land and replace Mr B's "pipe" with a professionally designed 450 mm bore drainage system, along with three inspection pits. (Mr Burningham was terminally at the time and it is not known if SODC pursued his estate recover their costs)
- 2006. Planning approval to demolish The Chevin and replace it with a 5 bedroom house, Chiltern Edge. The map below from the planning application shows the route of SODC's culvert and its inspection chambers

*Insert map from P06/E0147*

- 2007. The open ditch across the adjoining property, Pluto House, is converted to a 450 mm dia culvert, but without planning permission or inspection / maintenance chambers and terminated as an open ditch at Pavilion Cottage.

*Insert photo or ppt sketch of headwall*

- Jan / Feb 2014, a 20% probability flood, similar in height to 2003.

Eastfield Lane was partially flooded again for the same reason as in 2003, namely a restriction in the culverted section which caused upstream height Thames floodwater to erupt from manhole cover lifting eyes in Chiltern Edge and more significantly from the roadside drain outside that property.

The precise location of what was a partial blockage from these observations was known to be somewhere between the last manhole in Chiltern Edge and the culvert exit at the boundary of Pluto House / Pavilion Cottage.

In 2014, the flow rate from the roadside drain was insufficient to crest the watershed outside The Gables and as a result the floodwater was limited to Eastfield Lane, some of which reached the adjacent eastward drain outside Pluto House which separately drains to the Thames via a 150 mm pipe across Glebelands

Insert ppt diagram of the watershed / how far the 2020 flash flood got to



- Summer 2014, the ditch in Pavilion Cottage's garden is excavated to ensure free flow across that property in case that was a contributory cause, but further examination of the culvert was hindered by the high ground water table

Insert photo of soil excavated

*Insert photo of flooded headwall*

- Autumn 2014, the groundwater table had dropped sufficiently to enable an examination of the culvert exit and probing circa 2 metres inboard, a piece of chestnut paling fencing was found jammed across the pipe along with other debris.

*(This could have been the cause of the restriction as during a similar flood event in 2021 when the culvert was at 100% capacity there was not a back flow into Eastfield Land.*

*Insert photo of piece of fencing*

- June 2020, a locally severe summer storm resulted in a flash flood which flooded the Greyhound.

*Insert 2020 flood photo*

It was subsequently found that the roadside drains taking road drainage from outside The Greyhound across the High Street area had collapsed. (This collapse can be dated to pre 2003, see earlier mention fig???)

Insert GW 2003 photo?

- OCC investigate using the village watercourse as an alternative route for road drainage to the Thames, as was the case pre 1960.

*Insert photo of chamber outside the old fire station showing pre 1960 entry*

- OCC see the standing water at the culvert exit / ditch in Pavilion Cottage and request SODC ensure the ditch is lowered. (It now becomes an SODC surface water matter, not OCC road drainage, hence transfer to SODC.)
- July 2020, Investigation by SODC and subsequent correspondence show that the standing water is in fact the level of the local ground water table in that area so digging a deeper ditch locally (as in 2014) is unlikely to solve the problem.
- February 2021, following the wettest spring on record, springs appear in the front garden of Pavilion Cottage and elsewhere. But not in the rear garden, which is significantly lower than the front. (Is a seam of east / west gravel acting as a French drain???)
- End March 2021. Water is still lying along the ditch downstream of Pavilion Cottage and for several hundred metres beyond. (further evidence of ground water from Whitchurch Hill working its way underground towards the Thames)
- 19 May 2021, water is seen flowing downstream, - not due to overtopping of the levee upstream of the weir as in 2003 / 2014, thus proving the culvert exit at Pluto House / Pavilion Cottage is higher than the Thames. Consequently if the entire ditch downstream of the Pluto House / Pavilion Cottage culvert exit was excavated to "summer" Thames level, the local water table in that vicinity would be depressed.

Insert ppt sketches

## 1e - Ditch - Pavilion Cottage to the Thames

### *Synopsis*

Water levels in this final section of the open ditch correctly represent the local ground water table, but this is not the whole story.

The water levels at the culvert exit (boundary of Pluto House / Pavilion Cottage).

Insert photo of headwall

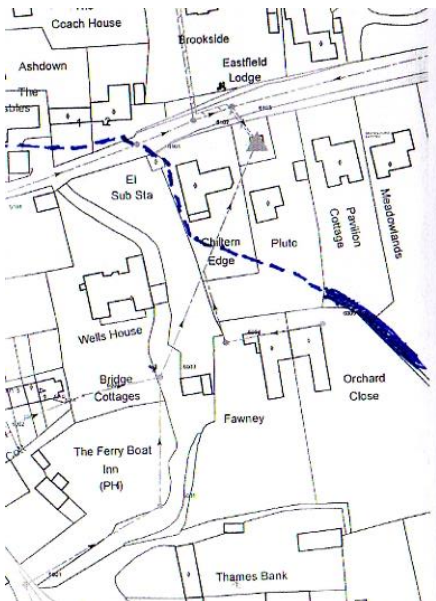
The water level can be lowered if the entire downstream ditch is excavated to Thames height. This did not become apparent

Part of this story is the change in direction circa 1900

### a) The pre 1899 route

*Insert map*

### b) Diversion of 1905



**Figure diverted route circa 1905**

*Above sketch is wrong – doesn't show full run*

This is curious.

Barely 10 years after the owners of Thames Bank invested in a significant horse transport facility, along with a new carriage drive and bridge over the original ditch, have they appeared to move away from relying on horses.

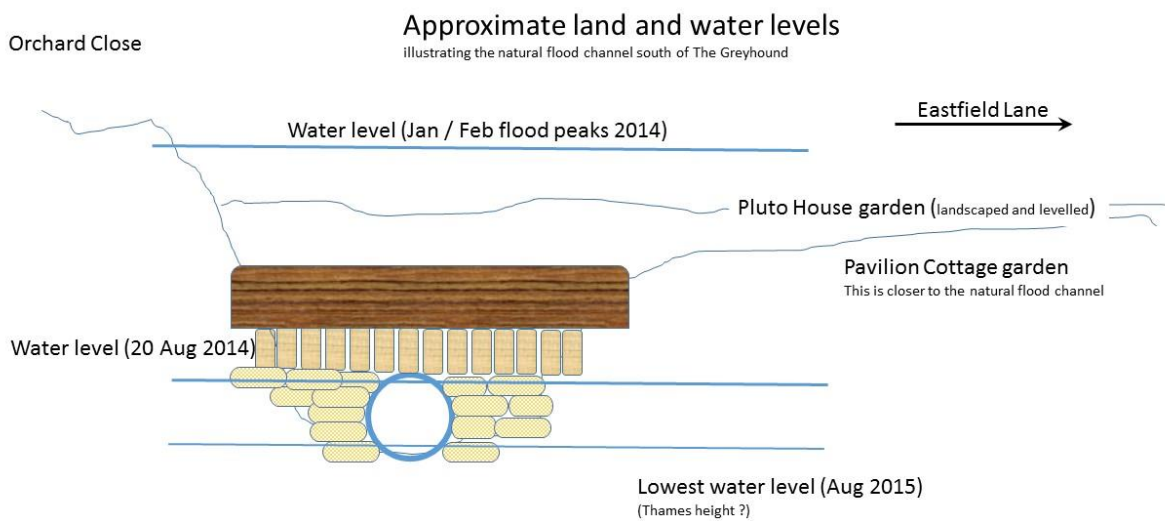
Namely, after constructing a new building circa 1895 comprising of 3 looseboxes for draught horses, a coachman's house, a forge and a tack room plus storage space for three carriages, the running water essential for these needs was diverted to run behind this building and in doing so also no longer supplied running water to the riding stables of Thames Bank, (now Thames Bank Cottage). It also made the recently constructed carriage drive's bridge over the original ditch redundant.

See fig ?? Below

Of interest is that the newly constructed ditch was much narrower than the one it replaced and the first part certainly had elm<sup>6</sup> plank sides and bottom making maintenance easier. A plank in Pavilion Cottage garden survived as witness to the position of the ditch bottom in relation to the culvert laid in 2007 across Pluto House garden.

Further, the bottom elm plank aligned with the base of the 2007 culvert exit at the Pluto House / Pavilion Cottage boundary. This has significance for the later discussion on ground water table and ditch maintenance downstream of Pluto House.

*Sketch below needs tidying up ND making a jpg*



<sup>6</sup> Elm does not rot if immersed







*Edit the picture to show the previous route*

*Re-draw map showing pre 1905*

This change of direction is apparent on revisions of OS maps and where boundaries in old deeds followed the line of the original watercourse.

Add OS maps before and after

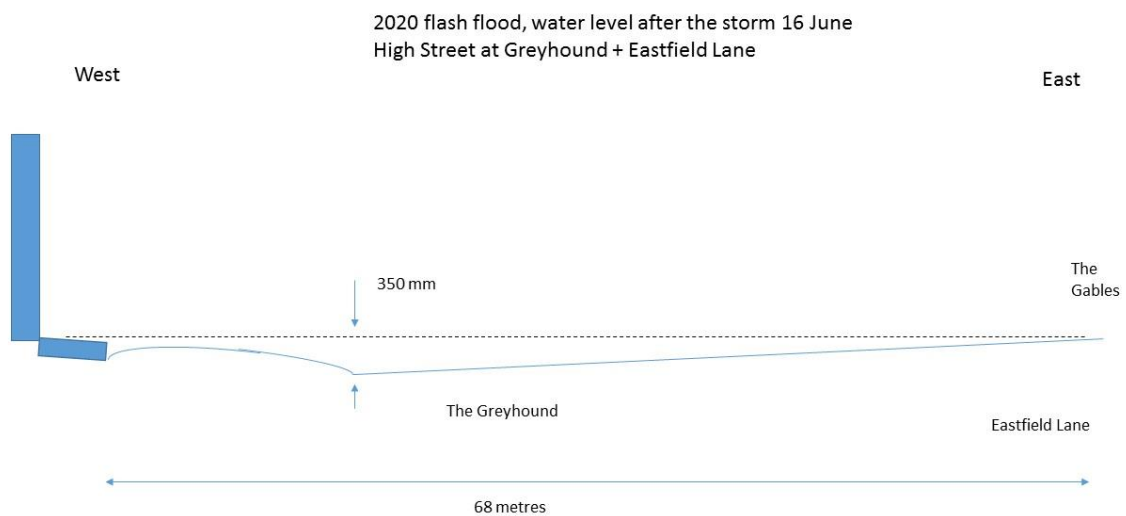
c) Final leg of the downstream ditch to the Thames (original ditch width)

*Insert map*



**Figure 11** The original line of the water course downstream of Pavilion Cottage. Note its width, about 5 metres, and a Victorian footbridge of the original Thames Bank estate. Photo taken September 2015. There is a puddle (groundwater table / Thames water level) in the low lying section under the bridge despite the dryness of the rest of the ditch.

The village watercourse is not relevant to flash flooding in The Greyhound area as since 1960 the only surface water that enters it downstream of the watershed outside The Gables in Eastfield Lane.



, a road drain outside Chiltern Edge.

However due to restrictions south of Eastfield Lane the back pressure caused water to erupt from the roadside drain outside Chiltern Edge, causing flooding of The Greyhound in 2003 and nearly repeated this in 2014.

During the flooding of Eastfield lane in 2014, caused by a restriction in the culvert south of Eastfield lane, sandbags were supplied by SODC to alleviate flooding, though with it would have been more cost effective to have addressed the cause of the back flow, (a restriction downstream of the SODC installed culvert)..

The generous width is not dissimilar to the upstream ditches in Walliscote farm, fig??. Note the stock fencing on the RH side. This shows the height of the adjacent field, i.e. the top of the ditch's side. Transpose that fence / land height to the LH side and we are looking at circa 20ft. Not so obvious today allowing for lack of maintenance / gradually filling in over the years.

There is a Thames Bank estate bridge linking the two fields, likely Victorian era. Not shown in the photo are remnants of hollies on the RH, (Thames) side. These (and the original ditch line) align as a defensible boundary. See extract from the Bulletin article and fig ???

Responsible owner  
Glebelands

#### **d) Historical references to the village watercourse**

In his 1926 book about Whitchurch, 'A Village on the Thames', the author Rickman J Godlee included a chapter on floods. He mentions, on page 249, "that rather mysterious ditch which leaves the river near the Coombe Park boat-house, passes through the Walliscote fields and garden, under the road just below the lane, and after crossing the bowling-green<sup>7</sup>, joins the river again below Thames Bank. One end of it is thus above the lock and the other below. It is this ditch which floods the main road<sup>8</sup>." Godlee's 'rather mysterious ditch' is referred to in this report as 'the village watercourse'. Some lengths of the watercourse, such as those in underground culverts on the north side of Eastfield Lane, retain an element of mystery in that their exact location remains unknown, see Culvert C – the lost culvert. But there is now an overall understanding of the function of the system, both historically and today. At its upstream end there are several connections from the river to the watercourse, at separate locations upstream. There may have been successive attempts to access a slightly higher river level, which would give a greater command for irrigation. The furthest upstream connection is near the Coombe Park boathouse. The watercourse follows the line of the Thames and is met in several places by ditches at right angles connecting to the river, Sluice gates at these points, now silted up, would have been used for control of both irrigation and drainage of the lower fields of Walliscote farm, using a ditch system that is still visible today.

#### **e) Summary of problems with the watercourse that caused flooding (2003 and 2014)**

Flooding of Eastfield Lane on both dates is described in the 2014 flood report.

To re-cap those preventable flood events were both due to:-  
A restricted culvert south of Eastfield Lane,

Compounded by  
A high water table  
Impervious clay in Walliscote farm  
The raised High Street / Church Drive acting as a dam  
Upstream of weir height floodwater flowing down the watercourse from when the upstream bank is overtopped

On both occasions, 2003 and 2014, but due to different restrictions, this caused sufficient back pressure in the final culvert south of Eastfield Lane to eject water from the downstream the lifting eyes of manhole covers and a large backflow from the roadside drain outside Chiltern Edge that connects to the final culvert. Flow from the roadside drain was sufficient to flood the road, which in 2003 (due to a more severe restriction) reached as far as the High Street and flooded The Greyhound, see photo fig 7

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<sup>7</sup> Now Pavilion Cottage

<sup>8</sup> Indicates a historic problem of flooding



Figure 7 2003 flooding of The Greyhound - an undersized culvert south of Eastfield Lane could not cope with the flow of upstream height Thames water causing it to eject from a roadside drain in Eastfield Lane (to the right of the photo about 100 metres away)

As the heights of the 1947 flood demonstrate, the Greyhound area is quite low, roughly the same elevation as the lock keeper's cottage, providing evidence of the depth of this old channel.

Insert photo of 2020 flood

Prior to 1885, excess surface water coming down the hill could flow unhindered westwards, into the pond in The Walled Garden House garden via its wicket gate near Church Drive, (thence under the High St. via the village watercourse to the Thames). The scale of both the raised road and footpath are evident immediately looking west through this gate. See attached photo that regret doesn't do justice to the significant height drop from what is now the pavement due to vegetation obscuring the lower ground level in the garden of The Walled Garden House.

## 2 – The raised High Street and its effect on flash flooding

### *Synopsis*

The low lying area near The Greyhound is now at greater risk from flash flooding since the level of the High Street was raised in the late 19<sup>th</sup> century which formed a north / south dam across an old river channel. This restricts excess surface water runoff from the road into the area opposite The Greyhound, relying today solely on the post 1960<sup>9</sup> roadside drains.

In addition, the “dam” formed by the raised High Street, holds back above weir height floodwater west of the High Street during the early stages of a Thames flood. If the level rises such that the culverted sections downstream of The Greyhound become flooded<sup>10</sup> (no air gap), then this will transfer above weir height (pressure) along the culvert but only if the higher flow completely fills<sup>11</sup> the underground sections.

### Pre 1894



Today

The pre 1894 road surface has been raised by approx 18”

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<sup>9</sup> Pre 1960, the road drains outside The Greyhound discharged into the village watercourse, thence to the Thames, see fig BBB

<sup>10</sup> A culvert has a free surface above which there is air, effectively an underground ditch – and cannot transfer pressure.

<sup>11</sup> The crux of the matter is whether the underground section changes from being a culvert to a pipe.

On the other hand, a pipe is hydraulically full and can transfer pressure.

2b - Raised ground level in detail

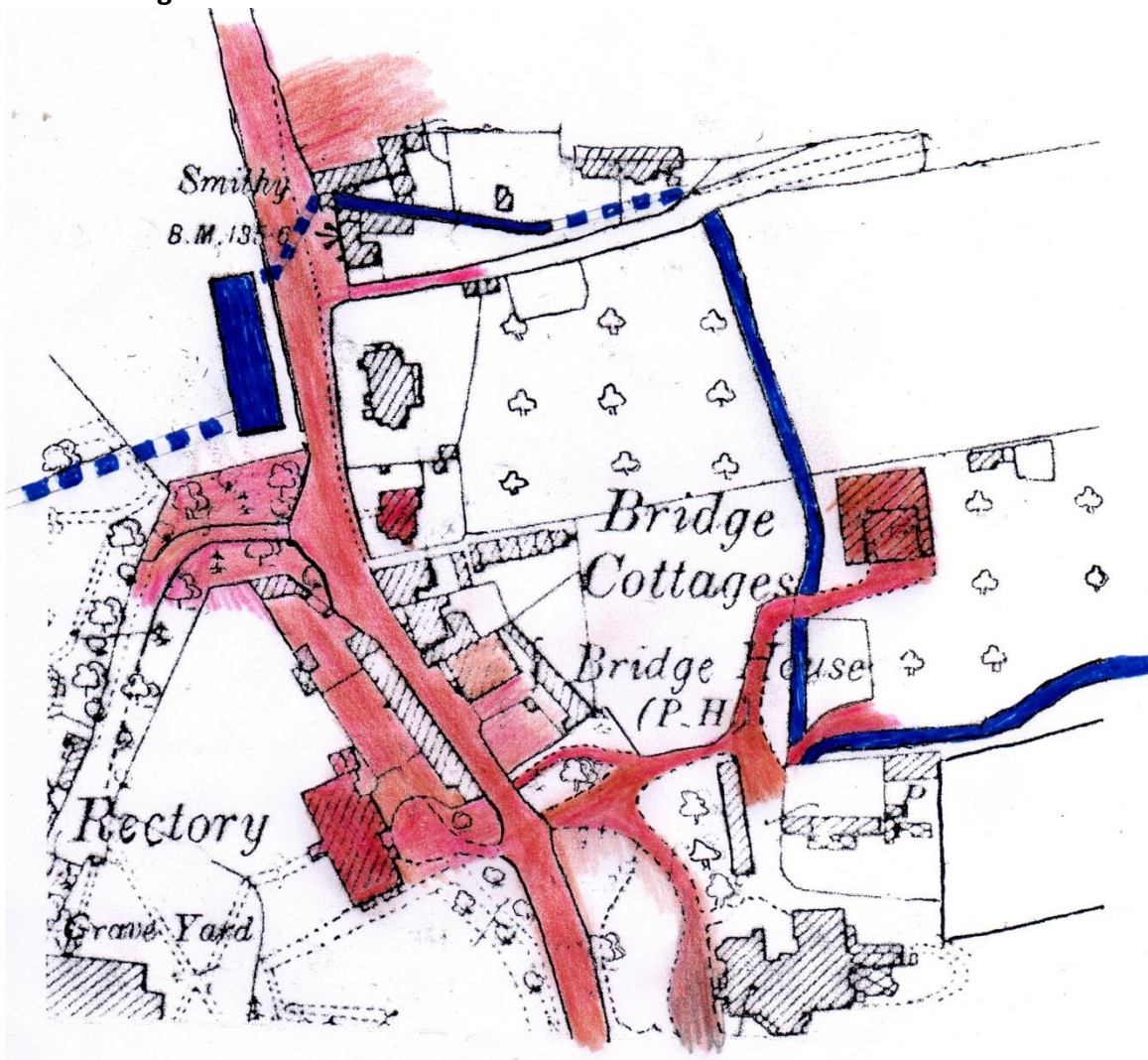


Fig 8 - Land raised following the 1894 flood, shown in red.



In other words the raised High Street means the culverted sections east of the High Street are more susceptible to a backpressure eruption from above weir height floodwater along their length if there is a restriction within the



culverted sections. (Obviously once the water reaches the open ditch (in Pavilion Cottage's garden) there is no back pressure. Back pressure due to restrictions of the recent culverts south of Eastfield Lane caused the flooding of The Greyhound in 2003 but happily only Eastfield Lane in 2014.

Surface water collecting outside The Greyhound can now only escape via the road drainage system which since before 2003 has been inadequately maintained by OCC. ( Investigation by OPC during June/ August 2020 has highlighted design and maintenance flaws, dating from pre 2003. These were partially rectified Sep 2021.

An old river channel runs west to east parallel to the Thames some 300 metres north of the toll bridge, from Walliscote farm, between what are now the two pubs and along the first part of Eastfield Lane. This is witnessed during floods, (river flood or rainfall flash flood). I.e., the area of the village near The Greyhound is only marginally higher than the lock keeper's cottage

Until the late 1800's the depression of this old river channel provided a diversion through the village when the Thames overtopped its banks above the weir. It can be seen today as water in Walliscote farm after a high Thames flood has overtopped the levee there, such as 2003 / 2007 / 2014. The large scale of the depression can be seen by the size of lake that forms in Walliscote farm.



(At normal river height the northern bank of the Thames at Walliscote farm is effectively a canal embankment and when close to the Thames the river can be seen to be about 600 mm higher than water in an adjacent ditch.

One doesn't question such a disparity of water levels beside a canal towpath on sloping ground, but it is unusual to see it on a river embankment. This points to deliberate "canalisation" of the Thames immediately upstream of the weir, likely pre Norman in support of a mill that is mentioned in the Domesday Book



Figure 9 Walliscote farm's levee, overtopped 2014

Further along this depression, either side of the High Street, the original ground height can be seen from the ground floor level disparities of pre 1894 buildings vs those post 1894. Such observations are detailed below.

The fact the floor of The Greyhound is at a similar level as the lock keeper's cottage beside the weir, despite being some 300 metres "uphill" and closer to the Chilterns.

What is visible of the post 1894 raising of the High Street and adjoining area

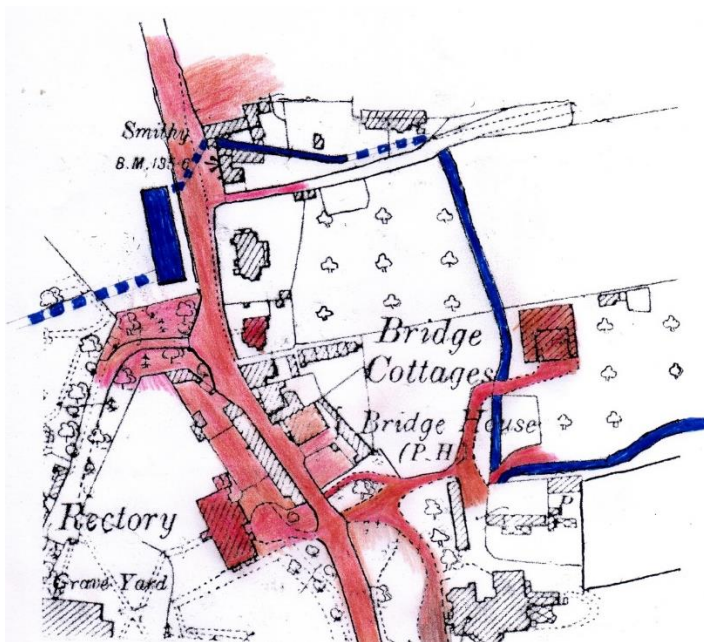


Figure 10  
General view of the scale

After the 1894 flood the High Street from north of The Greyhound to the toll bridge, plus parts of surrounding areas, were raised using material from the cutting that reduces the gradient<sup>12</sup> of Whitchurch hill above the war memorial. Chalk from there differs from the geology adjacent to the river (clay on gravel) so despite the surfaces today appearing to be no higher from infilling, the chalk becomes obvious when digging. See photo below of a circa 18" deep trench for an electricity cable.

<sup>12</sup> The work was funded as poor relief during the great agricultural depression 1873 – 96. This put many farm labourers out of work

Evidence of this major<sup>13</sup> soil movement is visible today though they are not obvious at first glance.

Such as pre 1894 properties that are lower than the road, through to more subtle features, such as low ceilings that wouldn't accept a horse, (the ceilings haven't dropped, the floor has been raised), and a garden were the pre 1894 land level looks as if it is a dried out pond because it is surrounded circa 2 ft higher land due to post 1894 chalk used to form driveways.



