



## Land at Tollgate Road, Colney Heath

**Rebuttal Proof of Evidence**

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**Director of Growth and Integration**

**Appeal Reference: APP/B1930/W/23/3323099**

On behalf of **Vistry Group**

Project Ref: 332510999 | Date: September 2023

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## Document Control Sheet

**Project Name:** Land at Tollgate Road, Colney Heath

**Project Ref:** 332510999

**Report Title:** Proof of Evidence of Ronald Henry BEng (Hons) MSt (Cantab) CEng CMgr MICE  
MIEI FCMI (on behalf of Vistry Group) in relation to the refusal of planning  
permission at Land at Tollgate Road, Colney Heath

**Doc Ref:** 332510999/6004

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# 1 Introduction

## 1.1 Witness

- 1.1.1 My name is Ronald Henry and I am Director of Stantec UK Ltd.
- 1.1.2 I hold an honours degree of Bachelor of Engineering (BEng(Hons) – 1995) and a Masters in Construction Engineering from University of Cambridge (2018). I am a member of the Institution of Civil Engineers (2001), a chartered engineer (CEng), chartered manager (CMgr), fellow of the Chartered Management Institute (2019) and a member of the Institution of Engineers of Ireland (2003). I have 25 years' experience in dealing with civil engineering and flood risk-related issues such as this.
- 1.1.3 Stantec has been involved with the appeal site ("the Site") in preparation of the outline planning application subject of this appeal. The proposals are for up to 150 dwellings on Land at Tollgate Road, Colney Heath. Stantec was also involved in post-submission discussions with the Environment Agency, the Lead Local Flood Authority, Thames Water and St Albans District Council to seek to resolve flood risk and drainage matters in relation to the Site. This proof of evidence addresses matters of flood risk evidence in relation to the appeal against refusal of permission, however flood risk or drainage was not a reason for refusal.

## 1.2 Declaration

- 1.2.1 The evidence which I have prepared in this Rebuttal Proof of Evidence is true and has been prepared, and is given in accordance with, the guidance of my professional institution. I confirm that the opinions expressed are my true and professional opinions.

## 1.3 Scope of Evidence

- 1.3.1 This rebuttal proof of evidence has been prepared in response to the evidence of John Clemow for Colney Heath Parish Council (Rule 6 Party), FLOODING proof of Evidence (**CD 9.19**).
- 1.3.2 My evidence also addresses specific points raised by John Clemow for Colney Heath Parish Council (Rule 6 Party) in the document RELEVANT PLANNING MATTERS (**CD 9.16**).
- 1.3.3 It provides summaries of flood risk from all sources as assessed in the **Flood Risk Assessment, Surface Water and Foul Water Drainage Strategy (FRA) report (CD 4.9)** and the guidance in the **South West Hertfordshire Level 1 Strategic Flood Risk Assessment (SFRA) on** when the Sequential Test should be applied.
- 1.3.4 It also provides summaries of the proposed drainage strategies for both surface water drainage and foul water, detailed in the **FRA (CD 4.9)**.
- 1.3.5 It has been demonstrated in the **FRA (CD 4.9)** that the development proposals are resistant and resilient to all sources of flood risk, taking into account the projected impacts of climate change, and that flood risk would not be increased to third parties. As such, the proposals are, in fact, in accordance with Local Policy 84 and Policy 167 of the NPPF.

## 2 Relevant Planning Policy and Guidance

### 2.1 National Planning Policy Framework

2.1.1 The National Planning Policy Framework (NPPF) (September 2023) section 14 relates to development, flood risk and climate change. Paragraphs 159 to 169 inclusive, establishes the Planning Policy relating to Flood Risk Management. The associated Planning Practice Guidance (PPG) (last updated August 2022) 'Flood risk and coastal change' provides further clarification on the application of the NPPF in practice.

2.1.2 NPPF Para 161 states:

*"All plans should apply a sequential, risk-based approach to the location of development – taking into account all sources of flood risk and the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property. They should do this, and manage any residual risk, by:*

- a. applying the sequential test and then, if necessary, the exception test as set out below;*
- b. safeguarding land from development that is required, or likely to be required, for current or future flood management;*
- c. using opportunities provided by new development and improvements in green and other infrastructure to reduce the causes and impacts of flooding, (making as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management); and*
- d. where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to relocate development, including housing, to more sustainable locations.*

2.1.3 The **SFRA** should be used to assist in applying the sequential test, where necessary, see section 2.3 below.

2.1.4 As required by **NPPF para 161 b.**, the Colney Heath Farm Meadow (a Local Wildlife Site (LWS)), that forms part of the total site area but is kept free from development, will provide access to the River Colne floodplain to allow for easy access for management of the floodplain and river channel. This is also a requirement in accordance with the **Local Plan policy 84**.

2.1.5 As required by **NPPF para 161 c.** developing this site will provide an opportunity to reduce flood risk for the larger events as surface water runoff will be captured in the proposed drainage network and attenuated within the site to Qbar (greenfield runoff rate), which is approximately the equivalent to the runoff in a 1 in 2.3 annual probability event, up to the 1 in 100 + climate change annual probability event. Due to the impermeable nature of the surface geology, infiltration potential is limited and the natural runoff is via overland flow to the river.

2.1.6 A 40% climate change allowance has been applied to the proposed outline design, as required for a residential development with a design life of 100 years

2.1.7 NPPF Para 167 states:

*"When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:*



- a. *within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location.*
  - b. *the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment.*
  - c. *it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate.*
  - d. *any residual risk can be safely managed; and*
  - e. *safe access and escape routes are included where appropriate, as part of an agreed emergency plan.*
- 2.1.8 A site-specific Flood Risk Assessment was prepared in support of the Outline Planning Application where the sequential approach has been applied whereby the most vulnerable site uses are located in areas with the lowest risk of flooding. In this case the flood risk within the development area has been assessed as low risk from all sources of flooding.
- 2.1.9 The exception test is described in Paragraph 164 as follows:
- “To pass the exception test it should be demonstrated that:
- a. the development would provide wider sustainability benefits to the community that outweigh the flood risk; and
  - b. the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.
- 2.1.10 Development of this site will provide unhindered access along the river corridor for dredging and maintenance purposes in accordance with local **Policy 84: Flooding and River Catchment Management**.
- 2.1.11 A robust flood mitigation strategy as detailed in a **Flood Risk Assessment, Surface Water and Foul Water Drainage Strategy (CD 4.9)** typically addresses the second part of the exception test.

## 2.2 City and District of St Albans Local Plan

- 2.2.1 Local planning policy is contained within the **City and District of St Albans District Local Plan Review 1994 – Saved and Detailed Policies version (2020)**, with particular reference to Policy 84 - 'Flooding and River Catchment management' and Policy 84A – 'Drainage and Infrastructure',

### **Policy 84: Flooding and River Catchment management**

*The Council will consult with the National Rivers Authority on all matters likely to affect the water environment in order to reduce the risk of flooding and to ensure proper management of the river catchment. The following principles will apply:*

- i.in areas liable to flood, development or the intensification of existing development, will not normally be permitted. Appropriate flood protection will generally be required where the redevelopment of existing developed areas is permitted in areas at risk from flooding;*
- ii.where appropriate, a condition will be attached to planning permissions to ensure that strips are provided alongside 'main river' watercourses and kept free of development in order to allow access for dredging and discretionary maintenance;*
- iii.all works in, under, over and adjacent to watercourses shall be appropriately designed and implemented and alternatives to culverting should be explored where possible; and*
- iv.proposals shall not increase flood risk in areas downstream due to additional surface water runoff. If development is permitted, it must include appropriate surface water runoff control measures.*

### **Policy 84A: Drainage and Infrastructure**

*The Council will consult Thames Water Utilities Ltd. and the National Rivers Authority on all planning applications that might cause sewerage flooding. The following principles will apply:*

- i.planning permission will not normally be granted for new development in areas which are considered presently at risk of sewerage flooding; or where development would result in an unacceptable increase in sewerage flood risk there or elsewhere;*
- ii.a detailed drainage impact study may be required at the planning application stage;*
- iii.where planning permission is granted, it may be subject to a condition or agreement relating to the approval of a drainage strategy, which may include phasing of the development.*

## 2.3 South West Hertfordshire Level 1 Strategic Flood Risk Assessment

- 2.3.1 The **South West Hertfordshire Strategic Flood Risk Assessment (SFRA) Stage 1** was released in 2019 and forms part of the draft Local Plan evidence base, to inform future spatial planning and to assist in developing planning policies to address flood risk. Moreover, the document provides an overall understanding of the flood risk within the study area taking into account all potential sources of flooding.
- 2.3.2 The SFRA Level 1 should inform and allow the Sequential Test to be applied to site allocations and identify where the Exception Test may be required. It should also help inform planning applications where speculative planning applications are submitted. Hence provide the criteria to assess future development proposals, the Sequential Test and Sequential Approach to flood risk.
- 2.3.3 The SFRA paragraph 3.4 confirms that the SFRA mapping or other more recent data should be used to determine if the Sequential Test is required.

### Surface Water Flood Risk

- 2.3.4 The SFRA goes on to say that the Environment Agency Risk of Flooding from Surface Water (RoFSW) map is based on a national scale map identifying areas where surface water poses a risk. The RoFSW predominantly follows topographical flow paths along existing water courses or dry valleys with some isolated ponding in low lying areas. However is also states that due to the broad scale and nature of this mapping the mapping should be used in conjunction with other information to confirm the presence of a surface water risk.
- 2.3.5 As part of the SFRA the Environment Agency's Risk of Flooding from Surface Water model was used to assess the impact of climate change on surface water flood risk. Paragraph 6.4 confirms that the surface water flood risk mapping is provided in Appendix A of the SFRA. See extract from the SFRA below with site boundary added for reference.
- 2.3.6 Based on the surface water flood risk mapping provided in the SFRA there is very limited surface water flood risk identified within the developable area. The majority of the flood risk extent is contained within the flood risk area identified for fluvial flood risk i.e. in Flood Zones 2 and 3 where no built development is proposed.



Figure 2-1: Flooding from Surface Water including Climate Change (SFRA, 2019)

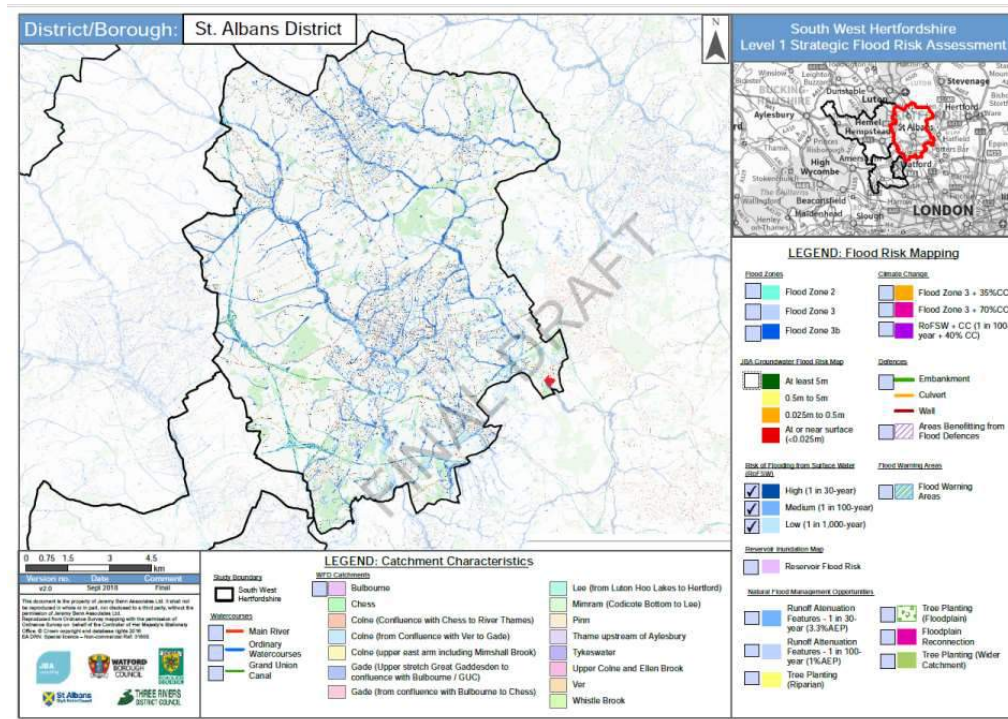


Figure 2-2: Image of SFRA Appendix A, with site shown in red.

## Level of Risk

2.3.7 The criteria for a site to be considered to be at low risk of flooding are as follows.

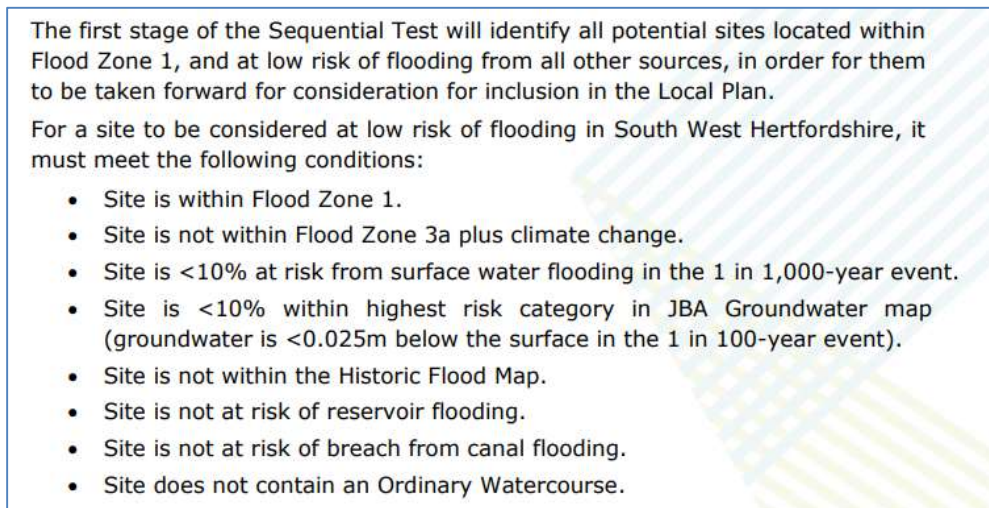


Figure 2-3: Criteria for site to be considered at low risk of flooding (SFRA Level 1)

- 2.3.8 As stated in **NPPF paragraph 161** – All plans should apply a sequential risk-based approach to the location of development – taking into account all sources of flood risk and the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property.
- 2.3.9 On this basis the sequential approach has been applied whereby built development has been located in areas with no or low risk of flooding. The red line boundary could have been limited to include this area only. The benefits to the development and the wider community by including the corridor along the River Colne are considered in the wider evidence before this inquiry.
- 2.3.10 Including the area that falls within Flood Zone 2 and 3 within the redline boundary, will help protect and manage the Colney Heath Farm Meadows, which is a Local Wildlife Site.
- 2.3.11 Including this area will also provide a way of accessing the River Colne along this stretch which will allow the appeal scheme to comply with **Planning Policy 84 ii**. *‘where appropriate, a condition will be attached to planning permissions to ensure that strips are provided alongside ‘main river’ watercourses and kept free of development in order to allow access for dredging and discretionary maintenance’.*
- 2.3.12 In addition, the Environment Agency (EA) has confirmed that they are in favour of opportunities to enhance the River Colne through the site.
- 2.3.13 The EA have also confirmed that the Thames River Basin Management Plan has set out actions to help the River Colne, currently classified as Bad ecological status, achieving good ecological status. For this site the proposed actions includes providing an undeveloped buffer zone to provide benefits for people and wildlife stabilising and reducing erosion of the river bank, incorporate trees to reduce fine sediment ingress into the river, amongst other things. This approach is supported by **paragraphs 174 and 179 of the NPPF** and would be difficult to achieve if the river corridor is excluded from the redline boundary.

2.3.14 Based on this approach the assessment of whether the Sequential Test is required has been limited to the extent of the built development. The following applies and confirms the site is considered at **Low Risk** of flooding from all sources.

- All the built development is to be located in Flood Zone 1.
- The site is not located within Flood Zone 3a plus climate change.
- The site is <10% at risk from surface water flooding in the 1 in 1000 probability event.
- The site is <10% at risk from groundwater flooding.
- The site is not within the Historic Flood Map.
- The site is not at risk of reservoir flooding.
- The site is not at risk of breach from canal flooding.

## **2.4 The site does not contain an Ordinary Watercourse.Climate Change**

2.4.1 Climate change guidance is set out within the Flood Risk Assessments: Climate Change Allowances document (<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>).

2.4.2 The FRA considers impacts of climate change as set out in the May 2022 update to this guidance, which was first issued in February 2016. Since the issue of the FRA, there has been no further updates to this guidance. Data provided by the Environment Agency (EA) that informed the FRA was prepared prior to the latest update and the implications of the May 2022 updates were considered in the FRA.

### 3 Sequential Test

The information below provides my assessment of the requirement for the sequential test to be applied, based on our assessment of flood risk from all sources within the Site and the information available in the SFRA.

#### 3.1 NPPF – Chapter 14

- 3.1.1 Paragraph 159 of the NPPF states ‘inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere’.
- 3.1.2 Paragraph 162 of NPPF states ‘the aim of the sequential test is to steer new development to areas with the lowest risk of flooding from any source. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding. The strategic flood risk assessment will provide the basis for applying this test. The sequential approach should be used in areas known to be at risk now or in the future from any form of flooding’.

#### 3.2 Conclusion

- 3.2.1 It is my opinion that the information provided in the Flood Risk Assessment (**CD 4.9**) and two Technical Notes (**CD 5.11 and CD 9.6**) supporting this application have demonstrated that this development is appropriate for this location. From a review of the submitted information and the stakeholder responses, no evidence has been provided that the Sequential Test is required to be carried out in relation to any source of flooding, although the information provided would be for the Local Planning Authority to review and determine its acceptability.
- 3.2.2 Our Flood Risk Assessment has EA, LPA and LLFA approval, the findings of which did not flag any issues aligned with the attempted case being made by the Colney Heath Parish Council and various interested parties. In relation to the EA’s, LPA and LLFA’s position it should be noted that the views as statutory consultees should be given great weight and that cogent and compelling reasons need to be given to depart from those views (see para 72, Shadwell Estate Ltd v Breckland District Council and Pigeon (Thetford) Ltd [2013] EWHC 12 (Admin) (**Appendix A** of this rebuttal). The EA, LPA and LLFA have confirmed they are not objecting to the proposal subject to conditions. Furthermore, the main Statement of Common Ground (CD8.3) confirms that the sequential test does not need to be applied in respect of fluvial or surface water flood risk (paragraph 6.66). I agree.
- 3.2.3 It is understood that each Appeal Site should be considered on its own merits however there are a couple of comparable sites of similar in size that has either been granted planning approval recently or is currently being considered for planning. Both sites have on site surface water flood risk to a similar or greater extent to the Appeal Site and the planning policy position is the same, where all sources of flooding should be considered when reviewing flood risk.
- 3.2.4 On the basis that one of the sites with a larger extent of surface water flood risk has been considered acceptable and not having required the Sequential Test to be applied (APP/B1930/W/3265925) the Appeal Site with a lesser risk of flooding should be considered acceptable.

## 4 Consultation Responses

The responses received from statutory consultees with a remit including flood risk and drainage are summarised in this section. Copies of the correspondence can be found in **Appendix B**.

### 4.1 Lead Local Flood Authority

- 4.1.1 Hertfordshire County Council Lead Local Flood Authority did not employ any flood risk officers when this application was made hence St Albans District Council consulted RAB in place of the LLFA with regards to surface water drainage.
- 4.1.2 Some guidance was however provided by the LLFA following queries regarding flood risk on the 20 February 2023 and again on the 6 September 2023 with reference to the comments from the CHPC regarding an underground stream and surface water flood risk at the rear of the properties off Tollgate Road.
- 4.1.3 The LLFA have confirmed that they are in agreement with our findings that the localised ponding referenced in a number of public objections are due to surface water flooding and not ground water flooding as a result of an underground stream.

### 4.2 Environment Agency

- 4.2.1 The Environment Agency responded to the planning application on 3 occasions, on the 3 October 2022, 30 January 2023 and 17 March 2023.
- 4.2.2 The EA are not objecting to the application.

### 4.3 RAB

- 4.3.1 RAB on behalf of St Albans City and District Council have provided comments on the planning application. They confirmed that the proposed drainage strategy is acceptable subject to a number of standard conditions as outlined in their response dated 15 September 2022.

### 4.4 Thames Water

- 4.4.1 Thames Water have not objected to the proposals and confirmed there is sufficient capacity in the sewer network to serve the site.

### 4.5 Affinity Water

- 4.5.1 Affinity Water have not objected to the proposals but set out a number of proposed conditions for consideration.



## 5 Development Proposals and Flood Risk Management

Within this section, I consider each potential source of flooding in turn, setting out the potential risk, under existing conditions and under the potential impacts of climate change, and set out how the development proposals have responded to flood risk to manage this risk. Please refer to **Appendix C** for the flood risk mapping.

### 5.1 Fluvial (River) Flood Risk

- 5.1.1 The River Colne, designated as an EA main river, is the dominant watercourse around the site. It is located along the south western boundary and is flowing northwest wards. An ordinary watercourse is also flowing parallel to the south west of the River Colne.
- 5.1.2 According to the EA online Flood Map for Planning the majority of the appeal site is shown to be located within Flood Zone 1 'Low Probability'. This figure is recreated in Figure 5-1 and Appendix A in the FRA. Flood Zone 1 is defined as land at less than 1 in 1000 (0.1%) annual probability of river flooding. The south western part of the site, located adjacent to River Colne, lies within Flood Zone 3 'High Probability' defined as land at 1 in 100 (1%) or greater annual probability of river flooding, with minor areas located within Flood Zone 2 'Medium Probability' defined as land between 1 in 100 (1%) and 1 in 1000 (0.1%) annual probability of river flooding. There has been no change to the Flood Map for Planning in Colney Heath since the FRA was written and the majority of the site is still shown to be in Flood Zone 1 in September 2023.

#### EA modelling (Upper Colne Flood Risk Mapping Study)

- 5.1.3 The EA provided their detailed Product 4 (EA ref: HNL 253613NR, 10/03/2022), as well as the associated model and reports in Products 5, 6 and 7 to inform the FRA. Products 5, 6 and 7 include outputs from the Upper Colne Flood Risk Mapping Study (Halcrow, 2010).
- 5.1.4 It should be noted that the 20% climate change allowance has been superseded by the new climate change allowances in the EA guidance released in May 2022 that can be found at (<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>). The updated climate change allowance to assess the future impact of climate change on fluvial flood risk, is 21% (central allowance), and therefore, the difference between the current and the previously modelled climate change allowances, can be considered to be minimal.
- 5.1.5 We have therefore assumed that the 1 in 1000 AEP event would act as a proxy for the 1 in 100 AEP event including a 21% allowance for climate change.
- 5.1.6 The potential impacts of climate change over the lifetime of the proposed development has been considered so that mitigation measures can be designed accordingly for a worst-case scenario.

### 5.2 Surface Water (Pluvial) Flood Risk

- 5.2.1 Pluvial flooding is that which occurs from rainfall falling into the land and running overland before it is infiltrated into the ground or reaches a watercourse.
- 5.2.2 The EA 'Risk of Flooding from Surface Water' mapping identifies areas that could be susceptible to surface water flooding in various rainfall events.
- 5.2.3 The FRA identifies that the majority of the site is predicted to be at a 'Very Low' risk of surface water flooding, defined as less than 1 in 1000 annual probability event; shown as areas without colouring on the mapping enclosed in **Appendix C**.

- 5.2.4 However, the area to the west of the site, adjacent to the River Colne is identified to be at 'Low' to 'High' susceptibility to surface water flooding. Low risk is defined as an 1 in 30 annual probability event, Medium as 1 in 100 whilst High risk is defined as 1 in 1000 annual probability event.
- 5.2.5 Additionally, there is an indicative flowpath of 'Low' to 'High' susceptibility to surface water flooding running along the north eastern boundary of the site.
- 5.2.6 Reviewing the topographical survey, the areas of 'Low' and 'High' risk from surface water flooding, are considered to result from localised low spots and as discussed in Section 2.3, the risk of surface water flooding is considered 'Low'.
- 5.2.7 Localised surface water flood risk identified on any greenfield or brownfield site is not unusual but in fact a common occurrence where there is uneven or flat ground conditions. This in isolation should not be considered a valid reason why a site should not be considered for development.