Figure 11 Chalk. This was used for the carriage drive and raised foundation of Thames Bank's new coach house.

#### a) The Rectory

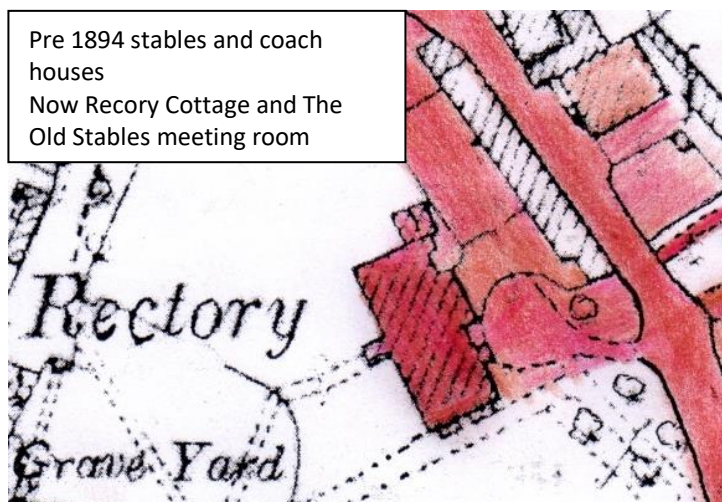


Figure 12

Today, this imposing building, but more importantly its set back location from a large forecourt looks "right". However this a modern development, built on a chalk plinth further west of the High Street post the 1984 flood. (The house is now named "The Old Rectory" following the building of new parsonage off Church Drive in 1999).

<sup>13</sup> It would have involved traction engines to bring the chalk down from the top of the hill. Horse drawn waggons are pulled, so going downhill with a load is a struggle.

However, the original rectory's stabling, servants' quarters, coach house etc., (now Rectory Cottage and outbuildings, along with the new "Old Stables meeting room") retain their original floor level.

However, the surrounding land was raised, though this is not immediately apparent today. Witness the shortened coach house and stable doors (that are too low, as well as a step down<sup>14</sup> into the Old Stables meeting rooms which continues this block.

### b) Church Drive entrance and beyond

The two<sup>15</sup> curved brick entrance walls that form the entrance of Church Drive give a clue to the pre 1894 land level, but this is hiding in plain sight as there is no obvious declination along Church Drive itself.

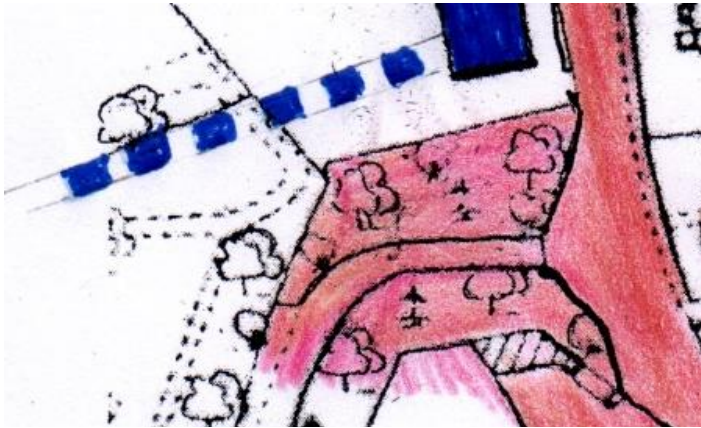


Figure 13 Church Drive entrance

### Church drive entrance

Insert photo

The curved brick entrances to Church Drive are aesthetically unbalanced<sup>16</sup> since the surrounding ground level was raised post 1894.

The ground level of the High Street and Church Drive, which looks so natural today, has obscured the design by burying an essential architectural feature, offending the eye

The simple rule is whenever there is a decorative recess, whether it's a panel in a door or a wall, the lower raised part is always taller than the upper.

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<sup>14</sup>It is conventional to step up to a door threshold, usually by at least one course of bricks (4 ½"), more if suspended floors. Bear this in mind when trying to gauge the original ground height outside the village's pre 1894 buildings that adjoining the raised areas of road.

For example, the significant step down seen from the pavement to Hawthorn Cottage's front doorstep would be even more if one removed the current flagstone in front of the doorway

<sup>15</sup> The northern brick wall is post 1900 (Portland cement and modern bricks). However it mirrors the design of the earlier southern wall built with lime mortar.

<sup>16</sup>

[Grab your reader's attention with a great quote from the document or use this space to emphasize a key point. To place this text box anywhere on the page, just drag it.]

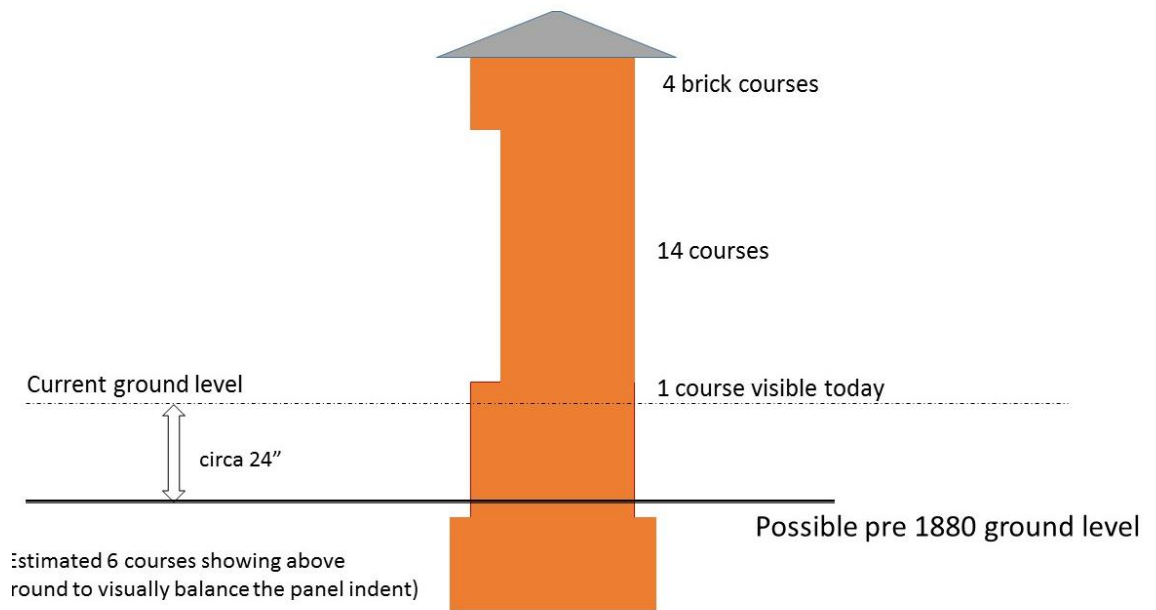
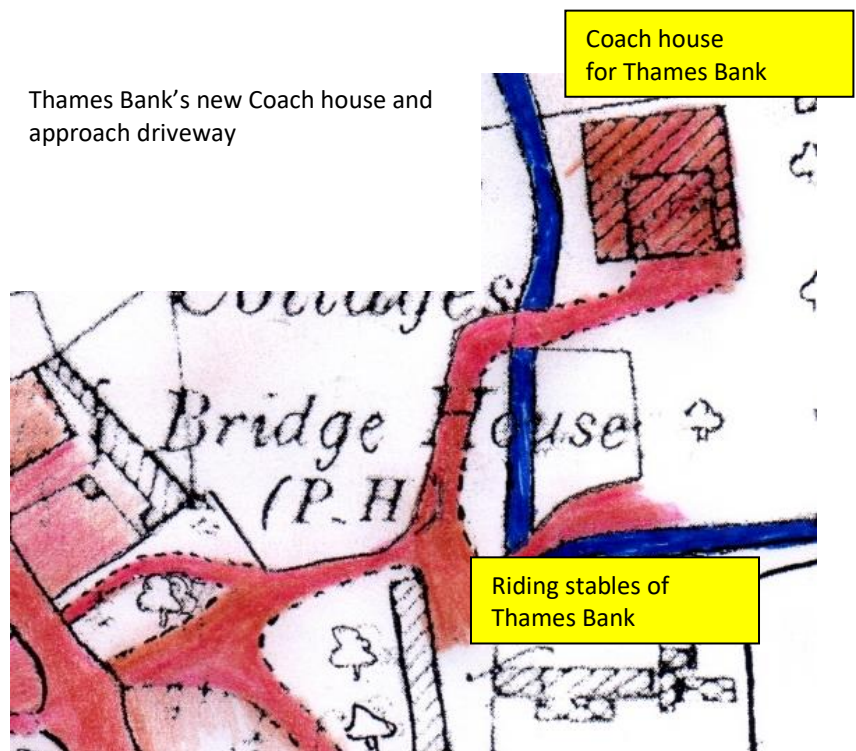


Figure 14. Church Drive entrance's recessed brick panels

### c) Thames Bank's coach house and its approach drive



The coach house / forge / stabling and coachman's accommodation built for Thames Bank post 1894, (now Fawney and Orchard Close), along with the approach drive are on a chalk bed about 12" thick. This became apparent when digging a trench for an electricity cable

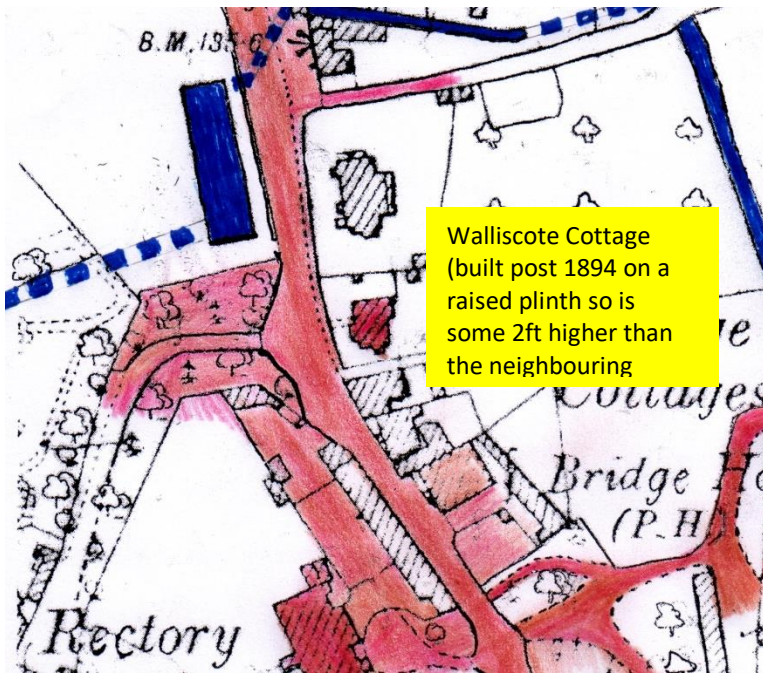


- A) A segment of the pre 1894 land height is preserved in the garden of Wells House, seen as a depression of what could be taken as an old pond as it is surrounded by the higher post 1984 chalk
- B) A significant step down from the road via the wicket gate to The Walled Garden House's garden

*Add photo*

- C) A significant step down from the current pavement to the area in front of Hawthorn Cottage, noting that the ground level immediately outside that property's front door is not representative of the pre 1894 ground level as a door threshold is normally placed at least a brick's height above its surroundings so would have needed a significant step up. It's not unreasonable to think the pre 1894 road / pavement level was lower.
- D) Step down into The Greyhound and its foreshortened door. (note the bqrge board slots). Also, since main drainage of 1960, the pub's toilets are above the 1984 height.
- E) The depressed rear lawn of Prospect House, assumed to be the same height and reason as the low lying land in Wells House, ie an undisturbed pre 1894 ground level.
- F) Stepdown to the front door of Highwayman Cottage, (just visible from the pavement)
- G) Shortened doors of the original loose boxes and coach house of the (pre 1894) Rectory, now Rectory Cottage, it's outbuildings and the Old Stables meeting rooms.
- H) Low ceiling and step down into The Old Stables meeting room

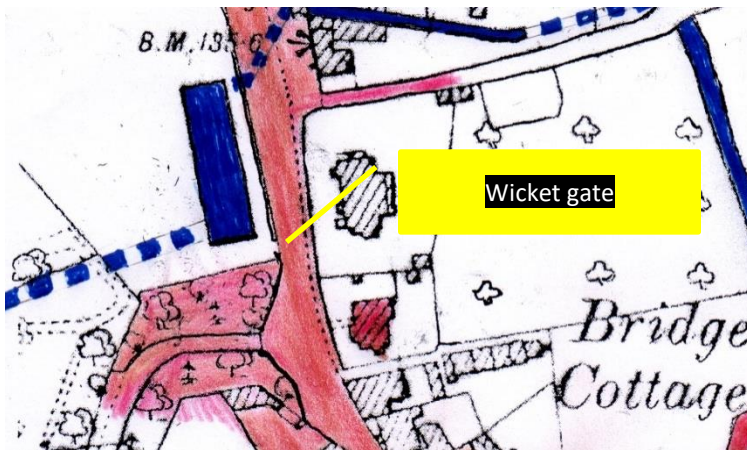
d) Hawthorn Cottage, Highwayman Cottage, Walliscote Cottage and Prospect House  
(as well as Bridge Cottages, but these are not visible from the road)



Walliscote Cottage  
(built post 1894 on a  
raised plinth so is  
some 2ft higher than  
the neighbouring

Hawthorn Cottage, Highwayman Cottage, (and Bridge Cottages behind) along with Prospect House are pre 1894 as they are below the road surface, whereas Walliscote Cottage is obviously post 1894 and is significantly above.

e) Wicket gateway for the garden of The Walled Garden House



Wicket gate

f) The Greyhound area



Figure 15 Pre 1894 photo of The Greyhound





Thus, the lower section of the High Street after 1885 effectively became a causeway, holding back flood water from the west (upstream of the weir. (Until it was breached, as in the Thames flood of 1947). - Prior to then the only escape route for floodwater was via the village watercourse that runs under the road, (for Thames flood water), or road drains, (for flash flood water).

An unintended consequence of raising the High Street has been to accentuate flash flooding in The Greyhound bowl because the higher road surface removed an escape path for surface water into the village watercourse via the pedestrian gateway of The Walled Garden House and into the pond there which is part of the village watercourse, (the iron gate opposite Walliscote Cottage).

*Needs a photo of Stan's metal gate*

Today this gateway has a step down from the High Street of some 300 mm, indicating the rise in road level circa 1885. Other evidence of the raised High Street are the low floor levels of pre 1885, buildings such as Bridge Cottages, Hawthorn Cottage, Highwayman Cottage, Prospect House as well as the low ceiling height of what were the riding stables and coach houses for the parsonage, now The Rectory Stables meeting room and Rectory Cottage.

Another unintended consequence of raising the High Street is that during a Thames flood, water from above weir height that would otherwise have flowed across the road is retained, increasing the head of water flowing from the pond in The Walled Garden House via culverts to an open ditch south of Eastfield Lane. The effect of this raised head is to make any restriction downstream more significant regards back pressure.

(The severity reduces once the "dam" of the High Street is overtopped by floodwater. The previous occurrence of that was during the major Thames flood of 1947.)

However, the rest of the High Street is itself is not entirely level as described in the following sections.

### g South of The Ferryboat Inn

Water from a burst water main just south of The Old Rectory in March 2020 provided evidence of a subtle watershed that is not obvious to the naked eye.

Some of the standing surface water ran northwards towards The Ferryboat Inn, which is not intuitive, whilst the rest went south towards The Thames, meeting the only roadside drain on the western side, thence via the road drainage system to The Thames.

In other words, the catchment area for surface water that could potentially flood the carpark of The Ferryboat (wherein lies the nearest surface water drain grille) is much larger than the carpark itself. The Ferryboat Inn's carpark drain goes to a private soakaway.

In practice, traffic coming south through the lower narrows tends to push any surface water southwards to the next roadside drain on the east, opposite The Old Rectory. Failure to keep that drain's grille clear of debris exacerbates puddling in that area, to the detriment of pedestrians who have to run the gauntlet of being splashed (like the puddles that form on the Surgery bend, (the roadside drains outside the surgery are the responsibility of the Toll Bridge as they own that part of the road.) But even if the grille of the drain opposite The Old Rectory is kept clear, not all surface water from road will enter it as the immediate road surface of the drain grille is slightly higher. Standing water in this area also makes for frequent road and kerbstone repair.

*Insert photo of burst main road repair*

**h) North of the lower narrows**

Another non-intuitive flow direction is from outside Prospect House / Eastfield Lane, where surface water runs northwards towards The Greyhound, not south to the next drain outside Highwayman Cottage. Visually it appears to run uphill, but this is an optical illusion.

**i) South of the lower narrows**

Water from a burst water main just south of The Old Rectory in March 2020 provided evidence of a subtle watershed in that area that is not obvious to the naked eye, namely water runs “uphill” towards The Ferryboat.

*Insert photo*

The 2020 flash flood demonstrated the large size of this depression, see Fig 2. It extends northwards almost as far as the Walliscote Farm entrance, south to Highwayman Cottage and eastwards to a watershed in Eastfield Lane near The Gables. Referred to as “The Greyhound bowl”. An estimated 400 m<sup>3</sup> of water accumulated there within 30 minutes and took some 2 hours to clear. Floodwater in the road came as far south as the Ferryboat Inn.



**Figure 16 shaded area is the extent of the 2020 flash flood, approx. 400 cubic metres**

This is a larger catchment area for floodwater to collect outside The Greyhound than at first sight.

The water height of the 2020 flash flood locally outside The Greyhound was similar to the 1947 Thames flood height across the entire village. This is confirmed from comparison with the 41 m benchmark and anecdotal memory of where water ran in 1947.



**Figure 17 June 2020 flash flood – the water level approximates to the Thames flood of 1947**

After the 1894 flood, chalk from the cutting that now reduces the gradient of Whitchurch hill was brought down into the village and used to raise low lying areas, including making a raised foundation for at least 3 new buildings. (The Parsonage which was rebuilt following 1894, Walliscote Cottage, and the new coach house for Thames Bank, (now Fawney and Orchard Close)

The chalk use to raise the road level had the unintended consequence of increasing the risk of flash flooding in the area of The Greyhound by closing off flash flood road drainage to the west, via the pedestrian gateway of The Walled Garden House, compounded by the fact the raised area of “the High Street” includes a significant part of Church Drive, (this looks so natural today, but the clues are there)

**Figure 18 High Street circa 1885 prior to being raised**

The flash flooding in the Greyhound area was further compounded by failure of the post 1960 road drainage system when the road drainage relied on this solely.

Evidence of this “causeway” can be seen by the lower ground level of pre 1894 buildings abutting the High Street  
Bridge Cottages  
Prospect House  
Highwayman Cottage  
Hawthorn Cottage

Mettem Cottage  
and The Greyhound itself

More subtle evidence of a raised ground level is the low ceiling and a stepdown into the Old Stables meeting rooms which itself is part of the terrace of what are now three garages, but were, pre 1894, two loose boxes for horses and a coach house. (The doors of which have been shortened and would not suffice for their original purposes <sup>17</sup>

Namely the raised High Street post 1884 now acts as a dam – or causeway, across an old river channel which forms a low part of the village. In doing so it temporarily holds back Thames flood water from above the weir. I.e., pre 1894 the old river channel would have provided a parallel escape route for floodwater from above the weir during a Thames flood and the Thames would have then flowed unimpeded eastwards along Eastfield Lane etc. (The raised High St. will continue to act as a dam until it's overwhelmed, as during the major floods of 1894 and 1947.

---

<sup>17</sup> The British Horse Society's Manual of Stable Management, (section on the design of stables). says:  
Roof Height - The roof must be high enough to provide sufficient air space, and to ensure that there is no danger of a horse hitting his head. Horses in outside looseboxes require 1600 cu ft, in barn stabling 2000 cu ft.

Stable Dimensions - 12ft x 12ft is suitable for a horse over 16hh (i.e. a large horse).  
So, for example, an outside loosebox for a large horse would need to be about 11ft high

### 3 – The Walliscote farm levee.

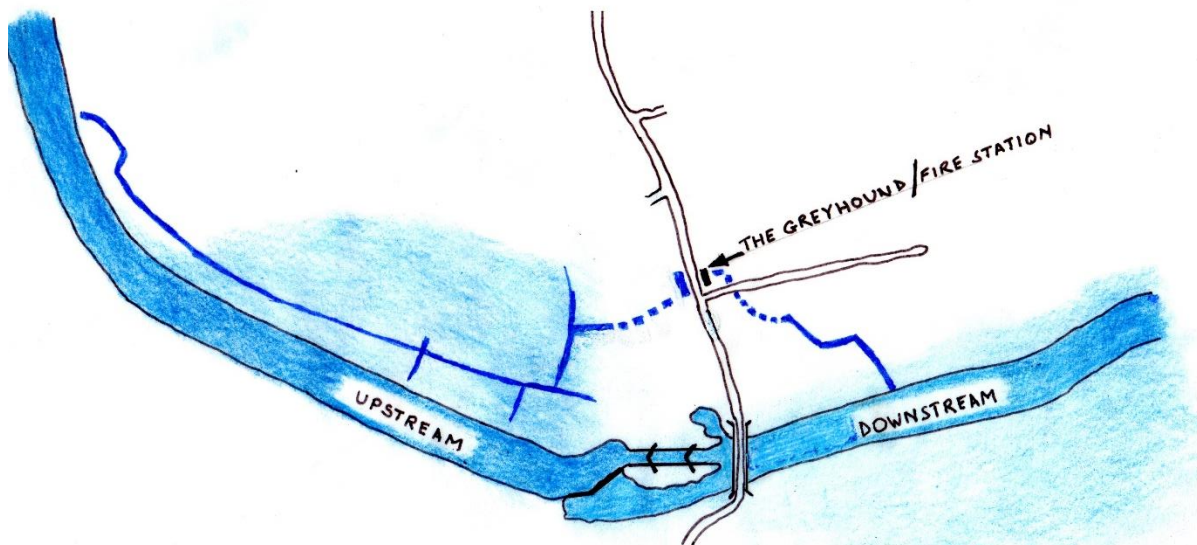
#### *Synopsis*

Upstream of the lock, a short section of the Thames is constrained within an artificial channel (becoming effectively a canal as its northern embankment is now a levee or dam).

The adjacent field in Walliscote farm is lower than the river, including water in the ditches that would have formed part of the farm's section of the village watercourse. (This levee also cuts off the post ice age Thames channel that would have drained this area)

Whenever this embankment is overtopped, (roughly a 20% flood probability or a five year event), the depression of the alternative Thames channel becomes significant, though the upstream (of weir) flood waters are then constrained by the North / South "dam" of the artificial raised High Street (post 1894 flood). Thus, until the High Street itself is overwhelmed, the only drainage route from what is in effect a lake that has formed in Walliscote Farm is via the village watercourse.

Natural drainage of this lake is further impeded by the clay subsoil in Walliscote Farm being significantly more impervious than the clay cap over gravel to the east of the High Street. Consequently the village watercourse has running water for a number of weeks after Walliscote farm is flooded.





## 4 – Groundwater table and the village watercourse, (downstream of Pluto House)

### *Synopsis*

The water level all the way from The Walled Garden House pond to the ditch in Pavilion cottage could be significantly lowered by excavating the ditch downstream of Pluto House to the Thames.

Prior to the wettest spring on record, (May 2021), and the absence of accurate ground heights, the water lying in the ditch (and culverts all the way back to the pond in the garden of The Walled Garden House) was assumed to be the natural ground table and so not influenced by downstream elevations.

However in late May 2021, the ditch started to flow of its own accord. This was despite the depression in Walliscote farm being dry. (until then, the ditch downstream of Pluto House only flowed whilst during this depression after the levee at Walliscote farm had been overtopped (20% probability flood or roughly every 5 years..

This proved that the water lying in the culverts all the way from the Pavilion Cottage / Pluto House boundary, including the pond in The Walled Garden House is higher than the Thames.

Or conversely, if the ditch downstream of Pluto House were lowered along its entire length to that of the Thames's usual height, the ground table in the immediate area would be significantly lowered.

### Earlier height references

An accurate height reference for the exit of the final culvert would have shown why water is retained here, months after flooding. Namely the entire length of the ditch downstream Pluto House to the Thames needs lowering by circa 300 mm.