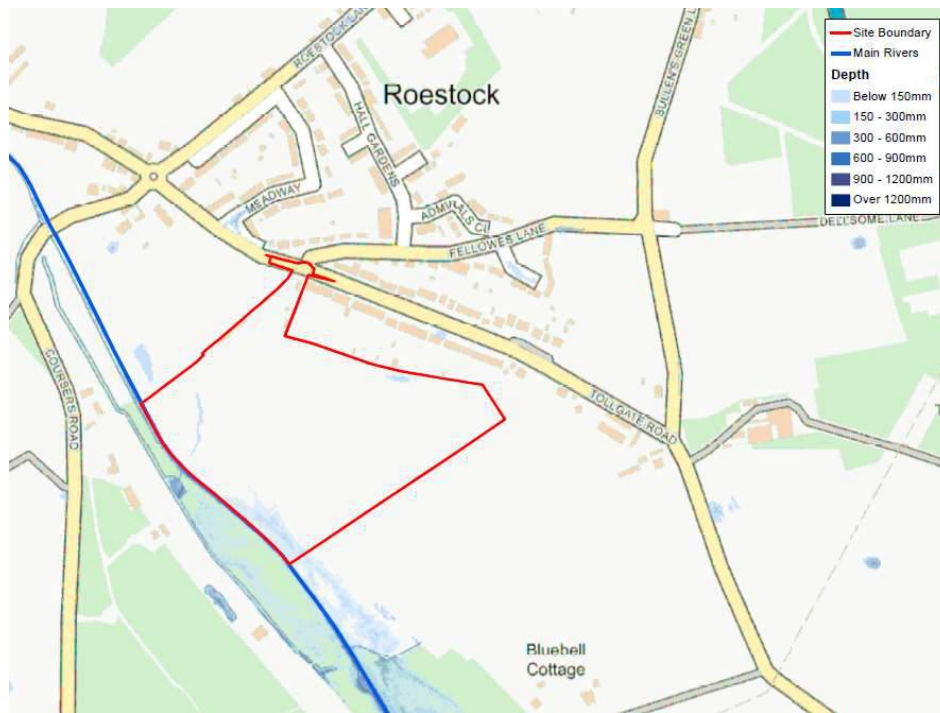


Figure 4-1: EA Risk of Flooding from Surface Water (High Risk) Map

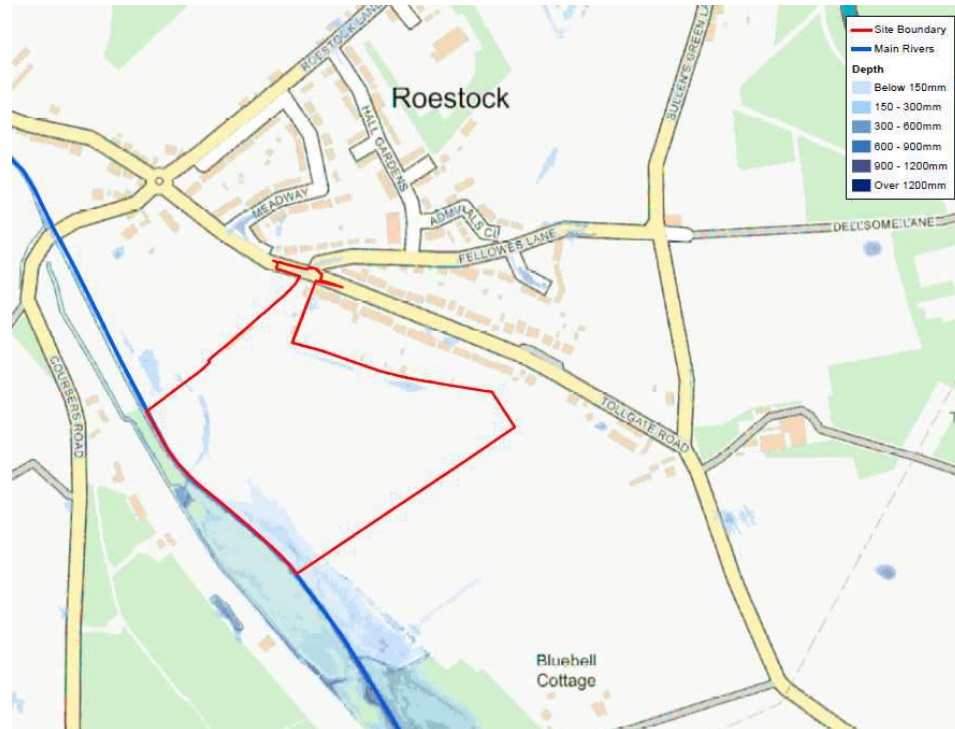


Figure 4-2: EA Risk of Flooding from Surface Water (Medium Risk) Map

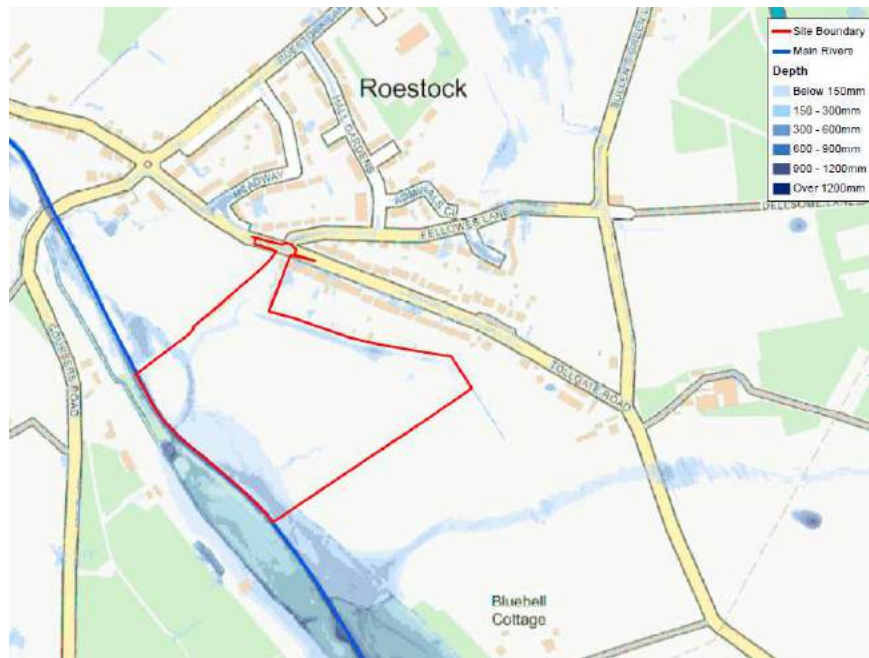


Figure 4-1: EA Risk of Flooding from Surface Water (Low Risk) Map

- 5.2.8 It should be noted that the surface water maps are generated using a generic methodology on a national scale, whereby rainfall is routed over a ground surface model. The analysis does not take account of any specific local information on below-ground drainage infrastructure and infiltration, although an adjustment is included in urban areas to account for the impact of sewerage and a standard infiltration allowance based on soil type. Consequently, the mapping only provides a guide to potentially vulnerable areas based on the general topography of an area.

### **5.3 Groundwater Flood Risk**

- 5.3.1 The South West Hertfordshire SFRA indicates that the western part of the site falls within an area where groundwater levels are at or near the surface (less than 0.025m from the surface).
- 5.3.2 Post-fieldwork monitoring recorded a relatively high groundwater table beneath the site, with groundwater present at approximately 3.0m to 4.0m bgl in the north and east of the site, and at around 0.6m to 2.0m bgl in the south and west of the site.
- 5.3.3 Groundwater flood risk is not consistent across the site and an area adjacent to the river would be considered at 'Medium' risk, with a similar extent to the fluvial flood extent.
- 5.3.4 The remainder of the site is considered to be at 'Low' risk of groundwater flooding.

### **5.4 Reservoir Flood Risk**

- 5.4.1 A review of the EA online reservoir map shows that the site lies outside of an area at risk of reservoir flooding. Therefore, there is no risk associated with this flood source and the risk of reservoir flooding is considered to be 'Very Low'.

### **5.5 Sewer Flood Risk**

- 5.5.1 The South West Hertfordshire SFRA shows that within the postcode where the site is located, there have been 11-15 Thames Water records of sewer flooding. However, the Thames Water sewer flooding register for St Albans does not present any internal or external property sewer flooding within Colney Heath.
- 5.5.2 Therefore the risk of sewer flooding is considered to be 'Low'.

### **5.6 Historical Flooding**

- 5.6.1 The EA 'Historic Flood Map' is a dataset showing the maximum extent of all individual recorded flood outlines from river, the sea and groundwater and shows areas of land that have previously been subject to flooding.
- 5.6.2 An extract of the Recorded Flood Outlines map, indicates that there have been recorded floods at the site.
- 5.6.3 The EA Product 4 Historic Flood Maps, indicate the flood outlines along the south western part of the site for events occurring in 1987, 1992, 2000, 2009, 2011 and 2012. The historic flood extent has a similar extent to the fluvial flood extent.

### **5.7 Underground Chalk Stream**

- 5.7.1 The incorrect reference to the perceived flooding within the north of the site being as a result to an underground chalk stream is unfounded.
- 5.7.2 Based on the findings from an intrusive ground investigation a technical note was prepared, see paragraph 8.1, that confirmed that the flooding seen at surface is due to rainwater accumulating in shallow surface depressions and not due to a subterranean stream.

- 5.7.3 The River Colne rises from a subterranean stream at a spring in North Mymms Park some 700m east of The Site. There are no records of other subterranean streams through Coney Heath.
- 5.7.4 The LLFA agrees with our conclusion that the reference to an underground stream in many of the 3<sup>rd</sup> party objections and the proof from the CHPC has come from a misunderstanding, see the LLFA response in **Appendix B**.

## 6 Nearby Developments

The sections below provide a summary of the surface water flood risk at nearby developments that have either obtained planning in recent years or been approved through appeal. Neither of the two developments have been requested to apply the Sequential Test.

### 6.1 Roundhouse Farm, Bullens Green (5/2020/1992) also referred to as Land Between Bullens Green Lane and Roestock Lanse (5/2022/0878)

- 6.1.1 This development is located to the north east of the Appeal Site and contains an extended area at risk of surface water flooding within the area proposed for built development.
- 6.1.2 The Appeal Decision and copy of the Flood Risk Assessment are included in **Appendix E** for reference.
- 6.1.3 Stakeholder comments from the EA and LLFA are also included in **Appendix E**, neither raise a concern with regards to flood risk or suggest a Sequential Test is required, both confirm no objections to planning.

### 6.2 Land Rear of Round House Farm Roestock Lane (5/2022/2726)

- 6.2.1 This proposed development is located to the north west of the Appeal Site and contains an area at risk of surface water flooding within the area proposed for built development.
- 6.2.2 A decision is yet to be made for this application however to date there has been no request for a Sequential Test.

### 6.3 SFRA - Surface Water Flood Risk

- 6.3.1 Both sites include areas identified at risk of surface water flooding in the SFRA. As identified in Section 2.3, The Site does not include any surface water flood risk within the built area, see **Appendix A** for a copy of the SFRA flood mapping.



Figure 6-1: Surface Water Flood Risk from adjacent site (SFRA, 2019)

6.3.2 Both sites also contain an ordinary watercourse or ditches either within the proposed development area or along the site boundaries.

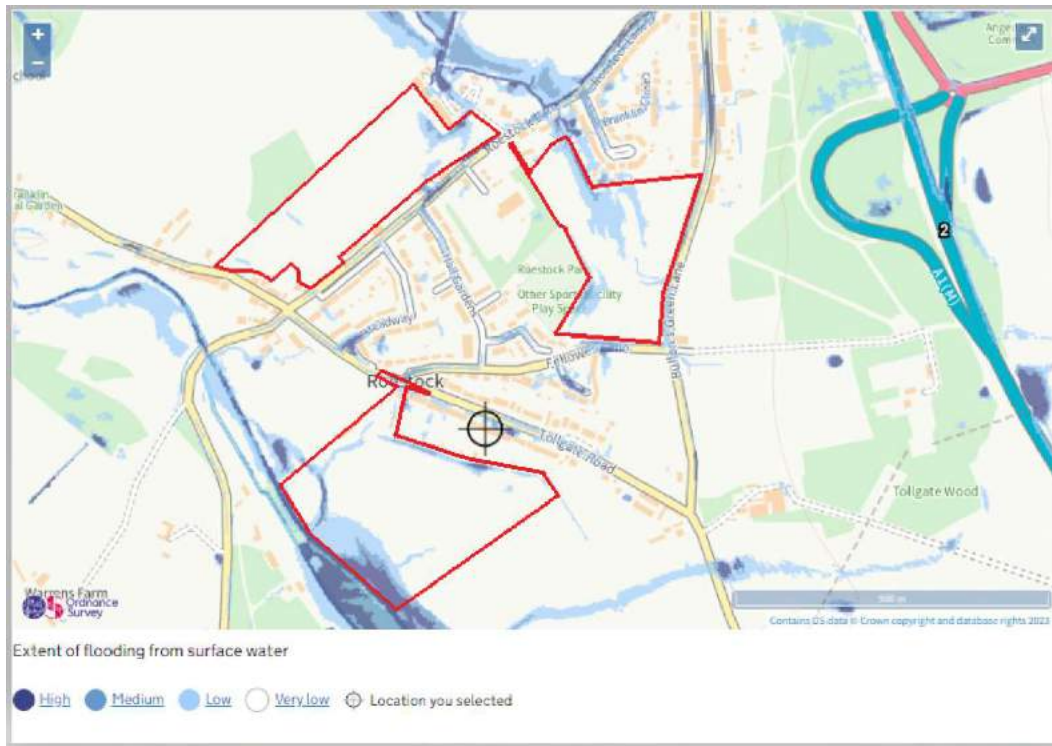


Figure 6-2: EA Surface Water Flood mapping – showing the Site and two adjacent developments.



Figure 6-3: Surface Water Flood Mapping – showing extent of green infrastructure and built areas.



## 7 Drainage

### 7.1 Surface Water Drainage

- 7.1.1 The NPPF recognises that flood risk and other environmental damage can be managed by minimising changes in the volume and rate of surface runoff from development sites and recommends that priority is given to the use of Sustainable Drainage Systems (SuDS) in new developments, this being complementary to the control of development within the floodplain.
- 7.1.2 Based on a ground investigation, infiltration rates are considered relatively poor. Therefore, for the purposes of this outline application, surface water drainage methods relying on infiltration have been discounted in order to provide a robust design.
- 7.1.3 The proposed drainage strategy consists of two lined attenuation basins to the south of the site. It is proposed that discharge will be conveyed through swales with piped surface water outfalls to the River Colne. See drawings 332510999/4001/102 and 332510999/4001/102 in **Appendix F** of the Outline Drainage Strategy.
- 7.1.4 The abovementioned SuDS features seek to deliver long term mitigation by attenuating and treating the development generated surface water runoff. The SuDS will also form an important part of the project's biodiversity strategy and features will be designed so that they maximise opportunities for habitat creation.
- 7.1.5 The proposed drainage strategy has been designed in accordance with the Hertfordshire LLFA Summary Guidance for developers. The LLFA expects all applicants to achieve greenfield runoff rates for greenfield development sites.
- 7.1.6 The total storage required has been modelled using MicroDrainage, assuming the following design criteria:
- Rainfall data generated by FEH
  - Development should be designed with the upper end allowance (40% climate change allowance) for the 1 in 100 AEP event, and;
    - There should be no increase in flood risk elsewhere.
    - The development should be safe from surface water flooding.
  - Qbar rate of 2.82 l/s/ha, see calculation in **Appendix F**.
- 7.1.7 The outline strategy has been based on all surface water discharge into the River Colne, up to the 1 in 100 annual probability event including climate change, being limited to Qbar. Qbar is approximately equivalent to a 1 in 2.3 annual probability event.
- 7.1.8 As a result the attenuated surface water discharge from the drainage network for all storm events above a 1 in 2.3 annual probability event will be lower than existing, up to the 1 in 100 annual probability event, and provide betterment.
- 7.1.9 LLFA were consulted during the development of the drainage scheme, however due to limited resources they did not provide a pre-app facility during that time.
- 7.1.10 RAB on behalf of St Albans District Council have confirmed they have no objections to the proposals (see RAB correspondence included in **Appendix B**).

## **7.2 Foul Water Drainage**

- 7.2.1 The foul water drainage strategy has been informed by the Development Framework Plan and the site topography.
- 7.2.2 Thames Water have been consulted and confirmed there is adequate capacity within the existing sewer network to serve the development (see Thames Water correspondence included in **Appendix B**). Foul water will discharge into manhole 8601, located on Tollgate Road.

## 8 Rebuttal to CD 9.19 Flooding Proof of Evidence by John Clemow

The evidence seeks to challenge the SoCG CD 8.3 as it has failed to address the flood risk at the rear of the houses in Tollgate Road, see copy of CHPC proof of evidence in [Appendix G](#).

### 8.1 Surface Water Flooding

- 8.1.1 The evidence provides photos of standing water at the rear of the houses in Tollgate Road. This is as a result of surface water ponding in a localised shallow surface depression which collects rainwater. Due to impermeable clay rich strata below with impeded drainage potential, as previously confirmed in our Technical Note dated 24 January 2023 (**CD 5.11**) and again in our Technical Note dated 22 August 2023 (**CD 9.6**), surface ponding occurs in events when the rainfall exceeds the drainage capability of the soil strata beneath. The conclusion provided within these technical notes has also been agreed by the LLFA in their email response to St Albans Council dated 20 February 2023, see Appendix C.
- 8.1.2 The shallow ponding of surface water will be mitigated and managed by simply levelling the site and setting ground levels so that all areas can drain naturally either through overland flow in blue and green corridors or intercepted and manage within the surface water drainage strategy following the Site being developed, incorporating Sustainable Drainage Systems (SuDS).
- 8.1.3 The SFRA mapping identifies the whole development area as low risk of surface water flooding, see **Section 2.3**. As a result the surface water flood risk does not require the Sequential test to be applied and hence the SoCG is still applicable.

### 8.2 River Flooding

- 8.2.1 The evidence raises a concern with regards to surface water entering the river quicker due to development and the risk of contamination washing into the river.
- 8.2.2 Surface water runoff will drain through the site eventually discharge into two attenuation basins where the water will be discharged at greenfield runoff rate, the equivalent of a 1 in 2 flow rate, with a flow of up to 2.80 l/s and 2.76 l/s. This is equivalent to two 75mm diameter pipes running full at a gradient of 1 in 100, hence a very low discharge.
- 8.2.3 All surface water discharge will be subject to a minimum of two treatment stages before discharging into the River Colne. The pollution control is in accordance with CIRIA C753 'The SuDS Manual'. RAB on behalf of St Albans City and District Council have confirmed that the proposed drainage strategy is acceptable subject to a number of standard conditions as outlined in their response dated 15/09/2022, see [Appendix C](#).
- 8.2.4 The evidence also raises a concern over the height difference between the area that flood regularly and the proposed development.
- 8.2.5 As confirmed in the FRA the minimum ground level within the development area is approximately 72.3m AOD. The flood levels across the site for the 1 in 2 annual probability event varies between 70.87m and 70.45m providing a freeboard of 1.43m – 1.85m. The flood level in the 1 in 10 annual probability event varies between 71.3m and 70.98m providing a freeboard of 1.0m – 1.32m. The 1 in 20 annual probability event reduced the freeboard by approximately 0.1m whilst the 1 in 50 annual probability event reduces the freeboard by approximately another 0.2m. So even for the less frequent flood events there is a substantial freeboard provided.

## 9 Rebuttal to CD 9.16 Relevant Planning Matter by John Clemow

The response below addresses each point raised by the CHPC as a reason for refusal. Please refer to **Appendix G** for a copy of the CHPC document.

### 9.1 Suggested reason for refusal raised by Colney Heath Parish Council.

*The appeal should be refused as the Appellant has failed to:*

- a. *Complete an Sequential Testing Assessment (STA) (NPPF P161)*
- b. *Take account of all sources of flooding (NPPF P161)*
- c. *Consider the whole development area (NPPF P159)*
- d. *To undertake research into other lesser flood risk sites that are reasonably available in the wider area (NPPF P162)*
- e. *Prove a wider sustainability benefits to the community (NPPF P164(a)). and that it will be safe for a lifetime (NPPF P164(b))*

### 9.2 Sequential Test

9.2.1 It has been demonstrated in Section 2.3 that the site is at low risk of flooding from all sources and hence the Sequential test is not required.

### 9.3 Take Account of All Sources of Flooding

9.3.1 All sources of flood risk was considered in the FRA.

### 9.4 Consider the Whole Development Area

9.4.1 As explained in Section 2.3 the built development area including the public open space, has been considered when assessing the requirement for the Sequential Test. As presented in paragraphs 2.3.9 – 2.3.13 the benefits the development can provide to manage and enhance the river corridor, would not be possible should the area in Flood Zone 2 and 3 have been excluded from the application.

9.4.2 The LWS (Colney Heath Farm Meadow), located within Flood Zone 2 and 3, will have limited access and includes no operational development.

### 9.5 To undertake research into lesser flood risk sites that are reasonably available in the wider area

9.5.1 As the Sequential Test is not required this is not applicable.

### 9.6 Provide wider sustainability benefits to the community and that the development will be safe for a lifetime

9.6.1 See sections 2.3.9 – 2.3.13 for details of how the development can provide benefits to the area and wider community.

- 9.6.2 It has been demonstrated in the FRA(CD 4.9) that the development proposals are resistant and resilient to all sources of flood risk, taking into account the projected impacts of climate change, and that flood risk would not be increased to third parties. As such, the proposals are, in fact, in accordance with Local Policy 84 and Policy 167 of the NPPF.

## 10 Conclusions

- 10.1.1 The developable area of the Site, including accessible areas of open space, is at low risk of flooding from fluvial sources or manmade sources such as reservoirs, even when the projected impacts of climate change are considered.
- 10.1.2 The majority of the site is at 'Low' or 'Very Low' risk of surface water flooding. However, the lowest areas of the site are at higher risk from both pluvial flooding and groundwater emergence. There has been recorded incidences of flooding in these lowest areas along the south western boundary of The Site.
- 10.1.3 All built development has been proposed to lie outside of the 1 in 100 annual probability pluvial flood extent, including a 40% allowance for climate change. Additionally, all surface water management features in the shape of Attenuation Basins are located outside of this flood extent.
- 10.1.4 Flood management measures are proposed to ensure that the development is safe, as follows:
- Finished floor levels raised 150mm above surrounding ground level.
  - Ground levels are to be set to avoid surface water ponding in low spot areas.
- 10.1.5 There are no objections with regard to flood risk, from any source, from HCC as Lead Local Flood Authority or the Environment Agency. RAB also had no objections with regards to Surface Water Drainage. Thames Water had no objections with regards to Foul Drainage. Affinity Water had no objections subject to some standard conditions.
- 10.1.6 Based on the information provided in the SFRA and based on the assessment of the risk of flooding from all sources, The Sequential Test is not required as position that is agreed with the Council in the main Statement of Common Ground at paragraph 6.66.
- 10.1.7 As such, I consider the development proposals will be flood resilient and resistant from all sources of flooding, the development will be safe and will not increase flood risk to third parties, including allowance for climate change. I conclude that the development proposals are therefore in accordance with Policy 84 and paragraphs 167 of the NPPF.
- 10.1.8 As per Paragraph 159 of the NPPF, the evidence within the FRA, and summarised in this Proof, confirms that the development will be safe for the lifetime of the development, without increasing flood risk elsewhere.

## **Appendix A Shadwell Estate Ltd v Breckland District Council and Pigeon**

Neutral Citation Number: [2013] EWHC 12 (Admin)

Case No: CO/8634/2012

**IN THE HIGH COURT OF JUSTICE**  
**QUEEN'S BENCH DIVISION**  
**ADMINISTRATIVE COURT IN BIRMINGHAM**

Birmingham Civil Justice Centre  
33 Bull Street, Birmingham, B4 6DS

Date: 11/01/2013

**Before :**

**THE HONOURABLE MR JUSTICE BEATSON**

-----  
**Between :**

<b>Shadwell Estates Ltd</b>	<b><u>Claimant</u></b>
<b>- and -</b>	
<b>Breckland District Council</b>	<b><u>Defendant</u></b>
<b>- and -</b>	
<b>Pigeon (Thetford) Ltd</b>	<b><u>Interested Party</u></b>

(Transcript of the Handed Down Judgment of  
WordWave International Limited  
A Merrill Communications Company  
165 Fleet Street, London EC4A 2DY  
Tel No: 020 7404 1400, Fax No: 020 7831 8838  
Official Shorthand Writers to the Court)

**Timothy Straker QC and Timothy Leader** (instructed by **Greenwoods Solicitors**) for the  
**Claimant**

**John Hobson QC and Ned Helme** (instructed by **Breckland District Council Legal  
Department**) for the **Defendant**

**James Maurici** (instructed by **Berwin Leighton Paisner LLP**) for the **Interested Party**

Hearing dates: 26 and 27 November 2012

-----  
**Judgment**  
**As Approved by the Court**

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**Mr Justice Beatson :**

## **I. Introduction**

1. The claimant, Shadwell Estate Company Ltd (“Shadwell”), owns a large agricultural and equine estate to the south-east of Thetford. In these proceedings, brought under section 113 of the Planning and Compulsory Purchase Act 2004 (“the 2004 Act”), it challenges the decision of the defendant, Breckland District Council (“the Council”) to adopt the Thetford Area Action Plan (“the TAAP”) on 5 July 2012.
2. The TAAP confirmed the designation in the Council’s Core Strategy of an area to the north-east of Thetford as a strategic urban extension for the town on which 5,000 houses are to be built. The area so designated does not include the Shadwell estate but does include the Kilverstone Estate (“Kilverstone”). A planning application on land which includes Kilverstone is being promoted by Pigeon (Thetford) Ltd, a property company. Pigeon is an interested party in these proceedings. On its face, Shadwell’s challenge does not concern the treatment of its own land. Its case is that there are public law deficiencies in the treatment of evidence relating to stone-curlews on the Kilverstone estate by the Council and by Mr Broyd, the Inspector at the examination in public of the TAAP on 6 and 7 March 2012.
3. Stone-curlews are a protected species under Council Directive 79/409/EEC (“the Birds Directive”), as updated by Council Directive 2009/147/EC. The Conservation of Habitats and Species Regulations 2010 SI 2010 No 490 (“the Habitats Regulations 2010”), now amended by the Habitats Regulation 2012 SI 2012 No 1927, have transposed the Birds Directive and Council Directive 92/43/EEC (“the Habitats Directive”) into United Kingdom law. Stone-curlews and their habitats must be protected from the effects of development. One of the areas designated under Article 4.1 of the Birds Directive which is therefore a “European Site” because of the presence on it of stone-curlews, is the Breckland Special Protection Area (“the SPA”), an area to the south-east of Thetford. The Habitats Regulations 2010 provide, *inter alia*, for the assessment of the implications of plans or projects for European Sites. Part of Shadwell’s estate is within the SPA and the remainder of the estate is no more than a few hundred metres from its boundary. The Kilverstone estate is situated to the north-east of Thetford and is not within any area designated as SPA due to stone-curlews. None of the allocation areas are within 1,500 metres of the boundary of the SPA designated due to stone-curlews, but some are within 2,500 metres of that boundary.
4. The TAAP is in what can be termed the third tier of development plan provided for by the 2004 Act. As such it is required that it be prepared in conformity with the first and second tiers, the Regional and Core Strategies, in order to provide local policy detail in relation to the strategic choices made in those development documents. The relevant Regional Strategy is the 2008 East of England Plan. The Council’s Core Strategy was adopted on 17 December 2009.

5. The East of England Plan designated Thetford as a key area for development, envisaging an additional 6,000 dwellings in and on the edge of the town. In its Core Strategy the Council defined an area to the north-east of Thetford as a strategic urban extension for the town. The Council's strategy is to protect species in the Breckland SPA and in a 1,500 metre buffer-zone from the edge of those parts of the SPA that support, or are capable of supporting, stone-curlews, from development that will adversely affect the SPA. In the SPA and the buffer-zone additional tests for planning permission apply in order to seek to protect the SPA. Because of the presence of the stone-curlews in the area to the south-east of the town, including on Shadwell's land, that area was not within the area designated by the Core Strategy for the strategic urban extension. Shadwell did not challenge the Core Strategy.
6. The TAAP was preceded by two documents; in 2008, "Issues and Options" and, in March 2009, "Preferred Options", and extensive consultation. At the TAAP's examination in public, the Inspectors *inter alia* tested whether the Core Strategy provided a sufficiently robust foundation for the preparation of action plans. They concluded that it did and rejected criticisms of the evidential base for the approach in the Core Strategy.
7. Shadwell contends that the TAAP was legally defective on the ground that the underlying sustainability appraisal was flawed in that it did not include an assessment of the environmental characteristics at Kilverstone because information about stone-curlews on that estate was incomplete. During earlier stages of the planning process, Shadwell's position had been very different. It had not sought the removal of Kilverstone as a suitable location for housing development, but opposed having an urban extension entirely to the north-east of Thetford on the basis that it would be unbalanced, and opposed the 1,500 metre buffer zone as having no sound basis. Its case now is that the Council was told of the presence of stone-curlews on part of the Kilverstone estate but did not put that material before the Inspector who conducted the examination of the TAAP either in detail or (since the Council's position was that that information was provided in confidence in relation to another matter) in general terms. It maintains that, for this reason, the picture before the Inspector was not complete.
8. In these proceedings, Shadwell's case as to the flaws in the TAAP has been crystallised into three grounds. The first two relate to the underlying sustainability appraisal and the consequences for the TAAP. The third relates to the Habitats Regulations 2010. They are:
  - (1) The Council failed to carry out an adequate sustainability appraisal and strategic environmental assessment in compliance with section 19(5)(b) of the 2004 Act, and various provisions of the Environmental Assessment of Plans and Programmes Regulations 2004 SI 2004/1633 ("the EAPPR 2004").
  - (2) The Inspector who conducted the examination of the TAAP erred in finding that the TAAP satisfied the requirements of section 19 of the 2004 Act and that it was "sound". Accordingly, the requirements of section 20(5) of the 2004 Act were not met.

- (3) The data in the Council's Habitats Regulations assessment did not take account of the finding that built development could adversely affect the nesting density of stone-curlews up to a distance of 2,500 metres, and was incomplete in excluding the Kilverstone estate after 2000 and only including data for other land around Thetford between 1988 and 2006. The result was that the assessment breached Regulation 61 of the Habitats Regulations 2010.

Shadwell also contended (see, for example, skeleton argument, paragraphs 5 and 61) that it was deprived of a proper opportunity to test the TAAP at the examination in public and to advance alternative proposals because its objections to the soundness of the TAAP were dismissed as based on anecdotal evidence.

9. The evidence on behalf of Shadwell consists of two statements of Christopher Kennard, its Finance Director, dated 28 August and 20 November 2012, and a statement of Darryl Broom dated 17 September 2012. Mr Broom was a gamekeeper at Kilverstone until 2008. The evidence on behalf of the Council consists of the statement, dated 3 October 2012, of David Spencer, the Council's Deputy Planning Manager. The evidence on behalf of the interested party consists of the statement of Daniel Brown, dated 15 November 2012. Mr Brown is a freelance ecologist and a director of Daniel Brown Ecology, which conducted stone-curlew surveys of Kilverstone from 2007 for the estate and for the interested party.
10. The legislative framework is summarised in section II of this judgment. The factual and regulatory background and Shadwell's criticism of the sustainability appraisal is summarised in section III in some detail. The detail is necessary because Shadwell's challenge involves consideration of the fine detail of the evidence before the TAAP Inspector and the evidence that was before the Core Strategy Inspectors in 2009. Section IV contains my discussion of the submissions, my conclusion that Shadwell's application must be dismissed, and my reasons for that conclusion. The written and oral submissions on behalf of the Council and the Interested Party made much of the fact that the position taken by Shadwell in these proceedings was radically different to the position it had taken at earlier stages of the development plan process. Although not stated expressly, it was implicit that they consider this challenge is one of those (alluded to by Carnwath LJ in *R (Jones) v Mansfield DC* [2003] EWCA Civ. 1408 at [57] ff) made where the environmental grounds pursued are in fact a tactical means of pursuing a different objective. The point remained implicit and it has played no part in my decision.

## **II. The Legislative framework**

### *(i) The preparation of development plan documents*

11. Section 15 of the 2004 Act requires local planning authorities to maintain a "local development scheme". The local development scheme consists of development plan documents which, together with any Regional Strategy, (here the East of England Plan) comprise the "development plan" for the area: see section 38(3) of the 2004 Act. The Core Strategy and the TAAP are also development plan documents.
12. Planning decisions must generally be made in accordance with the development plan unless other material considerations indicate otherwise. In view of the potential effect

of development plans, Parliament has required that when they are prepared certain steps should be taken to ensure that they are “sound” and “capable of being carried into effect”. Section 19(5) of the 2004 Act requires the local planning authority to carry out “an appraisal of the sustainability of the proposals in each development plan document”; i.e. a “sustainability appraisal” of the environment affected by a plan. It also involves (see section 20(1)) a consultation process which enables the representations to be made about the effects of the plan, including the adequacy of the “sustainability appraisal”, and an independent examination in public.

13. Section 20(5) of the 2004 Act provides that the purpose of independent examination is to determine in respect of a development plan document:

“(a) whether it satisfies the requirements of sections 19 and 24(1) [the regional strategy], regulations under section 17(7) [in relation to the form and content of local development documents] and any regulations under section 36 relating to the preparation of development plan documents;

(b) whether it is sound; and

(c) whether the local planning authority complied with any duty [to co-operate in relation to planning of sustainable development] imposed on the authority by section 33A in relation to its preparation.”

14. The preparation of development plan documents is governed by regulations made under section 36 of the 2004 Act. The TAAP was largely prepared under the Town and Country Planning (Local Development) (England) Regulations 2004 SI 2004 No 2204 (“the 2004 Regulations”), which were in force until 6 April 2012. Regulation 7 of the 2004 Regulations provided that core strategies and area action plans must be in the form of development plan documents. Regulation 30(1)(a) prescribed the sustainability appraisal report as one of the documents to be sent to the Secretary of State under s.20(3) of the 2004 Act before an examination in public of a development plan document.

15. The Town and Country Planning (Local Planning) (England) Regulations 2012 SI 2012 No 767 (“the 2012 Regulations”) came into force on 6 April 2012. The 2004 Regulations were, subject to a saving provision which gave effect to anything done under them as if it were done under the corresponding provisions of the 2012 Regulations, revoked: see Regulations 37-38.

16. By Regulation 25 of the 2012 Regulations, a local planning authority is required to publish the recommendations of the person who conducted the independent examination of a development plan document. If the development plan document is found to be sound, the local planning authority may adopt it as part of the development plan.

*(ii) Environmental assessment*

17. The Environmental Assessment of Plans and Programmes Regulations 2004 SI 2004 No 1633 (“the EAPPR 2004”) govern the strategic environmental assessment of plans and programmes. The effect of Regulations 5 and 8 is that an environmental assessment of certain plans and programmes must be carried out in accordance with Part 3 of the Regulations before its adoption.

18. Regulation 12, in Part 3 of the EAPPR 2004, provides:

**“12. — Preparation of environmental report**

(1) Where an environmental assessment is required by any provision of Part 2 of these Regulations, the responsible authority shall prepare, or secure the preparation of, an environmental report in accordance with paragraphs (2) and (3) of this regulation.

(2) The report shall identify, describe and evaluate the likely significant effects on the environment of—

(a) implementing the plan or programme; and

(b) reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme.

(3) The report shall include such of the information referred to in Schedule 2 to these Regulations as may reasonably be required, taking account of—

(a) current knowledge and methods of assessment;

(b) the contents and level of detail in the plan or programme;

(c) the stage of the plan or programme in the decision-making process; and

(d) the extent to which certain matters are more appropriately assessed at different levels in that process in order to avoid duplication of the assessment.

(4) Information referred to in Schedule 2 may be provided by reference to relevant information obtained at other levels of decision-making or through other [EU] legislation.

(5) When deciding on the scope and level of detail of the information that must be included in the report, the responsible authority shall consult the consultation bodies.

(6) Where a consultation body wishes to respond to a consultation under paragraph (5), it shall do so within the period of 5 weeks beginning with the date on which it receives the responsible authority's invitation to engage in the consultation.”

19. The information listed in Schedule 2 which Regulation 12(3) requires to be in the report is:

“1 An outline of the contents and main objectives of the plan or programme, and of its relationship (if any) with other relevant plans and programmes.

2 The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme.

3 The environmental characteristics of areas likely to be significantly affected.

4 Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Council

Directive 79/409/EEC on the conservation of wild birds and the Habitats Directive.

5 The environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation.

6 The likely significant effects on the environment, including short, medium and long-term effects, permanent and temporary effects, positive and negative effects, and secondary, cumulative and synergistic effects, on issues including—

(a) biodiversity;

(b) population;

...

(d) fauna;

(e) flora;

(f) soil;

...

(l) landscape; and

(m) the inter-relationship between the issues referred to in sub-paragraphs (a) to (l).

7 The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme.

8 An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties encountered in compiling the required information.

9 A description of the measures envisaged concerning monitoring in accordance with regulation 17.

10 A non-technical summary of the information provided under paragraphs 1 to 9.”

*(iii) The Habitats Regulations 2010*

20. Article 6 of the Habitats Directive and Article 6 of the Birds Directive have been transposed into United Kingdom law by regulation 61 of the Habitats Regulations 2010. This *inter alia* provides:

“(1) A competent authority [here the Council], before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which—

(a) is likely to have a significant effect on a European site ... (either alone or in combination with other plans or projects), and

(b) is not directly connected with or necessary to the management of that site,

must make an appropriate assessment of the implications for that site in view of that site's conservation objectives.

(2) A person applying for any such consent, permission or other authorisation must provide such information as the competent authority may reasonably require for the purposes of the assessment or to enable them to determine whether an appropriate assessment is required.

(3) The competent authority must for the purposes of the assessment consult the appropriate nature conservation body and have regard to any representations made by that body within such reasonable time as the authority specify.

(4) They must also, if they consider it appropriate, take the opinion of the general public, and if they do so, they must take such steps for that purpose as they consider appropriate.

(5) In the light of the conclusions of the assessment, and subject to regulation 62 (considerations of overriding public interest), the competent authority may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site or the European offshore marine site (as the case may be).

(6) In considering whether a plan or project will adversely affect the integrity of the site, the authority must have regard to the manner in which it is proposed to be carried out or to any conditions or restrictions subject to which they propose that the consent, permission or other authorisation should be given.”

Regulation 5 of the Habitats Regulations 2010 defines the appropriate nature conservation body which must be consulted under regulation 61(3). In this case, it is Natural England.

21. Development plan documents such as the Core Strategy and the TAAP may be agreed notwithstanding a negative assessment of the implications for a European Site if the plan or project must be carried out for reasons of overriding public interest: see regulations 62, 102 and 103.

*(iv) Challenges to development plan documents*

22. Section 113 of the 2004 Act enables a person aggrieved by, *inter alia*, a development plan document such as the Core Strategy or the TAAP, to apply to this court within six weeks of its adoption to quash or remit the document to the body responsible for its adoption. The grounds are the conventional ones for statutory judicial review, that the document is to any extent outside the “appropriate power” or that the interests of the applicant have been substantially prejudiced by a failure to comply with a “procedural requirement”.
23. Section 113 of the 2004 Act was amended by section 185 of the Planning Act 2008. As amended, section 113(7A) and (7C) provide for a power to give directions in relation to the whole or part of a development plan document which has been remitted. By section 113(7B):

“Directions under subsection (7A) may in particular—

(a) require the relevant document to be treated (generally or for specified purposes) as not having been approved or adopted;

(b) require specified steps in the process that has resulted in the approval or adoption of the relevant document to be treated (generally or for specified purposes) as having been taken or as not having been taken;

(c) require action to be taken by a person or body with a function relating to the preparation, publication, adoption or approval of the document (whether or not the person or body to which the document is remitted);

(d) require action to be taken by one person or body to depend on what action has been taken by another person or body.”

### **III. The factual and regulatory background**

#### *(i) 2007 – 2008*

24. One of the aims of designating Thetford as a key centre for development and change in the 2008 East of England Plan is to increase the number of dwellings in and on the edge of the town by 6,000. Policy TH1 of the Plan stated that this would be done “through maximising sensitive development within the urban area which respects its historic settings and features and through sustainable urban extensions which avoid harm to the Breckland Special Protection Area and/or Breckland’s Special Areas of Conservation”.
25. In the year before the adoption of the East of England Plan, the Council undertook a scoping report, its Core Strategy Preferred Options document and, as required by section 19(5) of the 2004 Act, a sustainability appraisal. It is also relevant to mention that Dan Brown Ecology undertook a preliminary stone-curlew survey of Kilverstone for the Landscape Partnership, which was completed in December 2007. I shall summarise the findings of this and other surveys later in this judgment.
26. During 2008, the Council produced the Thetford Area Action Plan “Issues and Options” document. Comments were invited on twelve areas identified for potential development. The document recognised the sensitivity that was the consequence of the presence of the SPA to the south-east of the town but at that stage land in and near that area was included in the areas identified for potential development. Two of the twelve areas were promoted by Shadwell.

#### *(ii) The Habitats Regulations Assessment*

27. During 2008, Footprint Ecology undertook an assessment under the Habitats Regulations for the Council. It produced two reports dated 10 November 2008. *Habitat Regulations Assessment: Breckland Council’s Submission, Core Strategy and Development Control Policy Document*, (“the Habitat Regulations assessment”) *inter alia* considered the effect of the proposed development in the Thetford area on relevant species. It concluded that there was evidence that stone-curlews avoided housing, and that the evidence was clear for at least a 1,000 metre distance. It also stated that, although it was difficult to give a definitive distance beyond which no



effect occurred, there would potentially be an effect at distances of between 1,000 and 2,500 metres: Report, paragraph 9.4.7.

28. The Habitat Regulations assessment concluded that “the point at which the effects are no longer adverse (i.e. at a distance somewhere between 1,000m and 2,500m) now requires further consideration” and that “based upon the evidence and taking a precautionary approach a distance must be set that prevents built development occurring within a zone whereby it is considered that adverse effects would occur”: paragraph 9.4.10. It also stated that the evidence in the report should enable “Natural England and possibly other key stakeholders to set the most appropriate distance on a precautionary basis”. The other report, *The Effect of Housing Development and Roads on the Distribution of Stone-Curlews in Brecks* (“Footprint Ecology’s Evidence report”), contained the supporting evidence for the Habitats Regulations assessment.
29. The two Footprint Ecology reports used comprehensive bird data acquired under licence from the Royal Society for the Protection of Birds (“RSPB”). The data covered the period 1988 to 2006, excluding 2001, when the occurrence of foot-and-mouth disease resulted in an incomplete data set. The data gave the specific location of stone-curlew nests to the nearest 50 metres.
30. The areas surveyed by the RSPB in this area included Shadwell Estate, Elveden Estate and the Crown Estate. Mr Spencer’s statement (paragraph 26) stated that the coverage did not include Kilverstone Estate because the RSPB had not been given access, but that that was not unusual, and indeed the Shadwell Estate had not given access to the RSPB since 2009.
31. Mr Spencer stated that one quarter of the land area of the urban extension is in the Crown Estate, which had been surveyed by the RSPB. His evidence is that the Crown Estate land is of key relevance to consideration of the Kilverstone Estate since it comprises an area of similar condition to the Kilverstone Estate, which is also bounded by the A11 and the urban edge of Thetford. He stated that “importantly, no stone-curlews have been recorded by the RSPB on Crown Estate land”. In a response dated 7 November 2012 to a request for further information and disclosure by the claimant, Mr Spencer stated that, since drafting his statement, he had been informed by the RSPB that the Kilverstone Estate was surveyed by it in the period 1992 – 2001 “on a limited *ad hoc* basis”, and that the RSPB did not hold records of the precise areas surveyed or the dates of the surveys, but had verified to him that no stone-curlews were found in that period.

*(iii) The evidence considered for the Core Strategy*

32. On 31 March 2009 the Council’s Core Strategy was submitted for examination, and the TAAP “Preferred Options” document was published. The “Preferred Options” document reflected the proposed Core Strategy submission, and the Habitats Regulations assessment which had been informed by the evidence in Footprint Ecology’s Evidence report. It stated (paragraph 8.2) that the work undertaken on the possible impact on protected habitats and species, especially stone-curlews, “has resulted in a bigger area than originally anticipated needing protection from development”. It also stated that “the main impact of this work has been to rule out

significant development to the south-east of Thetford, but not to the north of Thetford”.

33. Mr Spencer’s evidence (paragraph 51) is that the environmental work “raised a question as to whether a single urban extension to the north of the town, avoiding the 1,500 metre buffer for the SPA, could deliver the [East of England Plan] housing requirements” and “work by Roger Evans Associates demonstrated that it could”. Mr Spencer also stated (statement, paragraph 28) that, in preparing the Core Strategy, the Council had considered a number of alternatives, including a “two strategic directions of growth” option, one to the north-east and one to the south-east of Thetford, but had to discount the latter on environmental grounds.
34. The evidence provided in support of the Core Strategy included a Sustainability Appraisal Report (comprising the Scoping Report, and the Preferred Options’ and Submission Sustainability Appraisal Reports), and Footprint Ecology’s Habitats Regulations assessment, and Evidence report.
35. Natural England and the RSPB were consulted throughout the preparation of the Core Strategy. Although there was evidence of a positive relationship between nest densities and distance from settlement up to 2,500 metres, they strongly supported the Council’s general approach and the use of the buffer zones.
36. Natural England stated that it was satisfied with “the data set of bird distribution in Breckland which had been analysed” and “the quality of the interpretation of this data set by Footprint Ecology”. It supported “the analysis which recognises a 1,500m zone of impact around the SPA for stone-curlews”, and welcomed the Council’s “very strong response to the Footprint Ecology report, which [it] consider[ed] will effectively protect stone-curlews...from the adverse effects of development”.
37. The RSPB described the approach of the Council to assessing potential effects and the steps taken to protect the SPA as “exemplary”. It commended the Council on “the thorough manner in which the [Habitat Regulations assessment] has been undertaken, and the subsequent changes made to the Core Strategy and development control policies” reflecting the recommendations of that assessment. The RSPB also stated it considered that implementation of the changes “will avoid an adverse effect on the Breckland SPA as well as the other internationally important wildlife considered within the [Habitat Regulations assessment]”, and that the Core Strategy proposed submission document “is sound” although several points of clarification were suggested.

*(iv) The adopted Core Strategy*

38. The examination of the Core Strategy Development Plan took place between 30 June and 17 July 2009, the Inspectors’ report was published on 13 October, and the Core Strategy was adopted by the Council on 17 December 2009. I have stated (see [7]) that, at that stage, Shadwell accepted the north eastern area as an appropriate choice for an urban extension and did not seek the removal of Kilverstone as a suitable location for housing development. It considered that it was not the only appropriate location and, *inter alia* opposed the buffer zones as having no sound basis. Shadwell’s

general stance was that the Council was being over-precautionary in its desire to protect stone-curlews.

39. The three policies in the Core Strategy which are of particular relevance to the present proceedings are SS1, spatial strategy; CP1, housing; and CP10, natural environment. SS1 confirmed that Thetford is to be a location for major change and sets out the specific housing requirements for Thetford, which are to be delivered by way of a greenfield strategic urban extension allocation to the north-east of the town.
40. Policy CP1 set out how the strategic housing requirements will be met. Paragraph 3.8 of the Core Strategy document stated:

“At Thetford, mechanisms will be set out in an area action plan [this is the TAAP] for monitoring and managing the release of land to 2021 to meet RSS requirements, including phasing and any sequential release of land. The [TAAP] will also address the circumstances under which reserve land to 2026 would be released at Thetford. The broad location for the sustainable extension at Thetford will be land to the north-east of the town, within the boundary of the A11. Beyond 2021, new housing growth in Thetford will take place on identified sites within the town that may include deliverable brownfield land. The precise land areas and mix of uses will be set out in the [TAAP], utilising evidence base work undertaken in respect of the town’s Growth Point Status. The town is also constrained to the east, and north of the A11, due to protected European habitats and species. The Council will require demonstration, through subsequent Habitats Regulations assessments, that proposed development to the north-east of Thetford will not result in harm to European habitats or species.”

41. Policy CP10 concerned the protection of species in the Council’s area. Among other things, it sought to protect the SPA from development that will adversely affect it. To this end, it prescribed two buffer zones, an “orange” zone and a “blue” zone, to protect those parts of the SPA that support, or are capable of supporting stone-curlews. The policy provided:

“The Council will require that an appropriate assessment is undertaken of all proposals for development that are likely to have a significant effect on the Breckland Special Protection Area (SPA) and will only permit development that will not adversely affect the integrity of the SPA. In applying this policy, the Council has defined a buffer zone indicated in orange...that extends 1,500m from the edge of those parts of the SPA that support or are capable of supporting stone-curlews, within which:-

...

b. permission may be granted for development provided it is demonstrated by an appropriate assessment the development will not affect the integrity of the SPA.

In other locations, indicated in blue..., the Council will apply the policy set out above to afford protection to other land supporting the qualifying features of the SPA... .”

42. Paragraph 3.72 of the Core Strategy document stated that, “in order to ensure that there are no significant effects on European habitats and species, new development will only be permitted within 1,500m of SPAs that are suitable for stone-curlews if it

can be demonstrated, through an appropriate assessment under the Habitats Regulations, that there will be no adverse impact on the qualifying features”. This is the area described as the orange zone. This paragraph also stated that, outside the orange zone, in an area described as the blue zone, development restrictions would also operate on land suitable for stone-curlews or where they are present. It stated this to be an area within 1,500 metres of a place “where there have been five nesting attempts or more since 1995 or where other conditions are suitable, such as soil type”, but “in these areas development may also be acceptable providing alternative land outside the SPA can be secured to mitigate any potential effects”.

43. The “orange” and “blue” buffer zones are thus areas in which additional tests for planning permission will be applied in order to protect the SPA. They are stated in Mr Spencer’s statement (paragraph 24) to represent a precautionary approach for the protection of stone-curlews in which housing allocations are not made, and in which additional tests are applied to planning applications.
44. The Inspectors who considered the Core Strategy recommended a number of changes. None of these was seen as materially altering the substance of the original plan or undermining the sustainability appraisal and participatory processes already undertaken: see paragraph 1.4. The Inspectors’ report concluded that, subject to those changes, the Core Strategy Development Plan document was “sound”. The three tests of soundness are set out in PPS 12. They are that the development plan is “justified”, “effective” and “consistent with national policy”. The Inspectors were satisfied that the document met the requirements of the 2004 Act and Regulations, and that the three tests of soundness had been met.
45. Under the heading “Environment”, the Inspectors considered whether the Core Strategy and related development control policies made adequate provision for the protection of the natural environment and other environmental assets. The material headings in this section are “background”, “plans and guidance”, and “evidence base”. The area’s support of internationally important bird species, including stone-curlews, is mentioned at paragraph 3.207. The Inspectors referred to the views of some respondents that changes to policy CP10 would be beneficial because they would provide more scope for development where the impact on protected species could be shown to be minimal, or if suitable mitigation measures could be undertaken (paragraph 3.213). It was stated that, subject to the qualifications, the Inspectors “are satisfied that the broad thrust of the policy is consistent with relevant legislation and national guidance, and is supported by a robust evidence base based upon the current state of knowledge”: paragraph 3.214.
46. In the section on “evidence base”, it is stated that the work commissioned by the Council showed that the most significant effect on stone-curlews extended to 1,500 metres: paragraph 3.216. It is also stated that some commentators regarded that as excessive, but that Natural England and the RSPB endorsed the studies and their use by the Council (paragraph 3.217), although both bodies acknowledged “the relatively poor understanding of the bird’s behaviour and admit[ted] that this hinders possible mitigation measures which might permit a less restrictive approach to development” (paragraph 3.217).

47. Paragraph 3.218 referred to advice from the European Commission that measures based on the precautionary principle should be proportionate to the chosen level of protection and only maintained as long as the scientific data is inadequate, imprecise or inconclusive. In the following paragraphs, the Inspectors expressed concern that the policy was based on information about bird populations that is not freely available and therefore not subject to scrutiny. It is stated that the buffer zones lack subtlety because it seemed likely that parts of the SPA would contain habitats unsuitable for ground nesting birds, and because anecdotal evidence from experts and landowners suggested that stone-curlews may be less susceptible to human activity than either Natural England or the RSPB believed. However, despite these misgivings, the Inspectors concluded (paragraph 3.222) that “in the absence of evidence to show that development in ‘buffer zones’ will not adversely affect stone-curlew populations, the precautionary principle must be followed” and that “the evidence is sufficiently robust to support the protective measures in this respect”.

48. The way the Inspectors suggested their concerns might be addressed for the future was (see paragraph 3.223) by addressing the absence of evidence. This would enable the Council to seek a better balance between the future development needs of the area and maintaining the fullest possible protection for identified endangered species on the fringes of the SPAs when “carrying forward delivery of the [Core Strategy] growth agenda by way of the [TAAP] and the site allocations DPD.” The Inspectors “therefore” considered that:

“urgent work, including careful monitoring, is essential to provide a better understanding of the interactions between Stone-Curlews and human settlement, and to develop practical and effective mitigation methods to complement the modifications to the policy suggested by the Council. Without such steps we accept, as Natural England makes clear, that it will remain extremely difficult to overcome the presumption against development”: paragraph 3.224.

49. After the receipt of the Inspectors’ report and before the Council adopted the Core Strategy, it corresponded with Shadwell. In an email dated 14 November 2009, Shadwell’s finance director, Mr Kennard, stated that its concern was that Thetford’s expansion to the north-east would lead to the disintegration of the town. He also suggested that there had been more than five breeding attempts by stone-curlews on Kilverstone since 1995. In his first statement, he stated that he first told the Council of this in August 2009. In his November email, he stated that there had been more than five breeding attempts by stone-curlews on Kilverstone since 1995. He stated that he cited the Kilverstone evidence “not to preclude development there, but demonstrate quite how absurd the 1,500m requirement is, if the birds can co-exist within 400m of a 24-hour supermarket”.

50. Mr Kennard stated that, although the Council would probably claim the evidence is only “anecdotal”, it was more than that and had been corroborated. He was referring to information, in particular from Malcolm Kemp, a tenant farmer on the Kilverstone estate, and Darryl Broom, who, between 2000 and 2008, had been employed as a gamekeeper on Kilverstone estate. Their accounts are now contained in statutory declarations respectively dated 20 and 29 February 2012. Mr Broom stated that he was aware of stone-curlew nesting sites on areas identified on a map, and witnessed fledgling chicks in multiple locations close to Maiden’s Walk, confirming that there must have been more than one nest site in the area in each of the years. Mr Kemp, who has worked on the estate for 35 years, stated that, in the years prior to 2000, he

was aware of regular nesting in the locations referred to by Mr Broom, but was unable to be specific as to exact areas or incidence.

51. Mr Kennard's evidence (first statement, paragraph 19) is that, at a meeting with the Council about this evidence on 21 January 2010, Council officials declined to consider it. His evidence also refers to stone-curlews being identified on the Kilverstone estate in the summer of 2011, and that, in 2011, the Leader of the Council told him that Lady Fisher of the Kilverstone estate had told him that she had seen stone-curlews on her land, and that on one occasion Lady Fisher had confirmed this to him (Mr Kennard).

*(v) The recommended "urgent" work*

52. I have referred to the fact that the amended Core Strategy, as adopted on 17 December 2009, has not been challenged. In the light of what the Inspectors had said about addressing the absence of evidence, the Council, with the support of Natural England and the RSPB, is in the process of undertaking the further work recommended. Mr Spencer's evidence is (statement, paragraph 39) that the Core Strategy Inspectors' reference to "urgent work" is to the commissioning of that work, because it would take several years to plan, commission and undertake studies of the quality and robustness required to serve as an appropriate evidence base, and to avoid the difficulty identified by the Inspectors in paragraph 3.224 of their report (as to which see [47] – [48]). Mr Spencer's evidence is that it was for that reason that the Council did not consider it appropriate to delay the preparation of the TAAP. The work now being undertaken is due to be completed in the early part of 2013, with a report due in March. Mr Spencer's evidence is that the Council's approach has the support of Natural England and the RSPB.
53. Jumping forward in the chronology, the Council's approach was criticised by Shadwell at the TAAP examination in March 2012, but successfully defended. It had previously been endorsed in the 13 December 2011 report of the Inspector who considered the site-specific development plan document. The Inspector, who had conducted that examination the previous summer, stated (paragraph 58 of his report) that he interpreted the reference to "urgent work" as meaning that "the work should start as soon as possible, not that the work should necessarily be completed quickly, as it is clear that such work may take several years".