Up till now it had been

Insert ditch water level based on 2014 photos

### What feeds the ground water table?

A clue to the reason for the long time it took for the groundwater table to drop was a flood alert given in May 2020 for the East Hagbourne / East Ilsley area, despite it being the driest May on record. This drew attention to the slow percolation of rainwater from higher ground that was keeping the local water table high, thus rendering the area liable to flooding. (In the case of Pavilion Cottage water table, rainfall that fell at Crays Pond continuing to arrive months later).

Extract from the BBC News 13 May 2020

Flood alert

**Areas affected:** Groundwater flooding in West Ilsley, East Ilsley, Compton, Chilton and West Hagbourne

#### **Flooding is possible - be prepared**

Groundwater levels have slightly declined but remain high at our observation site, Hodcott borehole, in the West Ilsley, East Ilsley and Compton area. Groundwater levels in this area are still at a level where communities remain at risk from groundwater flooding if prolonged heavy rainfall is observed. We issued a groundwater flood alert on 13 February 2020 for the areas at risk of groundwater flooding, and this will remain in force. The weather forecast is for a dry

week (13 May to 20 May 2020). We continue to monitor groundwater levels and will update this message next week by 20 May 2020, or as the situation changes.

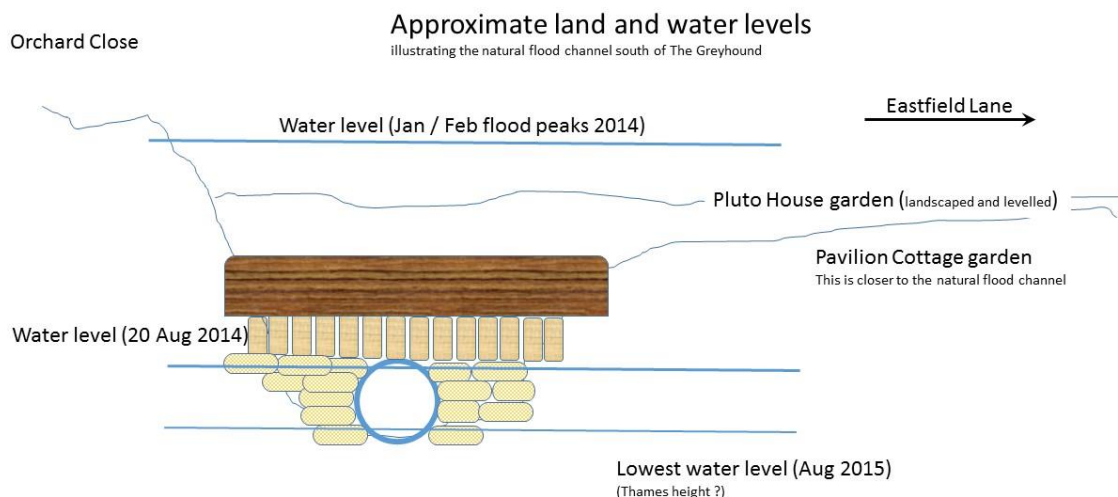
Further information and advice on groundwater flooding is available from the Environment Agency pages on gov.uk; <https://www.gov.uk/government/collections/groundwater-current-status-and-flood-risk>

### **Retention of a high ground water table**

After the 2014 event, once The Thames had dropped to its normal level, a high water table remained visible in the ditch in Pavilion Cottage's garden, see photo. The lying water was high enough to cover the most of the exit of the 450 mm dia culvert extended from the earlier SODC installed culvert.







Failure to maintain a gradient to the Thames once the flood had receded is significant factor in lowering the local water table. I.e., if the downstream ditch all the way to the Thames was lowered by circa 300 mm there would not be lying water in the culverts south of Eastfield Lane, with corresponding lowering of the ground water table in the immediate vicinity.

(It had earlier been thought that water lying in the culvert for months after a Thames flood represented the local ground table, i.e. Thames height. Not so. In the absence of accurate height measurements it took the exceptionally wet Spring of 2021 to show that percolated ground water could flow downstream of its own accord, proving the relative height of the culvert exit at Pluto House / Pavilion Cottage is above the Thames)

*Insert photo of water lying in the culvert*

This needs to be viewed alongside other factors, one being the permeability of the adjoining sub soil, the sub surface water pressure from percolated rainfall from hills higher up, Woodcote etc. and the height of the Thames – see the separate section on “ground water table”. I.e. it’s not a simple matter of saying “if only the downstream ditch was deeper it would have prevented flooding”

Nearly a year went by before checking the water in Pavilion Cottage’s ditch again. By then the ditch had been cleared with a mini digger, lowering the ditch below the ground water table. See fig below

**Figure 19. Sketch of upstream and downstream flooding. During flooding, the village watercourse transfers upstream head water level to below the weir**

**Figure 20 2014 view of the inundation of Walliscote Farm**

The clay underlying the depression in Walliscote farm is sufficiently impervious to retain water there for weeks after the Thames subsides resulting a gentle, continuous flow along the watercourse. Due to the impervious nature of the clay in Walliscote farm, the opposite is apparent when the ground table is low. Namely the Thames is higher than the adjacent ditches in the farm.

East of the High Street the underlying geology is different. Rising groundwater appears as puddles in low lying areas following the downstream Thames height compounded by subterranean flow from higher parts of the village after long wet periods (as in Jan / Feb 2021 when puddles appeared in front gardens of properties south of Eastfield Lane i.e. puddles appearing in land higher than the village watercourse)



**Figure 21 Thames appearing as puddles in lawn 2014**

**Figure 7 Pluto House culvert exit Aug 2014 from Pavilion Cottage. Water table 5 months after the flooding. (Top of the 450 mm dia culvert is just visible)**

Even in August 2014 the high water table was also visible as puddles / damp areas in other low lying sections of the ditch further downstream. An unintended result of the high ground water was that the water in the culvert precluded using a robotic survey camera, unless the culvert was blocked off and pumped dry. That would have increased the cost significantly so the proposed discussion for a CCTV drain survey wasn't pursued with the riparian landowners.

Figure 22 Pavilion Cottage ditch clearance Dec 2014

However the bottom of the culvert exit remained flooded by approx. 100 mm of ground table water.

2021 Puddoes in the front gardens south of Eastfield Lane

This precluded using a cctv camera, but with better access from the drier ditch a closer examination of the end of the culvert in Pluto House's garden with drain rods found a partial blockage some 2 metres inboard. This may have been the cause of the backpressure, but without a full rodding, or camera survey this can't be confirmed

## 5 - Likely cause of the 2014 Eastfield Lane flooding

### *synopsis*

A partial restriction in the drainage culvert downstream of the roadside drain outside Chiltern Edge, lying somewhere between the last manhole in the rear garden of Chiltern Edge and the culvert's exit at Pluto House / Pavilion Cottage where it meets an open ditch. (Witnessed at the time of the Eastfield Lane flooding by small fountains of water from the lifting holes of that manhole cover.)

Insert sketch of rear of propertieswIn September 2015, taking advantage of a long dry spell that further lowered the water table which allowed access to the culveet exit from the ditch in Pavilion Cottage, a partial blockage was found some two metres into the culvert from its discharge to the ditch. This was cleared using drain rods, working from Pavilion Cottage's garden.

A possible cause of this blockage was a piece of chestnut paling fence found jammed amongst the leaf litter there. This could have floated in and become wedged. Due to the high local water table even at that time in mid summer the culvert had about 70 mm of standing water.



The open ditch from the culvert exit at Pavilion Cottage to the rear garden of the adjacent property, Meadowland, was subsequently cleared later in 2014 and a silt trap dug at the culvert exit.



During a similar Thames flood event in 2020, there was not a problem with backpressure causing backflow into Eastfield Lane from the connected roadside drain.

## 6 – Road drains and flooding – Eastfield Lane and the High Street

*synopsis*

### Eastfield Lane

Insert watershed ppt

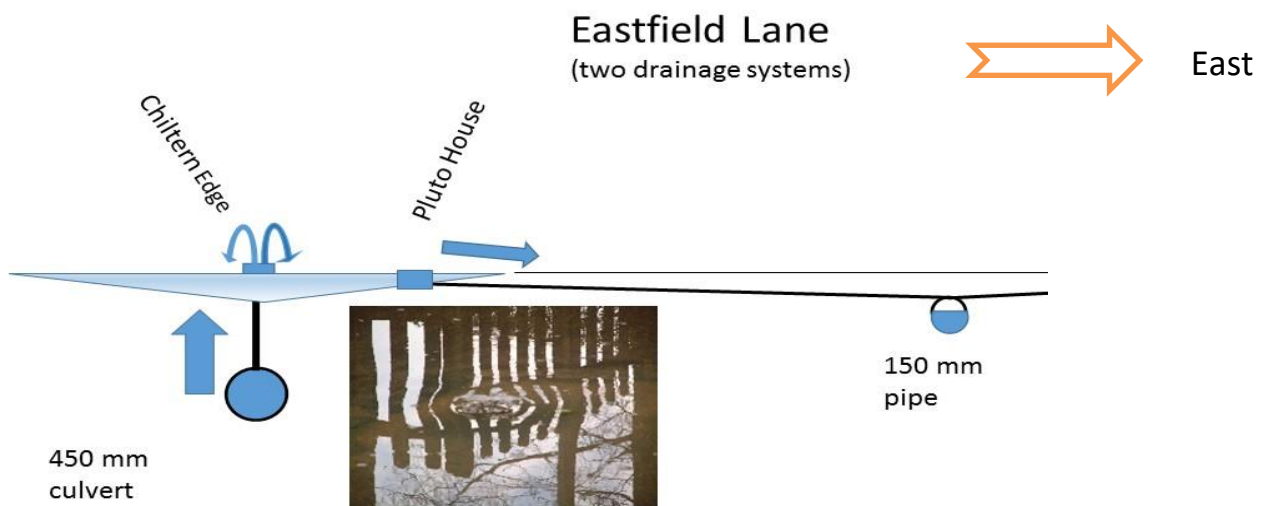
### Road drains that (today) discharge into the village watercourse

There are only two road drains in the village that feed directly into the village watercourse and they're both in Eastfield Lane.

One system consists of three gullies, two of which are on the northern side at a high point in the road so are of little interest. The third gully of this group, outside Ciltern Edge (formerly The Chevin), has twice been the cause of flooding in the area, (2003 and 2014) as its connection to the village watercourse is to an underground pipe / culvert which is transferring water at above weir height from The Walled Garden House, partly thanks to the post 1894 raising the High Street. Being a "pipe" rather than an open ditch it was able to transfer back pressure if there was a downstream restriction resulting in a backflow of above weir height floodwater into Eastfield Lane. In 2003 the flow was sufficient volume to crest a watershed outside The Gables and flood The Greyhound

*Insert sketch of the watershed*

The adjacent gully, outside the sewage pumping station / Pluto House, is the first of a string of 4 that discharge via long pipe run to the original ditch line behind Glebelands. (The other three gullies of this system are above road level so of little use.) Being unaffected by back pressure, this gully performed well .



Surface water rose from one drain, and went down the next (photo)

In reality, there are only two effective road drains in Eastfield Lane and one of these is connected to a culvert which can, if restricted, result in a back flow of above weir height water into the road. (as happened in 2003 and 2014)

### Leaf litter

Furthermore, these two important drains are easily blocked by leaf litter, because they work so well in accepting a high flow that carries with it a lot of leaf debris, for example that brought down by the summer downpour of 2020. (The High Street gullies in the area of The Greyhound were less affected by litter for the simple reason they took little flow due to their blocked pipework taking surface water to the Thames. (one of these pipes has now been replaced).



### The High Street

Pre 1894

Up to circa 1960

1960 to date

## 7 - Miscellaneous

### River levels and historical precedents

River levels during January and February 2014 are shown in the graphs in Appendix A.

Throughout the report, flood levels are quoted as ~~in~~ metres above Ordnance Datum, abbreviated to 'mAOD'. (Note, the EA website quotes flood heights minus the height of the local measuring station in an attempt to simplify matters by quoting small numbers.)

Historically, the 1947 river Thames flood has been viewed as the 1 in 100 year event, which corresponds to a 1% probability of it occurring in any one year. This exceptional event followed a sudden thaw after a winter of heavy snowfall lying on frozen ground. The melting snow could not drain into the ground and very high levels of run-off occurred.

Properties in the village flooded in 2014 experienced considerably lower levels than those of 1947. Levels in 2003 and 2007 were also of note. The highest local event occurred November 1894, caused by heavy rainfall. A flood mark for 1894 on the lock keepers cottage shows the upstream level was just beneath the window ledge. It should be noted that direct comparisons with historic floods are complicated by changes made over the years to the height and shape of river weirs and also to changes in channel shape caused by silting up and silt removal.

Ordnance Survey maps of Whitchurch show a 41 mAOD<sup>18</sup> spot height (bench mark) which is conveniently in the centre of the village, engraved on the wall of the old fire station beside The Greyhound in the High Street. See the photo below.

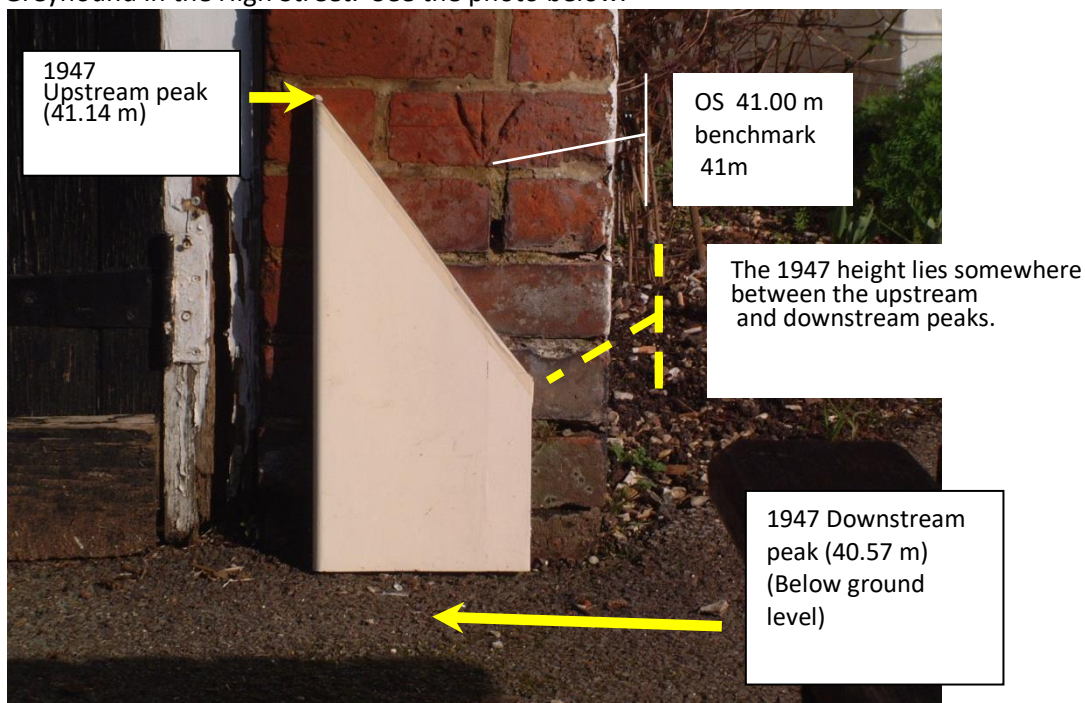


Figure 2 – Benchmark at The Greyhound.

Fig 2 above is an attempt to gauge where the water level could have come to in 1947. It could not have been lower than the downstream recording, nor higher than the upstream. An assumption that it was somewhat midway is not unreasonable.

Compare the benchmark photo with one of the 16 June 2020 flash flood below. Whilst the 2020 photo does not show the benchmark itself, the water level outside the old fire station gives an impression of what the water level may have looked like in 1947, i.e. halfway between the suggested lines in fig 2. The

<sup>18</sup> Metres above Ordnance datum



big difference was that in 1947 the floodwater would have covered a much larger area and taken a long time to subside.

In 2014 the peak levels were around 500 mm and 400 mm lower than those of 1947 so overall didn't come close to the widespread flooding of 70 years earlier. However, concentrated flash flood events can provide a glimpse of what this larger scale flooding looked like.

Ground levels can be deceptive. See Appendix C, topography

The view north along the High Street, from Prospect House towards The Greyhound, appears to be uphill, but in fact surface water runs northwards from outside Prospect House / Eastfield Lane to the southern edge of The Greyhound's car park. The above photo shows a level water line from just south of Walliscote Farm entrance to further south, indicating the High Street is in a natural depression despite the road being artificially raised in late 1800s. Further, water would have been retained in this area due to the watershed in Eastfield Lane near The Gables.

### **Insurance**

The Environment Agency encourages use of data on its website to check for flood risk by looking up a post code.

A 10% to 1% probability per year of flooding is regarded as 'severe to moderate'. In the village this 'severe to moderate' designation unfortunately includes pockets of land at 1% to 0.1% probability of flooding (water levels higher than in 1894). Insurance companies will assume all properties within the EA's post code area are likely to flood as they won't be privy to individual details, though these can vary from house to house.

Also, there are many properties that are within the EA's map of moderate to severe flood risk, but built above the 1947 level (1% probability), but because they are in the general area classed by the EA as at risk, they are likely to be declined.

The problem is to get past the insurance company's front desk, speak to their technical people and present local data. Recent planning applications will have flood risk assessment.

Sensitivity to insuring bad risks can lead to other reasons to decline cover, such as being too close to a river. A property near the art gallery in the High Street was declined cover, despite being some 20 m higher than the Thames, because they were within ½ km of it. It may be worthwhile demonstrating to your existing insurer that the risk of making a claim in the future is low, based on the events of this year as the more intelligent companies don't just use the EA data.

### **Flood risk mapping**

The Environment Agency maintains maps showing zones of flood risk. The map for Whitchurch, as presented in 2017, is shown below. Flood Zone 3 (shown in blue) shows an event of 10 years return period, while Flood Zone 3 (pale greenish-blue) is a rarer event, equivalent to 100 years return period (and exemplified by the 1947 flood). Flood Zone 1, even more extreme and equivalent to a return period of 1000 years, is not shown.

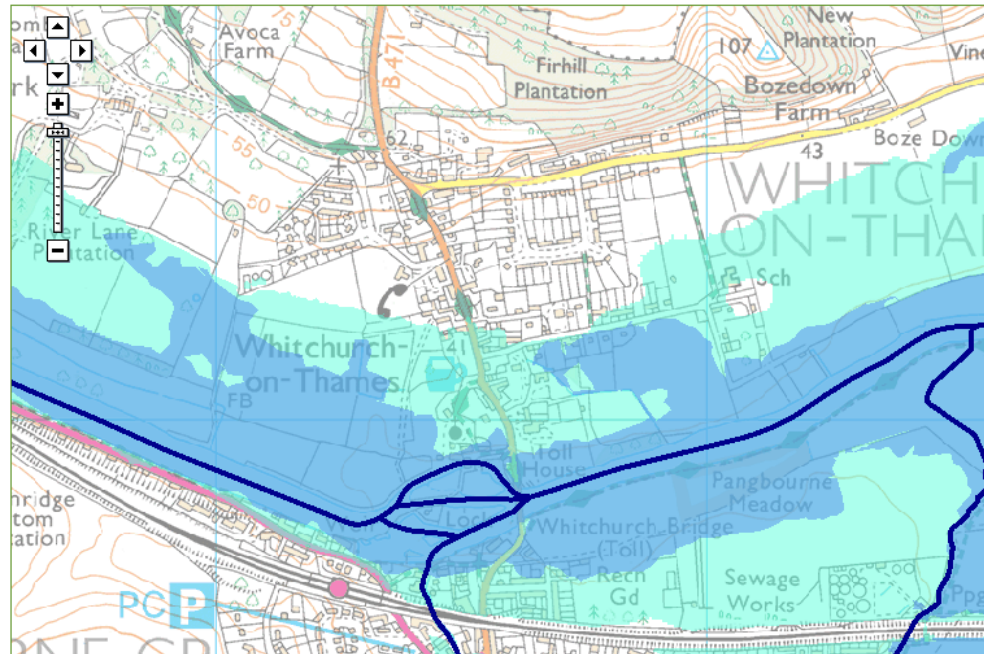
**Map legend**

Click on the map to see what Flood Zone (National Planning Policy Guidance definitions) the proposed development is in.

- Flood Map for Planning (Rivers and Sea) ⓘ
- Flood Zone 3
- Flood Zone 2
- Flood defences (Not all may be shown\*)
- Areas benefiting from flood defences (Not all may be shown\*)
- Main River Line ⓘ
- Main River Line
- Other national environmental organisations ⓘ
- Natural Resources Wales Area of responsibility
- Scottish Environment Protection Agency Area of responsibility

X: 463,577;Y: 177,181 at scale 1:10,000

Other maps ⓘ Data search ⓘ Text only version ⓘ

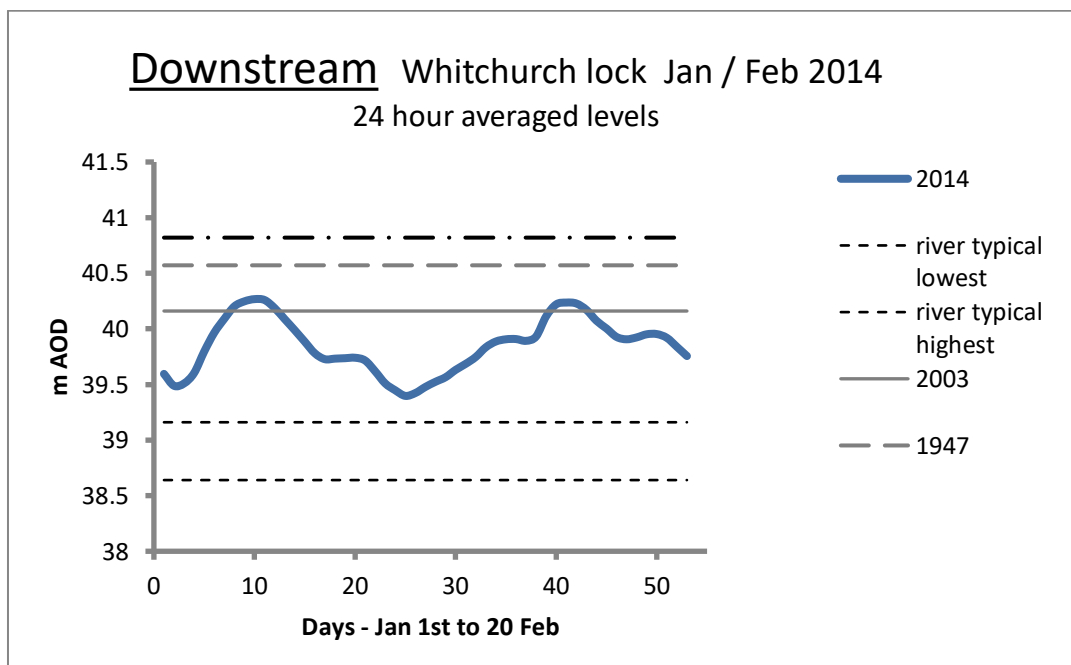


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**Figure 22 – Flood risk map**

The way the information is presented is being changed. The information is currently (2019) being given in terms of High, Medium and Low risk on maps that can be viewed at <https://flood-warning-information.service.gov.uk/long-term-flood-risk>. Two maps are available, one for flooding from rivers and one for flooding from surface water.