*(vi) The TAAP*

54. I have referred to the fact that the purpose of the TAAP was to manage the growth and regeneration around Thetford within the Core Strategy in a more detailed way. The final draft of the TAAP was published in August 2011. It was accompanied by a Sustainability Appraisal as required by section 19(5) of the 2004 Act, and a Habitats Regulations assessment under the Habitats Regulations 2010. The Sustainability Appraisal is a document of some 200 pages. It identifies various sustainability appraisal objectives, including objective 6, the need to "protect, conserve, enhance and expand biodiversity, and promote and conserve geodiversity". One of the objectives identified is to ensure that new development does not impact upon the integrity of European sites. The Habitats Regulations assessment (dated July 2011) substantially adopted the assessment used for the Core Strategy.

55. Section 4 of the submission suitability appraisal report for the TAAP contains the sustainability appraisal framework. It poses a series of questions examining whether sustainability objectives will be met if particular sites are allocated for development, and whether an allocation will “conserve and enhance species, diversity and avoid harm to protected species”. Shadwell criticised this section (skeleton argument, paragraph 15(v)) because the site specific appraisal questions listed did not include whether the land to be allocated is a suitable habitat for protected species, whether protected species have been (i) surveyed and (ii) recorded on the land, and, if they have been recorded, details as to the species, the location, and the numbers.

56. Section 5 is concerned with developing and appraising the options. The option of developing the south-east of Thetford on the claimant’s land is dismissed on the ground that:

“... no new empirical evidence presented. Infrastructure requirements not yet fully understood for south-east option. Preliminary work indicates higher costs and environmental impacts.”

57. Section 6 is concerned with predicting the effects of the TAAP in order to consider the potential changes to identified baseline conditions with or without actions, and the direct and indirect effects of the policies against the baseline. The process included predicting the scale, probability and impact of such effects and of any alternative options that have been identified.

58. One of the effects predicted was the deterioration of local biodiversity habitats as a result of development. The significance of the effect is designated as high, and its evaluation is as follows:

“There are a high number of important European designated wildlife sites around Thetford. The [TAAP] affords a high degree of protection to areas of special environmental importance. Therefore, this effect is highly significant to the DPD.

...

Because biodiversity is an important issue to Thetford and its surroundings, these are highly significant effects. Separate to the requirements of the SA/SEA an appropriate assessment of the DPD under the Habitats Regulations has been undertaken at all the statutory stages of document production. The outcomes of the submission HRA document are presented in the literature review and confirm that the plan in itself will not have a likely significant effect on protected European habitats and qualifying features.”

59. Shadwell has criticised the sustainability appraisal as focused on European sites but not specifying what the impact might be in “any meaningful sense”, and as not looking in the direction of protected birds and their habitats outside the SPA and the buffer: skeleton argument, paragraph 15(xi). A specific example is the observation (skeleton argument, paragraph 15(xii)) that the section of the sustainability appraisal dealing with the mitigation of the adverse effects of the plan did not canvass the possibility that those effects might need to be mitigated outside the SPA and the buffer zones.

60. The baseline data is set out between pages 36 and 53 of the submission sustainability appraisal report for the TAAP. As to the number of stone-curlew breeding pairs, the tables give figures for the years 2007 – 2009, which are respectively 208, 222, and 230. Section 9 contains a number of targets which had been specified to determine whether the TAAP has a positive or negative effect. They include maintaining the breeding population in Breckland at no fewer than 172 pairs, and increasing the breeding population in Norfolk and Suffolk as a whole. Another aspect of Shadwell's criticisms (see skeleton argument, paragraphs 15(xv) and 57-58) is that, although, Kilverstone "has a considerable area of suitable habitat capable of supporting stone-curlews", the sustainability appraisal did not apply those targets to Kilverstone, and that the Habitats Regulations assessment used made no reference to the fact that Footprint Ecology had no data about stone-curlews nesting in Kilverstone. In these proceedings Mr Straker submitted that the latter point was significant because Kilverstone lay within 2,500 metres of the SPA and that the consequence was that the Habitats Regulations assessment of the TAAP did not enable the Council to conclude that the plan will not adversely affect the SPA.
61. Shadwell and others commissioned a report from the Landscape Science Consultancy ("LSC"). This was circulated in draft in the spring of 2011 and subsequently submitted as part of Shadwell's representations on the TAAP at the examination by the Inspector. The LSC report was criticised by Natural England, the RSPB and the Council. Mr Spencer's evidence (paragraph 69) is that the principal problem was that the LSC report did not focus on the issue of disturbance to stone-curlews caused by development, and it did not add to the understanding of what would constitute effective mitigation from development.
62. Shadwell's submissions on the final draft of the TAAP were that the 1,500 metre buffer was excessively precautionary, and that the further work recommended by the Core Strategy Inspectors had not been completed in the two years since the adoption of the Core Strategy. The result was that planning "continue[d] to be based on a lack of evidence". It maintained that the evidence of stone-curlews to the north-east of Thetford that it had provided had been ignored. During the hearing Mr Kennard produced an email dated 1 February 2010 to Tim Cowan of the RSPB and the statutory declarations referred to at [50].
63. The RSPB responded by exhibiting an email sent to the claimant on 2 February 2010 in response to an earlier email from the claimant which stated that the land at Kilverstone allocated for the housing extension lay outside both buffers and there were no reasons under the Habitats Regulations why it could not be allocated for housing. The email stated that any developments outside the buffer zones were likely to require environmental impact assessments and also project-level Habitats Regulations assessments, which would include assessing whether stone-curlews are present and are likely to be affected at the planning application stage. The RSPB's view was that the evidence relied on by the claimant was "anecdotal survey information" which did not jeopardise or contradict the approach taken by the Council or Footprint Ecology. It stated it "fully supports the approach taken in the [Habitats Regulations assessment]". In response to a request by the Inspector, the Council later stated that it had not previously had sight of the material submitted by Shadwell, but noted that four of the nest locations were within 1,500 metres of the SPA and only two were indicated on land outside the buffer zone.



64. At the examination of the final TAAP, the Council and the RSPB provided Dr Durwyn Liley of Footprint Ecology to answer any lines of enquiry on the veracity of Footprint Ecology's report and the Habitats Regulations assessment. The RSPB provided Professor Rhys Green, who was stated to be "widely accepted as the leading UK scientific authority on stone-curlews".
65. The Inspector issued his report on the TAAP on 30 May 2012. The report specifically addressed the evidence base and the sustainability appraisal. He accepted the RSPB's characterisation of the evidence about stone-curlews on Kilverstone as "anecdotal". His report made the following points:
- (1) The LSC Report's conclusions were not "sufficiently well founded, particularly in relation to the likely impact of development on breeding protected species, to justify overriding the protection afforded by the 1,500m buffer" (paragraph 27);
  - (2) The LSC Report's conclusions were not sufficiently robust to set aside the "comprehensive [Footprint Ecology Study] that has been found to be sound through examination of both the [Core Strategy] and the Site Specific DPDs" (paragraph 28);
  - (3) Natural England continued to support the initiatives pursued by the Council to protect the integrity of the SPA and the precautionary approach of the Council to locate development beyond the 1,500m buffer remained justified (paragraph 28);
  - (4) The single direction of growth to the north of Thetford remained justified (paragraph 29);
  - (5) Contrary to SECL's case, different approaches had not been taken towards stone-curlew nesting evidence on sites to the north as compared with sites to the south (paragraph 30);
  - (6) Notwithstanding Shadwell's criticisms, the Inspector stated: "I am satisfied that the SA was carried out in accordance with the Strategic Environmental Directive and the reasons for not pursuing development to the south-east of the town are explained in the SA. The SA is sound and the evidence base as a whole is proportionate and meets the requirements of the NPPF" (paragraph 30).
66. Shadwell's criticism of the sustainability appraisal is usefully summarised in paragraph 16 of its skeleton argument. Mr Straker QC submitted on its behalf that the sustainability appraisal did not: (a) set out baseline evidence on the presence or absence of stone-curlews or their habitat outside the SPA and the buffer zone; (b) predict or evaluate the effects of the plan on stone-curlews in those places; or (c) consider how those effects could be mitigated. The criticism is that the sustainability appraisal approached the matter on the basis that there would be no impact on stone-curlews in the proposed urban extension because it lies beyond the 1,500 metre

buffer. The criticism is thus that there was no assessment of individual instances of the stone-curlew on the Kilverstone land.

67. Mr Spencer's evidence is that at no point in the Habitats Regulations assessment process for the TAAP or the Core Strategy, or through other representations, has Natural England ever asked the Council to assess individual instances of the stone-curlew on the Kilverstone land. Nor did the RSPB, although the email dated 2 February 2010 referred to at [63] recognized that such work may be required in the more specific context of a planning application for the urban extension.
68. Such a planning application is currently under consideration by the Council. Mr Spencer's evidence (paragraph 66) is that, in connection with that application, Pigeon, the interested party, submitted a study by Dan Brown Ecology Ltd containing surveys of Kilverstone for the years 2007 – 2011 using a methodology which has been endorsed by the RSPB. Pigeon supplied this information to the Council in April 2012, a month after the conclusion of the examination on the TAAP, but some seven weeks before the Inspector reported.
69. Shadwell relied on the fact that the Council had not attempted to obtain any of this material earlier and, after it received it, did not inform the Inspector or Shadwell: see skeleton argument, paragraph 40. It also relied (skeleton argument, paragraph 37) on what it described as a concession by Dan Brown Ecology that its survey methodology may have under-recorded stone curlew activity because the surveys were carried out at the wrong time of the year. What Shadwell described as a "concession", however, related only to the material for 2007 when Dan Brown Ecology undertook a "preliminary scoping exercise" not a full survey. The RSPB has raised no caveat about the method Dan Brown Ecology used.
70. As to what the surveys revealed, the 2008 survey was carried out between March and October. The report stated that in fourteen visits no stone-curlew were seen within the area of the TAAP but that one territorial pair had been seen outside its area. No territorial pairs were located in 2009 or 2010, although in 2010 on two occasions stone-curlews were recorded foraging. In 2011 one territorial pair was found, but again this was outside the area of the TAAP. In summary, the surveys by Dan Brown Ecology indicated some limited stone-curlew presence on Kilverstone, but did not reveal a scale of nesting attempts by stone-curlews at a sufficient level (i.e a minimum of five) to indicate that it should be within the blue buffer for the purpose of Core Strategy policy CP10.

#### **IV. Discussion**

##### *(i) The process and the role of the Court*

71. Before turning to the three grounds upon which the TAAP is challenged, I make two observations about the process and one about the role of the court. The procedure at an independent examination in public is less formal than at a traditional planning inquiry. It generally proceeds on the basis of written documents being presented, and discussion between the parties and the Inspector based upon those documents: *Persimmon Homes (North East) Ltd v Blyth Valley BC* [2008] EWHC 1258 (Admin)

at [49] Collins J. While formal evidence can be given where the Inspector decides that is essential, this would be so only rarely.

72. Secondly, a decision-maker should give the views of statutory consultees, in this context the “appropriate nature conservation bodies”, “great” or “considerable” weight. A departure from those views requires “cogent and compelling reasons”: see *R (Hart DC) v Secretary of State for Communities and Local Government* [2008] EWHC 1204 (Admin) at [49] *per* Sullivan J, and *R (Akester) v Department for the Environment, Food and Rural Affairs* [2010] EWHC 232 (Admin) at [112] *per* Owen J. See also *R (Jones) v Mansfield DC* [2003] EWCA Civ. 1408 *per* Dyson LJ at [54].
73. As to the role of the Court, review of the adequacy of environmental appraisals, assessments, and impact statements, is on conventional *Wednesbury* grounds: see *R v Rochdale NBC, ex p Milne* [2001] Env. L.R. 22 at [106] *per* Sullivan J (Environmental Assessment); *R (Bedford & Clare) v Islington LBC* [2002] EWHC 2044 (Admin) at [199] and [203] *per* Ouseley J (Environmental Statement); *R (Jones) v Mansfield DC* [2003] EWCA Civ. 1408 at [14] – [18] (Environmental Impact Assessment), and *Bowen-West v Secretary of State for Communities and Local Government* [2012] EWCA Civ 321, at [39] *per* Laws LJ (Environmental Impact Assessment and Environmental Statement).
74. What does review of environmental documents on conventional *Wednesbury* grounds mean in practice? The judgments of Ouseley J in the *Bedford & Clare* case, of Sullivan J (as he then was) in *R (Blewett) v. Derbyshire CC* [2003] EWHC 2775 (Admin) and of Weatherup J in the Northern Irish case *Seaport of Investments Ltd, Re Application for Judicial Review* [2007] NIQB 62 illustrate the general approach of the court.
75. Ouseley J (at [203]) distinguished deficiencies resulting from the omission of a topic or because it has been inadequately dealt with which may have force on the planning merits and deficiencies which show that there has been an error of law or mean that the document cannot reasonably be regarded as (in that case) an Environmental Statement. Only the latter can found a statutory application to quash.
76. In the *Blewett* case Sullivan J stated that:
- “41.... In an imperfect world it is an unrealistic counsel of perfection to expect that an applicant’s environmental statement will always contain the ‘full information’ about the environmental impact of a project. The Regulations are not based upon such an unrealistic expectation. They recognise that an environmental statement may well be deficient, and make provision through the publicity and consultation processes for any deficiencies to be identified so that the resulting ‘environmental information’ provides the local planning authority with as full a picture as possible. There will be cases where the document purporting to be an environmental statement is so deficient that it could not reasonably be described as an environmental statement as defined by the Regulations ... but they are likely to be few and far between.”
77. He also (see [68]) deprecated the tendency of “claimants opposed to the grant of planning permission to focus upon deficiencies in environmental statements, as revealed by the consultation process prescribed by the Regulations, and to contend that because the document did not contain all the information required by [the Regulations] it was therefore not an environmental statement and the local planning authority had no power

to grant planning permission” He considered this to be misconceived unless, in language similar to that of Ouseley J, “the deficiencies are so serious that the document cannot be described as, in substance, an environmental statement for the purposes of the Regulations”. Sullivan J’s approach was approved by Lord Hoffmann in *R (Edwards) v. Environment Agency* [2008] UKHL 22 at [38] and [61].

78. In *Seaport Investments Ltd, Re Application for Judicial Review* [2007] NIQB 62 Weatherup J stated (at [26]) that “the responsible authority must be accorded a substantial discretionary area of judgment in relation to compliance with the required information for environmental reports”. He also stated that the Court will not examine the fine detail of the contents of such a report but will seek to establish whether there has been substantial compliance with the information required. He went on to consider whether the specified matters have been addressed “rather than considering the quality of the address”.

(ii) *Ground 1: Did the Council’s sustainability appraisal and strategic environmental assessment comply with section 19(5)(b) of the 2004 Act and the 2004 Regulations?*

79. Shadwell’s case on this ground is essentially that the sustainability appraisal did not include an assessment of the environmental characteristics of Kilverstone because it approached the proposed urban extension on the basis that it will have no impact on stone-curlew because it lies beyond the 1,500 metre buffer. It was argued that it therefore did not contain all relevant information relating to the current state of the environment as required by regulation 12 and Schedule 2 of the EAPPR 2004.

80. My summary of the sustainability appraisal shows that there are numerous references in it to biodiversity issues, impacts on stone-curlews, and alternatives, including developing the area to the south east of Thetford. Shadwell’s criticisms of the appraisal (see [59], [60], and [69]) are of a highly detailed nature. Does the appraisal’s treatment of the position of Kilverstone and the area to the north east of Thetford mean that it cannot be described as, in substance, a sustainability appraisal for the purposes of the Regulations? The answer depends on whether it was required to provide a comprehensive assessment of the entire body of evidence about stone-curlew activity, notwithstanding the quality of the evidence. I have concluded that it was not.

81. First, the sustainability appraisal was required to assess the likely significant effects on the environment of implementing the TAAP and reasonable alternatives. The Regulations make it clear that the information required is that which may “reasonably be required” taking account *inter alia* of the need “to avoid duplication of the assessment”: EAPPR 2004, regulation 12(3)(d). The sustainability appraisal, strategic environmental assessment and Habitats Regulations assessment for the Core Strategy had not been challenged and were supported by Natural England and the RSPB. Those assessments led to the decision to adopt the orange and blue buffer zones in the designated areas. Shadwell’s current position appears to be that the buffer zones should be altered either by including Kilverstone in the orange zone or by including it or part of it in the blue zone. But since the TAAP is required to conform to the Core Strategy, it is difficult to see how it would be possible to alter the buffer zones.

82. Secondly, there has been no challenge to the “five nesting attempts” criterion for inclusion in the blue zone. The evidence provided by Shadwell (see [49] - [51]) was considered “anecdotal” by the RSPB which stated (see [63]) that it did not “jeopardise or contradict” the approach taken by the Council and Footprint Ecology. The Dan Brown Ecology survey evidence concerning Kilverstone that has become available since the Core Strategy (see [69] - [70]) was adopted shows that it does not meet the “five nesting attempts” criterion. Shadwell’s contention that the Dan Brown Ecology surveys underestimated the presence of stone-curlew is both not sustained and, in the light of the guidance in the cases I have cited (see [75] – [78]), assumes an inappropriate standard of review to an environmental report in an application of this sort.
83. Thirdly, the Council’s approach has the strong support of Natural England, a statutory consultee whose views must (see [72]) be given “considerable weight”, and of the RSPB, an important and expert interest group. Shadwell’s case on this ground involves inviting the Court to say that it was *Wednesbury* unreasonable for the Inspector to have found the sustainability appraisal and the TAAP to be “sound” solely on the basis of the treatment of the evidence about Kilverstone and despite the support for those documents and the Council’s approach by Natural England and the RSPB. The evidence about Kilverstone, however, is nowhere near providing the “cogent and compelling” reasons that are needed in order to depart from the views of a statutory consultee.
84. Mr Straker also relied on the fact that the work which the Core Strategy Inspectors described as “urgent work” in October 2009 had not been completed. He argued (see e.g. skeleton argument, paragraph 13) that this meant that, although the buffer zones reflected in Policy CP10 possessed “utility as a tool”, the tool carried a health warning. The implication of this was that it was not possible to make progress with the TAAP until that work was completed. But, given the time needed to complete suitable ecological studies and assemble a robust body of evidence, this would have involved a considerable delay. Taking the March 2013 anticipated completion date of the work, the delay would be of some three and a half years.
85. The Core Strategy Inspectors who made the recommendation did not conclude that the plan including the buffers could not be found to be “sound” pending the completion of this work, and they found it was “sound”. The RSPB, in its email dated 2 February 2010 (see [63]) did not consider that further assessment work was needed before a decision could be made about the TAAP. Had the completion of the TAAP been deferred pending the completion of that work, planning applications would have had to be considered and determined with only the more general level of development plan control that is possible within the Core Strategy. For these reasons, it is, in my judgment, unarguable that the TAAP Inspector should have sought to delay progressing or completing the TAAP until the work was completed. I also note that the approach taken by the Council and the TAAP Inspector has (see [53]) also been endorsed by the Inspector who considered the site specific development plan document.

*(iii) Ground 2: Did the Inspector breach section 20(5) of the 2004 Act in concluding that the TAAP satisfied the requirements of section 19 of the 2004 Act and was “sound”?*

86. For the reasons I have given in relation to ground 1, on the material before the TAAP Inspector, his findings were open to him. He expressly referred in his report to the matters raised by Shadwell. The question is whether the non-disclosure by the Council of the Dan Brown Ecology survey work to the Inspector means there is a public law basis for challenging the Inspector’s examination of the TAAP. It was (see [67]) not information which the statutory consultee and the RSPB considered was required before a decision could be made about the TAAP.
87. The Council relied on the confidential nature of the information supplied, which included site specific information about stone-curlews. It argued that it would not have been appropriate to disclose this to the Inspector at the independent examination because (skeleton argument, paragraph 69) that “would have given rise to a potential for birds and/or nests to be destroyed”. It relied on regulation 12(5)(g) of the Environmental Information Regulations 2004 SI 2004 No. 3391 which entitles a public authority to refuse to disclose information to the extent that its disclosure would adversely affect ... the protection of the environment to which the information relates”. It also submitted that it was not required to place fine detail work submitted in support of a particular planning application before an examination directed to a more general strategic document.
88. The Council is, of course, entitled to rely on regulation 12(5)(g). But, had the information from the Dan Brown Ecology surveys been crucial to the further consideration of the TAAP, it would have been possible for the Council to disclose it with suitable safeguards. It was not, for example suggested that there was a risk of either Shadwell or the Inspector treating the information inappropriately. Indeed, given the position Shadwell has now taken, it would be against its interests to do anything which would adversely affect any stone-curlews on the Kilverstone estate.
89. That brings me to the crucial point in this context. Even if the Council was not entitled to withhold the Dan Brown Ecology survey work, in assessing whether the failure to disclose it means that the TAAP should be wholly or partly quashed, it is important to consider what impact that work might have had on the Inspector’s conclusions. The information contained in it does not (see [69] - [70]) reveal a scale of nesting attempts by stone-curlews which would have put Kilverstone within the blue buffer zone and does not support the position Shadwell has taken in these proceedings. I accept the submissions of Mr Hobson QC and Mr Maurici that the disclosure of Dan Brown Ecology’s surveys could have had no impact on the Inspector’s conclusions. In terms of Policy CP 10 and the buffer zones, it in fact undermines Shadwell’s case because the survey results are consistent with the other material considered by the Inspector which provided no evidence of sufficient breeding attempts on Kilverstone land.

(iv) *Ground 3: Did the Council's Habitats Regulations assessment breach Regulation 61 of the Habitats Regulations 2010?*

90. In order to succeed on ground 3, Shadwell has to produce credible evidence of a real risk to the integrity of the SPA (see *R (Boggis) and another v Natural England* [2009] EWCA Civ 1061 at [37]) as a result of the TAAP. Shadwell relied upon six matters in support of its contention that the Council breached the Habitats Regulations 2010. The first two relate to Footprint Ecology and the Council not taking account of the evidence in Footprint Ecology's reports that development could adversely affect the nesting density of stone-curlews up to a distance of 2,500 metres. Shadwell contended that, in the light of this, the assessment of Kilverstone's position could not be based on the fact that Kilverstone was more than 1,500 metres from the SPA and the land in the blue buffer zone.
91. The difficulty with this contention is that the 1,500 metre distance was not challenged when the Core Strategy was being considered. No one then argued that a more precautionary approach was necessary. Indeed Shadwell's position at that time was that a less precautionary approach would suffice. The 1,500 metre distance was endorsed by Natural England and the RSPB. It was adopted in the Core Strategy, and the Core Strategy is no longer challengeable. No new evidence has been produced which undermines the validity of the 1,500 metre distance.
92. Three of the other alleged breaches rely on the matters relied on in support of ground 1. It is argued that the data from which the two buffer zones were derived was incomplete because it excluded data concerning the Kilverstone Estate, and evidence that stone-curlews had nested there and that its land was suitable for them. The reasons for which I rejected these contentions in the context of the sustainability appraisal also apply in the context of regulation 61 and the Habitats Regulations assessment.
93. The last of the matters relied on concerns an indication given to Shadwell by Mr Cowan of the RSPB in January 2010 that land to the north-east of Thetford ought to be surveyed by an independent expert to determine whether its development would adversely affect stone-curlews. Schedule 3 to Shadwell's grounds describes the view expressed as "a personal view", and, since the position taken by the RSPB was consistently supportive of the Council's approach and did not recommend such survey work, Shadwell is not assisted by it.
94. For the above reasons, I also reject this limb of the challenge.

## **Appendix B Stakeholder Correspondence**

- Lead Local Flood Authority – Hertfordshire County Council
- Environment Agency correspondence
- RAB (St Albans District Council) correspondence
- Thames Water correspondence
- Affinity Water correspondence



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**From:** Julie Manlove [mailto:Julie.Manlove@hertfordshire.gov.uk]  
**Sent:** 16 November 2022 17:30  
**To:** George Burgess <George.Burgess@stalbans.gov.uk>; Planning Applications <Planning.Applications@stalbans.gov.uk>  
**Subject:** 5/2022/1988 - Land To The Rear Of 42-100 Tollgate Road & 42 Tollgate Road Colney Heath

**CAUTION: This email originated from outside of the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.**

Dear George,

Thank you for re-consulting us on the above application for: 5/2022/1988 - Land To The Rear Of 42-100 Tollgate Road & 42 Tollgate Road Colney Heath St Albans. Outline application (access sought) - Demolition of existing house and stables and the construction of up to 150 dwellings including affordable and custom-build dwellings together with all ancillary works.

We note that an external consultant has been instructed to review this case and in order to avoid conflicting reviews, the LLFA will not provide formal comments and therefore close the case from our side.

Please note that if the LPA decides to grant planning permission we wish to be notified for our records.

Regards

Julie



**Julie Manlove**  
**Senior Support Officer| Flood Risk Management**  
**Environment & Transport & Sustainable Growth**

**Hertfordshire County Council**  
County Hall, Pegs Lane, Hertford, SG13 8DN Postal Point: CHN101  
T: 01992 555340 (Internal: 25340)

E: [julie.manlove@hertfordshire.gov.uk](mailto:julie.manlove@hertfordshire.gov.uk)



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## Soderberg, Asa

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**From:** George Burgess <George.Burgess@stalbans.gov.uk>  
**Sent:** 29 August 2023 17:33  
**To:** George Burgess  
**Subject:** RE: Riparian responsibilities

**From:** David Uncle <[David.Uncle@hertfordshire.gov.uk](mailto:David.Uncle@hertfordshire.gov.uk)>  
**Sent:** 22 February 2023 09:42  
**To:** George Burgess <[George.Burgess@stalbans.gov.uk](mailto:George.Burgess@stalbans.gov.uk)>  
**Cc:** FRMConsultations <[FRMConsultations@hertfordshire.gov.uk](mailto:FRMConsultations@hertfordshire.gov.uk)>; Ordinary Water Courses <[ordinarywatercourses@hertfordshire.gov.uk](mailto:ordinarywatercourses@hertfordshire.gov.uk)>  
**Subject:** RE: Riparian responsibilities

CAUTION: This email originated from outside of the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Good morning George

Something along the lines of

No development shall be commenced until detailed ground investigations have been conducted across the site and submitted to the Local Planning Authority. The ground investigations should identify seasonal groundwater levels (to reflect that the initial testing was conducted in summer) and ensure areas of shallow groundwater will not compromise the development and vice versa. Where shallow groundwater is identified, appropriate measures to mitigate groundwater flood risk should be proposed to ensure the risk of groundwater flooding is not increased on or off site.

How does that sound?

Best wishes,



**David Uncle**  
**Senior Flood Risk Officer | Flood Risk Management**  
**Environment, Transport & Sustainable Growth**  
**Hertfordshire County Council**  
County Hall, Pegs Lane, Hertford, SG13 8DN Postal Point: CHN101  
E: [David.Uncle@hertfordshire.gov.uk](mailto:David.Uncle@hertfordshire.gov.uk)  
T: 01992 555839 (Internal: 25839)



---

**From:** George Burgess <[George.Burgess@stalbans.gov.uk](mailto:George.Burgess@stalbans.gov.uk)>  
**Sent:** 21 February 2023 12:32  
**To:** David Uncle <[David.Uncle@hertfordshire.gov.uk](mailto:David.Uncle@hertfordshire.gov.uk)>; Ordinary Water Courses <[ordinarywatercourses@hertfordshire.gov.uk](mailto:ordinarywatercourses@hertfordshire.gov.uk)>  
**Cc:** FRMConsultations <[FRMConsultations@hertfordshire.gov.uk](mailto:FRMConsultations@hertfordshire.gov.uk)>  
**Subject:** RE: Riparian responsibilities

Hi David,

Thanks for your helpful email.

Your suggestion of a condition for additional boreholes to determine groundwater levels sounds sensible. Is there wording for this that you could recommend please?

Appreciate you don't want to tread on RAB's toes, but I'm wary that re-consulting them will cost the applicant an additional £840 which I imagine they will be reluctant to do. RAB commented on the application prior to the subterranean stream issue being raised and stated the application is acceptable subject to a drainage scheme condition (comments attached for reference).

Kind regards

George

**George Burgess**

Principal Planning Officer  
Development Management  
Community and Place Delivery

**St Albans City and District Council**

Council general home page: [www.stalbans.gov.uk](http://www.stalbans.gov.uk)  
Council contact details and address: [www.stalbans.gov.uk/contact-us](http://www.stalbans.gov.uk/contact-us)

My usual working days are Monday, Tuesday, Wednesday and Friday.

---

**From:** David Uncle [<mailto:David.Uncle@hertfordshire.gov.uk>]  
**Sent:** 20 February 2023 12:17  
**To:** George Burgess <[George.Burgess@stalbans.gov.uk](mailto:George.Burgess@stalbans.gov.uk)>; Ordinary Water Courses <[ordinarywatercourses@hertfordshire.gov.uk](mailto:ordinarywatercourses@hertfordshire.gov.uk)>  
**Cc:** FRMConsultations <[FRMConsultations@hertfordshire.gov.uk](mailto:FRMConsultations@hertfordshire.gov.uk)>  
**Subject:** RE: Riparian responsibilities

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Hi George

I think at this stage there is insufficient information and it has not been demonstrated to us to confirm there is an underground stream here.

I agree with Mr Ellis that seasonal groundwater monitoring would be useful – underground stream or not – I believe the ground investigation report says the investigations were undertaken in the summer and therefore not necessarily representative of winter conditions, when the water table will be higher, but I'm conscious of treading on RAB's toes if they have been involved in the case previously. From a SuDS point of view we would want the groundwater levels confirmed across the seasons to ensure they do not pose a risk to the development itself or could compromise the SuDS network.

I've also not come across a subterranean stream flow survey before. If there was an underground stream here it would certainly be useful and important to understand the route it takes, its width and its depth. My view is there is not enough evidence of an underground stream yet to warrant putting this onus on the applicant at this stage and considering they have already undertaken ground investigations, but it may be worth keeping in mind. Certainly if evidence of an underground stream is uncovered at a later stage, it will be necessary to make sure this does not impact the development or increase flood risk on or off site.

Perhaps this could be secured by way of a condition to conduct a series of further boreholes etc across the site to confirm groundwater levels (which is beneficial anyway) and potentially pick up this stream, if it does exist? Then if it does exist the drainage strategy etc could be updated accordingly?

Best wishes,



**David Uncle**  
**Senior Flood Risk Officer | Flood Risk Management**  
**Environment, Transport & Sustainable Growth**  
**Hertfordshire County Council**  
County Hall, Pegs Lane, Hertford, SG13 8DN Postal Point: CHN101  
E: [David.Uncle@hertfordshire.gov.uk](mailto:David.Uncle@hertfordshire.gov.uk)  
T: 01992 555839 (Internal: 25839)



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**From:** George Burgess <[George.Burgess@stalbans.gov.uk](mailto:George.Burgess@stalbans.gov.uk)>  
**Sent:** 20 February 2023 09:59  
**To:** David Uncle <[David.Uncle@hertfordshire.gov.uk](mailto:David.Uncle@hertfordshire.gov.uk)>; Ordinary Water Courses <[ordinarywatercourses@hertfordshire.gov.uk](mailto:ordinarywatercourses@hertfordshire.gov.uk)>  
**Cc:** FRMConsultations <[FRMConsultations@hertfordshire.gov.uk](mailto:FRMConsultations@hertfordshire.gov.uk)>  
**Subject:** RE: Riparian responsibilities

Hi David,

Thanks for your quick and helpful response.

Based on your comments it sounds to me that there is insufficient evidence to demonstrate that there is an underground stream in this location and this should not be a reason to restrict development at the site. Is this a fair summary?

Rob Ellis left further comments on the application portal on 16 Feb stating "*Hopefully the planning office will now liaise with other involved departments to instigate the subterranean stream flow survey and seasonal monitoring that will be necessary to decide the protection area over this stream together with the additional required "stream set back" provisions that will inevitably limit development to the Northern part of the site.*"

Do you feel that requiring a subterranean stream flow survey would be justified? I can't say I've come across such a survey before.

Many thanks

George

**George Burgess**  
Principal Planning Officer  
Development Management  
Community and Place Delivery

**St Albans City and District Council**  
Council general home page: [www.stalbans.gov.uk](http://www.stalbans.gov.uk)  
Council contact details and address: [www.stalbans.gov.uk/contact-us](http://www.stalbans.gov.uk/contact-us)

My usual working days are Monday, Tuesday, Wednesday and Friday.

---

**From:** David Uncle [<mailto:David.Uncle@hertfordshire.gov.uk>]  
**Sent:** 20 February 2023 09:38  
**To:** George Burgess <[George.Burgess@stalbans.gov.uk](mailto:George.Burgess@stalbans.gov.uk)>; Ordinary Water Courses <[ordinarywatercourses@hertfordshire.gov.uk](mailto:ordinarywatercourses@hertfordshire.gov.uk)>  
**Cc:** FRMConsultations <[FRMConsultations@hertfordshire.gov.uk](mailto:FRMConsultations@hertfordshire.gov.uk)>  
**Subject:** RE: Riparian responsibilities

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Hi George

Thanks for your email, I have since seen this document thanks to Mr Ellis and I am in agreement with Stantec.

If ground investigations had not already been carried out I would have suggested this should be done to verify and hopefully resolve Mr Ellis' concerns. However, fortunately ground investigations have been done and luckily more or less exactly where the "blue ribbon" (circled in green in Fig. 1 of Stantec note dated 24 Jan 2024) is that Mr Ellis assumed indicated the route of the underground stream.

I agree with Stantec in that the "blue ribbon" identified is the risk of flooding from surface water mapping, which when cross-referenced with Mr Ellis' photographs does appear to be a localised depression in the ground. As the Stantec note identifies, a borehole and 2 trial pits were conducted along this area which identified what appears to be generally impermeable strata (lots of clay). As such I do not think it is a case of water coming out of the ground, but rather due to the clay the water simply cannot infiltrate fast enough so ponds in these depressions.

I think the key issue at the moment is the existence of an underground stream is anecdotal and not yet picked up by any investigations on site.

Best wishes,



**David Uncle**  
**Senior Flood Risk Officer | Flood Risk Management**  
**Environment, Transport & Sustainable Growth**  
**Hertfordshire County Council**  
County Hall, Pegs Lane, Hertford, SG13 8DN Postal Point: CHN101  
E: [David.Uncle@hertfordshire.gov.uk](mailto:David.Uncle@hertfordshire.gov.uk)  
T: 01992 555839 (Internal: 25839)



---

**From:** George Burgess <[George.Burgess@stalbens.gov.uk](mailto:George.Burgess@stalbens.gov.uk)>  
**Sent:** 20 February 2023 09:21  
**To:** Ordinary Water Courses <[ordinarywatercourses@hertfordshire.gov.uk](mailto:ordinarywatercourses@hertfordshire.gov.uk)>; David Uncle <[David.Uncle@hertfordshire.gov.uk](mailto:David.Uncle@hertfordshire.gov.uk)>  
**Cc:** FRMConsultations <[FRMConsultations@hertfordshire.gov.uk](mailto:FRMConsultations@hertfordshire.gov.uk)>  
**Subject:** RE: Riparian responsibilities

Good morning David,

Thanks for your email and for sharing your correspondence with Rob Ellis.

Rob has also been in touch with the Council, applicant and Environment Agency regarding the potential subterranean stream. The EA has said it does not change their comments on the application (which make no references to a subterranean stream).

The applicant has provided the attached note in response to Rob's comments, which suggests the ponding of surface water is due to localised low spots in the land. I appreciate the LLFA is not currently providing responses for SADC, but any thoughts you have on the attached note would be welcome. RAB hasn't commented on the attached.

Many thanks

George

**George Burgess**  
Principal Planning Officer  
Development Management  
Community and Place Delivery

**St Albans City and District Council**

Council general home page: [www.stalbans.gov.uk](http://www.stalbans.gov.uk)

Council contact details and address: [www.stalbans.gov.uk/contact-us](http://www.stalbans.gov.uk/contact-us)

My usual working days are Monday, Tuesday, Wednesday and Friday.

**From:** David Uncle <David.Uncle@hertfordshire.gov.uk>  
**Sent:** 22 February 2023 09:42  
**To:** George Burgess <George.Burgess@stalbans.gov.uk>  
**Cc:** FRMConsultations <FRMConsultations@hertfordshire.gov.uk>; Ordinary Water Courses <ordinarywatercourses@hertfordshire.gov.uk>  
**Subject:** RE: Riparian responsibilities

Good morning George

Something along the lines of

No development shall be commenced until detailed ground investigations have been conducted across the site and submitted to the Local Planning Authority. The ground investigations should identify seasonal groundwater levels (to reflect that the initial testing was conducted in summer) and ensure areas of shallow groundwater will not compromise the development and vice versa. Where shallow groundwater is identified, appropriate measures to mitigate groundwater flood risk should be proposed to ensure the risk of groundwater flooding is not increased on or off site.

How does that sound?

Best wishes,



**David Uncle**  
**Senior Flood Risk Officer | Flood Risk Management**  
**Environment, Transport & Sustainable Growth**  
**Hertfordshire County Council**  
County Hall, Pegs Lane, Hertford, SG13 8DN Postal Point: CHN101  
E: [David.Uncle@hertfordshire.gov.uk](mailto:David.Uncle@hertfordshire.gov.uk)  
T: 01992 555839 (Internal: 25839)



## Soderberg, Asa

---

**From:** David Uncle <David.Uncle@hertfordshire.gov.uk>  
**Sent:** 05 September 2023 13:56  
**To:** Soderberg, Asa  
**Subject:** RE: Tollgate Road, Colney Heath (APP/B1930/W/23/3323099)

Hi Asa,

I'm well thanks, hope you are too?

Agreed that the main thing the interested parties wish to cover is the supposed underground stream, which I agree has largely come from a misunderstanding from the Parish Council that assumed the surface water flood maps indicated a potential underground watercourse.

As far as I am aware there are no points of disagreement here between HCC LLFA and Vistry specifically on this topic of the underground stream. I would just note that regarding the actual surface water drainage design, St Albans quite understandably chose to consult RAB in place of the LLFA when this application was made because at the time HCC employed no flood risk officers. So on that basis just wanted to confirm that we (HCC) will not be passing any judgement on the SuDS and drainage etc, but happy to support on the flood risk/underground stream issue.

I'm not going to be around much this afternoon but happy to schedule in a 30 min Teams call tomorrow to ensure we're on the same page? I can do whenever suits you apart from 09:30 – 11:30. I'm quite confident that we agree on the same position but might be worth discussing. If it helps I have briefly set out my understanding of the issues below

- The Parish Council and one resident in particular picked up on the Risk of Flooding from Surface Water (RoFfSW) from one of the documents Stantec had provided in support of the planning application
- The concerned residents misunderstood the RoFfSW mapping and noticed a "blue ribbon" to the near of the existing properties, which they interpreted as an underground stream. This is where there are localised depressions on the site and where the RoFfSW modelling assumes ponding occurs, based on LIDAR data.
- Stantec prepared a response to this assertion which referred to ground testing that had been undertaken on site including in close proximity to this "blue ribbon" which did not support the existence of an underground river near the surface
- This is where the concerned residents contacted HCC LLFA ordinary watercourses because they wanted to have the potential underground stream designated as an ordinary watercourse/under riparian responsibility such that it couldn't be altered
- HCC LLFA (me) advise the residents that while any potential underground streams should be considered and suitably mitigated as part of the site design, it would not be possible/reasonable for us to apply riparian law to a feature we're not sure exists with no details of its depth, route, width etc.
- At this point we advise St Albans LPA that noting the applicant had already undertaken some ground investigations, they could include a condition to ensure groundwater is investigated further and with appropriate measures to ensure that both groundwater and the development do not have an adverse effect on each other.
- Vistry's application was refused by the LPA however surface water drainage/SuDS was not a reason for refusal

Best wishes,



**David Uncle**  
**Senior Flood Risk Officer | Flood Risk Management**  
**Growth and Environment**  
**Hertfordshire County Council**  
County Hall, Pegs Lane, Hertford, SG13 8DN Postal Point: CHN101



E: [David.Uncle@hertfordshire.gov.uk](mailto:David.Uncle@hertfordshire.gov.uk)

T: 01992 555839 (Internal: 25839)

Working hours: 08:00 – 16:00 Monday - Friday



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We champion  
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**From:** Soderberg, Asa <asa.soderberg@stantec.com>

**Sent:** 05 September 2023 12:29

**To:** David Uncle <David.Uncle@hertfordshire.gov.uk>

**Subject:** Tollgate Road, Colney Heath (APP/B1930/W/23/3323099)

**Importance:** High

Dear David,

I hope you are well. We have been asked by our client Vistry, to prepare evidence of proof at short notice for the upcoming inquiry for this appeal site and we have also been asked to contact you to see if you would be happy for us to prepare a SoCG between the LLFA and Vistry with regards to Flood Risk. I was going to refer to the different sources of flood risk and identify whether we consider it being a risk to the development.

In my mind the main thing that interested parties are objecting to with regards to flood risk and the sequential test is the very localised surface water flood risk which has been misunderstood as ground water flooding from an underground stream. This seems to be the main issue raised by the Parish Council where they have referred to the surface water flood risk as ground water flood risk and state that it has been ignored and as a result the sequential test should be applied.

In my mind and as you confirm in your email to the LPA in February, see attached, the surface water flood risk is due to some localised low spots where rainwater is ponding due to poor infiltration potential of the soils beneath. This will be mitigated easily when designing the final ground levels suitably so that no rainwater will accumulate and pond in gardens etc.

There are no surface water flow routes entering the site so all the flooding shown is site generated and once a surface water drainage network is installed the majority of the rainfall will be managed through the drainage system in any case.

If you are in agreement, I am hoping to get a short SoCG prepared to close out any misunderstanding with regards to the risk of flooding at this site, for submission this week but our planner has confirmed as a worst case scenario it goes in late but he thinks the inspector would still be minded to accept it.

If you wish to discuss I can give you a call after 2pm today.

Kind regards,

**Åsa Söderberg**

Senior Associate  
(she/her)

3<sup>rd</sup> Floor, 50-60 Station Road, Cambridge, CB1 2JH

Direct: 01223 802 911

Mobile: 07469 118 527

[asa.soderberg@stantec.com](mailto:asa.soderberg@stantec.com)

*Please note my working hours are 0900 -1730 Monday to Thursday, I am not working Fridays.*





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St Albans City and District Council  
Development Control  
Civic Centre St. Peters Street  
St. Albans  
Hertfordshire  
AL1 3LA

**Our ref:** NE/2022/134880/01-L01  
**Your ref:** 5/2022/1988  
**Date:** 3 October 2022

Dear Planning team,

**Land to the rear of 42-100 Tollgate Road & 42 Tollgate Road Colney Heath St.  
Albans Hertfordshire**

**Outline application (access sought) - demolition of existing house and stables  
and the construction of up to 150 dwellings including affordable and custom-  
build dwellings together with all ancillary works.**

Thank you for consulting us on the above planning application and apologies for the delay in getting back to you.

**Environment Agency's Position:**

After a review of the submitted information, we **object** to the proposed development on the bases of proximity to the River Colne and risk to groundwater quality within Source Protection Zone 1.

**Objection 1: Building next to main river**

We object to this planning application as it involves works within 8 metres of a main river – River Colne. As submitted, it is unlikely that we would grant a flood risk activity permit for this application.

As submitted, the proposal does not comply with the requirements for planning, as set out in the Flood Risk and Coastal Change section of the Planning Practice Guidance and saved policy 84 (Flooding and River Catchment Management) of the St. Albans District Local Plan 1994.

**Reasons**

The proposed development would restrict essential access to the main river. In particular, the proposal does not consider access to the 8-metre buffer zone from outside the site. This is necessary for maintenance or improvement works, particularly in an emergency.

**Overcoming this objection**

Where the flood defence is 3rd party owned/maintained (i.e., not Environment Agency owned or maintained), the applicant must provide evidence that access to the natural bank will be maintained post construction. The applicant needs to consider the availability of access to the 8-metre buffer zone in order to carry out maintenance and/or improvement works, particularly in an emergency (e.g., a track for machinery).

Cont/d..

## **Objection 2: Insufficient information to determine risks to groundwater**

We object to the planning application, as submitted, because the risks to groundwater from the development are unacceptable. The applicant has not supplied adequate information to demonstrate that the risks posed to groundwater can be satisfactorily managed. We recommend that planning permission should be refused on this basis in line with paragraph 174 of the National Planning Policy Framework.

### **Reasons**

Our approach to groundwater protection is set out in “The Environment Agency’s approach to groundwater protection” (Feb 2018 V1.2). In implementing the position statements in this guidance, we will oppose development proposals that may pollute groundwater especially where the risks of pollution are high and the groundwater asset is of high value. In this case position statement “A5- Supply of adequate information” applies.

Groundwater is particularly sensitive in this location because the proposed development site:

- is within Source Protection Zone 1 for multiple potable abstractions
- is located within the Kesgrave Gravel Formation which is underlain by a Principal aquifer within the Lewis Nodular Chalk Formation and Seaford Chalk Formation.

To ensure development is sustainable, applicants must provide adequate information to demonstrate that the risks posed by development to groundwater can be satisfactorily managed. In this instance the applicant has failed to provide this information and we consider that the proposed development may pose an unacceptable risk of causing a detrimental impact to groundwater quality because:

- No preliminary risk assessment with respect to land contamination has been provided. The Environment Agency notes the site is immediately adjacent to a historic landfill.
- The proposed location of a foul sewage station in an area of shallow groundwater presents a risk to controlled waters, including groundwater which supports potable abstractions. Any leakage, no matter how small would result in a direct input of untreated effluent to groundwater. Currently there is insufficient information to demonstrate the risk posed can be suitably managed.

In addition, the Thames River Basin Management Plan requires the restoration and enhancement of water bodies. The proposal could cause further deterioration of controlled waters and prevent recovery of groundwater within the Mid Chilterns Chalk groundwater body.

### **Overcoming this objection**

In accordance with our Groundwater Protection: Principles and Practice we will maintain our objection until we receive a satisfactory risk assessment that demonstrates that the risks to groundwater posed by this development can be satisfactorily managed.

In order to overcome this objection, the applicant must:

- Submit a preliminary risk assessment and, depending on the results potentially further investigation and assessment. These works should follow the procedure set in “[Land contamination risk management \(LCRM\)](#)”.
- Submit further details on the design of the pumping station and a strategy to manage the risk associated with any leakage (i.e a groundwater monitoring strategy). This information will need to confirm that the pumping station will not be subwater tables.

## **Informative - Flood Risk Activity Permit**

The Environmental Permitting (England and Wales) Regulations 2016 require a permit to be obtained for any activities which will take place:

- on or within 8 metres of a main river (16 metres if tidal)
- on or within 8 metres of a flood defence structure or culvert (16 metres if tidal)
- on or within 16 metres of a sea defence
- involving quarrying or excavation within 16 metres of any main river, flood defence (including a remote defence) or culvert
- in a floodplain more than 8 metres from the river bank, culvert or flood defence structure (16 metres if it's a tidal main river) and you don't already have planning permission.

For further guidance please visit <https://www.gov.uk/guidance/flood-risk-activities-environmental-permits> or contact our National Customer Contact Centre on 03702 422 549 or by emailing [enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk). The applicant should not assume that a permit will automatically be forthcoming once planning permission has been granted, and we advise them to consult with us at the earliest opportunity.

## **Advice to the applicant**

### **Flood resistance and resilience**

We strongly recommend the use of flood resistance and resilience measures. Physical barriers, raised electrical fittings and special construction materials are just some of the ways you can help reduce flood damage.

To find out which measures will be effective for this development, please contact your building control department. To find out more about reducing flood damage, visit the Flood Risk and Coastal Change pages of the [planning practice guidance](#). Further guidance on flood resistance and resilience measures can also be found in:

Government guidance on flood resilient construction

<https://www.gov.uk/government/publications/flood-resilient-construction-of-new-buildings>

CIRIA Code of Practice for property flood resilience

<https://www.ciria.org/ItemDetail?iProductCode=C790F&Category=FREEPUBS>

British Standard 85500 – Flood resistant and resilient construction

<https://shop.bsigroup.com/ProductDetail/?pid=000000000030299686>

### **Pre-application advice**

We strongly encourage applicants to seek our pre-application advice to ensure environmental opportunities are maximised and to avoid any formal objections from us. If the applicant had come to us we could have worked with them to resolve these issues prior to submitting their planning application. The applicant is welcome to seek our advice now to help them overcome our objection via [HNL.SustainablePlaces@environment-agency.gov.uk](mailto:HNL.SustainablePlaces@environment-agency.gov.uk).

Further information on our charged planning advice service is available at;

<https://www.gov.uk/government/publications/planning-advice-environment-agency-standard-terms-and-conditions>.

**Final comments**

Thank you for contacting us regarding the above application. Our comments are based on our available records and the information submitted to us. Please quote our reference number in any future correspondence. Please provide us with a copy of the decision notice for our records. This would be greatly appreciated.

**If you are minded to approve the application contrary to our objection, I would be grateful if you could re-notify us to explain why, and to give us the opportunity to make further representations.**

Should you have any queries regarding this response, please contact me.

Yours sincerely,

**Mohammad Ahmed**  
**Sustainable Places Planning Advisor**

Direct Dial: 020 847 45213

E-mail: [HNL SustainablePlaces@environment-agency.gov.uk](mailto:HNL SustainablePlaces@environment-agency.gov.uk)

George Burgess  
St Albans District Council  
Development Control  
Civic Centre St. Peters Street  
St. Albans  
Hertfordshire  
AL1 3LA

**Our ref:** NE/2022/134880/02-L01  
**Your ref:** 5/2022/1988  
**Date:** 30 January 2023

Dear George,

**Outline application (access sought) - Demolition of existing house and stables and the construction of up to 150 dwellings including affordable and custom-build dwellings together with all ancillary works.**

**Land To The Rear Of 42-100 Tollgate Road & 42 Tollgate Road Colney Heath St Albans Hertfordshire.**

Thank you for consulting us on the above application with additional information which we received on 9 January. As part of the consultation we have reviewed the documents submitted in line with our remit.

### **Environment Agency Position**

Based on a review of the submitted information **we maintain our objection** outlined in response NE/2022/134880/01-L01 dated 3 October 2022.

### **Objection - Development in close proximity to main river**

We object to this planning application as it involves works within 8 metres of a main river – River Colne. As submitted, it is unlikely that we would grant a flood risk activity permit for this application.

As submitted, the proposal does not comply with the requirements for planning, as set out in the Flood Risk and Coastal Change section of the Planning Practice Guidance and saved policy 84 (Flooding and River Catchment Management) of the St. Albans District Local Plan 1994.

### **Reason**

Although the applicant has provided the necessary buffer zone, they have failed to demonstrate how the Environment Agency will be able to gain access to this buffer zone through the site. There needs to be a clear path for vehicles to be able to access the buffer zone and river. These vehicles play a vital role in clearing debris and blockages from the channel in times of high flow. Without a clear and efficient route of access, our teams would not be able to clear these blockages, therefore the development as proposed would increase flood risk to the site and the surrounding areas

### **Overcoming our objection**

The applicant must consider the space required for future emergency access and

Cont/d..

maintenance, including the use of vehicles and heavy-duty machinery. This can be demonstrated by, but is not limited to, submitting vehicle tracking plans showing there is unrestricted vehicular access for a six-wheeler grab lorry to enter the site and park parallel to the watercourse for operation of the mechanical arm.

### **Risks to groundwater**

Thames Water have recently changed their position and now state they lack sufficient capacity to manage the foul effluent.

*Section 3. Thames Water Waste Comment - email dated 31 August 2022 of the Stantec letter dated 10 Nov 2022, identifies that Thames Water lacks sufficient capacity to deal with the foul effluent generated by the proposed development.*

*Should it not be possible to utilise the existing foul system, there is a risk that foul effluent will have to be discharged to the water environment (either groundwater or surface water).*

**Should the development propose to use non-mains drainage then we would likely also object to this application** due to the risk to groundwater and recommend planning permission is refused

Such a discharge would require an environmental permit and it is not clear if one would be granted. Where a proposed development requires both planning permission and an environmental permit the Environment Agency will object and recommend parallel tracking to ensure pertinent aspects agreed via planning will be acceptable under permitting.

Given Thames Water's new stance please could the applicant confirm what they plan to do.

The Environment Agency would also like clarify that the site is entirely within an SPZ1 for the Roestock abstraction.

### **Informative**

#### **Flood Risk Activity Permit**

The Environmental Permitting (England and Wales) Regulations 2016 require a permit to be obtained for any activities which will take place:

- on or within 8 metres of a main river
- on or within 8 metres of a flood defence structure or culvert
- involving quarrying or excavation within 16 metres of any main river, flood defence (including a remote defence) or culvert
- in a floodplain more than 8 metres from the river bank, culvert or flood defence structure and you don't already have planning permission.

For further guidance please visit <https://www.gov.uk/guidance/flood-risk-activities-environmental-permits> or contact our National Customer Contact Centre on 03702 422 549 or by emailing [enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk). The applicant should not assume that a permit will automatically be forthcoming once planning permission has been granted, and we advise them to consult with us at the earliest opportunity.

### **Advice to LPA**

#### **Sequential Test**

In accordance with the National Planning Policy Framework (paragraph 162),



development in flood risk areas should not be permitted if there are reasonably available alternative sites, appropriate for the proposed development, in areas with a lower risk of flooding. The sequential test establishes if this is the case.

Development is in a flood risk area if it is in Flood Zone 2 or 3, or it is within Flood Zone 1 and your strategic flood risk assessment shows it to be at future flood risk or at risk from other sources of flooding such as surface water or groundwater.

The only developments exempt from the sequential test in flood risk areas are:

- Householder developments such as residential extensions, conservatories, or loft conversions
- Small non-residential extensions with a footprint of less than 250sqm
- Changes of use (except changes of use to a caravan, camping or chalet site, or to a mobile home or park home site)
- Applications for development on sites allocated in the development plan through the sequential test and:
  - the proposed development is consistent with the use for which the site was allocated; and
  - there have been no significant changes to the known level of flood risk to the site, now or in the future, which would have affected the outcome of the test

Avoiding flood risk through the sequential test is the most effective way of addressing flood risk because it places the least reliance on measures such as flood defences, flood warnings and property level resilience.