**Graphs of river water level**



**Figure 16 - River levels - Downstream Jan / Feb 2014**

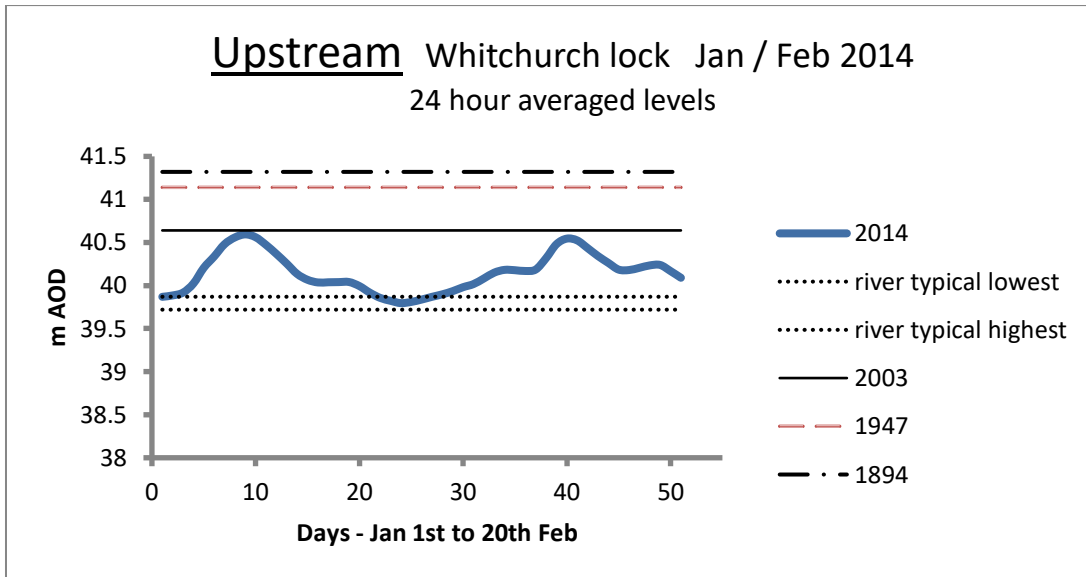


Figure 17 - River levels - Upstream Jan / Feb 2014

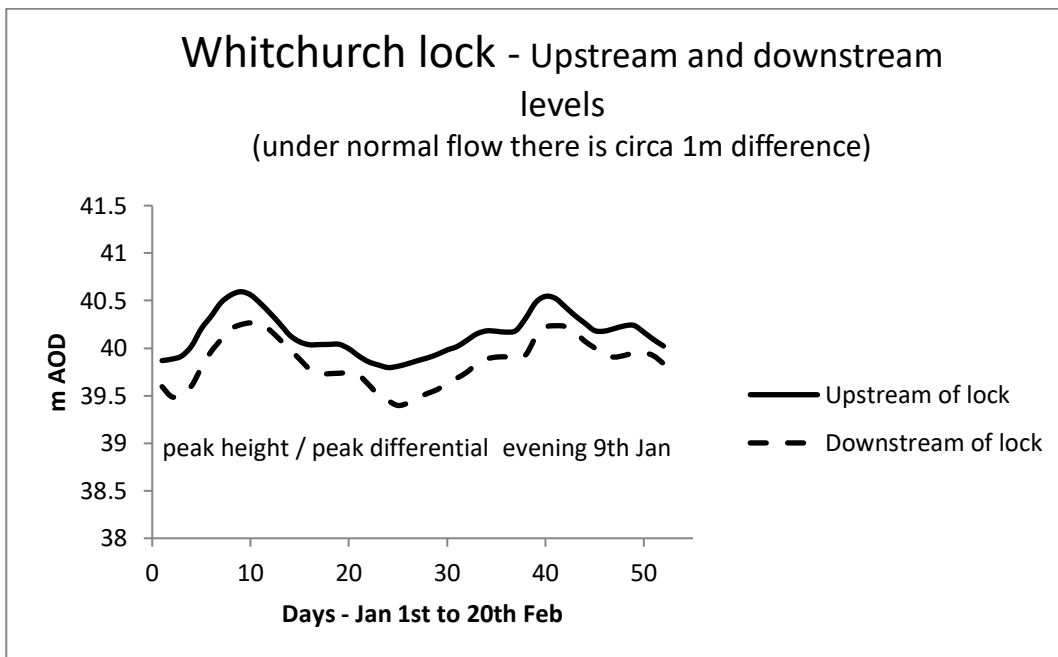


Figure 18 - River level differential during the flooding Jan / Feb. Circa 400 mm

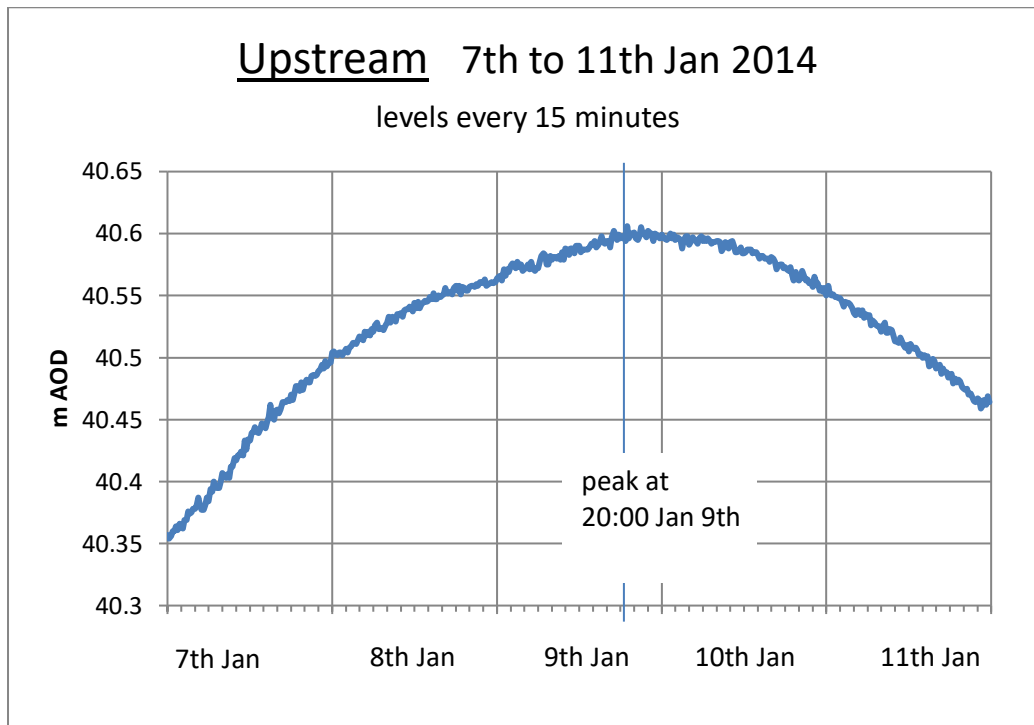


Figure 19 - Detailed River levels - Upstream 7 - 11 Jan 2014

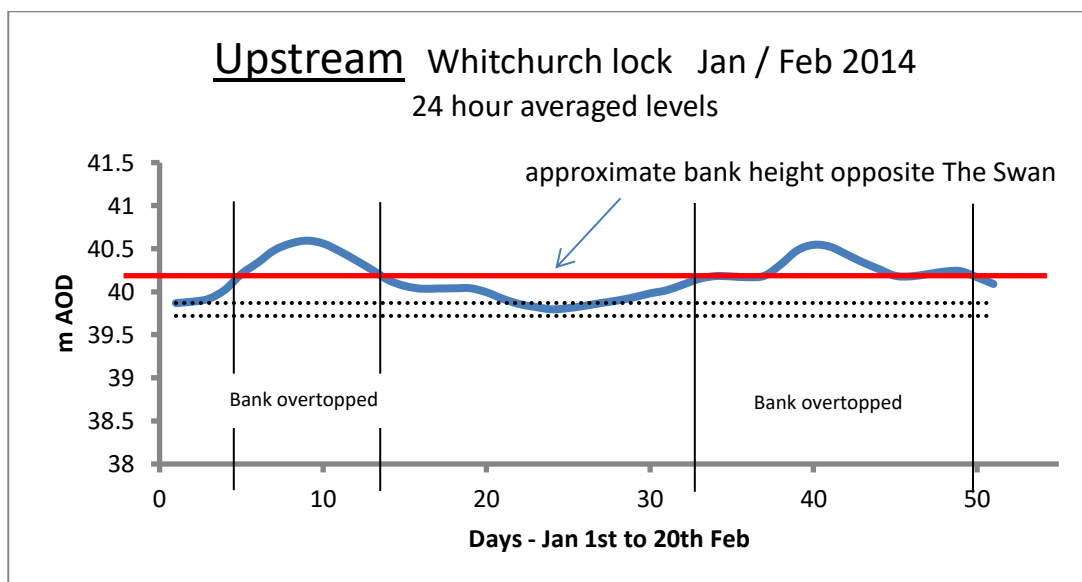


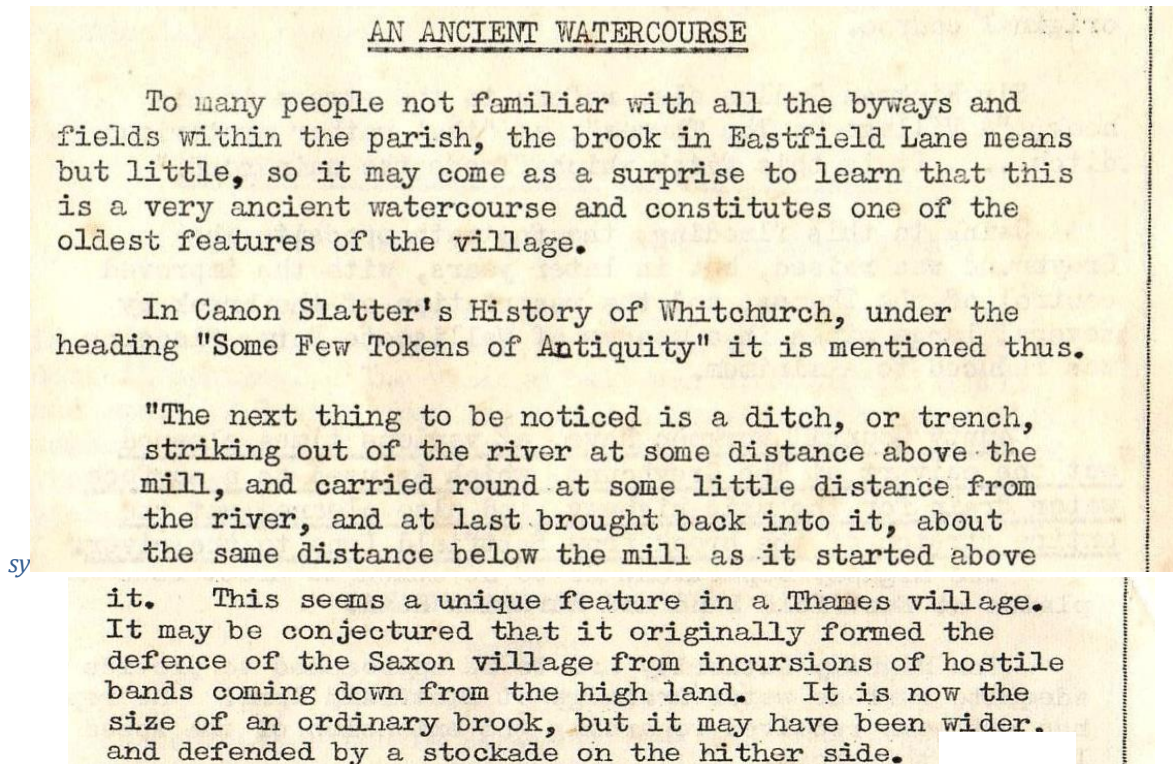
Figure 20 – periods of upstream bank overtopping. (dotted lines are the range of normal Thames height) dotted lines are range of normal Thames heights)

## Appendix A - Watercourse article from the first issue of the Bulletin, (October 1955)

### *synopsis*

Comments have been added in 2020 as some parts of the original article deserve expansion, and other details need reading with caution in light of today's practices.

Together they provide a synopsis of this artificial channel's function and hint to it being earlier than the Norman invasion.



*Before the 9 acre estate of Thames Bank was broken up in 1950 into separate plots, the estate included about a 1/4 of the downstream length of the village watercourse which predated the establishment of the Thames Bank estate and walled garden circa 1760 as witnessed by an arch in the wall of its walled garden connecting a spur to the original watercourse.*

*An intact section of this ditch further to the east is some 20 feet across and there is a row of holly trees on its inboard or hither side, (three of which are growing vigorously in full sun and exhibit several generations of growth from their rootstock, indicating their root system predates that seen above ground. (Like the lime tree at Westonbirt arboretum whose root system is at least 1000 years old, though the growth above ground having been frequently cut back over the millennia gives the impression of young tree.<sup>19</sup>*

<https://www.gazetteandherald.co.uk/news/10043199.national-arboretums-lime-is-one-of-the-oldest-trees-in-britain/>

*Suggestion of its use as a Saxon defensive boundary, importance of a hedge on the defended bank. May seem far-fetched, but not if its purpose was provide a nightly stockade against rustling, rather than marauding humans. A stout hedge of holly after a wide ditch would make a significant barrier.*

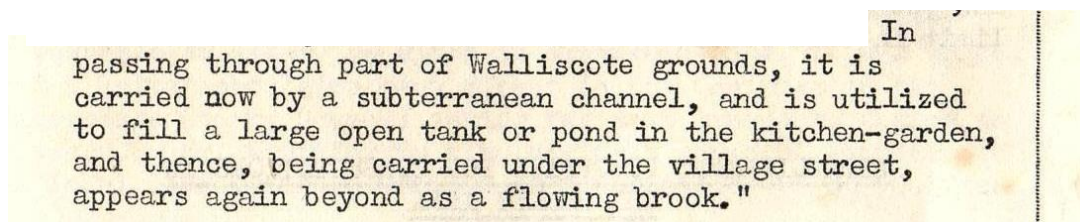
<sup>19</sup> See Appendix D for a more comprehensive explanation

The original watercourse's route, pre the pre 1905 diversion, is visible as a depression just north of the 1760's wall of Thames Bank's walled garden with a row of hollies along its southern (defended) side. *The hollies have several generations of growth from their stools. I.e. the stools pre-date what is seen above ground and could be many centuries old.*

*From old maps a large area south of Eastfield lane is shown as orchard. So why retain a row of hollies across an orchard unless they were there beforehand and it was not worth the effort to grub them out? Also the original ditch there pre-dates the 1760's wall, witnessed by a small arch in the wall.*

*So the notion of defensible area on a spur of high ground between the village watercourse and the Thames being of Saxon origin is not without merit. Perhaps a moat might be a more accurate term given its original width and as the earliest reference to a weir is 1200 ad, (the Saxon period of individual, warring tribes being 400 to 950.)*

Add photo



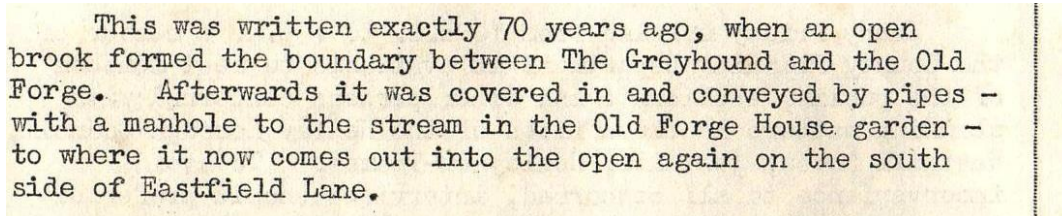
In  
passing through part of Walliscote grounds, it is carried now by a subterranean channel, and is utilized to fill a large open tank or pond in the kitchen-garden, and thence, being carried under the village street, appears again beyond as a flowing brook."

This is the first mention of part of the open ditch being diverted into a "subterranean channel" or culvert, (ignoring the two channels to get it under the High Street and Eastfield Lane that are obviously much earlier for road traffic).

Today, the village watercourse runs via some 5 underground sections and there are 13 landowners involved in ensuring it runs freely, including OCC where it crosses the highway in two places.)

The initial underground section starts in Walliscote farm and is formed of brickwork some 4ft diameter. It starts downstream of small weir at the eastern edge of the farm that retains irrigation height ditch water in the fields to the west. The culvert continues across two other properties to feed the south western corner of a large cistern or pond immediately west of the High Street.

The large open tank or pond referred to is in the garden of The Walled Garden House. It can be glimpsed through the iron gate at the southern end of that property - more on this later. (The walled garden of that property's name alluding to the walled garden of Walliscote House.) - Incidentally, the pond's water level approximates to that of the ground water table / downstream Thames height except during flood events when it follows that of the upstream level- see section in these Notes on Topography.



This was written exactly 70 years ago, when an open brook formed the boundary between The Greyhound and the Old Forge. Afterwards it was covered in and conveyed by pipes - with a manhole to the stream in the Old Forge House garden - to where it now comes out into the open again on the south side of Eastfield Lane.

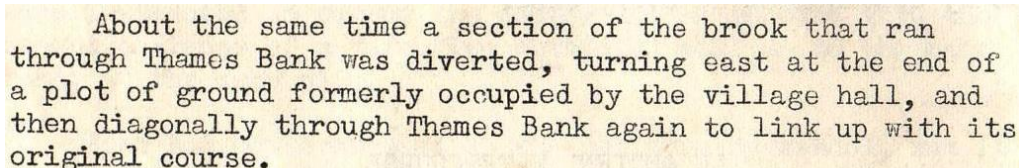
NB The text referred to in the above extract was itself written 70 years before this Bulletin article was published, i.e. October 1885.

The open ditch / boundary east of The Greyhound becoming a culvert can be traced from OS map revisions 1900 to 1910, for further details see section in these Notes titled, "The lost culvert, (Greyhound to Eastfield Lane). Appendix XXX

*The angled northern boundary of The Greyhound's land aligns with the open ditch shown on pre 1904 OS maps so it is good to have comment that the culverted section replacing the ditch forms this boundary as suspected. (as it forms the boundary, there is a shared riparian ownership).*

*No mention is made of the extensive chamber under the old fire station.*

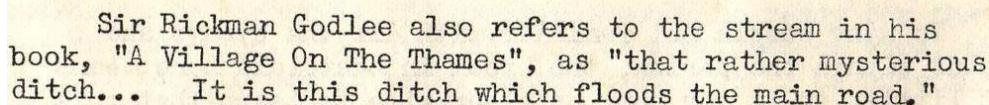
Insert photos of chamber



About the same time a section of the brook that ran through Thames Bank was diverted, turning east at the end of a plot of ground formerly occupied by the village hall, and then diagonally through Thames Bank again to link up with its original course.

*From earlier OS maps the diversion made across the orchard of the Thames Bank estate can be dated between 1900 and 1910. The diverted channel was much narrower than the original ditch still evident further east and the last spade depth of the new diversion had elm plank lining to the lower sides, (this is still evident in places)*

*The original village hall was situated in an area occupied today by Chiltern Edge and Pluto House. One result of the diversion is that the riding stables for Thames Bank, now Thames Bank Cottage, and the walled garden of the Thames Bank estate are no longer shown as receiving water from the ditch.*



Sir Rickman Godlee also refers to the stream in his book, "A Village On The Thames", as "that rather mysterious ditch... It is this ditch which floods the main road."

Not so.

Godlee's statement: - "It is this ditch which floods the main road" does not stand up to scrutiny.

To flood the road, water must get above the road level. But the top of the ditch's banks are lower than the road. (even allowing for the infill of some 700 mm in this area in 1896).

The ditch banks will only become over topped during a severe, or 1% probability, flood as in 1894 and 1947 for example. (by which time any ditch / culvert is under water anyway so of no influence)

Note The Greyhound area is about the same height as the lock keeper's cottage so flooding from the Thames and covering the road only happens when the lock island itself is overwhelmed, as happened in 1894 and 1947 (and almost in 2003). Prior to that the village watercourse acts as a modest flood relief channel, i.e. the opposite of Godlee's statement

To summarise, Godlee is wrong for two reasons and his quote needs firmly rebutting.

- 1) The culvert taking the village watercourse under the High Street is significantly lower than the road, see front cover. It transfers water from the pond to the west to, (at the time of Godlee's book), an open ditch to the east. The High Street will only flood when the Thames exceeds the height of the High Street, (1894 and 1947), by which time any flow along the culvert becomes academic and prior to that, the village watercourse is acting as a flood relief channel.
- 2) The ditch can overflow and flood the surrounding land if it is blocked, but can only flood to the height of the water that is flowing into it. See above.

Owing to this flooding, the footpath opposite The Greyhound was raised, but in later years, with the improved control of the Thames, and the restriction of the brook by several large pipes in a meadow of Walliscote Farm, flooding was reduced to a minimum.

*This is where it gets complicated, again Godlee's account is questionable.*

*When the road was raised circa 1896 (and for a considerable length) it then formed a causeway some 700 mm high across what is a silted up alternative Thames flood relief channel).*

*The effect of the causeway is to increase the probability of flooding along the lines that Godlee suggests, as the higher level of the road will hold back water on the western side, resulting in flooding of land west of the High Street thus raising the head of water coming east via the culvert under the road. This is especially true given the "levelling" earthworks going extensively along Church Drive (Despite some water escaping via the village watercourse through the culvert under the High Street.)*

*Work to fill these low lying areas of the High Street occurred circa 1896 when the gradient approaching the top of Whitchurch hill was reduced by making the cutting above the war memorial. The chalk from there was brought down and used to flatten a shallow depression in the High Street running from just south of Walliscote farm entrance to Thames Bank that was originally a natural flood relief channel north of the Thames.*

*Evidence of this is witnessed by pre 1896 properties along the High Street now at a lower elevation to the road surface and post 1896 buildings above it, Hawthorn Cottage vs Walliscote cottage. (Subtle evidence is also the low ceiling height of what were the stables and coach house of "the parsonage" as well as the lower floor level of what is now the Rectory Stables meeting room.*

*Observations to the west showing the extent of the 1896 levelling are more subtle, unlike those to the east i.e. the obvious height differences of Hawthorn Cottage vs Walliscote cottage as they are not immediately apparent.*

#### **Raising the footpath opposite the Greyhound.**

*The article gives the impression that the raised "footpath" had the effect of reducing the flow of floodwater into Eastfield Lane, which it did, but this is not the whole picture.*

*Further, it was the entire road that was raised, not just the footpath. A long section of the High Street was raised along with part of Church Drive and The Rectory stable area. This happened circa 1886 using chalk from the cutting at the top of Whitchurch hill. The raised area runs from just south of Walliscote Farm entrance to Thames Bank, and in places adds almost a metre to the original ground height.*

*The comment ignores the significantly lower depth of the village watercourse where it goes under the High Street, so any further raising of the road /footpath has no effect on the flooding that Godlee blames on the "mysterious ditch", which in itself didn't cause flooding anyway, it just flowed at the same rate even in flood conditions – (sort of, but too complicated to explain here.)*

*What is not mentioned in the article is the interaction that the raising of ground level had on surface water drainage (road) and Thames flooding into what we refer to as the Greyhound bowl.*

*Namely the raised High Street post 1886 now acts as a dam – or causeway, across an old river channel which forms a low part of the village. In doing so this dam holds back Thames flood water from above the weir. I.e., pre 1885 the old river channel would have provided a parallel escape route for floodwater from above the weir during a Thames flood and the Thames would have then flowed unimpeded eastwards along Eastfield Lane etc. (The raised High St. will continue to act as a dam until it's overwhelmed, as during the Thames floods of 1894 and 1947.*

*As the heights of the 1947 flood demonstrate, the Greyhound is quite low, roughly the same elevation as the lock keeper's cottage, providing evidence of the depth of this old channel.*



*(Richard has earlier pointed out that when the river starts to flood, the weir's downstream and upstream heights start to converge such that by the time the raised High Street is overwhelmed (1947 etc.) and floods into the Greyhound bowl it will meet water from below the weir that is by then only a few hundred millimetres different in height.*

*Whilst raising the height of the High Street circa 1885 holds back Thames floodwater until overwhelmed, it also has the perverse effect of increasing the potential for flash flooding in the Greyhound bowl area. Prior to 1885, excess surface water coming down the hill could flow unhindered westwards, into the pond in The Walled Garden House garden via its wicket gate near Church Drive, (thence under the High St. via the village watercourse to the Thames). The scale of both the raised road and footpath are evident immediately looking west through this gate. See attached photo that regret doesn't do justice to the significant height drop from what is now the pavement due to vegetation obscuring the lower ground level in the garden of The Walled Garden House.*

*Needs expanding or referring to later notes*

*Flattening (raising) the High Street has had several unintended consequences:-*

*The dam it created retains Thames floodwater upstream of the High Street except during severe floods as in 1894 and 1947, (notional 1% probability events), when the High Street becomes overwhelmed.*

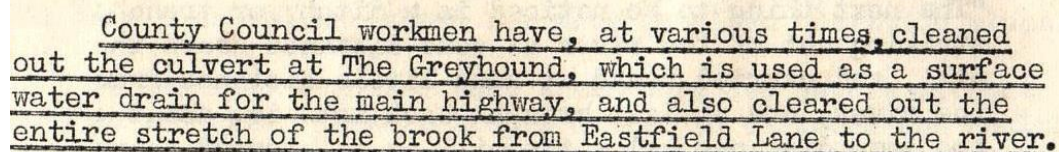
*The effect of the retained water is to increase the pressure in the culvert under the road along with the section laid underground from 1905 so this increased head that as transferred all along the underground sections until it met an open ditch, which until about 35 years ago was immediately south of Eastfield Lane*

*Aggravate road flooding during flash flood events as the water's escape route to the west is restricted so the road water run-off is now dependant on road drainage pipework taking it to the Thames installed in 1960. (Prior to 1960 road drainage in the Greyhound area entered the village watercourse at the chamber beneath the old fire station.)*

***Using the village watercourse as a supplementary road drainage / flash flood channel.***

*Unlikely this approach would be permitted today due to the road water runoff with its associated vehicular pollutants entering the pond in The Walled Garden House, and gardens downstream. (Emergency drainage outside The Greyhound by raising a cover to this chamber may be another matter)*

1)



County Council workmen have, at various times, cleaned out the culvert at The Greyhound, which is used as a surface water drain for the main highway, and also cleared out the entire stretch of the brook from Eastfield Lane to the river.