It is for you, as the local planning authority, to determine an appropriate area of search and to decide whether the sequential test has been passed, with reference to the information you hold on land availability. You may also ask the applicant to identify any other 'reasonably available' sites which are on the open market and to check on the current status of identified sites to determine if they can be considered 'reasonably available'. Further guidance on the area of search can be found in paragraphs 027-030 of the planning practice guidance [here](#).

We can advise on the relative flood risk between the proposed site and any alternative sites identified - although your strategic flood risk assessment should allow you to do this yourself in most cases. We won't advise on whether alternative sites are reasonably available or whether they would be suitable for the proposed development. We also won't advise on whether there are sustainable development objectives that mean steering the development to any alternative sites would be inappropriate. Further guidance on how to apply the sequential test to site specific applications can be found in the planning practice guidance [here](#).

#### Flood resistance and resilience

We strongly recommend the use of flood resistance and resilience measures. Physical barriers, raised electrical fittings, and special construction materials are just some of the ways you can help reduce flood damage.

To find out which measures will be effective for this development, please contact your building control department. If you'd like to find out more about reducing flood damage, visit the Flood Risk and Coastal Change pages of the planning practice guidance. Further guidance on flood resistance and resilience measures can also be found in:

Government guidance on flood resilient construction

<https://www.gov.uk/government/publications/flood-resilient-construction-of-new->

## [buildings](#)

CIRIA Code of Practice for property flood resilience

[https://www.ciria.org/Research/Projects\\_underway2/Code\\_of\\_Practice\\_and\\_guidance\\_for\\_property\\_flood\\_resilience.aspx](https://www.ciria.org/Research/Projects_underway2/Code_of_Practice_and_guidance_for_property_flood_resilience.aspx)

British Standard 85500 – Flood resistant and resilient construction

<https://shop.bsigroup.com/ProductDetail/?pid=00000000030299686>

### **Advice to applicant**

#### Water Resources

Increased water efficiency for all new developments potentially enables more growth with the same water resources. Developers can highlight positive corporate social responsibility messages and the use of technology to help sell their homes. For the homeowner lower water usage also reduces water and energy bills.

We endorse the use of water efficiency measures especially in new developments. Use of technology that ensures efficient use of natural resources could support the environmental benefits of future proposals and could help attract investment to the area. Therefore, water efficient technology, fixtures and fittings should be considered as part of new developments.

All new residential development is required to achieve a water consumption limit of a maximum of 125 litres per person per day as set out within [the Building Regulations &c. \(Amendment\) Regulations 2015](#).

However, we recommend that in areas of serious water stress (as identified in our report [Water stressed areas - final classification](#)) a higher standard of a maximum of 110 litres per person per day is applied. This standard or higher may already be a requirement of the local planning authority.

### **Final comments**

Thank you for contacting us regarding the above application. Our comments are based on our available records and the information submitted to us. Please quote our reference number in any future correspondence. Please provide us with a copy of the decision notice for our records. This would be greatly appreciated.

**If you are minded to approve the application contrary to our objection, I would be grateful if you could re-notify us to explain why, and to give us the opportunity to make further representations.**

Should you have any queries regarding this response, please contact me.

Yours sincerely,

**George Lloyd**  
**Sustainable Places Planning Advisor**

Direct dial: 02030 254843

E-mail: [HNL.SustainablePlaces@environment-agency.gov.uk](mailto:HNL.SustainablePlaces@environment-agency.gov.uk)

George Burgess  
St Albans District Council  
Development Control  
Civic Centre St. Peters Street  
St. Albans  
Hertfordshire  
AL1 3LA

**Our ref:** NE/2022/134880/03-L01  
**Your ref:** 5/2022/1988  
**Date:** 17 March 2023

Dear George,

**Outline application (access sought) - Demolition of existing house and stables and the construction of up to 150 dwellings including affordable and custom-build dwellings together with all ancillary works.**

**Land To The Rear Of 42-100 Tollgate Road & 42 Tollgate Road, Colney Heath, St Albans, Hertfordshire.**

Thank you for consulting us on the above application which we received additional information for on 20 February. As part of the consultation we have now reviewed the following:

- Concept Masterplan, dated June 2022, reference CSA/3925/117, prepared by CSA Environmental
- Email dated 28 November from [BCTAdmin@thameswater.co.uk](mailto:BCTAdmin@thameswater.co.uk) to [Planning.Applications@stalbans.gov.uk](mailto:Planning.Applications@stalbans.gov.uk), Subject: '3rd Party Planning Application - 5/2022/1988- AMENDED RESPONSE'.
- Land at Tollgate Road, Colney Heath, Flood Risk Assessment, Surface Water and Foul Water Drainage Strategy
- Land at Tollgate Road, Colney Heath, Phase 1 Ground Conditions Assessment (GCA) (Stantec, ref 332510999/3501/R01, May 2022)
- Land at Tollgate Road, Colney Heath, Phase 2 Ground Investigation Report (GIR) (Stantec, ref 332510999/3501/R02, May 2022)

### Environment Agency Position

Based on a review of the submitted information **we remove our previous objection** outlined under response reference NE/2022/134880/02, dated 30 January subject to the inclusion of the following **8 conditions** on any grant of decision notice

### Groundwater and contaminated land

The proposed development is located within an area where controlled waters, including groundwater because the site is:

- is within source protection zone 1
- is located upon a Secondary Aquifer A which overlies a Principal Aquifer.

Cont/d..

The documents and email submitted provide us with confidence that it will be possible to suitably manage the risks posed to groundwater resources by this development. Further detailed information will however be required before any development is undertaken. It is our opinion that it would place an unreasonable burden on the developer to ask for more detailed information prior to the granting of planning permission but respect that this is a decision for the local planning authority. In light of the above, the proposed development will be acceptable if a planning condition is included requiring submission and subsequent agreement of further details as set out below. Without this condition we would object to the proposal in line with paragraph 170 of the National Planning Policy Framework because it cannot be guaranteed that the development will not present unacceptable risks to groundwater resources.

### **Condition 1**

#### Previously Unidentified Contamination

If, during development, contamination not previously identified is found to be present at the site then no further development (unless otherwise agreed in writing with the local planning authority) shall be carried out until a remediation strategy detailing how this contamination will be dealt with has been submitted to, and approved in writing by, the local planning authority. The remediation strategy shall be implemented as approved.

#### Reason(s) 1

To prevent deterioration of controlled waters and to ensure that the development does not contribute to and is not put at unacceptable risk from or adversely affected by unacceptable levels of water pollution from previously unidentified contamination sources at the development site. This is in line with paragraph 170 of the National Planning Policy Framework.

### **Condition 2**

#### SuDS Infiltration of surface water into ground

No drainage systems for the infiltration of surface water to the ground are permitted other than with the written consent of the local planning authority. Any proposals for such systems must be supported by an assessment of the risks to controlled waters. The development shall be carried out in accordance with the approved details.

#### Reason(s) 2

- To ensure that the development does not contribute to and is not put at unacceptable risk from or adversely affected by unacceptable levels of water pollution caused by mobilised contaminants. This is in line with paragraph 170 of the National Planning Policy Framework.
- To prevent deterioration of controlled waters.

### **Condition 3**

#### Piling/boreholes/tunnel shafts/ground source heating and cooling systems– lack of information – details to be agreed

Piling, deep foundations or other intrusive groundworks (investigation boreholes/tunnel shafts/ground source heating and cooling systems) using penetrative methods shall not be carried out other than with the written consent of the local planning authority. The development shall be carried out in accordance with the approved details.

#### Reason(s) 3

To ensure that the proposed Piling, deep foundations or other intrusive groundworks (investigation boreholes/tunnel shafts/ground source heating and cooling systems) using does not harm groundwater resources in line with paragraph 170 of the National

Advice to applicant

The use of piled foundations and other types of intrusive groundworks have the potential create preferential pathways allowing for the mixing of groundwaters of different quality. Additionally, piles and certain drilling fluids can themselves be a source of pollutants.

Any scheme must be supported by sufficient information to demonstrate that there will not be an unacceptable risk to controlled waters, including groundwater.

**Condition 4**

Decommissioning of investigative boreholes

A scheme for managing any borehole installed for the investigation of soils, groundwater or geotechnical purposes shall be submitted to and approved in writing by the local planning authority. The scheme shall provide details of how redundant boreholes are to be decommissioned and how any boreholes that need to be retained, post-development, for monitoring purposes will be secured, protected and inspected. The scheme as approved shall be implemented prior to the occupation of any part of the permitted development.

Reason 4

- To ensure that the development does not contribute to and is not put at unacceptable risk from or adversely affected by unacceptable levels of water pollution caused by mobilised contaminants. This is in line with paragraph 170 of the National Planning Policy Framework.
- To prevent deterioration of controlled waters.

**Condition 5**

Long term management of pumping station

The development hereby permitted may not commence until such time as a scheme detailing the design and long-term management of the pumping station has been submitted.

The scheme shall include the full structural details of the installation, including details of the excavation, depth to groundwater and measures taken to ensure that there is a year-round unsaturated zone between at the base of the wet well.

The scheme shall be fully implemented and subsequently maintained, in accordance with the scheme, or any changes subsequently agreed, in writing, by the local planning authority.

**Reason**

The direct input of both hazardous substances and non-hazardous pollutants is prohibited by Paragraph 20(2)(j) to WER 2017 which fully implements Article 11(3)(j) of WFD. Any leakage from a subwater table wet-well would constitute such an input. Prior to development commencing it will need to be demonstrated that there is a sufficient year unsaturated zone at the proposed location of the pumping station.

**Condition 6**

Sewage pipe specifications

The development hereby permitted may not commence until such time as a scheme to agree sewage pipe work specifications (in SPZ1s) has been submitted to, and approved in writing by, the local planning authority. The scheme shall be implemented as approved.

### Reason

To ensure that the proposed development does not harm groundwater resources in line with paragraph 170 of the National Planning Policy Framework and Position Statement *G8- Sewerage pipework* of the 'The Environment Agency's approach to groundwater protection'

### **Ecology**

We feel that the comprehensive EIA report verifies that the designation of priority habitat (coastal and floodplain grazing marsh) is no longer an appropriate designation, but rather it shows the potential of the site. Our designation of this site as floodplain grazing marsh was in 1994, however, the EIA now denotes this land as open grassland (no longer a priority habitat).

We are in favour of opportunities to enhance the river Colne through this site and believe this can be addressed by 2 conditions. It is not necessary for the river and wetland plan to be provided prior to the granting of planning permission, as this matter can be addressed by a planning condition. The second condition requires a scheme to be agreed to protect a 10-metre-wide buffer zone around the river Colne

### River Basin Management Plans

The Thames River basin management plan requires the restoration and enhancement of water bodies to prevent deterioration and promote their recovery. Without a river and wetland management plan, the proposal's ecological impact may lead to prevent a water body quality element from attaining good status. This is because it the river Colne (designated chalk stream priority habitat) and its associated floodplain sit within the site boundary. This floodplain has previously been recognised as Coastal and Floodplain Grazing Marsh, a priority habitat protected under Natural Environment and Rural Communities Act (2006), Section 41 habitats of principal importance. In addition, ponds near to the proposed development are inhabited by Great Crested Newts, designated and protected as European protected species, protected under the Conservation of Habitats and Species Regulations 2017. This evidence shows that enhancements to the site should be targeted at achieving restoring and protecting the River Colne's chalk stream habitat and wetland habitats at this site.

The Thames River Basin Management Plan (TRBMP) sets out actions that will contribute to the objectives of the Water Framework Directive to help the river Colne waterbody achieve Good ecological status (currently classified as Bad). The actions for the river Colne at the site of this development are:

- To restore natural profile, planform, potential for narrowing and restoring flow characteristics
- To improve modified habitat, to improve condition to channel, bed and banks of the River Colne from TL2084105311 to TL2064805518 (through the site of the development)
- To remove weir structure at TL2054505725 (off-site)

This approach is supported by paragraphs 170 and 175 of the National Planning Policy Framework (NPPF) which recognise that the planning system should conserve and enhance the environment by minimising impacts on and providing net gains for biodiversity. If significant harm resulting from a development cannot be avoided, adequately mitigated, or as a last resort compensated for, planning permission should be refused. Without this condition we would object to the proposal because it cannot be

guaranteed that the development will not result in significant harm to chalk stream and wetland habitats.

### Riparian Corridors

Development that encroaches on watercourses can have a potentially severe impact on their ecological value. The river Colne and associated riparian zone runs along the boundary of the proposed development.

Networks of undeveloped buffer zones help wildlife adapt to climate change and will help restore watercourses to a more natural state as required by the river basin management plan. The River Colne Waterbody Status is currently at Bad (2019), as classified by the Water Framework Directive. The creation and protection of quality, complex, riparian buffer zones is listed as an objective within the TRBMP, to help waterbodies achieve Good ecological status.

Undeveloped buffer zones can provide multiple benefits for people and wildlife, these include:

- Help to stabilise the riverbank, reducing bank erosion.
- Improve water quality and protect rivers from pollution events. Tree roots can also help bind soil together, reducing fine sediment ingress into river catchments.
- Act as natural flood management. Trees along rivers intercept rainfall, mitigating flooding by reducing the speed at which water reaches rivers.
- Increase biodiversity by creating and connecting new habitat corridors.

### **Condition 7**

#### Landscape and ecological management plan

No development shall take place until a river and wetland management plan, including long-term design objectives, management responsibilities and maintenance schedules for all river and wetland habitat areas, shall be submitted to, and approved in writing by, the local planning authority. The river and wetland management plan shall be carried out as approved and any subsequent variations shall be agreed in writing by the local planning authority.

The scheme shall include the following elements:

- details of any new habitat created on site, including enhancements to the river, and ponds/wetland habitats.
- details of treatment of site boundaries and/or buffers around water bodies
- details of management responsibilities
- details of maintenance regimes

### Reason

The ecological enhancements that have been proposed will require a management plan to be in place. This will ensure the landscape provides a maximum benefit to people and the environment and ensure the protection of wildlife and supporting habitat. Also, to secure opportunities for enhancing the site's nature conservation value in line with national planning policy and adopted Policy 106: Nature Conservation of the St Albans District Council Local Plan. The Thames River Basin Management Plan states that the water environment should be protected and enhanced to prevent deterioration and promote the recovery of water bodies. The river Colne is a chalk stream. In England and Wales, chalk streams are classed as Priority Habitats, also known as Habitats of Principal Importance, (classified under the UK Biodiversity Action Plan government legislation) and as such are recognised as being amongst the most threatened habitats

that require conservation action. Their rarity and distinctiveness support some of the UK's most endangered species. The River Colne Waterbody Status is currently at Bad (2019). The omission of proposed enhancements to the river and wetland habitats with this development allows for the continued deterioration of the river Colne as classified under WFD and will contribute to reason for not achieving 'Good' status.

### **Condition 8**

#### Undeveloped buffer zone: scheme to be submitted

No development shall take place until a scheme for the provision and management of a 10-metre-wide buffer zone alongside the river Colne has been submitted to, and approved in writing by, the local planning authority. Thereafter, the development shall be carried out with the approved scheme. Any subsequent variations shall be agreed in writing by the local planning authority, in which case the development shall be carried out in accordance with the amended scheme. The buffer zone scheme shall be free from built development including lighting, footpaths, domestic gardens, river bank modifications such as hard engineering, and formal landscaping. The scheme shall include:

- plans showing the extent and layout of the buffer zone.
- details of any proposed planting scheme (for example, native species).
- details demonstrating how the buffer zone will be protected during development and managed over the longer term including adequate financial provision and named body responsible for management plus production of detailed management plan.
- details of any proposed footpaths, fencing, lighting etc.
- details of proposed SuDS scheme, including details of planting, outfalls and scour protection etc.

#### Reasons

Land alongside watercourses and wetlands are particularly valuable for wildlife and it is essential this is protected.

This approach is supported by paragraphs 170 and 175 of the National Planning Policy Framework (NPPF) which recognise that the planning system should conserve and enhance the environment by minimising impacts on and providing net gains for biodiversity. If significant harm resulting from a development cannot be avoided, adequately mitigated, or as a last resort compensated for, planning permission should be refused.

This condition is also supported by legislation set out in the Natural Environment and Rural Communities Act 2006 and Article 10 of the Habitats Directive which stresses the importance of natural networks of linked corridors to allow movement of species between suitable habitats, and promote the expansion of biodiversity

### **Informative**

#### Flood Risk Activity Permit

The Environmental Permitting (England and Wales) Regulations 2016 require a permit to be obtained for any activities which will take place:

- on or within 8 metres of a main river
- on or within 8 metres of a flood defence structure or culvert (16 metres if tidal)
- involving quarrying or excavation within 16 metres of any main river, flood defence (including a remote defence) or culvert
- in a floodplain more than 8 metres from the river bank, culvert or flood defence



structure and you don't already have planning permission.

For further guidance please visit <https://www.gov.uk/guidance/flood-risk-activities-environmental-permits> or contact our National Customer Contact Centre on 03702 422 549 or by emailing [enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk). The applicant should not assume that a permit will automatically be forthcoming once planning permission has been granted, and we advise them to consult with us at the earliest opportunity.

### **Further advice**

#### Emergency access

We are pleased to see a field gate has been added for emergency access. Please contact [HNL-APTENQUIRIES@environment-agency.gov.uk](mailto:HNL-APTENQUIRIES@environment-agency.gov.uk) in order to organise access through the gate.

#### Asset liability

The Environment Agency would like to remind the applicant that, in the absence of an alternative agreement or special transference of liability or contract, the owner of the asset remains responsible for the asset. The risk remains with the asset owner and this response does not remove any of this liability from the owner or contractually responsible party.

#### Riparian responsibilities

As runs within the red line boundary, it is likely that you own a stretch of watercourse. This means you have riparian responsibilities. Responsibilities include (but are not limited to) the maintenance of the river at this location including the riverbank. Further information on this can be found here: <https://www.gov.uk/guidance/owning-a-watercourse>

### **Advice to LPA**

#### Sequential Test

##### What is the sequential test, and does it apply to this application?

In accordance with the National Planning Policy Framework (paragraph 162), development in flood risk areas should not be permitted if there are reasonably available alternative sites, appropriate for the proposed development, in areas with a lower risk of flooding. The sequential test establishes if this is the case.

Development is in a flood risk area if it is in Flood Zone 2 or 3, or it is within Flood Zone 1 and your strategic flood risk assessment shows it to be at future flood risk or at risk from other sources of flooding such as surface water or groundwater.

The only developments exempt from the sequential test in flood risk areas are:

- Householder developments such as residential extensions, conservatories, or loft conversions
- Small non-residential extensions with a footprint of less than 250sqm
- Changes of use (except changes of use to a caravan, camping or chalet site, or to a mobile home or park home site)
- Applications for development on sites allocated in the development plan through the sequential test and:
  - the proposed development is consistent with the use for which the site was allocated; and
  - there have been no significant changes to the known level of flood risk to the site, now or in the future, which would have affected the outcome of the test

Avoiding flood risk through the sequential test is the most effective way of addressing

flood risk because it places the least reliance on measures such as flood defences, flood warnings and property level resilience.

#### Who undertakes the sequential test?

It is for you, as the local planning authority, to determine an appropriate area of search and to decide whether the sequential test has been passed, with reference to the information you hold on land availability. You may also ask the applicant to identify any other 'reasonably available' sites which are on the open market and to check on the current status of identified sites to determine if they can be considered 'reasonably available'. Further guidance on the area of search can be found in paragraphs 027-030 of the planning practice guidance [here](#).

#### What is our role in the sequential test?

We can advise on the relative flood risk between the proposed site and any alternative sites identified - although your strategic flood risk assessment should allow you to do this yourself in most cases. We won't advise on whether alternative sites are reasonably available or whether they would be suitable for the proposed development. We also won't advise on whether there are sustainable development objectives that mean steering the development to any alternative sites would be inappropriate. Further guidance on how to apply the sequential test to site specific applications can be found in the planning practice guidance [here](#).

We have not objected to this application on flood risk grounds, but this does not remove the need for you to apply the sequential test and to consider whether it has been satisfied. Where a flood risk assessment shows the development can be made safe throughout its lifetime without increasing risk elsewhere, there will always be some remaining risk that the development will be affected either directly or indirectly by flooding. A failure to satisfy the sequential test can be grounds alone to refuse planning permission.

#### Flood warning and emergency response

We do not normally comment on or approve the adequacy of flood emergency response procedures accompanying development proposals, as we do not carry out these roles during a flood. Our involvement with this development during an emergency will be limited to delivering flood warnings to occupants/users covered by our flood warning network. Planning practice guidance (PPG) states that, in determining whether a development is safe, the ability of residents and users to safely access and exit a building during a design flood and to evacuate before an extreme flood needs to be considered. One of the key considerations to ensure that any new development is safe is whether adequate flood warnings would be available to people using the development.

In all circumstances where warning and emergency response is fundamental to managing flood risk, we advise local planning authorities to formally consider the emergency planning and rescue implications of new development in making their decisions. As such, we recommend you refer to '[Flood risk emergency plans for new development](#)' and undertake appropriate consultation with your emergency planners and the emergency services to determine whether the proposals are safe in accordance with paragraph 167 of the NPPF and the guiding principles of the PPG.

#### Chalk river

The proposal is adjacent to a chalk river and therefore may be prone to groundwater flooding. We do not normally comment on issues about groundwater flooding; however

we deem this proposal at potential risk from groundwater flooding and therefore ask the LPA to review this risk before granting this development. The LLFA is the lead for groundwater flood risk.

### **Advice to applicant**

#### Water Resources

Increased water efficiency for all new developments potentially enables more growth with the same water resources. Developers can highlight positive corporate social responsibility messages and the use of technology to help sell their homes. For the homeowner lower water usage also reduces water and energy bills.

We endorse the use of water efficiency measures especially in new developments. Use of technology that ensures efficient use of natural resources could support the environmental benefits of future proposals and could help attract investment to the area. Therefore, water efficient technology, fixtures and fittings should be considered as part of new developments.

All new residential development is required to achieve a water consumption limit of a maximum of 125 litres per person per day as set out within [the Building Regulations &c. \(Amendment\) Regulations 2015](#).

However, we recommend that in areas of serious water stress (as identified in our report [Water stressed areas - final classification](#)) a higher standard of a maximum of 110 litres per person per day is applied. This standard or higher may already be a requirement of the local planning authority.

#### Insurance eligibility

New homes built in flood risk areas after 1 January 2009 are not covered by the Flood Re-insurance scheme and may not be eligible for home insurance. We advise contacting an insurance provider to discuss whether your development would qualify for insurance.

#### Flood Risk Management Scheme Funding eligibility

New properties and buildings converted to housings within areas of flood risk after 1 January 2012 will not be counted towards the outcome measures of any proposed future flood alleviation scheme. This is to avoid inappropriate development in flood risk areas. Further information can be found at <https://www.gov.uk/government/publications/calculate-grant-in-aid-funding-flood-risk-management-authorities>

### **Final comments**

Thank you for contacting us regarding the above application. Our comments are based on our available records and the information submitted to us. Please quote our reference number in any future correspondence. Please provide us with a copy of the decision notice for our records. This would be greatly appreciated.

Should you have any queries regarding this response, please contact me.

Yours sincerely,

**George Lloyd**  
**Sustainable Places Planning Advisor**

Direct dial: 02030 254843

E-mail: [HNL SustainablePlaces@environment-agency.gov.uk](mailto:HNL SustainablePlaces@environment-agency.gov.uk)

<b>SITE:</b>	Land To The Rear Of 42-100 Tollgate Road & 42 Tollgate Road Colney Heath St Albans Hertfordshire
<b>DESCRIPTION:</b>	Outline application (access sought) - Demolition of existing house and stables and the construction of up to 150 dwellings including affordable and custom-build dwellings together with all ancillary works
<b>APPLICATION NO:</b>	5/2022/1988
<b>GRID REFERENCE:</b>	TL 20862 05485
<b>APPLICANT:</b>	Vistry Homes Ltd
<b>AGENT:</b>	Dla Town Planning Ltd (Dla Town Planning Ltd)
<b>DATE OF THIS RESPONSE:</b>	15/09/2022
<b>RESPONSE BY:</b>	RAB

### **Planning Authority Comments**

This technical review has been carried out by RAB on behalf of St Albans District Council.

The proposed development would be considered acceptable to St Albans District Council as the Local Planning Authority if the following planning condition is attached to any permission granted.

1. No development shall be commenced until details of the surface water drainage scheme, based on sustainable drainage principles together with a programme of implementation and maintenance for the lifetime of the development, have been submitted to and approved in writing by the Local Planning Authority, which must include the following:
  - a. A fully detailed surface water drainage scheme has been submitted to, and approved in writing, by the Local Planning Authority. The scheme shall include the utilisation of contemporary and appropriate sustainable drainage (SuDS) techniques, with reference to the '*Flood Risk Assessment, Surface Water and Foul Water Drainage Strategy*' by Stantec and dated 28<sup>th</sup> June 2022.

- b. Accompanying hydraulic modelling calculations for the entire surface water drainage scheme have been submitted and approved. These detailed calculations should demonstrate that both the site and surrounding area will not flood from surface water as a result of the development for a full range of return periods and durations for summer and winter storm events, up to the 1 in 100 year return period event including an appropriate allowance for climate change.
- c. The maximum permissible flow controlled discharge rate shall no more than QBAR (2.82 l/s/ha) for all events up to and including the 1 in 100 year return period event plus an appropriate allowance for climate change.
- d. If discharging to a drainage system maintained/operated by other authorities (Lead Local Flood Authority, Environment Agency, internal drainage board, highway authority, sewerage undertaker, or Canal and River Trust) that evidence of consultation and the acceptability of any discharge to their system is provided. In this instance confirmation of approval to discharge to the River Colne.
- e. Submission of final detailed drainage layout plan(s) including the location and provided volumes of all storage and sustainable drainage (SuDS) features, pipe runs, invert levels and discharge points. If there are areas to be designated for informal flooding these should also be shown on a detailed site plan. The volume, size, inlet and outlet features, long-sections and cross sections of the proposed storage and SuDS features should also be provided.
- f. The surface water drainage plan(s) should include hydraulic modelling pipe label numbers that correspond with the hydraulic modelling calculations submitted, to allow for accurate cross-checking and review.
- g. If any infiltration drainage is proposed on the final drainage layout, this should be supported with appropriate infiltration testing carried out to the BRE Digest 365 Soakaway Design standard. This would also require confirmation of groundwater levels to demonstrate that the invert level of any soakaways or unlined attenuation features can be located a minimum of 1m above maximum groundwater levels.
- h. A detailed assessment of the proposed SuDS treatment train and water quality management stages, for all surface water runoff from the entire development site.

- i. The provision of a detailed plan showing the management of exceedance flow paths for surface water for events greater than the 1 in 100 year return period plus climate change event.
- j. A construction management plan to address all surface water runoff and any flooding issues during the construction stage is submitted and approved.
- k. If access or works to third party land is required, confirmation that an agreement has been made with the necessary landowners/consenting authorities to cross third party land and/or make a connection to the proposed sewer chamber location.
- l. A detailed management and maintenance plan for the lifetime of the development has been submitted and approved, which shall include the arrangements for adoption by an appropriate public body or water company, management company or maintenance by a Residents' Management Company and/or any other arrangements to secure the operation and maintenance to an approved standard and working condition throughout the lifetime of the development.