*This statement has two aspects, neither of which are relevant today, but for different reasons.*

*The first part of the sentence refers to the village watercourse being used as a "surface water drain for the main highway" and so the "interceptor chamber under the old fire station" requiring clearing out.*

*This statement was correct when this article was written in 1955 as up until 1960, road drainage from the High Street down to The Greyhound was directed into the Thames via the village watercourse, entering the village watercourse at the much earlier constructed chamber under the old fire station, witnessed by the 12" salt glazed pipe being retrospectively entering the brickwork of that chamber. As a result this chamber would accumulate silt up carried down the High Street from road water runoff.*

*Clearing the accumulated silt would be the responsibility of the highways authority as at that time the chamber formed part of the road drainage system.*

*Circa early 1960 an enlarged surface water drain to the Thames was laid along the western side of the High Street with cross connection pipework taking water from the four gullies outside The Greyhound, making use of the village watercourse (via the chamber under the old fire station. That pipework running across High Street has had a history of failures, evident from abandoned pipework seen as repairs in the road.*

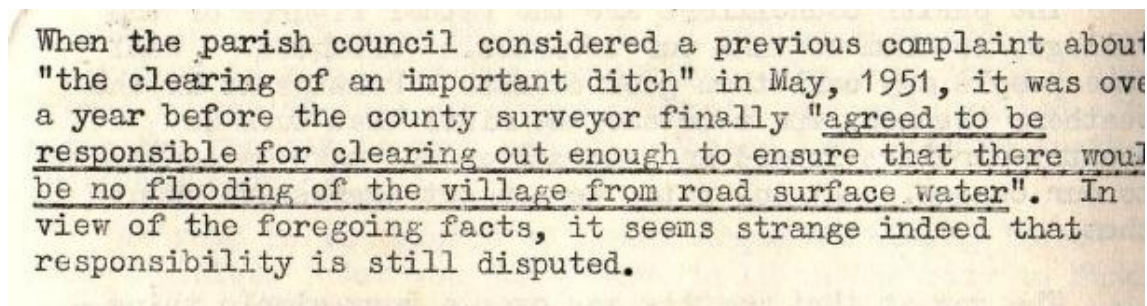
Failure of the current pipework across the High Street dates from before 2003, witness standing water seen in fig XXXX. Failure of the cross High Street pipework has been a contributory factor in flooding of The Greyhound on numerous occasions since. (OCC plan to take remedial action in 2021).

The post 1960 road drainage system does incorporate an interceptor chamber. This is outside Mill Drive almost before it reaches the Thames and at the end of a long run with little fall resulting in significant silt deposition along a circa 150 metre long pipe of only 350 mm bore. The chamber and length of pipework required several days work to clear in 2020.

Maintenance of the chamber at Mill Drive is not helped by a 100 mm dia foul sewer pipe retrospectively being placed in 1960 running through the middle of it. (The village's sewage treatment plant was installed in 1960 making individual cess pits and septic tank installations redundant)

2 "and also cleared out the entire stretch of the brook from Eastfield Lane to the river."

This would not happen today as it is on private land. OCC are quite blunt on who does what. OCC's responsibility is solely to identify the responsible (riparian) land owner as below.



When the parish council considered a previous complaint about "the clearing of an important ditch" in May, 1951, it was over a year before the county surveyor finally "agreed to be responsible for clearing out enough to ensure that there would be no flooding of the village from road surface water". In view of the foregoing facts, it seems strange indeed that responsibility is still disputed.

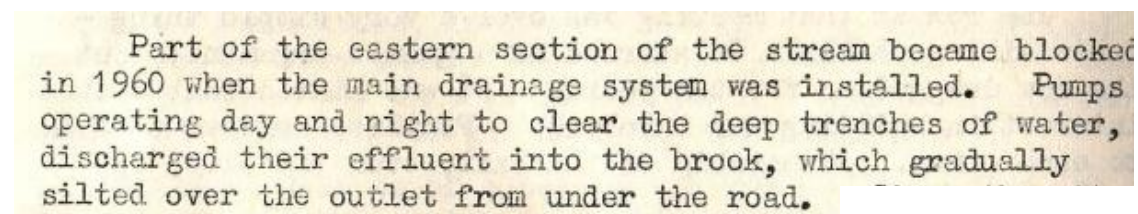
SODC clearing the watercourse !

Municipal bodies would not do this today unless certain of recompense from the landowner – or using their statutory powers (as with The Chevin in 2004), thence suing.

Extract from OCC's web site.

"Oxfordshire County Council is responsible for coordinating the management of [flood risk from surface water](#), groundwater and ordinary watercourses. However this does not mean that they can or will undertake works to fix a flooding issue, but they can investigate to find out who the Riparian Owner is and therefore who is responsible; and advise on potential solutions. The cost of any works to fix these flooding issues will be charged back to the responsible person or organisation. "

The article's last para requires interpretation and only the first two sentences are historically relevant as the temporary blockage was subsequently cleared



Part of the eastern section of the stream became blocked in 1960 when the main drainage system was installed. Pumps operating day and night to clear the deep trenches of water, discharged their effluent into the brook, which gradually silted over the outlet from under the road.

The clue as to which part of the eastern section of the village watercourse this paragraph refers to is the word "stream" and the phrase "silted over the outlet from under the road". These can only refer to where the village watercourse became an open ditch, immediately south of Eastfield Lane in an area that formerly housed the village hall, subsequently developed as a bungalow called The Chevin, now Chiltern Edge and Pluto House.

*The excavations were for the new sewer to the village's new pumping station, (situated behind fencing outside Pluto House) This collects gravity fed effluent from the low parts of the village and pumps it to the village's treatment plant in Manor Road)*

*Apart from deep pipework along the centre of Eastfield Lane, witness the unique clover leaf shaped covers, here is an even deeper pit for the pumping station's collection sump.  
A quirk of local geology is that the immediate area*

*The works referred to in the Bulletin article were in an old Thames flood channel, and by chance in an area of pervious ground so the pumps had to keep pace with Thames level water running in from the adjacent ground water, hence high volume pumps and 24/7 operation bringing up a lot of silt with the water.*

*Further west and east the clay topping is more impervious, see notes on geology*

*(The large sewer along the centre of Eastfield Lane goes under the culvert carrying the village watercourse across the road.)*

*Some modern footnotes*

*An option today would be to freeze the area to prevent in-rush of groundwater.  
For those living near the Thames, shallow wells can easily provide 50,000 litres / day.*

*No longer is it a swift running brook, abounding with a bustling family of wild life and the haunt of kingfishers. Gone, too, are many hours of enjoyment for our junior tiddler catchers! An absorbing recreation still as much appreciated today as by countless generations before.*

*The route today goes across numerous private gardens*

*In addition, an effective drain for the flooded meadows on both sides of the lock will be lost, leaving these pastures waterlogged for unnecessarily long periods. It is to be hoped, therefore, that our efforts to restore this ancient watercourse to its former condition will eventually be rewarded.*

*Obviously the silted ditch was cleared when the sewage works were completed.*

*The village watercourse was multi-purpose. In addition to field irrigation and drainage, it provided running water for Walliscote Farm to properties including stables and for the convenience of any cottage industries in the village that lie some distance from the Thames. It is also likely to have collected some foul drainage in its passage through the village.*

*Today, the village watercourse has two important functions. First, it conveys a little road surface water from Eastfield Lane to the Thames.*

*Second, it drains the large depression in Walliscote Farm when this fills with floodwater, which has happened recently about every five years when the Thames overtops its bank, see fig....*

*This lake draining process can continue for weeks after the Thames itself has subsided due to the impervious nature of the underlying clay at this point. Under normal river conditions there is now no flow to the watercourse but the lowest lying parts of the depression are lower than the ground water table and so remain as puddles or muddy areas even after a prolonged dry period. The groundwater table tends to reflect the river level to which it is connected via permeable river gravels.*

## Appendix B – Responsibility for watercourses

### *synopsis*

Owners of land with a watercourse have a duty to ensure it is free flowing. The local authority has no involvement.

Both SODC and OCC have powers to enter private property to rectify flooding problems from surface water, subsequently recovering their costs, (and legal fees if needs be), by civil action.

SODC invoked their power of entry to carry out works after the Thames flood of 2003 inundated The Greyhound. The cause of that flood was an amateur installed culvert south of Eastfield Lane in the grounds of The Chevin, (now redeveloped ad Chiltern Edge), (Mr Burningham’s pipe). SODC replaced this section with a professionally installed system of 450 mm bore, including three inspection chambers which terminated at the boundary with Pluto House.

Insert sketch map

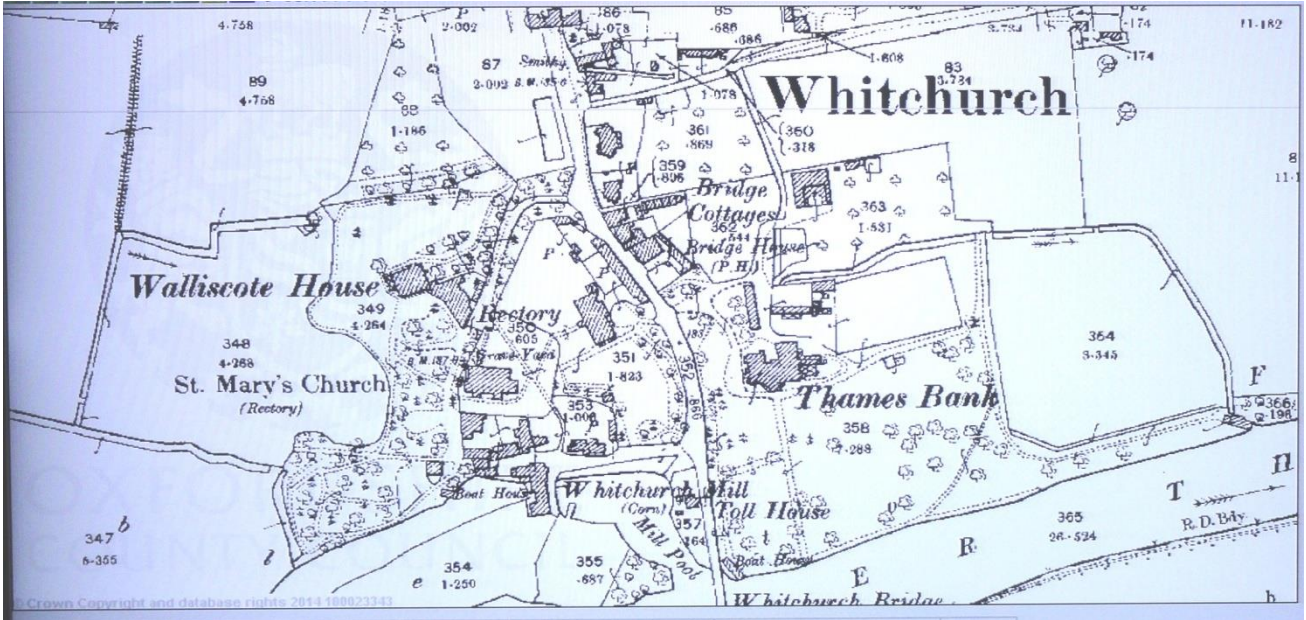
SODC’s website has a long article on riparian responsibilities, but OCC’s web site comment is more concise, extract below.

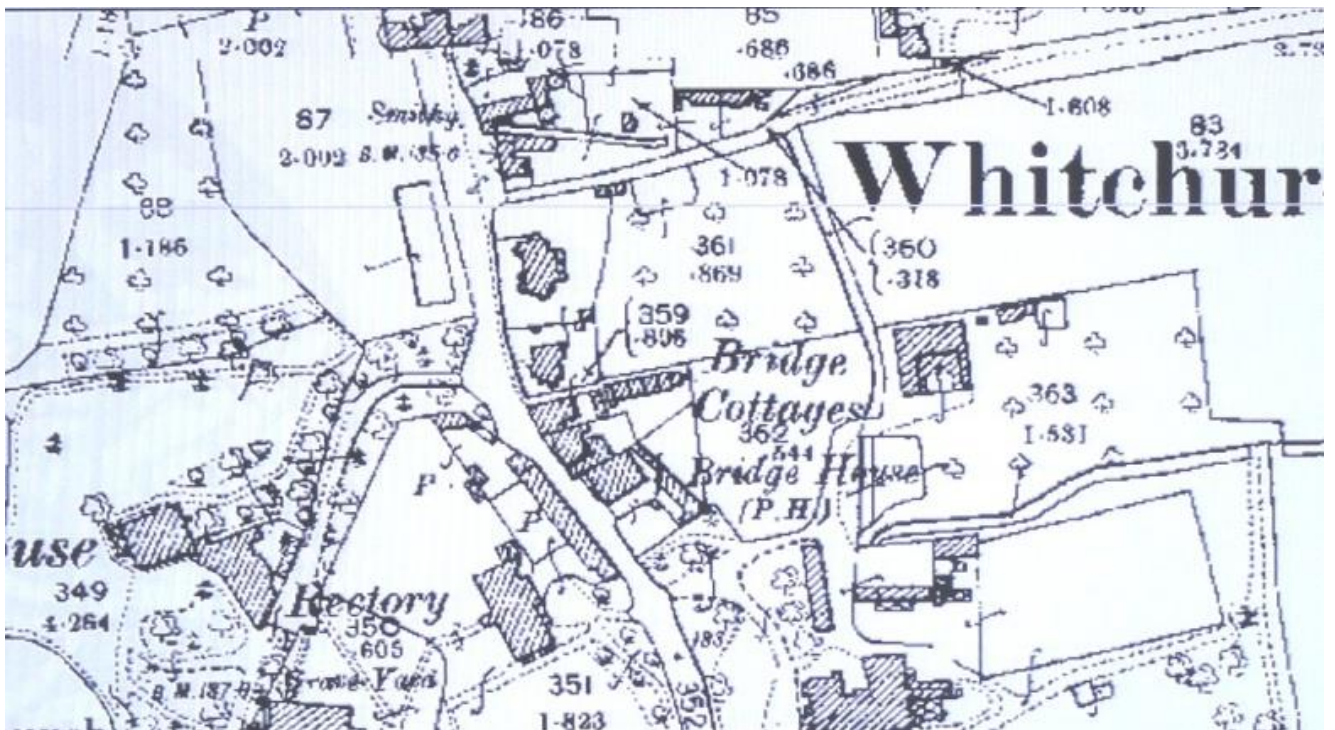
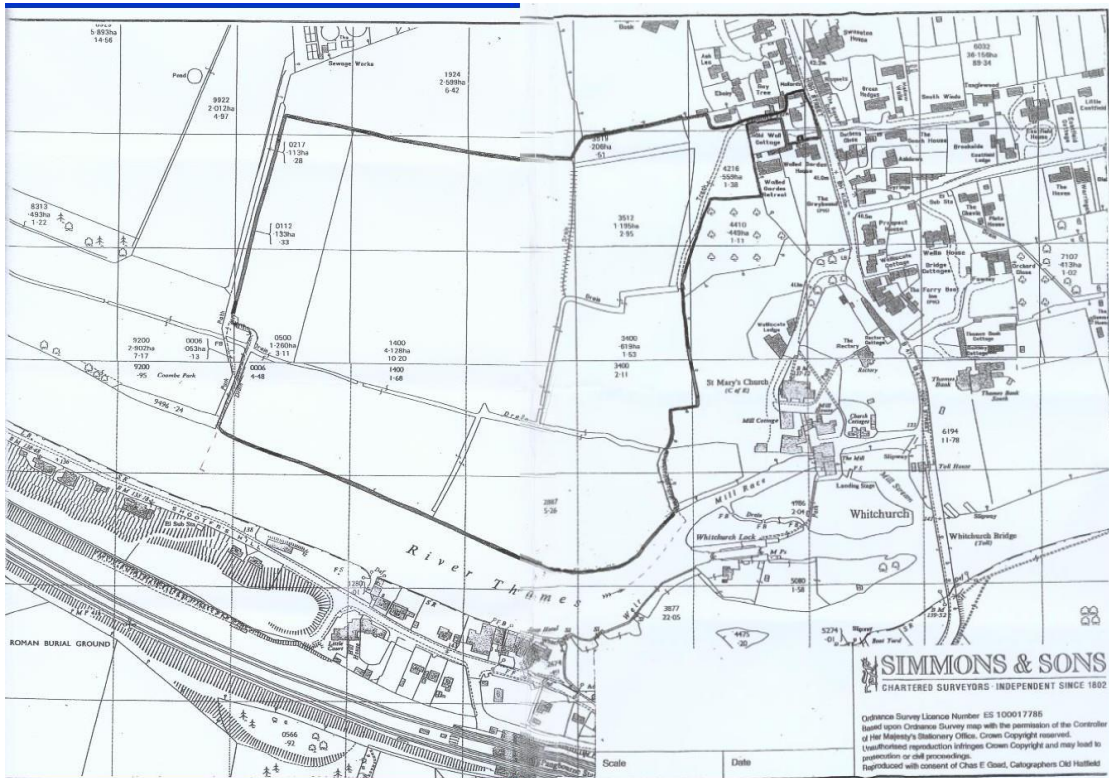
*“Oxfordshire County Council is responsible for coordinating the management of [flood risk from surface water](#), groundwater and ordinary watercourses. However this does not mean that they can or will undertake works to fix a flooding issue, but they can investigate to find out who the Riparian Owner is and therefore who is responsible; and advise on potential solutions. The cost of any works to fix these flooding issues will be charged back to the responsible person or organisation.”*

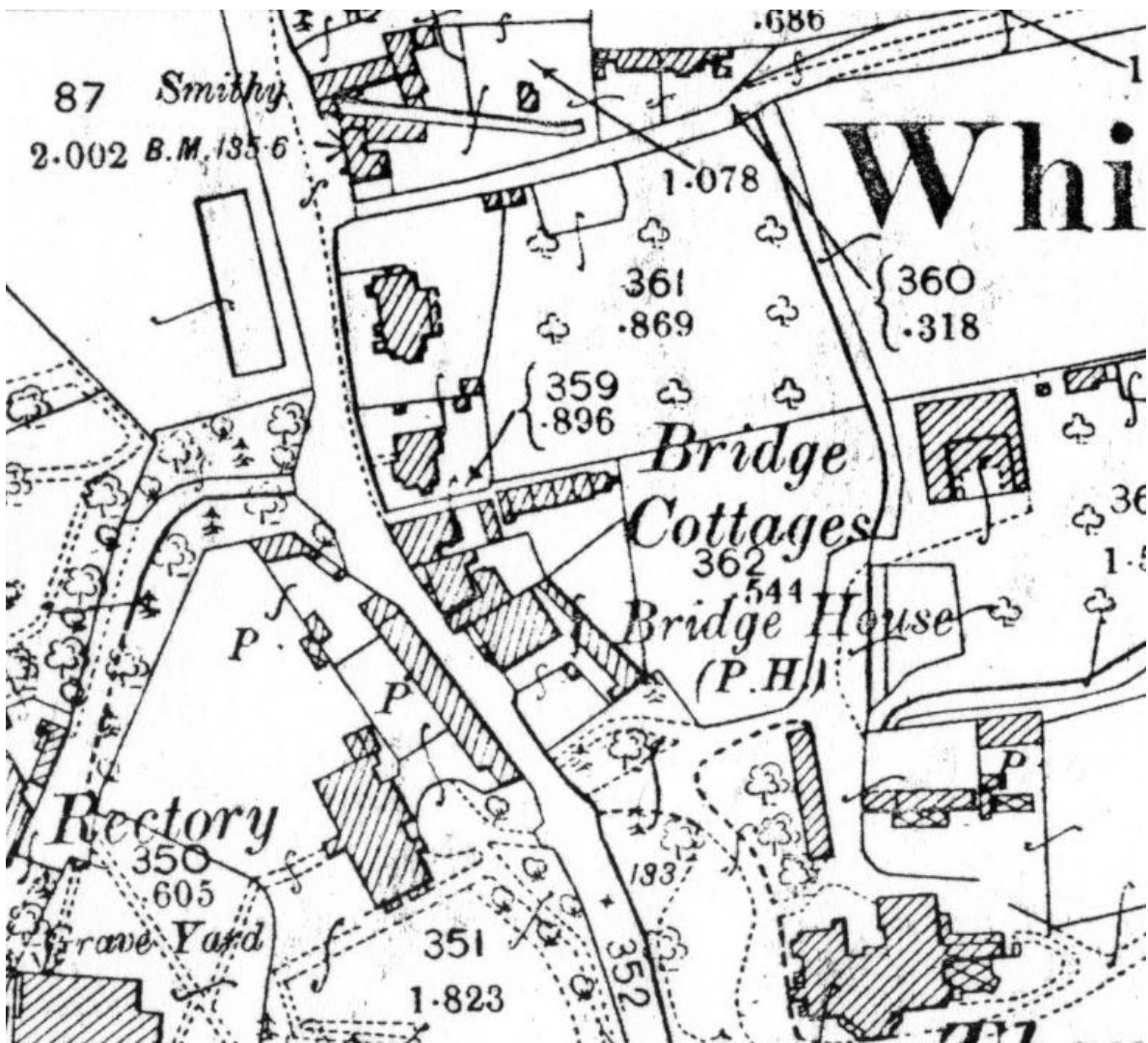
# Appendix C – old maps

## Synopsis

Extracts from these maps appear within the report. For historical reference the full maps are repeated here.

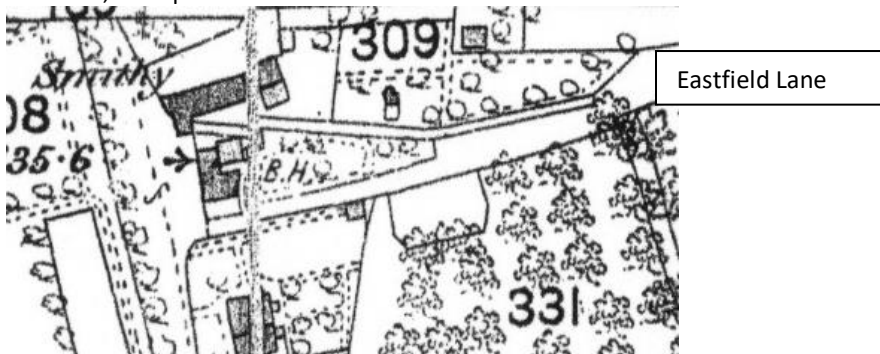






asDraft for 2014 flood report, Appendix No. ? **RMW thoughts marked, 5.3.20**

Pre 1899, the open ditch ran from north of the old fire station to Eastfield Lane





Notes

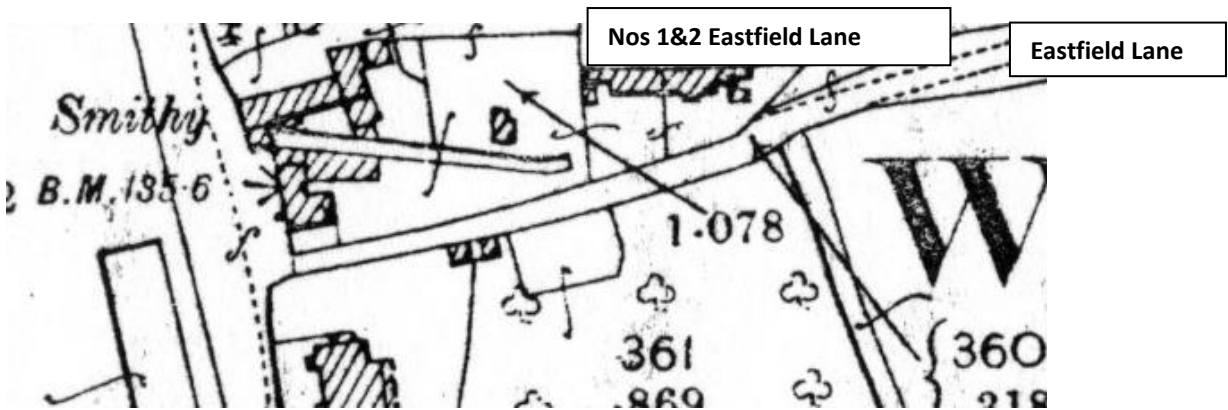
A bench mark (height above sea level), is shown by the arrow on the old fire station, see photo - fig ???  
The open ditch, (east of the High Street), starts north of the old fire station with its headwall close to the High Street.

The ornamental pond (forming part of the watercourse’s route) in what is now “The Walled Garden House”, west of the High Street, is shown – the exit of which, (see photo – fig XXX), may cross the High Street diagonally northwards into what has been termed a silt trap, an unusually large chamber in front of and beneath the old fire station. The pond level seems to be weir controlled

East of the High Street it’s shown as two straight lines, the easternmost part running parallel with Eastfield Lane, and its western leg aligns with the skewed northern boundary of “The Greyhound’s “ beer garden.

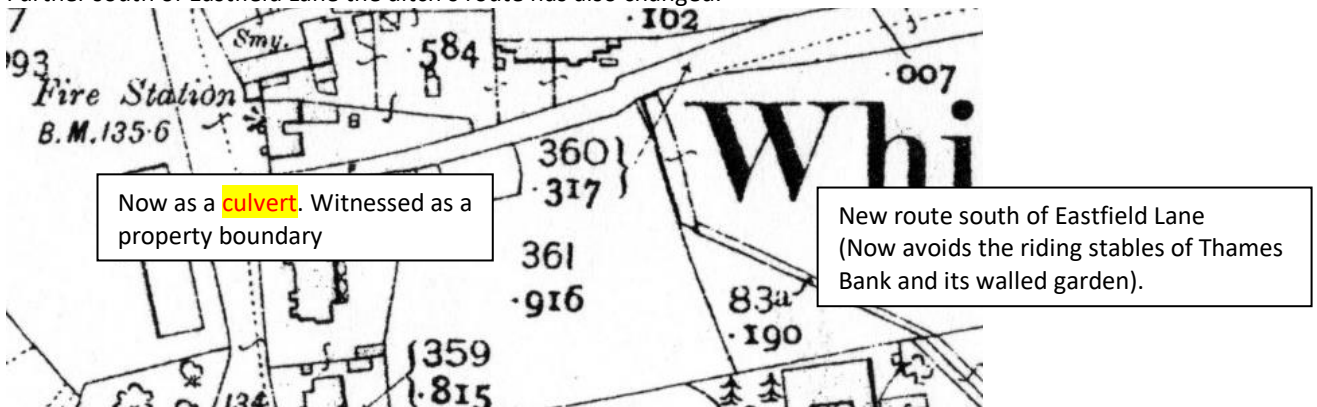
1899 map

Following the building of 1 & 2 Eastfield Lane circa 1890, (Can they be labelled on the map?) the ditch became a culvert beneath their front gardens before crossing under Eastfield Lane to re-appear as an open ditch. see map below



1910 map revision

North of Eastfield Lane it is now all culverted. (and is shown as the northern boundary of the Greyhound’s garden). Further south of Eastfield Lane the ditch’s route has also changed.



## Watercourse downstream of the High Street, Whitchurch-on-Thames

### Summary

Pre 1899, this section of the village watercourse was a ditch crossing open fields until it went under Eastfield Lane, between what is today No.2 Eastfield Lane and Chiltern Edge.

Piecemeal development along its route resulted in the ditch's complete enclosure from The Greyhound to Eastfield Lane. The sequence of it becoming a culvert is seen in OS map revisions.

Of note :-

- Its exact route is not known, (except from OS maps).
- It's not listed in planning databases, so doesn't show up in conveyancing searches, nor in planning applications.
- It may not be maintainable, (no visible access points).

### Earliest map (pre 1899)



#### Map observations

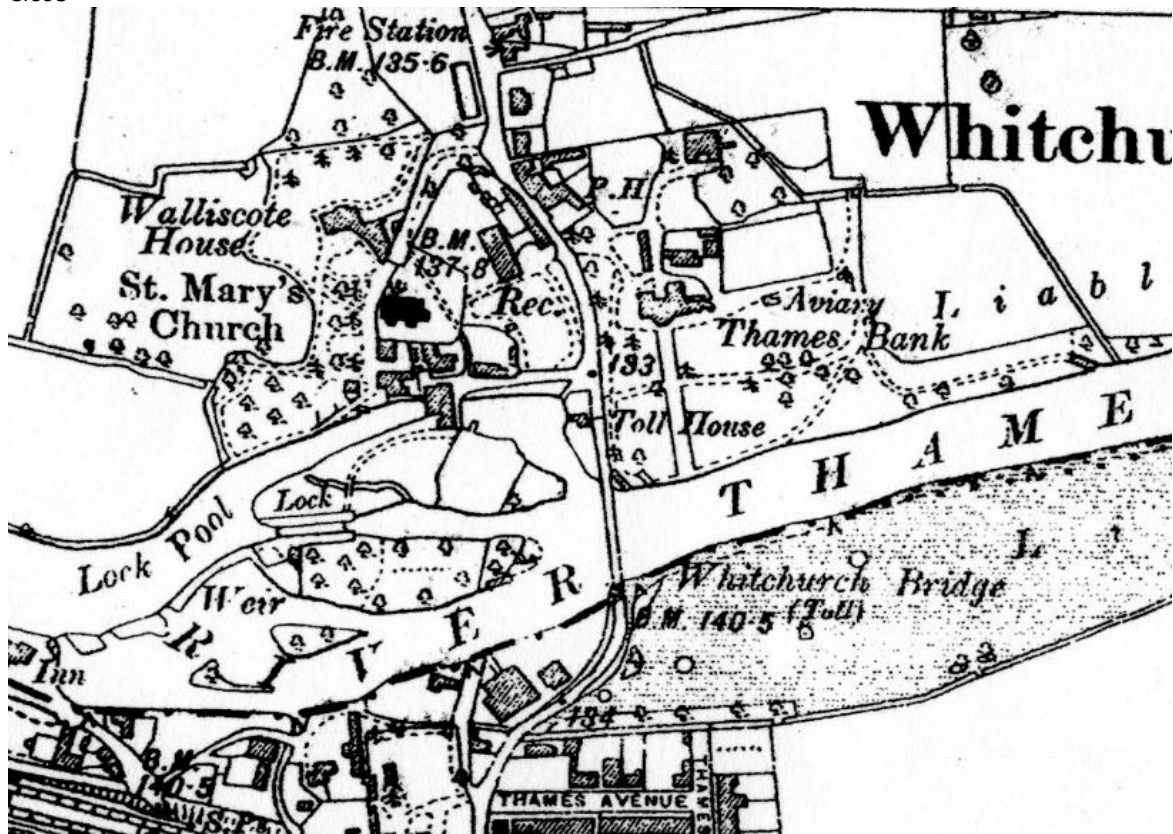
A bench mark (height above sea level) is shown by the arrow on the old fire station, see photo - fig ??? and explanation of bench marks in appendix ???

The ornamental pond in what is now "The Walled Garden House" (opposite The Greyhound) is shown – the exit of which, (see photo – fig XXX), may cross the High Street diagonally northwards to what is now termed as silt trap in front of and beneath the old fire station. (beside "The Greyhound", then a smithy)

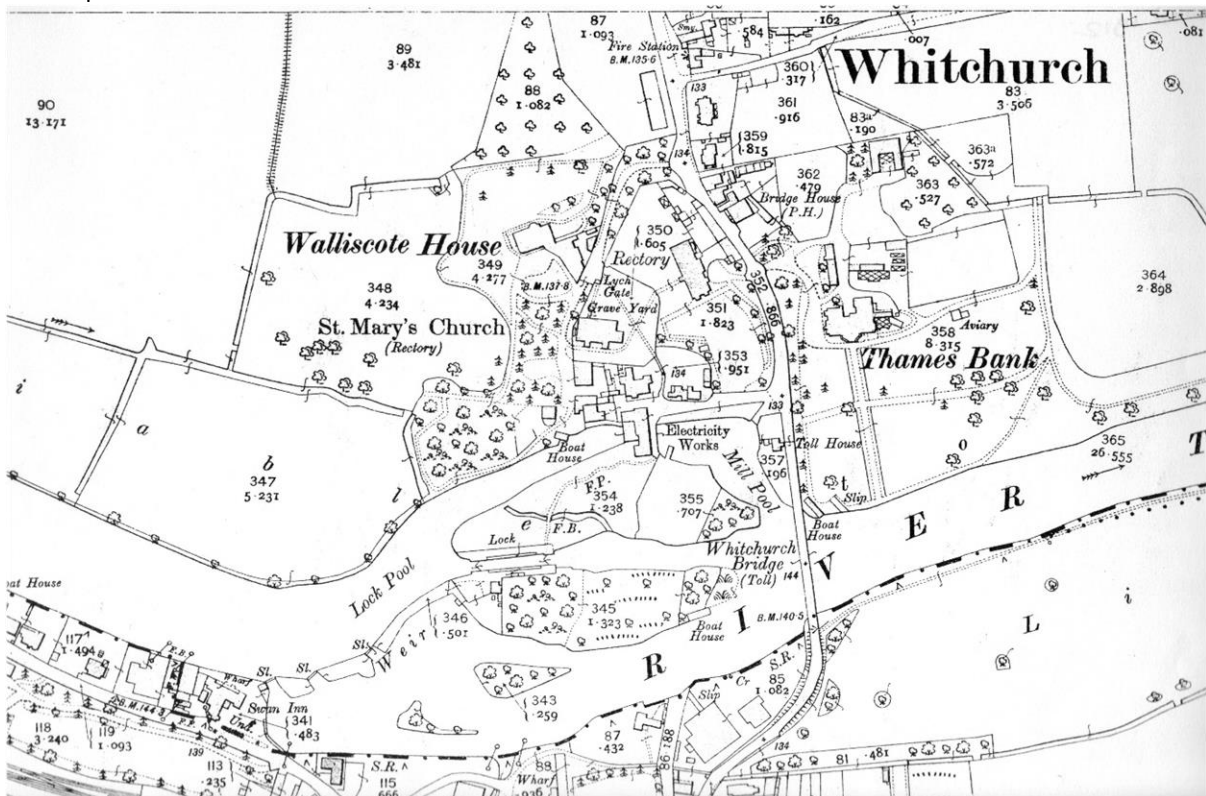
The ditch runs virtually parallel with Eastfield Lane before it turns 90 degrees south under Eastfield Lane

Note the kink, marked "332"

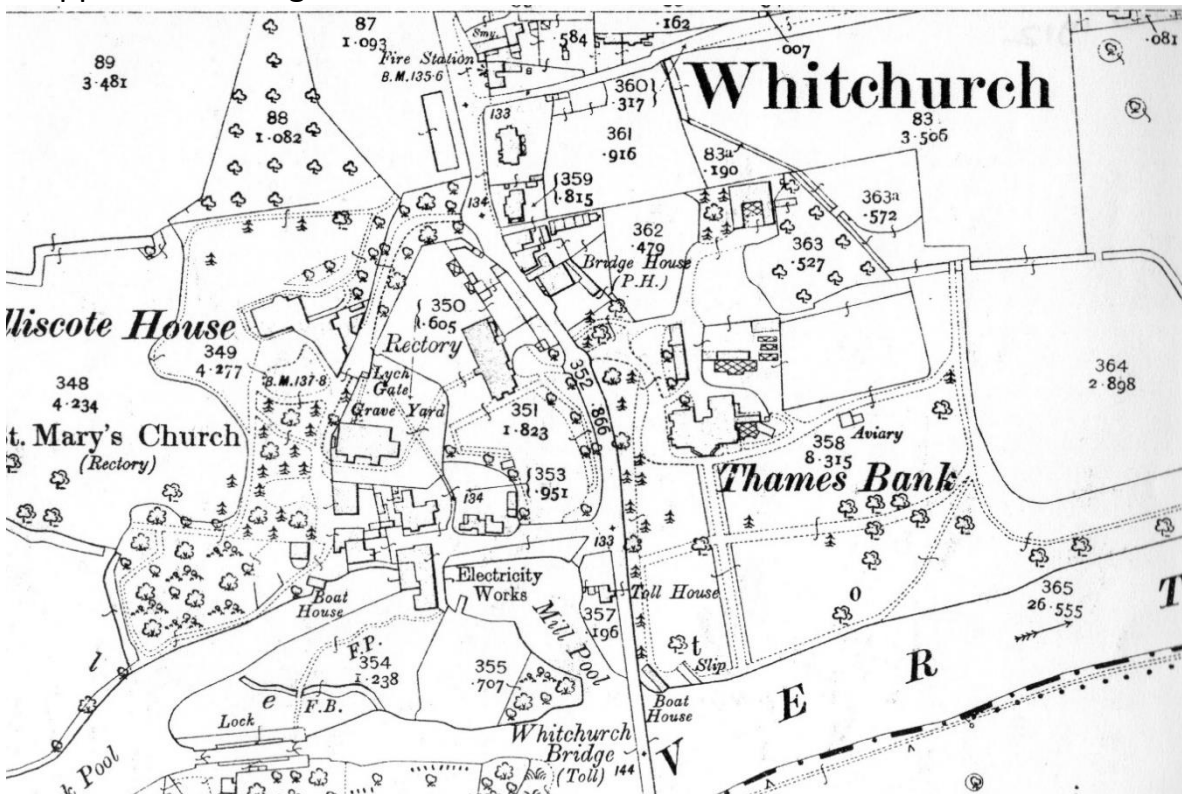
In culvert, Fire Station to Easfield Lane, thence open ditch to river via an angled diversion around Fawney / Orchard Close



1910 revision  
Full map



Cropped and enlarged



Further cropped and enlarged

Shows the diverted ditch now to the east of the new coach house, the ditch no longer feeding the riding stables of Thames Bank (Thames Bank Cottage and The Peach House), nor Thames Bank's walled garden.

Note the southern boundary of what is now Orchard Close follows the line of the original watercourse which is assumed to pre-date the walled garden of Thames Bank, circa 1799. This line also appeared on a recent Land Registry thumbnail, ie hadn't been updated by LR. Likewise the boundary of what is now The Greyhound follows the course of the previously open ditch

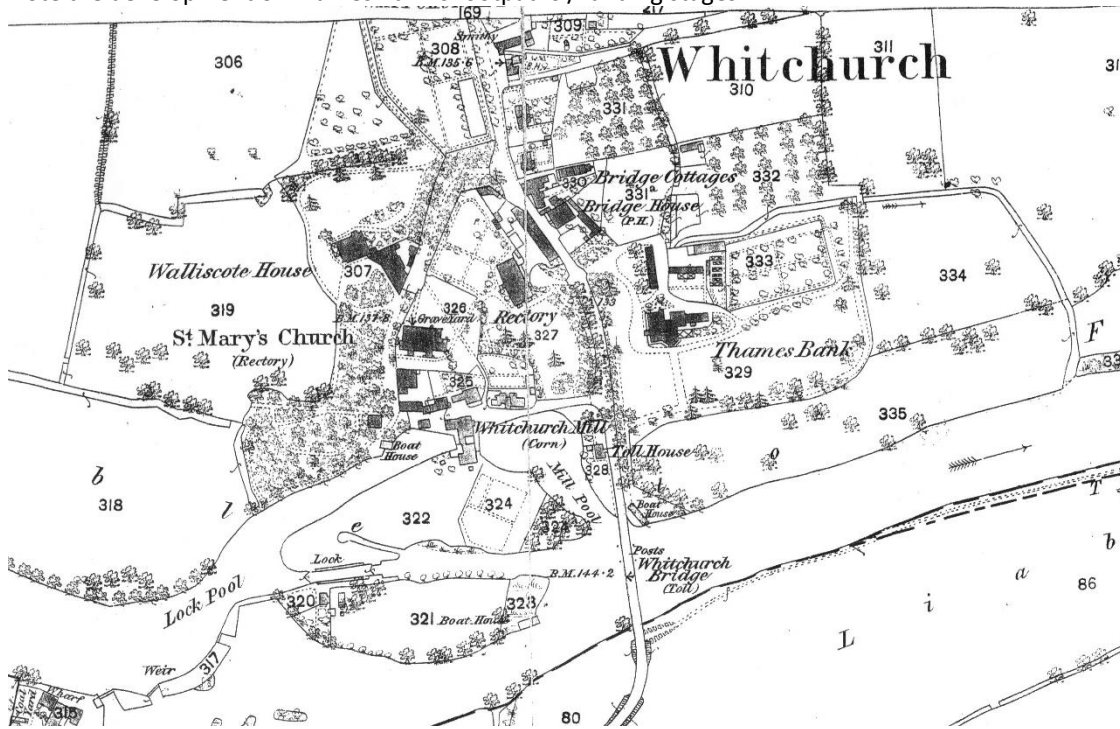






Pre 1899 – date unknown but published before the corn mill became a DC power station, shown as “electricity works” on later maps. This is pre- Nos 1&2 Eastfield Lane and shows an open ditch before it goes under what is now Eastfield Lane

Note the development of Thames Bank’s footpaths / landing stages.





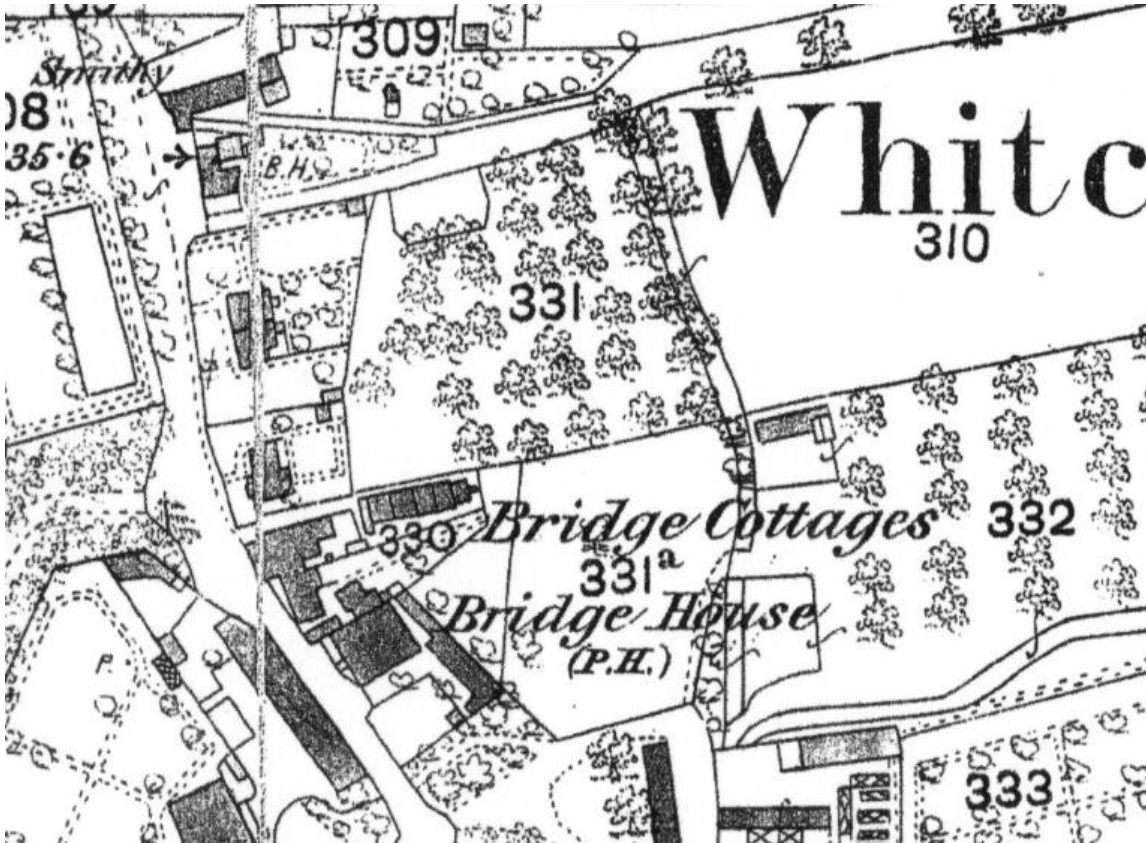
### Cropped and enlarged pre 1899 map (pre Eastfield Lane)

Clearly shows an open ditch starting north of the benchmark on the fire station wall - (was this the Duchess Close stables ??), to a culvert under what is now Eastfield Lane.

Also shown is the large pond directly to the west of the High Street that feeds the eastern leg..

Insert photo of pond exit

The coach house for Thames Bank, now Fawney and Orchard Close, has not yet been built.



### The lost culvert - (The Greyhound to Eastfield Lane)

Development has been applied for and granted on two occasions without reference to this watercourse, likewise property sales. There are no access points along its route and it remains flooded throughout the year making a CCTV survey difficult.

Pre 1890, this part of the village watercourse was an open ditch. It ran from north of the old fire station (next to what is now The Greyhound), going under Eastfield Lane between what is today No.2 Eastfield Lane to Chiltern Edge.

About 100 years ago, development along its route caused the original ditch to be placed in a culvert.

Note. The culverted section from The Greyhound to Eastfield Lane did not cause a flood problem in either 2003 or 2014.

Over time, record of this culvert's existence has been lost, though it's route can be traced from old OS maps. Respective landowners where it crosses their land have become riparian land owners with the all the responsibilities all that that entails – see xxxx

#### Points

- Its location and condition are unknown.
- The culvert's existence didn't shown up in recent conveyancing searches.
- SODC have granted planning applications on two occasions for houses to be built on land where it passes without making reference to it<sup>20</sup>.
- It may not be maintainable as it doesn't appear to have access points.

The sequence of it becoming a culvert can be traced from OS maps.

Pre 1899 – The map's date is not known but was published before the corn mill became a DC power station, shown as "electricity works" on later maps. This is before the building of Nos 1&2 Eastfield Lane. The village watercourse is shown as an open ditch before it goes under what is now Eastfield Lane.

Note, the western end of the ditch is shown starting from the "Smithy", not from the old fire station (bench mark arrow) below which there is a substantial chamber (2 x 2 x 4 metres). See section "old fire station chamber).