Reason: To ensure that the development is served by a satisfactory system of sustainable surface water drainage and that the approved system is retained, managed and maintained throughout the lifetime of the development. In compliance with Policy 84 of the St Albans District Local Plan Review 1994, the National Planning Policy Framework 2021 and the Technical Guidance to the National Planning Policy Framework.

-----Original Message-----

From: BCTAdmin@thameswater.co.uk [mailto:BCTAdmin@thameswater.co.uk]  
Sent: 31 August 2022 15:18  
To: Planning Applications <Planning.Applications@stalbans.gov.uk>  
Subject: 3rd Party Planning Application - 5/2022/1988

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St Albans City & District Council  
DTS Ref: 72409  
District Council Offices, Planning & Bldg Control  
Ref: 5/2022/1988  
Civic Centre, St Peter's Street  
St Albans  
Herts  
AL1 3JL

Our  
Your

31 August 2022

Dear Sir/Madam

Re: COLNE SPRING HOUSE, COURSERS ROAD, COLNEY HEATH, ST. ALBANS,  
HERTFORDSHIRE , AL4 0PB

#### Waste Comments

Thames Water recognises this catchment is subject to high infiltration flows during certain groundwater conditions. The scale of the proposed development doesn't materially affect the sewer network and as such we have no objection, however care needs to be taken when designing new networks to ensure they don't surcharge and cause flooding. In the longer term Thames Water, along with other partners, are working on a strategy to reduce groundwater entering the sewer networks.

Thames Water recognises this catchment is subject to high infiltration flows during certain groundwater conditions. The developer should liaise with the LLFA to agree an appropriate sustainable surface water strategy following the sequential approach before considering connection to the public sewer network. The scale of the proposed development doesn't materially affect the sewer network and as such we have no objection, however care needs to be taken when designing new networks to ensure they don't surcharge and cause flooding. In the longer term Thames Water, along with other partners, are working on a strategy to reduce groundwater entering the sewer network.

Following initial investigations, Thames Water has identified an inability of the existing FOUL WATER network infrastructure to accommodate the needs of this development proposal. Thames Water has contacted the developer in an attempt to agree a position for foul water networks but has been unable to do so in the time available and as such Thames Water request that the



following condition be added to any planning permission. "The development shall not be occupied until confirmation has been provided that either:-  
1. All foul water network upgrades required to accommodate the additional flows from the development have been completed; or- 2. A development and infrastructure phasing plan has been agreed with the Local Authority in consultation with Thames Water to allow development to be occupied. Where a development and infrastructure phasing plan is agreed, no occupation shall take place other than in accordance with the agreed development and infrastructure phasing plan." Reason - Network reinforcement works are likely to be required to accommodate the proposed development. Any reinforcement works identified will be necessary in order to avoid sewage flooding and/or potential pollution incidents. The developer can request information to support the discharge of this condition by visiting the Thames Water website at [thameswater.co.uk/preplanning](http://thameswater.co.uk/preplanning). Should the Local Planning Authority consider the above recommendation inappropriate or are unable to include it in the decision notice, it is important that the Local Planning Authority liaises with Thames Water Development Planning Department (telephone 0203 577 9998) prior to the planning application approval.

The application indicates that SURFACE WATER will NOT be discharged to the public network and as such Thames Water has no objection, however approval should be sought from the Lead Local Flood Authority. Should the applicant subsequently seek a connection to discharge surface water into the public network in the future then we would consider this to be a material change to the proposal, which would require an amendment to the application at which point we would need to review our position.

#### Water Comments

With regard to water supply, this comes within the area covered by the Affinity Water Company. For your information the address to write to is - Affinity Water Company The Hub, Tamblin Way, Hatfield, Herts, AL10 9EZ - Tel - 0845 782 3333.

Yours faithfully  
Development Planning Department

Development Planning,  
Thames Water,  
Maple Lodge STW,  
Denham Way,  
Rickmansworth,  
WD3 9SQ  
Tel:020 3577 9998  
Email: [devcon.team@thameswater.co.uk](mailto:devcon.team@thameswater.co.uk)

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[1.protection.sophos.com?d=facebook.com&u=d3d3LmZhY2Vib29rLmNvbS90aGFtZXN3YXRlcg==&i=NWQ1ZmMwOTQxNGFiNmYxMGEyYjA0MGY3&t=UTVjQ2hpWTdKdnRlbnVhSS9rSFhKeUJ1UmRhSU1MSGFZdnZjY3BValpYWT0=&h=6e2d432c16964c9c91f67f89d2e16909](https://eu-west-1.protection.sophos.com?d=facebook.com&u=d3d3LmZhY2Vib29rLmNvbS90aGFtZXN3YXRlcg==&i=NWQ1ZmMwOTQxNGFiNmYxMGEyYjA0MGY3&t=UTVjQ2hpWTdKdnRlbnVhSS9rSFhKeUJ1UmRhSU1MSGFZdnZjY3BValpYWT0=&h=6e2d432c16964c9c91f67f89d2e16909). We're happy to help you 24/7.

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-----Original Message-----

From: BCTAdmin@thameswater.co.uk [mailto:BCTAdmin@thameswater.co.uk]  
Sent: 28 November 2022 09:16  
To: Planning Applications <Planning.Applications@stalbans.gov.uk>  
Subject: 3rd Party Planning Application - 5/2022/1988- AMENDED RESPONSE

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St Albans City & District Council  
DTS Ref: 72409  
District Council Offices, Planning & Bldg Control  
Ref: 5/2022/1988- AMENDED RESPONSE  
Civic Centre, St Peter's Street  
St Albans  
Herts  
AL1 3JL

Our  
Your

28 November 2022

Dear Sir/Madam

Re: COLNE SPRING HOUSE, COURSERS ROAD, COLNEY HEATH, ST. ALBANS,  
HERTFORDSHIRE , AL4 0PB

#### Waste Comments

Thames Water recognises this catchment is subject to high infiltration flows during certain groundwater conditions. The scale of the proposed development doesn't materially affect the sewer network and as such we have no objection, however care needs to be taken when designing new networks to ensure they don't surcharge and cause flooding. In the longer term Thames Water, along with other partners, are working on a strategy to reduce groundwater entering the sewer networks.

Thames Water recognises this catchment is subject to high infiltration flows during certain groundwater conditions. The developer should liaise with the LLFA to agree an appropriate sustainable surface water strategy following the sequential approach before considering connection to the public sewer network. The scale of the proposed development doesn't materially affect the sewer network and as such we have no objection, however care needs to be taken when designing new networks to ensure they don't surcharge and cause flooding. In the longer term Thames Water, along with other partners, are working on a strategy to reduce groundwater entering the sewer network.

The application indicates that SURFACE WATER will NOT be discharged to the public network and as such Thames Water has no objection, however approval should be sought from the Lead Local Flood Authority. Should the applicant subsequently seek a connection to discharge surface water into the public network in the future then we would consider this to be a

material change to the proposal, which would require an amendment to the application at which point we would need to review our position.

Thames Water would advise that with regard to FOUL WATER sewerage network infrastructure capacity, we would not have any objection to the above planning application, based on the information provided.

#### Water Comments

With regard to water supply, this comes within the area covered by the Affinity Water Company. For your information the address to write to is - Affinity Water Company The Hub, Tamblin Way, Hatfield, Herts, AL10 9EZ - Tel - 0845 782 3333.

Yours faithfully  
Development Planning Department

Development Planning,  
Thames Water,  
Maple Lodge STW,  
Denham Way,  
Rickmansworth,  
WD3 9SQ  
Tel:020 3577 9998  
Email: devcon.team@thameswater.co.uk

This is an automated email, please do not reply to the sender. If you wish to reply to this email, send to devcon.team@thameswater.co.uk Visit us online <https://eu-west-1.protection.sophos.com?d=thameswater.co.uk&u=d3d3LnRoYW1lc3dhhdGVyLmNvLnVr&i=NWQ1ZmMwOTQxNGFiNmYxMGEyYjA0MGY3&t=anppVWZyMHRBV1craURjam5sZ0NVUElzUENSWnQ3OTYzdl1lTFdacz0xaz0=&h=b42cf059bf334cf1907fcb18b49b885b&s=AVNPUEhUT0NFTkNSWVBUSVbsUj4wVKMGKjGJXJiJpzD8DiP9r-uzjLvCljm6t0B1Q> , follow us on twitter <https://eu-west-1.protection.sophos.com?d=twitter.com&u=d3d3LnR3aXR0ZXIuY29tL3RoYW1lc3dhhdGVy&i=NWQ1ZmMwOTQxNGFiNmYxMGEyYjA0MGY3&t=ZDJNeGhMaEJaNkJaLzVid1RnZjVRWXZ3QTZ2dGttRmlNTnp2dGZra2RHST0=&h=b42cf059bf334cf1907fcb18b49b885b&s=AVNPUEhUT0NFTkNSWVBUSVbsUj4wVKMGKjGJXJiJpzD8DiP9r-uzjLvCljm6t0B1Q> or find us on <https://eu-west-1.protection.sophos.com?d=facebook.com&u=d3d3LmZhY2Vib29rLmNvbs90aGFtZXN3YXRlclg=&i=NWQ1ZmMwOTQxNGFiNmYxMGEyYjA0MGY3&t=UTVjQ2hpWTdKdnRlbnVhSS9rSFhKeUJ1UmRhSU1MSGFZdnZjY3BValpYWT0=&h=b42cf059bf334cf1907fcb18b49b885b&s=AVNPUEhUT0NFTkNSWVBUSVbsUj4wVKMGKjGJXJiJpzD8DiP9r-uzjLvCljm6t0B1Q>. We're happy to help you 24/7.

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Planning & Building Control  
St Albans City & District Council  
St Peter's Street  
St Albans  
AL1 3JE

Reference Number: 5/2022/1988

21 September 2022

Dear Madam/Sir

DESCRIPTION: Outline application (access sought) - Demolition of existing house and stables and the construction of up to 150 dwellings including affordable and custom-build dwellings together with all ancillary works

LOCATION: Land To The Rear Of 42-100 Tollgate Road & 42 Tollgate Road Colney Heath St Albans Hertfordshire

Thank you for notification of the above planning application. Planning applications are referred to us where our input on issues relating to water quality or quantity may be required.

You should be aware that the proposed development site is located within an Environment Agency defined groundwater Source Protection Zone (SPZ) corresponding to our Pumping Station (ROES). This is a public water supply, comprising a number of Chalk abstraction boreholes, operated by Affinity Water Ltd.

Provided that the below conditions are implemented and it has been demonstrated that public water supply will not be impacted, we would have no objections to the development.

#### 1. Contamination through Ground Works

Any works involving excavations that penetrate into the chalk aquifer below the groundwater table (for example, piling or the installation of a geothermal open/closed loop system) should be avoided. If these are necessary, then the following condition needs to be implemented:

#### Condition

- A)** Prior to the commencement of the development, no works involving excavations (e.g. piling or the implementation of a geothermal open/closed loop system) shall be carried until the following has been submitted to and

approved in writing by the Local Planning Authority in consultation with Affinity Water:

- i)** An Intrusive Ground Investigation to identify the current state of the site and appropriate techniques to avoid displacing any shallow contamination to a greater depth.
- ii)** A Risk Assessment identifying both the aquifer and the abstraction point(s) as potential receptor(s) of contamination.
- iii)** A Method Statement detailing the depth and type of excavations (e.g. piling) to be undertaken including mitigation measures (e.g. appropriate piling design, off site monitoring boreholes etc.) to prevent and/or minimise any potential migration of pollutants to public water supply. Any excavations must be undertaken in accordance with the terms of the approved method statement.

Reason: To avoid displacing any shallow contamination to a greater depth and to prevent and/or minimise any potential migration of pollutants to a public water supply abstraction.

## 2. Contamination during construction

Construction works may exacerbate any known or previously unidentified contamination. If any pollution is found at the site, then works should cease immediately and appropriate monitoring and remediation will need to be undertaken to avoid any impact on water quality in the chalk aquifer.

### Condition

- B)** If, during development, contamination not previously identified is found to be present at the site, then no further development shall be carried out until a Remediation Strategy detailing how this contamination will be dealt with has been submitted to and approved in writing by the Local Planning Authority in consultation with Affinity Water. The remediation strategy shall be implemented as approved with a robust pre and post monitoring plan to determine its effectiveness.

Reason: To ensure that the development does not contribute to unacceptable concentrations of pollution posing a risk to public water supply from previously unidentified contamination sources at the development site and to prevent deterioration of groundwater and/or surface water.

## 3. Contamination through Surface Water Drainage

Surface water drainage should use appropriate Sustainable Urban Drainage Systems that prevent the mobilisation of any contaminants where a direct pathway to the aquifer is present. This should use appropriate techniques that prevent direct pathways into the aquifer and ensure that sufficient capacity for all surface water to be dealt with on site is provided and prevents consequential flooding elsewhere.

### Condition

- C)** Prior to the commencement of development, details of a Surface Water Drainage Scheme should be provided that prevents contamination of any public water supply abstractions present. This shall be submitted to and approved in writing by the Local Planning Authority in consultation with Affinity Water.

Reason: Surface water drainage can mobilise contaminants into the aquifer through infiltration in areas impacted by ground contamination. Surface water also has the potential to become contaminated and can enter the aquifer through open pathways, either created for drainage or moved towards existing open pathways where existing drainage has reached capacity. All have the potential to impact public water supply.

Issues arising from any of the above can cause critical abstractions to switch off resulting in the immediate need for water to be sourced from another location, which incurs significant costs and risks of loss of supply during periods of high demand.

The construction works and operation of the proposed development site should be done in accordance with the relevant British Standards and Best Management Practices, thereby significantly reducing the groundwater pollution risk.

For further information we refer you to CIRIA Publication C532 "Control of water pollution from construction - guidance for consultants and contractors".

### Water efficiency

Being within a water stressed area, we expect that the development includes water efficient fixtures and fittings. Measures such as rainwater harvesting and grey water recycling help the environment by reducing pressure for abstractions in chalk stream catchments. They also minimise potable water use by reducing the amount of potable water used for washing, cleaning and watering gardens. This in turn reduces the carbon emissions associated with treating this water to a standard suitable for drinking, and will help in our efforts to get emissions down in the borough.

### Infrastructure connections and diversions

There are potentially water mains running through or near to part of proposed development site. If the development goes ahead as proposed, the developer will need to get in contact with our Developer Services Team to discuss asset protection or diversionary measures. This can be done through the My Developments Portal (<https://affinitywater.custhelp.com/>) or [aw\\_developerservices@custhelp.com](mailto:aw_developerservices@custhelp.com).

In this location Affinity Water will supply drinking water to the development. To apply for a new or upgraded connection, please contact our Developer Services Team by going through their My Developments Portal (<https://affinitywater.custhelp.com/>) or [aw\\_developerservices@custhelp.com](mailto:aw_developerservices@custhelp.com). The Team also handle C3 and C4 requests to cost potential water mains diversions. If a water mains plan is required, this can also be obtained by emailing [maps@affinitywater.co.uk](mailto:maps@affinitywater.co.uk). Please note that charges may apply.

Thank you for your consideration.



# AffinityWater

Taking care of your water

Yours sincerely

Laurence Chalk  
Catchment Officer  
Catchment Management  
[planning@affinitywater.co.uk](mailto:planning@affinitywater.co.uk)  
[laurence.chalk@affinitywater.co.uk](mailto:laurence.chalk@affinitywater.co.uk)

## The Planning Inspectorate

### COMMENTS ON CASE (Online Version)

Please note that comments about this case need to be made within the timetable. This can be found in the notification letter sent by the local planning authority or the start date letter. Comments submitted after the deadline may be considered invalid and returned to sender.

Appeal Reference: APP/B1930/W/23/3323099

#### DETAILS OF THE CASE

Appeal Reference	APP/B1930/W/23/3323099
Appeal By	VISTRY HOMES LIMITED
Site Address	Land to the Rear of 42-100 Tollgate Road & 42 Tollgate Road Colney Heath St Albans AL4 0PY

#### SENDER DETAILS

Name	MRS HANNAH WILSON
Address	Affinity Water, Tamblin Way, Hatfield AL10 9EZ
Company/Group/Organisation Name	Affinity Water

#### ABOUT YOUR COMMENTS

In what capacity do you wish to make representations on this case?

- Appellant
- Agent
- Interested Party / Person
- Land Owner
- Rule 6 (6)

What kind of representation are you making?

- Final Comments
- Proof of Evidence
- Statement
- Statement of Common Ground
- Interested Party/Person Correspondence

Other

#### YOUR COMMENTS ON THE CASE

You should be aware that the proposed development site is located within an Environment Agency defined groundwater Source Protection Zone (SPZ) corresponding to our Pumping Station (ROES). This is a public water supply, comprising a number of Chalk abstraction boreholes, operated by Affinity Water Ltd. Provided that the below conditions are implemented and it has been demonstrated that public water supply will not be impacted, we would have no objections to the development.

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Condition

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i) An Intrusive Ground Investigation to identify the current state of the site and appropriate techniques to avoid displacing any shallow contamination to a greater depth.

ii) A Risk Assessment identifying both the aquifer and the abstraction point(s) as potential receptor(s) of contamination.

iii) A Method Statement detailing the depth and type of excavations (e.g. piling) to be undertaken including mitigation measures (e.g. appropriate piling design, off site monitoring boreholes etc.) to prevent and/or minimise any potential migration of pollutants to public water supply. Any excavations must be undertaken in accordance with the terms of the approved method statement.

Reason: To avoid displacing any shallow contamination to a greater depth and to prevent and/or minimise any potential migration of pollutants to a public water supply abstraction.

##### 2. Contamination during construction

Construction works may exacerbate any known or previously unidentified contamination. If any pollution is found at the site, then works should cease immediately and appropriate monitoring and remediation will need to be undertaken to avoid any impact on water quality in the chalk aquifer.

Condition

B) If, during development, contamination not previously identified is found to be present at the site, then no further development shall be carried out until a Remediation Strategy detailing how this contamination will be dealt with has been submitted to and approved in writing by the Local Planning Authority in consultation with Affinity Water. The remediation strategy shall be implemented as approved with a robust pre and post monitoring plan to determine its effectiveness.

Reason: To ensure that the development does not contribute to unacceptable concentrations of pollution posing a risk to public water supply from previously unidentified contamination sources at the development site and to prevent deterioration of groundwater and/or surface water.

##### 3. Contamination through Surface Water Drainage

Surface water drainage should use appropriate Sustainable Urban Drainage Systems that prevent the mobilisation of any contaminants where a direct pathway to the aquifer is present. This should use appropriate techniques that prevent direct

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Condition

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Reason: Surface water drainage can mobilise contaminants into the aquifer through infiltration in areas impacted by ground contamination. Surface water also has the potential to become contaminated and can enter the aquifer through open pathways, either created for drainage or moved towards existing open pathways where existing drainage has reached capacity. All have the potential to impact public water supply.

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The construction works and operation of the proposed development site should be done in accordance with the relevant British Standards and Best Management Practices, thereby significantly reducing the groundwater pollution risk.

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Water efficiency

Being within a water stressed area, we expect that the development includes water efficient fixtures and fittings. Measures such as rainwater harvesting and grey water recycling help the environment by reducing pressure for abstractions in chalk stream catchments. They also minimise potable water use by reducing the amount of potable water used for washing, cleaning and watering gardens. This in turn reduces the carbon emissions associated with treating this water to a standard suitable for drinking, and will help in our efforts to get emissions down in the borough.

Infrastructure connections and diversions

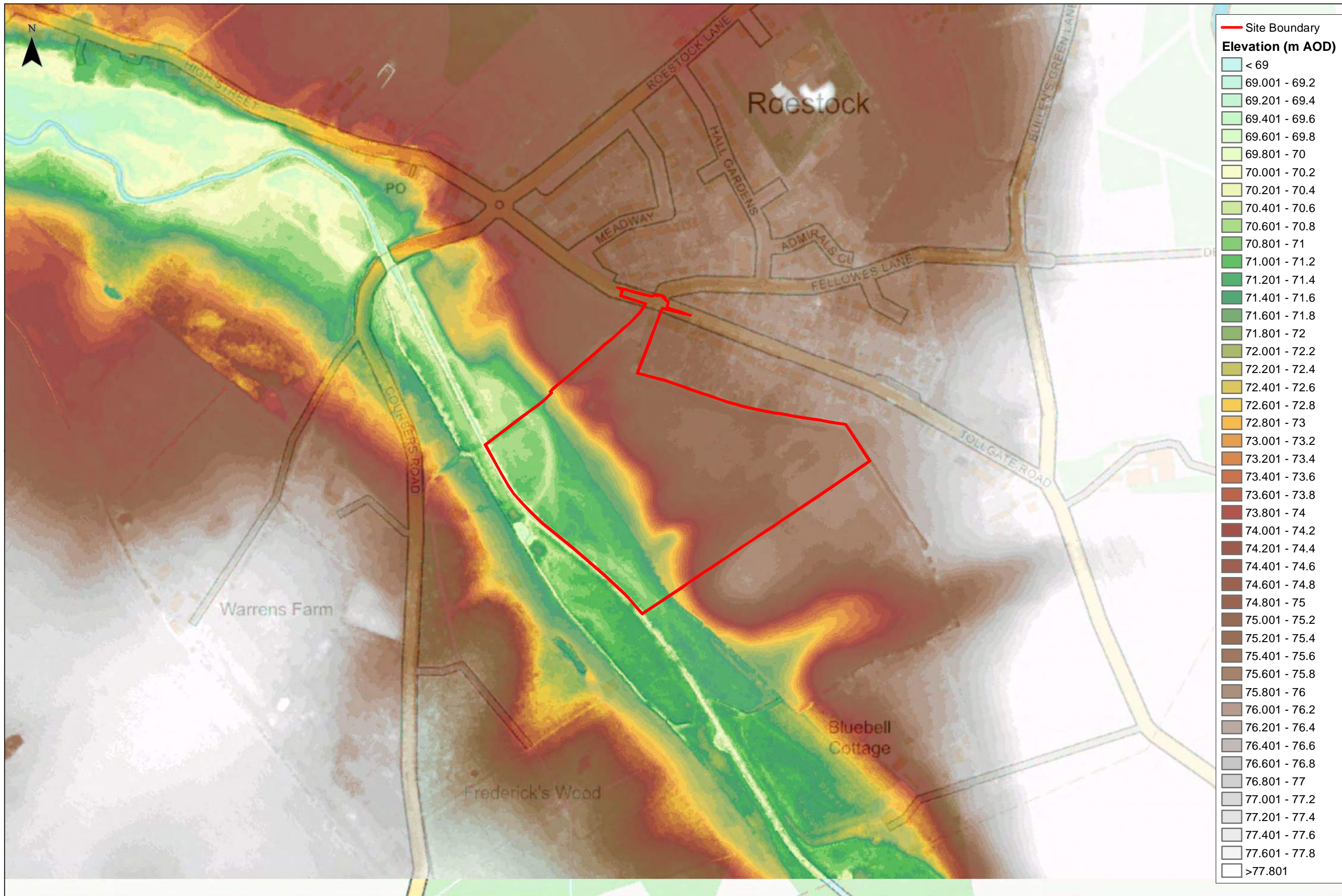
There are potentially water mains running through or near to part of proposed development site. If the development goes ahead as proposed, the developer will need to get in contact with our Developer Services Team to discuss asset protection or diversionary measures. This can be done through the My Developments Portal (<https://affinitywater.custhelp.com/>) or [aw\\_developerservices@custhelp.com](mailto:aw_developerservices@custhelp.com).

In this location Affinity Water will supply drinking water to the development. To apply for a new or upgraded connection, please contact our Developer Services Team by going through their My Developments Portal (<https://affinitywater.custhelp.com/>) or [aw\\_developerservices@custhelp.com](mailto:aw_developerservices@custhelp.com). The Team also handle C3 and C4 requests to cost potential water mains diversions. If a water mains plan is required, this can also be obtained by emailing [maps@affinitywater.co.uk](mailto:maps@affinitywater.co.uk). Please note that charges may apply.