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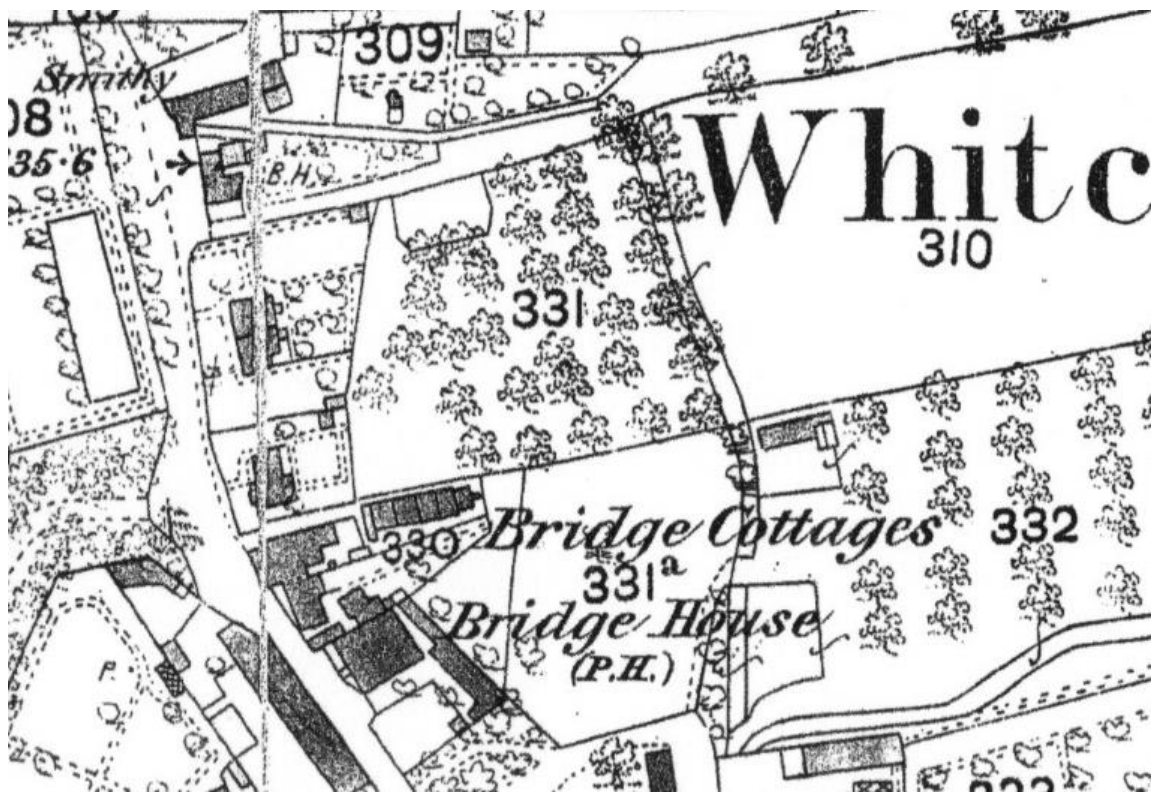
<sup>20</sup> P60/H0732 Outline application with little detail. (This is the only time the word "culvert" appears in any of the following applications or approvals. It could refer to the village watercourse, culvert from 1900, or that for the roadside drain that any traffic to the site must pass over. The requirement to deal with this in the approval is rather bland)

P61/H0061 Detailed application for a bungalow, unlikely that this was built, see P65/H0240

P62/H0383 Approval for a garage

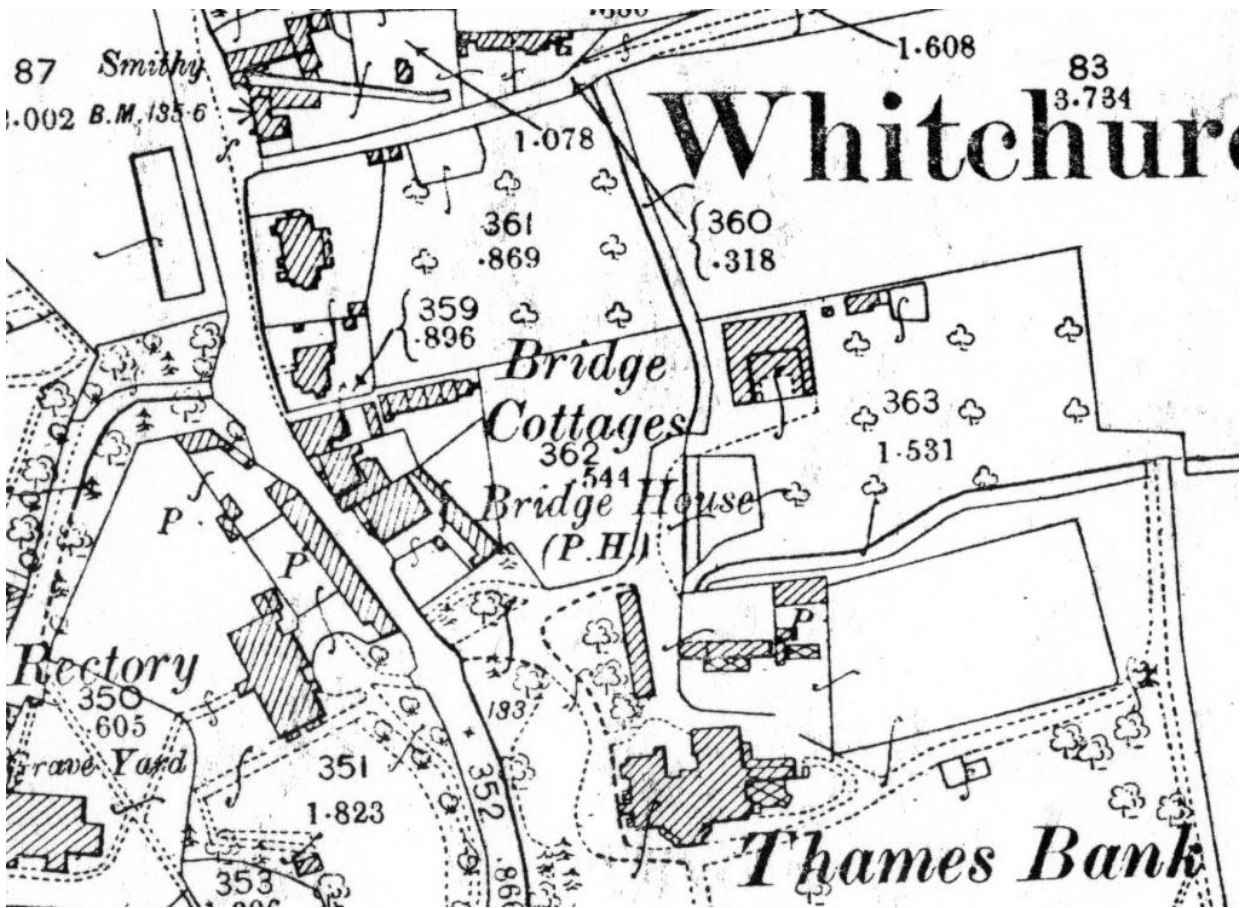
P65/H0240 Approval for an even larger bungalow

P87/S0376 Approval (after some objections to the scale of development) for the existing two storey house and separate brick garage. The line of the 1900 culvert from OS maps seems to lie between the garage and house



1899

After the building of Nos. 1 & 2 Eastfield Lane the open ditch is no longer shown, so is assumed to run in a culvert beneath their front gardens, following the line of the original ditch.



1910

The ditch south of Eastfield Lane has been diverted to a new channel to the east of Thames Bank's newly built coach house (now Fawney and Orchard Close).

The northern boundary of The Greyhound's beer garden appears to follow the route of the original ditch



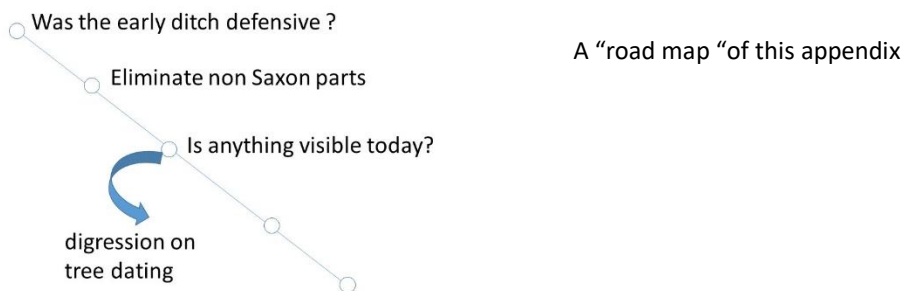
# Appendix D – Was the first watercourse a defensive measure?

## Synopsis

The 1950 Bulletin article<sup>21</sup> suggests a defensive role of an early ditch, but without offering proof.

*"It may be conjectured that it originally formed the defence of the Saxon village<sup>22</sup> .....  
.....but it may have been wider, and defended by a stockade on the hither side."*

Evidence for this may be gleaned from a number of observations, one of which is a line of holly trees that could be remnants of a stockade on the defendable side of what was once a wide ditch. – This needs a digression on dating trees that don't look old



## Section 1 Which part of the watercourse could have been defensive?

### a) Delete modern sections, or parts of it in an illogical position)

This leads to the question of when would a defensive structure have been justified?

Either pre or post Roman is a good guess for a period when there could have been need of a defensive structure, as during the Roman occupation AD43 to AD 400, and since say AD750, the country had an established civil order with no need for settlement defence against marauding tribes or cattle rustlers. Making that assumption one could date an early watercourse to either the post or pre Christian era, (Saxon or Iron Age.)

Modern parts – obviously post Saxon

### *The northern loop that crosses the High Street near The Greyhound*

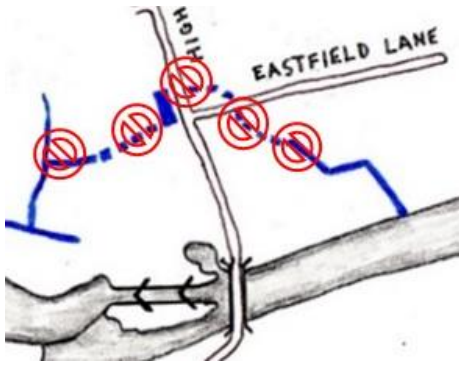
Economic factors that promoted watercourse development, i.e. not defensive additions:-

- 1) Expansion of the village northwards after the first bridge was built in 1792.  
This produced a demand for water some distance from the Thames to cater for the increase in horse traffic, (after the first bridge was built) – i.e., the northern loop past that runs past The Greyhound, provided running water for the stabling for the Duchesses of? (Now Duchess Close) plus associated forges etc.

<sup>21</sup> see XXX for the full extract

<sup>22</sup> this requires a

\*\* see cccc for supposition of an original short ditch route



The northern loop, highlighted by red symbols in fig ?? is relatively modern it provided water to estate gardens / forges and stables that developed as the village grew after the bridge was built, 1792.

It runs from a culvert that starts in Walliscote farm via The Walled Garden Retreat and The Walled Garden House before it enters a large, originally stone, (now surfaced in concrete) cistern, formerly in the walled garden of Walliscote house (now a pond in the garden of The Walled Garden House). See photo page ??

From there it runs under the High Street to another significant, (now concrete lined) chamber, over which the old fire station was built. Se photo fig ?

This suggest a correlation of the watercourse's route with the village's expansion after the first bridge was built in 1792, ie

- i) Cisterns to serve estate gardens, horse traffic / stabling forges etc, so definately not Saxon
- ii) Expansion northwards of a settlement bordering the river into a depression that what was an earlier Thames flood channel, so not a defensive measure

*Definately post 1792 –for the record, what proof is there of this?*

(the benchmark on the wall of the old fire station, see fig ?? can be dated as pre 1854 as it is before a standard pattern of OS benchmark was adopted)<sup>2324</sup>. The watercourse's route passing various stables / forges and coach houses to join a possibly an original leg, thence to be the river. (fig ?? above)

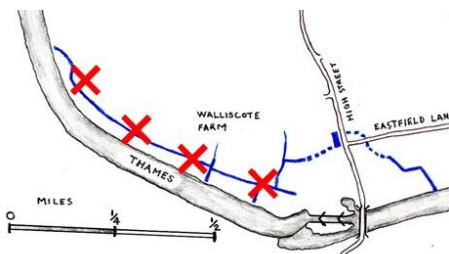
Today, most of this modern leg is hidden from view, underground in culverts, some dating from circa 1700, some added in the last 20 years. It resurfaces as an open ditch again in Pavilion Cottage's garden, from where it runs diagonally along the garden boundary of Meadowlands ( this section can be dated at 1905, see section vvv), before it joins the "Saxon or earlier" ditch which is a much larger section. (and has evidence of defendable planting along its hither side.

Defensive capability, None. No military engineer would consider a marshy area to dig a defensive ditch  
Correlation with Bulletin hypotothes, none

### *b) Walliscote farm field ditches*

All of these ditches these are post Saxon and have no defensive role.

A levee built across the lower reaches of Walliscote farm (for the benefit of the mill owner to maximise the energy of the Thames above the weir) can be dated circa AD 912 – (a weir and mill are mentioned in the Domesday book)



What proof do we have that these ditches were not defensive?

They're unlikely to be post circa AD 800 as the purpose of constructing the levee was to maximise the head of water above the weir and so improve the mill's<sup>25</sup> efficiency. The levee construction itself was a major feat of civil engineering so was not undertaken lightly.

<sup>23</sup> The symbol on Ordnance Survey maps indicating bench marks was approved after 1854, they usually appear as an **incised horizontal bar with a broad arrow immediately below**, the height of the bar accurately determined by spirit levelling, each "leg" being 4" (100mm).

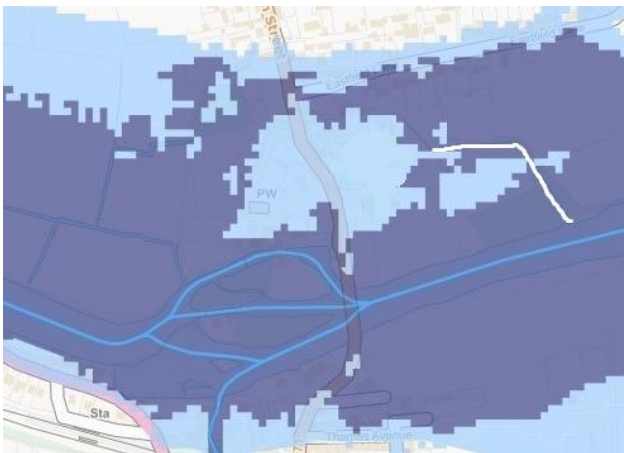
<sup>24</sup> The accuracy of this bench mark i8s questionable as the brick on which it is engraved could have been re-laid, - the mark is upside down and does not align with anticipated levels

<sup>25</sup> A weir and mill are mentioned in the Domesdaqy book (1068)

Also, prior to building the levee, that area of Walliscote farm would have been an inlet of the river, so marshy, see photo below showing the natural water level once the levee is overtopped



This corresponds with EA flood modelling



Could there have been a defensive purpose to the long western ditches in Walliscote farm? (shown in dark blue fig HH above)

This is unlikely for several reasons:-

a) Before the levee was built, (pre Domesday by say 100 years?) this area would have been a shallow inlet of the Thames, similar as the photo taken in 2014 when the levee was overtopped during that years' flood, fig ??

b) Once the levee was built, the effort to defend a long and narrow stretch of land by building a ditch does not

make sense, ie, what threat was there post Domesday ?

A reasonable assumption is that the Walliscote farm's ditches were to :-

- i) Drainaway leakage coming past the levee
- ii) Provide irrigation / soil warming (classic water meadow management)

Do the Walliscote farm ditches correlate with the Bulletin ? No

Apart from increasing the pasture of Walliscote farm, the person who would gain from a higher level of river of water above the weir and the provision of a leat would be the miller. Domesday Book mentions a weir and mill so this is not Saxon.

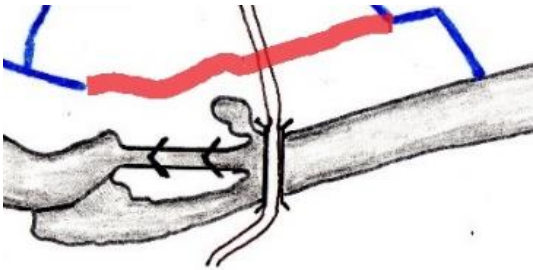


## Section 2 - Could what remains be a valid defensive measure?

Once the modern northern extensions via The Greyhound, as well the ditches in Walliscote farm are discounted, one is left with a much shorter channel surrounding an area of high ground at the apex of the bend, (where the church and much later, Thames Bank now stand.)

Physical and documented evidence of the western leg have long since disappeared in development in that area - from the church to Thames Bank the other side of the High Street.

Without supporting evidence, the only credence for the suggested route (red line in the sketch below) as a defensive measure is simply by joining the two legs together, red in fig XX



It could be a defensive measure.

The land on the hither side is higher, and any approach from the north would have to cross a low lying area (an old river channel), presumably marsh, now not so obvious following the raising of the High Street in that area post 1894

See (or import) earlier map

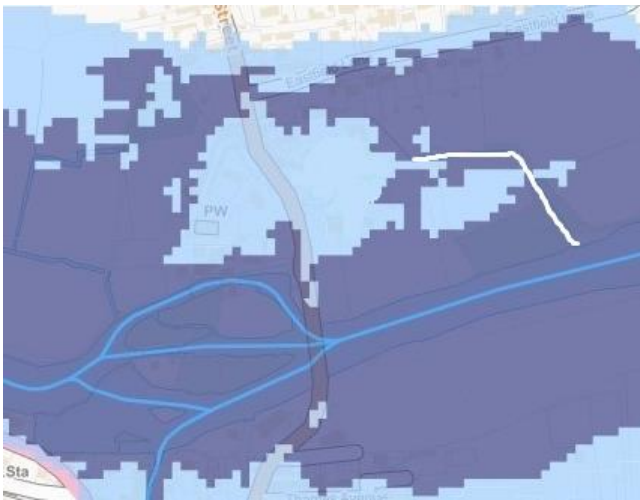
This offers several clues in support of the Bulletin article

*Needs expansion*

### *2021 flood modelling showing the higher ground*

See fig BB . This shows the area of high ground in light blue close to the bend's apex

This is from a 2021 EA flood model that has factored in data about climate change to arrive at 1/100 to 1/1000 probability of flooding in the light blue areas, (Zone 2), but also takes into account – as it should - the artificially raised land post 1894, see RRR .



(The high ground, ight blue, and protected to the south by the Thames is a more likely area for an original settlement. It is a low flood risk area where the church, and Thames Bank etc. Were subsequently built

Not shown in this 2021 EA flood model are the lower land levels pre 1894 or low ground to the north of where a leg of the Thames once crossed what is now the High Street where The Greyhound now stands.

Surviving parts the original ditch are superimposed, highlighted in white.

This is an important point

See fig CC

If the 2021 EA mod4ld flood risk is modified by taking the pre 1894 land levels into account, the position of a defe3nsive ditch becomes more logical.



Taking these two together, a better guess can be made as to the route of a defensive ditch in fig XX below re- drawn in red.

### **Section 3 - Evidence for the Bulletin article visible today**

#### *Synopsis*

*What is growing above ground has to be collated with other data to get the true picture, "reading the landscape".*

*Recent growth could come from roots that go back millennia. (This only applies to trees that have been repeatedly cut back. Untouched trees grown from seed are easy to date, what you see above ground is their life history).*

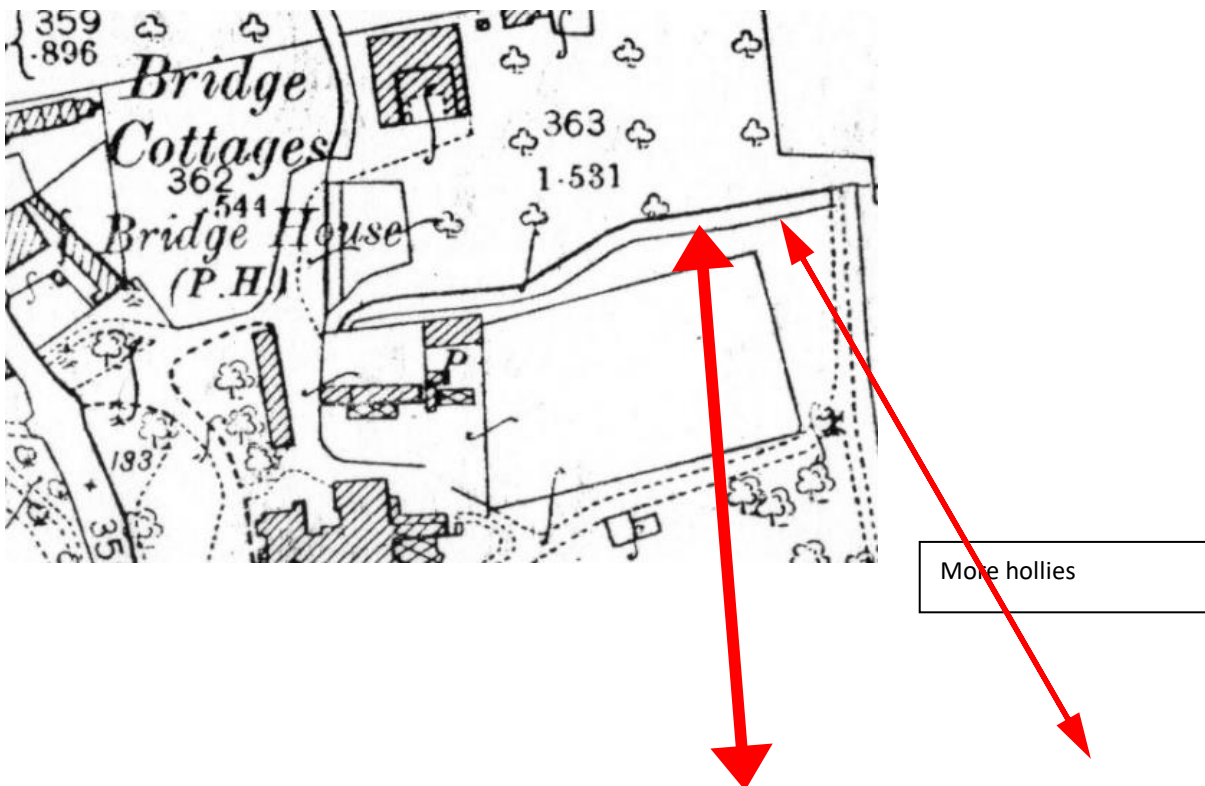
A short length of the original ditch (highlighted below), that was filled in 1905 following the ditch's diversion – see XXX, has a row of holly trees along the higher side of its bank. There are other hollies also evidently growing from rootstock in a similar line along the defendable side further downstream of the original watercourse, though those struggling for light under a sycamore canopy.

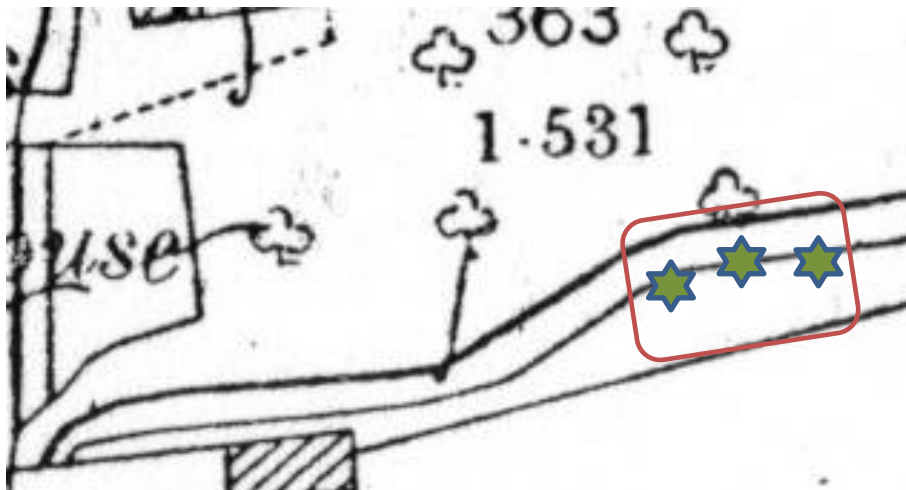
Insert photo

Holly is an anomaly in a fruit orchard. Also, the "hither or defendable side" perversely continued to be the shown as a property boundary even up to Land Registry documents of 2019 despite the entire field being part of the Thames Bank estate. In other words, the ditch line was a property demarcation pre 1780, (Thames Bank).

Another clue to their age is an arch in the brick wall of the garden for Thames Bank. Namely the ditch was there before Thames Bank (1780 ish)

Insert photos



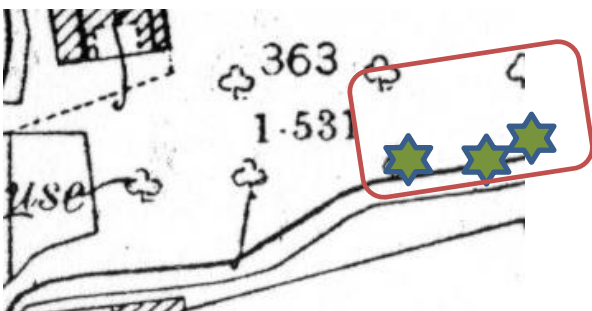


Photos of the above section



Before the ditch south of Eastfield Lane was diverted in 1905, (see VVVV)a wide section of the original watercourse that ran parallel to the Thames had a row holly trees growing along its hither or defended side of a higher area that / Thames Bank etc.

Three of these holly trees survive today along with others further downstream that are growing from rootstock in a similar "hither side" position but



Insert sketch / photos of full length remaining, especially on Glebelands

Insert Photos of the above section

There are no ancient trunks along the ditch to indicate a previous stockade, but that doesn't mean evidence isn't there, hiding in plain sight...

Some varieties will re-grow vigorously if cut back, coppiced regularly to produce straight withies (10 year cycle and if combined with slower growing trees this will promote straight trunks as those grown from seed are forced to reach above canopy of the coppice understorey for light

Hedge laying is another example of promoting new growth from old rootstock though on a longer cycle between cutting back and re-laying (30 to 80 years).

## **Section 4 – determining the age of trees**

### *Synopsis*

*An old tree does not necessarily have an old trunk as some forestry practices deliberately maintain young growth from old roots, i.e., coppicing or clonal growth*

*Because of this, dating of trees needs corroborating evidence, historical, DNA etc.*

### **Forestry techniques that hide a tree's true age**

**Coppicing** – (Refers to frequently cutting back to ground level to promote new growth)

*Extract from Oliver Rackman's book, Trees and Woodland in the British Landscape. Archaeology in the Field Series*

*Trees being coppiced cannot die of old age as coppicing maintains the tree at a juvenile stage, allowing them to reach immense ages. The age of a stool may be estimated from its diameter; some are so large – as much as 5.4 metres (18 ft.) across – that they are thought to have been continually coppiced for centuries.*

- a) One of the UK's oldest trees, visible today as an unassuming ring of 60 year old lime saplings in the Forestry Commission's Westonbirt arboretum, is growing from roots dating from 1000 to 2000 years ago.

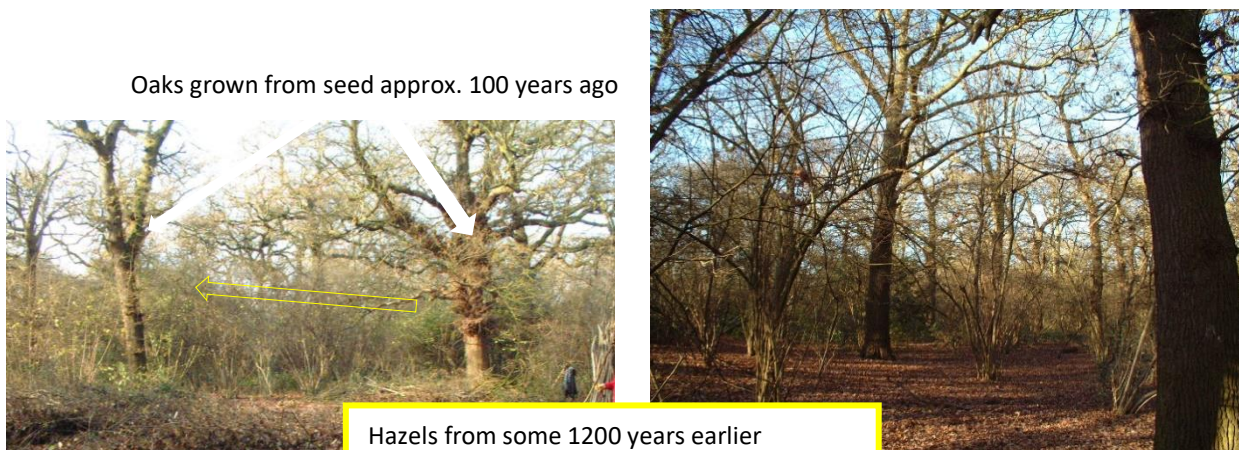
Confidence of its age comes a variety of data,

- 1) Historical records of a 60 year coppice cycle
- 2) The size and shape of the new growth,
- 3) DNA analysis proving all the stems are from the same plant.

- b) another example of dating coppice woodland

In this case its history can be determined with confidence as it aligns with forestry techniques and historical data (Domesday Book)

A combination of >1200 year old hazel coppice understorey and oaks growing from seed circa 100 years ago.



This woodland was established to grow crops or oak and hazel well over 1000 years ago. (The oak for building, ships or houses and the hazel that promotes their straight trunks by forcing the oaks to grow above the hazel canopy used for hurdles etc. How can this be dated and given a purpose

We are confident of the wood's age because the Domesday Book mentions it as "Braddish" or broad hedge wood. The significant width of its eastern hedge bank is visible today. At circa 2 metres it is much wider than a conventional hedge bank. Further, the surrounding fields are lower than the woodland floor. (Erosion).

Common sense would suggest that if it was already an established wood at the time of Domesday (1068), so likely predates the Norman Conquest by several centuries

What the photos show

The tall trees (oaks) are obviously of a similar age and are 100 to 120 years old

Background information. Oaks don't easily propagate within an established oak woodland. Two reasons.

- a) Lack of daylight – a single oak needs a significant hole in the canopy to get sufficient daylight, roughly 10,000 sq. feet. Whilst this sounds a lot, it is equivalent the circle of a mature tree felled and rotated
- b) Predation by oak parasites falling from mature canopy above

Any oaks that do manage to grow are poor specimens.

Thus the photos show equal age oaks suggesting clear felling and natural regeneration from acorns disturbed during the timber extraction which being by horse would have been when the trunks were of manageable sizes, say 60 to 80 years old.

The oaks are randomly spaced, which again suggests natural regeneration rather than planting and likewise coppice or the hedge growth seen above ground will go back the original planting so also be equal age. The big difference is the coppice or hedge plant roots can go back thousands of years whereas the oaks have grown from seed, so what you see in terms of the oaks is real life

The same applies, as in this case, to hedges that would have been laid at regular intervals to ensure fresh growth from their rootstock to keep them stock proof and so could go back many centuries.

The photo shows a dense, but random spacing of oaks. The oaks have been grown to give a useful length of straight timber. This is due to the hazel understorey which has forced the oak lings, to reach above the hazel canopy for daylight, which is. The hazels have large leaves so are happily in the shade under the oaks.

The hazels predate the oaks by at least 1000 years.

What is seen above ground is not necessarily an indication of its age. Coppicing or hedge laying regenerates growth from a root structure that could go back millennia whereas the major canopy is grown from seed as in the case of this ancient oak and hazel coppice woodland that predates the Norman invasion<sup>26</sup>

The definition for the style of this wood is ancient replanted woodland. The term replanted means manual replanting or regeneration from dormant seeds that have been disturbed during clear felling and dragging out the timber. There are other flora indicators of ancient woodland: - wild service trees (they are slow to germinate) and bluebells which can complete their seed cycle before shaded by the hazel canopy

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<sup>26</sup> The eastern boundary of the wood is mentioned in the Domesday book, giving the wood its early name "Braddish" or broad hedge wood. Physical evidence of the hedge's original width is evident from the width of the hedge "plinth" or raised area.

## Clonal reproduction (cuttings or root suckers)

### *Synopsis.*

*This is an introduction to naturally occurring growth that is identical to the parent, (a self-perpetuating lineage as it were.) Unlike coppicing that needs regular human activity to maintain the tree's juvenile state, though the end result is similar – young trees from old roots.*

### Lilac



Fig?? Shows clones of the parent – a lilac

(It also shows poor garden management. Lilac flowers are only produced on new growth. If flowers are wanted at low level it requires regular removal of tall growth

From the variety of stem diameters seen in this photo, this task has been neglected for a number of years.

The clump of new clones (shoots) would naturally expand equally as a circularly but in this instance has been curtailed by mowing

A grove of aspen trees in Utah now covers over 100 acres. As each tree has the same DNA, so, as with the lilac example above, they are one tree

(If they had propagated from seed there would be subtle genetic variations, - Darwin etc.)

The time needed to reach an area of more than 100 acres by clonal reproduction is estimated to have taken between 40 and 80,000 years. During these millennia, the old trees would have died fresh growth occurred naturally. (Unlike coppice where human intervention keeps the original plant in its juvenile phase, despite being centuries old.)

The point is that whilst these aspens are very old, what is visible above ground is young and so doesn't give an indication of their true age



## **Section 5 - How old are the row of hollies? Do they fit the description of a defensive barrier?**

### *Synopsis*

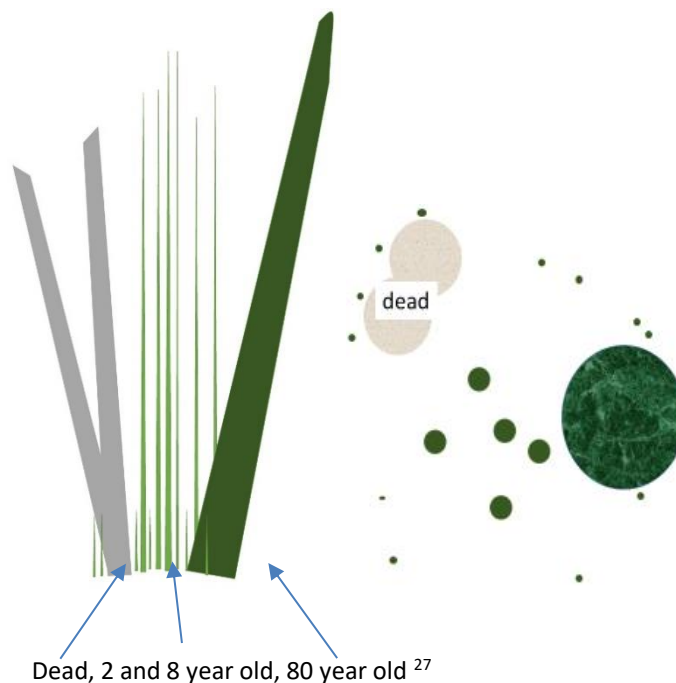
*Being confident of a date for this line of trees is not possible due to lack of supporting information, though a variety of circumstantial evidence points to the hollies being remnants of a defensive boundary.*

*All the hollies are growing on the defensible side of the ditch are male, (no berries). This suggests a deliberate propagation from cuttings. (no berries, hence no seeds). There are too many males to be coincidental. DNA analysis would confirm if they are from the same cuttings*

Evidence of their true age is more circumstantial.

- a) Their growth pattern confirms several generations from the same rootstock indicating clonal growth, meaning, but not proving the rootstock could go back millennia potentially ancient.
- b) DNA, as in the preceding examples, has the benefit of linking to other data plus historical records. Without such corroborating evidence in the case of these hollies all that DNA could prove is whether the hollies share the same parent – which is likely if using cuttings to propagate in the first place so is meaningless.
- c) Their position, indeed their existence within an orchard is unusual
- d) The lack of growth outside the main stool maybe to

The illustrations below show one of the holly trees exhibiting several ages of clonal growth. (The schematics on the right are clearer, having been drawn stripped of leaves to show their trunks).



Hollies are in a line along on the hither side of what was once a significantly wide ditch. The boundary they delineate predates the Thames Bank (1770), garden walled maps etc.

They are an evergreen species that grows close together with prickly lower leaves. This variety has no place in an orchard.

Insert photo

<sup>27</sup> For a holly, the girth at chest height in mm divided by 12.5 = age

*Common sense used as historical support*

Why holly?

Summary

Holly is an unusual hedging plant. It

## **Appendix E – Bargeboards**

Synopsis

What is bargeboard and what does it do

Add photos of the three properties with bargeboard slots

Greyhound

Pangbourne (Triangle travel agents)

Pangbourne sorting office

## Appendix F – The Greyhound - flash flood alleviation proposals

### Synopsis

The Greyhound lies in an old river channel at a similar height to the lock keeper's cottage. It has been flooded on numerous occasions for different reasons, all of which were preventable. (Three times in one year).

The artificial raising of the High Street post 1894 unintentionally reduced the capability of natural run off from excess surface water. Surface water drainage in front of the pub is now solely dependent on the capability of road drainage, which itself depends on the integrity of the pipework taking it across the High Street. (Several attempts to correct this had collapsed well before 2003 – see photo taken XXX)

All the surface water that collects in front of The Greyhound has now (since 1960), to cross under the High Street to the “1960 new culvert on the western side”.

Remedial action by OCC in 2020 has resulted in four road gullies in the area of The Greyhound now discharging direct to The Thames. Or in other words, the entire drainage of surface water in that area relies solely on one cross High St pipe and the unobstructed of just four road gullies.

Whilst the pc continues to remind OCC that the 2<sup>nd</sup> cross High Street pipe (outside Highwayman Cottage) needs to be re-instated, The Greyhound's new owners would feel happier if they had an independent back up.

To this extent, two proposals are put forward, essentially replicating the pre 1960 situation where all the surface water in that area was directed to the river via the village watercourse. see fig CCC

### The problem





Proposal 1 – replace the inspection pit cover immediately in front of the old fire station door with a bespoke ventilated one.

**THE OLD  
FIRE STATION**

**KEEP THIS AREA CLEAR OF WAGGONS  
AT ALL TIMES (EVEN IF IT'S NOT BEEN USED SINCE 1876)**

**THE WHITTCURCH-ON-T'HAMES SOCIETY  
FOR THE PROMOTION OF EMBROIDERED  
ROAD SIGNS AND DISTRIBUTION OF**

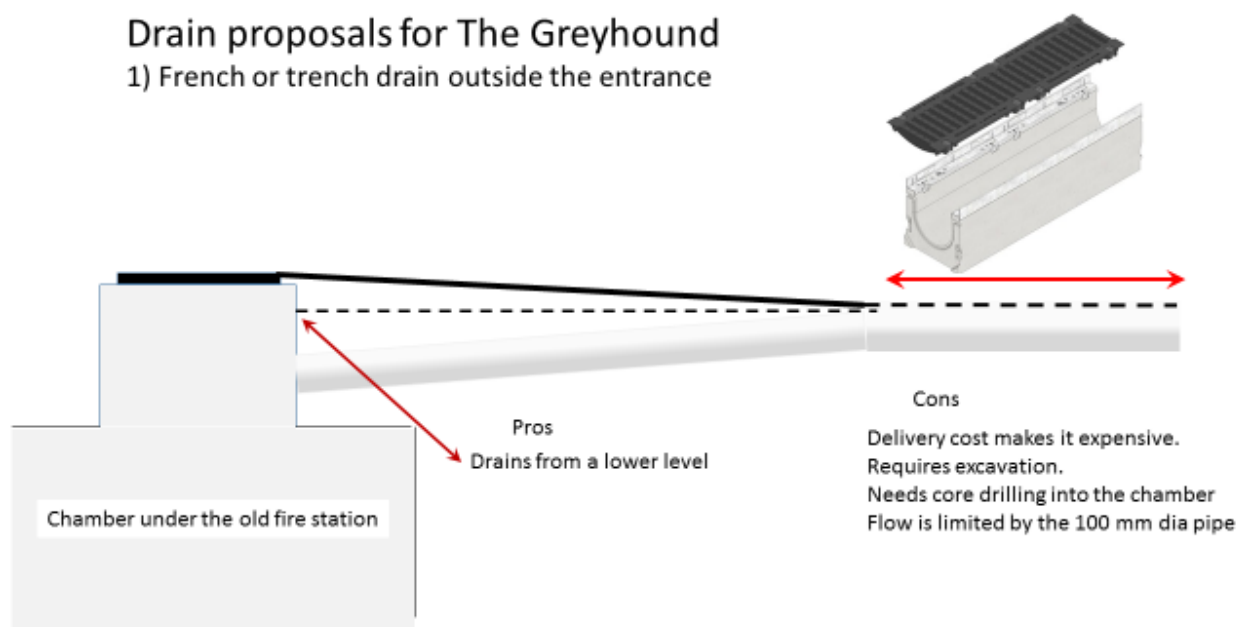
**FREE BEER** SPECIAL OFFER. NEW MEMBERS  
ONLY £499.50 PER MONTH

**- CONTACT THE LANDORD**

Laser cutting enables any shape to be cut out. Cost depends on the time to cut the material, so for a representative quote a first draft has used using a stencil font as it's quicker to fill the page with typescript than illustrations.

## Drain proposals for The Greyhound

### 1) French or trench drain outside the entrance

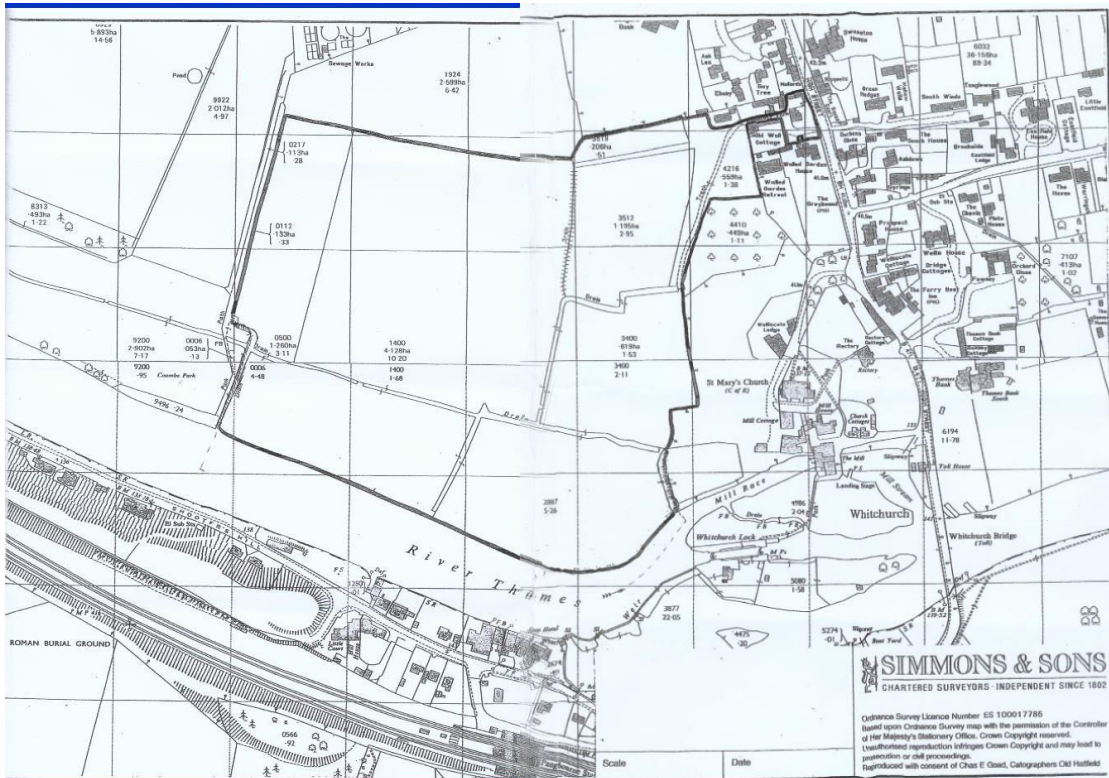




**Figure 7. Flood water in Eastfield Lane, 10th January 2014.** *Note the tide mark to the north (left of photo) following the peak height at 9 pm the previous evening. This shows that virtually the entire road width was covered at the time of the peak.*

Fig? Shows the High Street flooded by Thames flood water back charged from the Eastfield Lane roadside drain.  
Note the road drain system is not draining water away. This is 17 years prior to the June 2020 flash flood



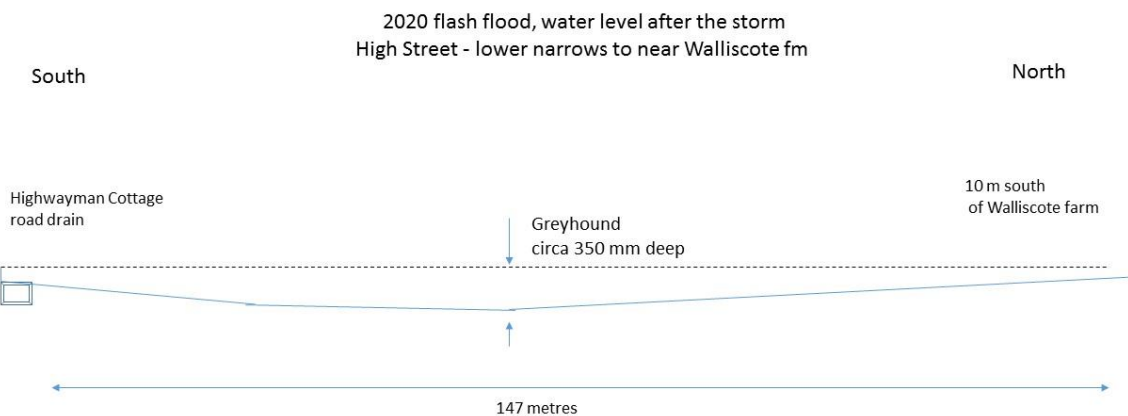


Geology

and water table

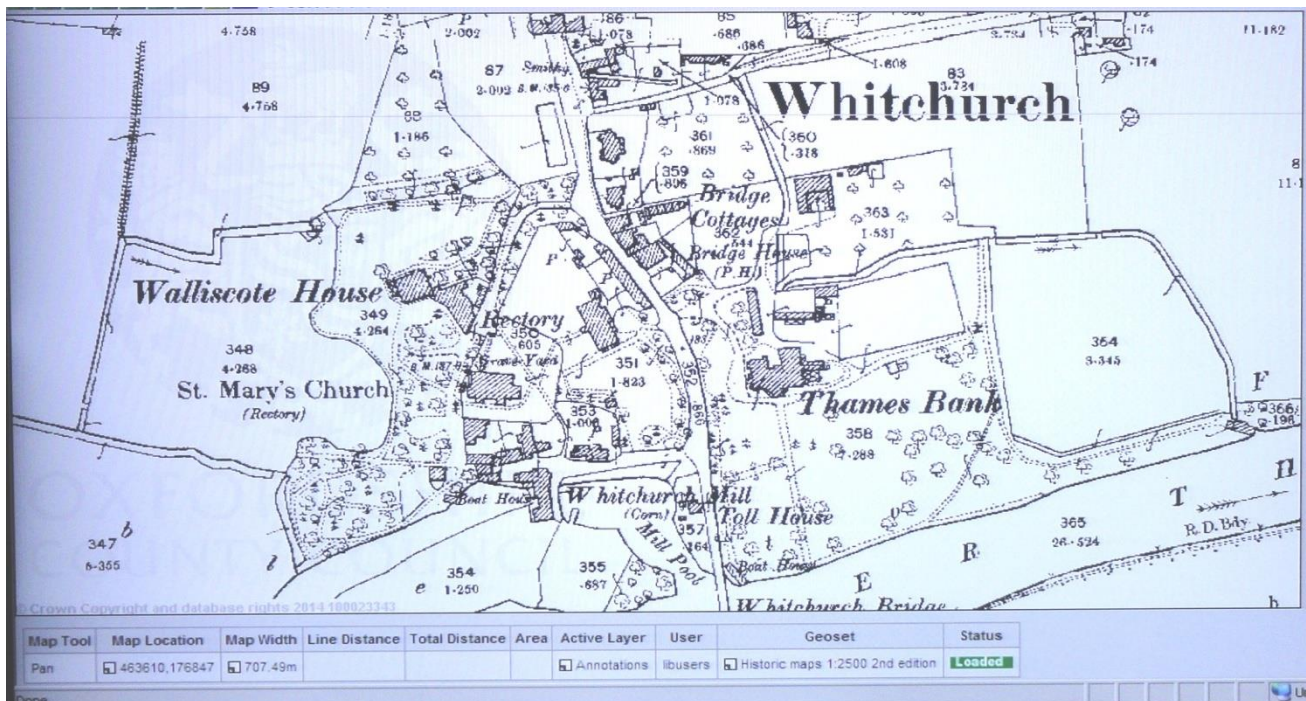
In Walliscote Farm the clay is significantly more impervious than that east of the High Street where it is relatively free draining, (with the exception of a field south of Eastfield Lane near the school where standing water is trapped weeks after the Thames subsides.)

Elsewhere in the village, the ground is permeable enough for floodwater to rise up through it, appearing initially as puddles in low areas. The appearance of these puddles follow the Thames level surprisingly quickly. Those forming for no apparent reason, (no rain) in Pangbourne meadows just outside the Dolphin Centre are a good example.



A weir across the Thames between Pangbourne and Whitchurch is believed to have been in existence since around the 13th century. Even prior to a weir, the bend would result in a head loss that would promote flow along a direct cut a watercourse to benefit Whitchurch could have been created at any time. It is mentioned as far back as 1750 and some parts of it could be much earlier. Some have suggested that it might have served a defensive purpose. The original cross-section was substantial

Many clues to the history of the village watercourse can be made out in the map of 1899, which is shown below, together with a modern map.



Old photos of The Greyhound



Note features in Fig 1, the white road, (pre tarmac), lack of kerb on the western side, (LH), and significantly higher ground outside The Smithy, the old fire station and The Greyhound. The two white pillars and entrance of what is now Duchess Close are at road level, and lower than what is now The Greyhound's car park.

Compare this scene with today's situation, fig 3, which is basically the opposite, namely the High Street is higher than The Greyhound's carpark by some 400 mm

#### Figure Today's road height

Needs photo of this gate  
Likewise Church Drive

One of Britain's oldest trees, a small-leaved lime at the Forestry Commission's Arboretum at Westonbirt, will be cut back this week as part of a tree management cycle dating back centuries.

A mix of traditional and modern techniques will be used to cut back or coppice around 60 lime stems that have grown from one original tree thought to be over a thousand years old. DNA tests carried out on this tree in the 1990s, at the time of the last coppicing, showed that the clump originates from one tree.

Experts agreed that the size of the clump and its pattern of growth meant the lime is certainly ancient, and could even be up to 2,000 years old.

At the time when the first two additions to the village watercourse were made, immediately pre Norman and after the bridge was built in 1794, England already had a stable society, so logic suggests there was no need for defence against marauding tribe. So if these sections can be identified they can be safely removed.