Thank you for your consideration

## Appendix C Flood Maps

- Topography
- EA Flood Zone Map
- EA Surface Water Flood Risk
- EA Reservoir Flood Map
- EA Historic Flood Map
- SFRA Flood mapping



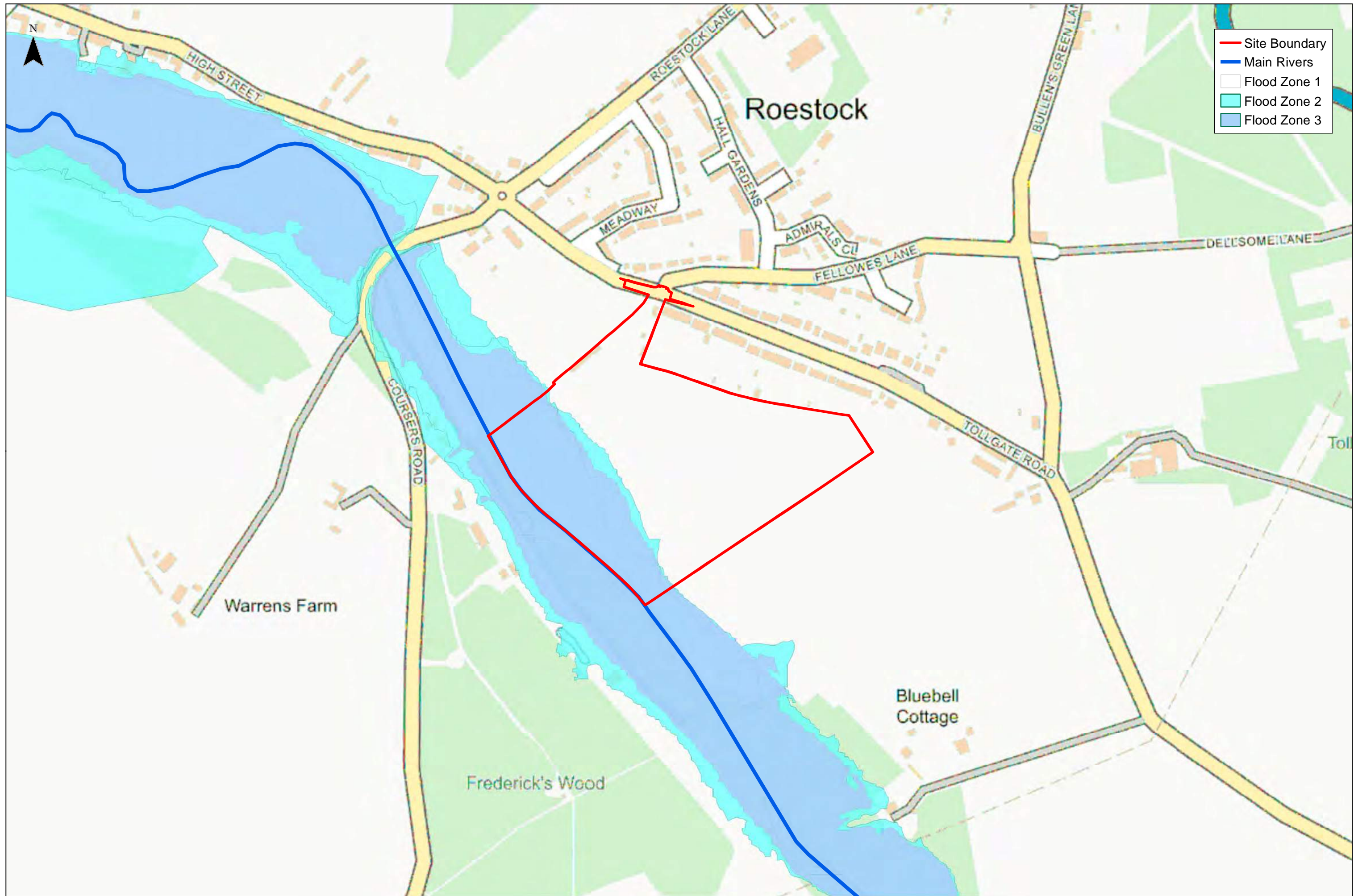
Client  
Vistry Group

**LAND AT TOLLGATE ROAD, COLNEY HEATH**  
Site Topography (1m LiDAR)



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1:4,000 @ A3	Date: 05/09/2023
Drawn: YR	Checked: AS
Figure 332510999/4002/002	Rev B



- Site Boundary
- Main Rivers
- Flood Zone 1
- Flood Zone 2
- Flood Zone 3



Client  
Vistry Group

**LAND AT TOLLGATE ROAD, COLNEY HEATH**  
Environment Agency Flood Zones for Planning

0 200 400  
m

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1:4,000 @ A3	Date: 23/06/2022
Drawn: MD	Checked: CB
Figure 332510999/4002/003	Rev A

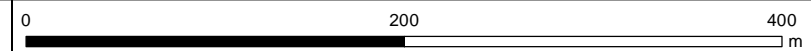


— Site Boundary  
— Main Rivers  
**Flood Risk**  
 High  
 Medium  
 Low  
 Very Low



Client  
Vistry Group

**LAND AT TOLLGATE ROAD, COLNEY HEATH**  
Flood Risk from Surface Water  
(Flood Extents)



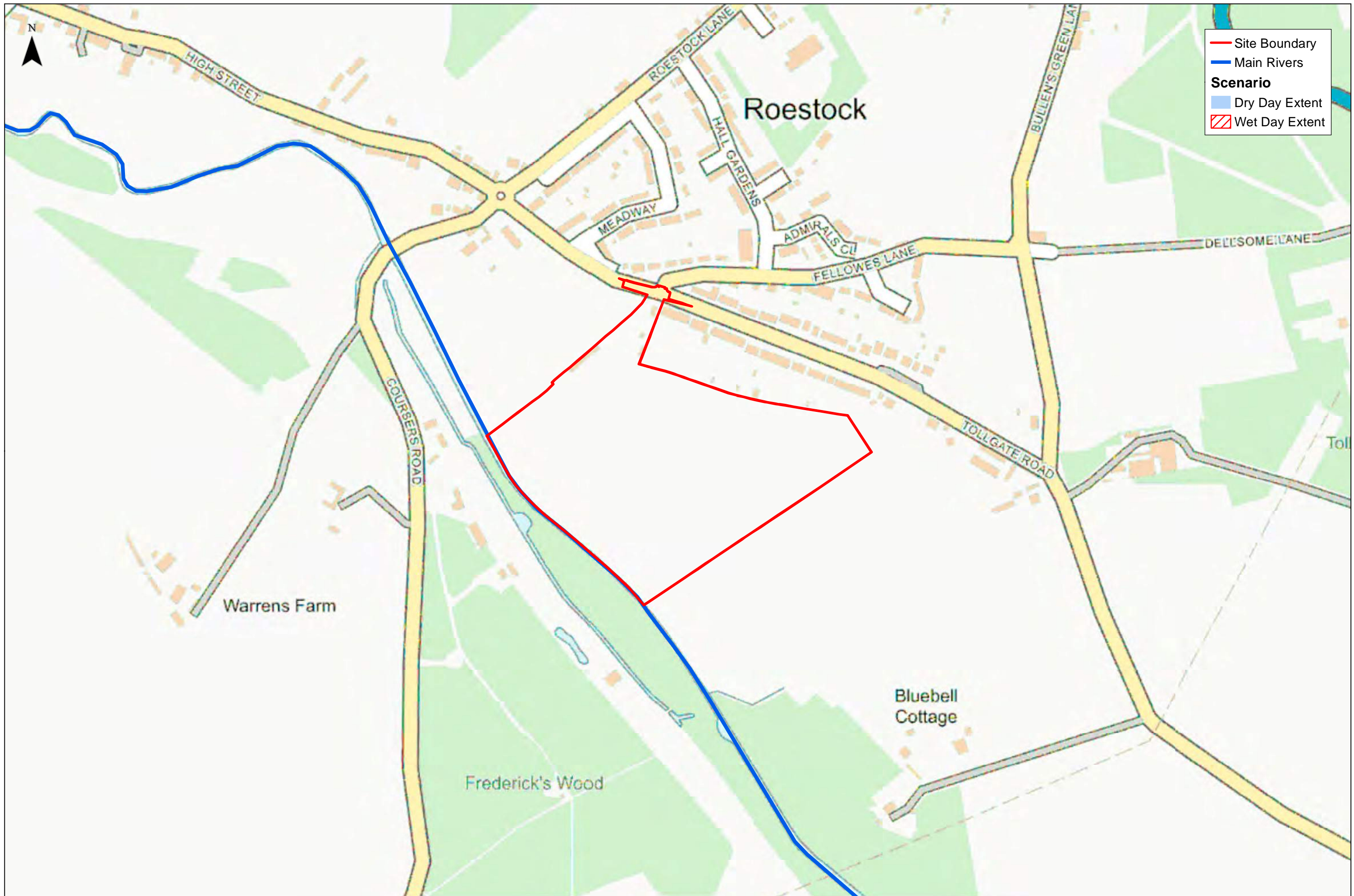
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1:4,000 @ A3 Date: 23/06/2022

Drawn: MD Checked: CB

Figure 332510999/4002/004 Rev A





— Site Boundary  
— Main Rivers  
**Scenario**  
 Dry Day Extent  
 Wet Day Extent



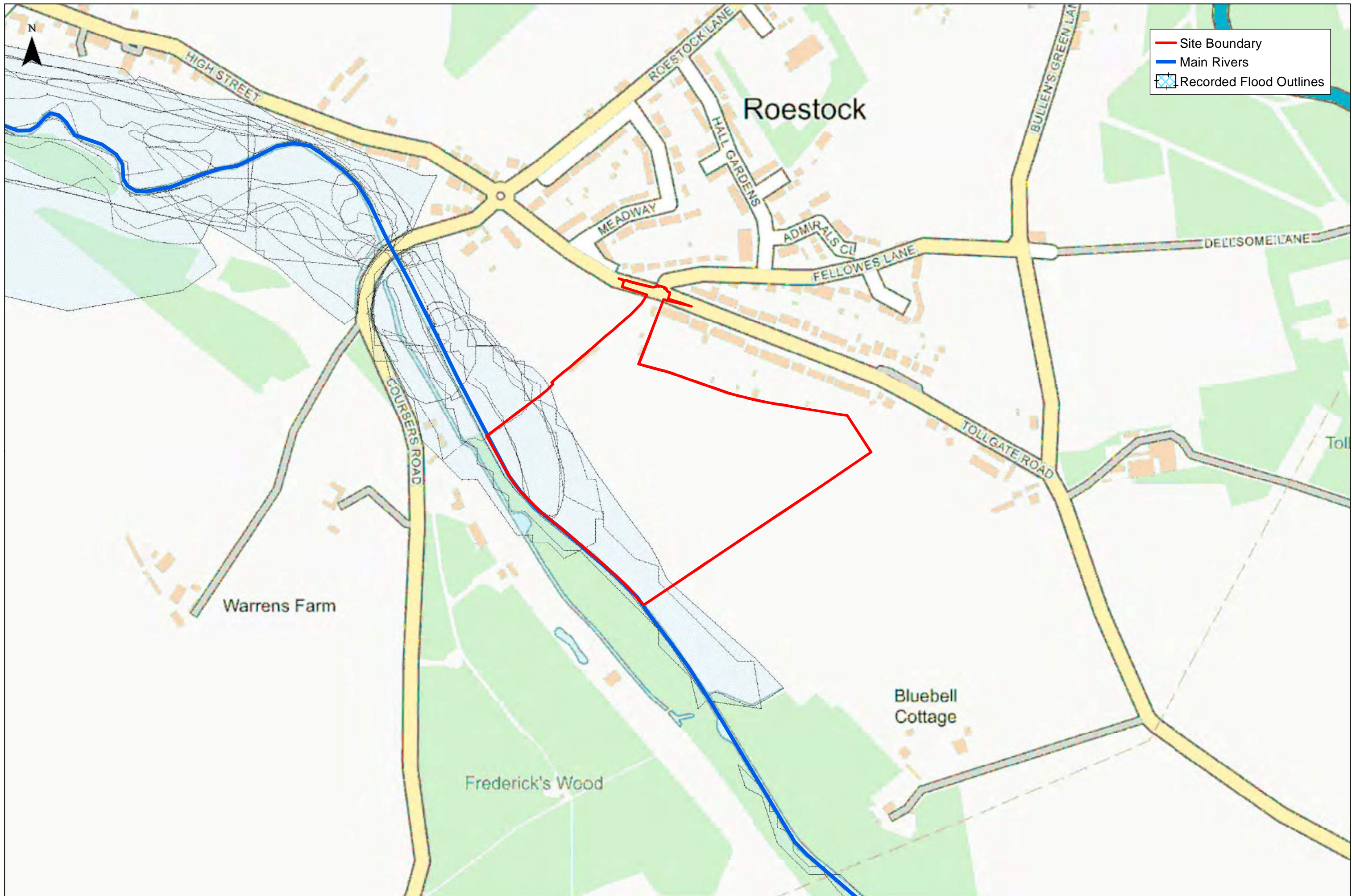
Client  
Vistry Group

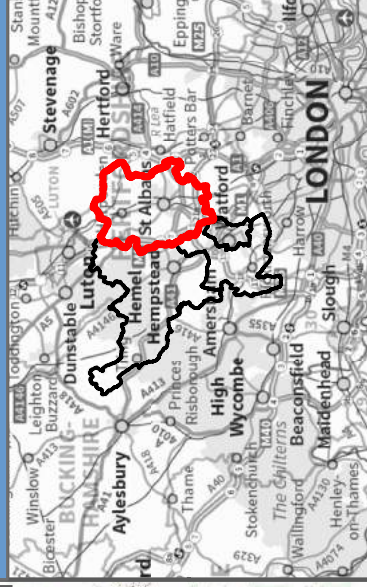
**LAND AT TOLLGATE ROAD, COLNEY HEATH**  
Flood Risk from Reservoirs

0 200 400 m

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1:4,000 @ A3	Date: 23/06/2022
Drawn: MD	Checked: CB
Figure 332510999/4002/011	Rev A





**LEGEND: Flood Risk Mapping**

Flood Zone 2	Flood Zone 3 + 35%CC
Flood Zone 3	Flood Zone 3 + 70%CC
Flood Zone 3b	RoFSW + CC (1 in 100-year + 40% CC)

**Climate Change**

**Defences**

At least 5m	Embankment
0.5m to 5m	Culvert
0.025m to 0.5m	Wall
At or near surface (<0.025m)	Areas Benefiting from Flood Defences

**JBA Groundwater Flood Risk Map**

At least 5m	Flood Warning Areas
0.5m to 5m	Flood Warning Areas
0.025m to 0.5m	Flood Warning Areas
At or near surface (<0.025m)	Flood Warning Areas

**Risk of Flooding from Surface Water (RoFSW)**

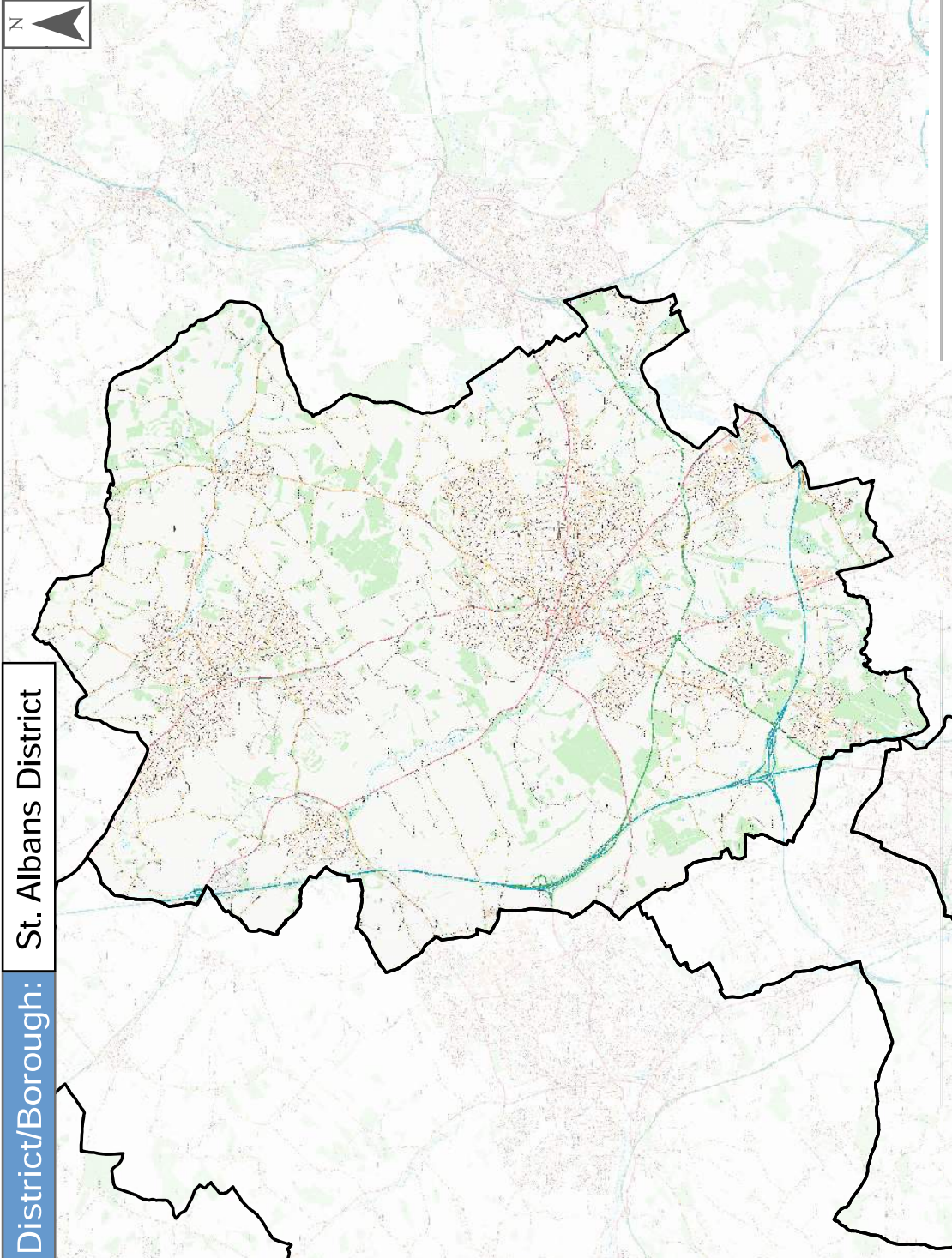
High (1 in 30-year)	Reservoir Flooding
Medium (1 in 100-year)	Reservoir Flooding
Low (1 in 1,000-year)	Reservoir Flooding

**Reservoir Inundation Map**

Reservoir Flooding	Reservoir Flooding
--------------------	--------------------

**Natural Flood Management Opportunities**

Runoff Attenuation Features - 1 in 30-year (3.3%AEP)	Tree Planting (Floodplain)
Runoff Attenuation Features - 1 in 100-year (1%AEP)	Floodplain Reconnection
Tree Planting (Riparian)	Tree Planting (Wider Catchment)



**LEGEND: Catchment Characteristics**

Lee (from Luton Hoo Lakes to Hertford)	Lee (from Luton Hoo Lakes to Hertford)
Mimram (Codicote Bottom to Lee)	Mimram (Codicote Bottom to Lee)
Pinn	Pinn
Thames upstream of Aylesbury	Thames upstream of Aylesbury
Tykeswater	Tykeswater
Upper Colne and Ellen Brook	Upper Colne and Ellen Brook
Ver	Ver
Whistle Brook	Whistle Brook

**WFD Catchments**

Bulbourne	Bulbourne
Chess	Chess
Colne (Confluence with Chess to River Thames)	Colne (Confluence with Chess to River Thames)
Colne (from Confluence with Ver to Gade)	Colne (from Confluence with Ver to Gade)
Colne (upper east arm including Minshall Brook)	Colne (upper east arm including Minshall Brook)
Gade (Upper stretch Great Gaddesden to confluence with Bulbourne / GUC)	Gade (Upper stretch Great Gaddesden to confluence with Bulbourne / GUC)
Gade (from confluence with Bulbourne to Chess)	Gade (from confluence with Bulbourne to Chess)

**Study Boundary**

South West Hertfordshire	South West Hertfordshire
--------------------------	--------------------------

**Watercourses**

Main River	Main River
Ordinary Watercourses	Ordinary Watercourses
Grand Union Canal	Grand Union Canal

**Version no.** v2.0    **Date** Sept 2018    **Comment** Final

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## Appendix D Technical Note

- TN001 – Response to resident objection, dated 24 January 2023
- TN002 – Response to 3<sup>rd</sup> Party Representations, dated 22 August 2023

# TECHNICAL NOTE

**Job Name:** Tollgate Road, Colney Heath  
**Job No:** 332510999  
**Note No:** TN001  
**Date:** 24 January 2023  
**Prepared By:** Åsa Söderberg  
**Subject:** **Response to Resident Objection, dated 16 and 17 January 2023 (planning application reference 5/2022/1988)**

## 1. Introduction

On behalf of Vistry Group, Stantec UK Limited has prepared this rebuttal in response to an objection received from a local resident in relation to flood risk. The following correspondence refers to this matter:

- Email from Mr Rob Ellis of 84 Tollgate Road, dated 16 January 2023 @ 08:53 to Vistry
- Email from Mr Rob Ellis of 84 Tollgate Road, dated 17 January 2023 @ 11:38 to Vistry
- Email from Mr Rob Ellis of 84 Tollgate Road, dated 17 January 2023 @ 11:41 to Ms Cooper (MP)

The objections raised suggest the Flood Risk Assessment (FRA) fails to consider all sources of flood risk as well as failing to consider an underground stream that crosses the site.

## 2. Response to objection

In section 5 of the FRA, flood risk from all sources of flooding have been considered such as flood risk from main rivers (fluvial), surface water (pluvial), groundwater, reservoirs and sewers as well as considering historic flood risk. The flood risk referred to within the email correspondence listed in paragraph 1 above, is addressed in section 5.3.4 and 5.3.5 in the FRA confirming there is a surface water flow path identified on the surface water flood map, see figure 1 below. The conclusion within the FRA is that the surface water flood risk is due to ponding of surface water runoff due to localised low spots.

Figure 1 – Surface water flood risk



### DOCUMENT ISSUE RECORD

Technical Note No	Rev	Date	Prepared	Checked	Reviewed (Discipline Lead)	Approved (Project Director)
332510999/TN001	-	24.01.23	ACS	OB	ACS	RH

This report has been prepared by Stantec UK Limited ('Stantec') on behalf of its client to whom this report is addressed ('Client') in connection with the project described in this report and takes into account the Client's particular instructions and requirements. This report was prepared in accordance with the professional services appointment under which Stantec was appointed by its Client. This report is not intended for and should not be relied on by any third party (i.e. parties other than the Client). Stantec accepts no duty or responsibility (including in negligence) to any party other than the Client and disclaims all liability of any nature whatsoever to any such party in respect of this report.

## TECHNICAL NOTE

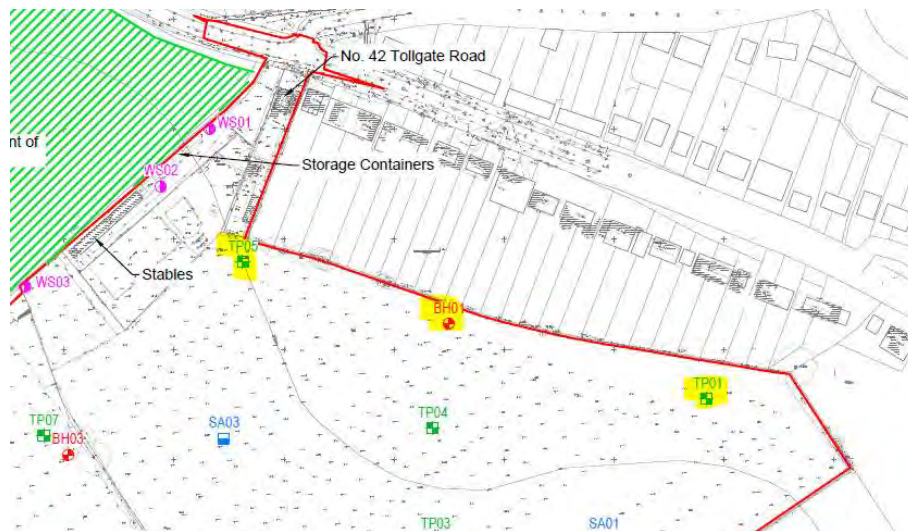
The underground/subterranean stream referred to in the email correspondence is in all likelihood referencing a sub surface chalk stream within the main aquifer. The ephemeral nature of chalk streams in Herts and surrounds is related to ground water levels in the Chalk Aquifer beneath, rising to the point where they appear above ground when incident rainfall is sufficient to recharge the aquifers to that level.

Based on the photos provided, it is suspected that there is local ponding of water in a depression in the surface of the site in clay rich Kesgrave Group geology or potentially within granular Kesgrave Group deposits where the groundwater is unable to drain due to surrounding cohesive/ relatively impermeable geology. The natural drainage of the area may well concentrate within these local depressions which may even form a longitudinal feature, depending on the topography locally this may even induce a flow in particularly heavy rainfall events.

The geology present at the site is not typical of where underground/ subterranean river – or ‘winterbourne rivers’ as they are sometimes referred – would form. The geological sequence along that northern boundary (BH01, TP01 and TP05, see location plan in Figure 2 below) indicates the presence of the following sequence:

- BH01 Kesgrave Sub Group – gravel dominated (1.3m thick) over clay dominated Kesgrave (3.1m thick) over Diamicton Till
- TP01 Kesgrave Clay (0.55m thick) kesgrave sand (1.65m) over Kesgrave Clay (unproven depth)
- TP05 Kesgrave Sand (1.45m) over Kesgrave sandy clay (unproven depth)

Figure 2 – Borehole and trial pit locations



The location of the borehole and trial pits coincide with the area shown in Figure 1 shown to be at risk of surface water flooding.

In even lightly wet weather, surface water could easily pool in a shallow topographical depression such as this and realistically has nowhere to go until it can roll downhill or permeate into the sub ground.

On inspection of the historical mapping resources there is nothing to describe an issue, spring or winterbourne river in this area.

## TECHNICAL NOTE

The subterranean stream locations identified in the local vicinity do indeed appear to be related to chalk outcrops which is to be expected, however these conditions do not exist within this site.

What appears to have been photographed is a low spot/minor depression in the local topography in a clay rich soil which drains very slowly. Most likely an artefact from the grading works involved on the housing plot builds when they were constructed in the 1930's.

### 3. Conclusion

Based on the above the FRA supporting this planning application is shown to be assessing flood risk from all sources of flooding and has been prepared in accordance with the fundamental objectives of the National Planning Policy Framework (NPPF) and local planning policy. Which demonstrates that:

- The development is safe
- The development does not increase flood risk; and
- The development does not detrimentally affect third parties.

## TECHNICAL NOTE

### Appendix A

- Email from Mr Rob Ellis of 84 Tollgate Road, dated 16 January 2023 @ 08:53 to Vistry
- Email from Mr Rob Ellis of 84 Tollgate Road, dated 17 January 2023 @ 11:38 to Vistry
- Email from Mr Rob Ellis of 84 Tollgate Road, dated 17 January 2023 @ 11:41 to Ms Cooper (MP)



**From:** Rob & Penny <robpenny@talktalk.net>  
**Sent:** 16 January 2023 08:53  
**To:** Strategic Land  
**Cc:** Lynn Skelt; George.Burges@stalbans.gov.uk  
**Subject:** Planning Ref 5/2022/1988 - land to rear & South of Tollgate Road AL4 0PY

**NOTE:** Email originated outside of Vistry Group.

**F. A. O. Mr. Greg Fitzgerald**

Dear Mr. Fitzgerald,

I have recently made comment to St.Albans District Council planning office regarding an underground stream that traverses the area of land that is the subject of this application by Vistry to build 150 houses. The stream runs from East to west adjacent to the Northern site boundary. A visible depression in the ground along the Northern boundary is indicative of the stream below.

Your unrepresentative flood risk assessment was undertaken in the summer and concentrated of the River Colne but ignored the very real and regular risk of flooding from this stream that at the time of the FRA survey was not visible on the surface. The attached photographs were taken recently after light rainfall and illustrates two areas of flooding. During heavy and prolonged rainfall the Northern boundary floods extensively to a depth of about 300mm.

My telephone number is 01727 822888 should you wish to discuss this in more detail and allow me to provide further information.

Sincerely

Rob Ellis - 84 Tollgate Road



**From:** Rob & Penny <robpenny@talktalk.net>  
**Sent:** 17 January 2023 11:38  
**To:** Strategic Land  
**Cc:** George.Burges@stalbans.gov.uk; Lynn Skelt  
**Subject:** 5/2022/1988 Land behind and South of Tollgate Road

**NOTE:** Email originated outside of Vistry Group.

**F. A. O Mr. Gerald Fitzgerald**

Dear Mr. Fitzgerald.

Following on from my earlier email, the question around the historic underground stream that runs along the Northern boundary of your proposed development site has gained momentum and I would like to update you as to recent considerations.

I am copying in Mr. George Burgess At SADC with this email in the hope that he will now consider the flood risk assessment included in your planning application as being inadequate or incomplete as it failed to consider the regular and extensive flooding of the Northern part of the site due to the historic underground stream regularly flooding above ground. I trust that Mr. Burgess will involve The Environment Agency and any other responsible or interested parties.

Dr. Haydon Bailey, Chairman of The Geological Society of Hertfordshire advises that a subterranean streamflow survey would be necessary to confirm that the underground stream is an ancient watercourse but that given the geology and routing of the River Colne this is entirely feasible. By including the planning officer in this email I suggest that Mr. Burgess requests that Vistry arrange to undertake the survey that has recommended before any further thought is given to this planning application.

Regards

Rob Ellis

**From:** Rob & Penny <robnpenny@talktalk.net>  
**Sent:** 17 January 2023 11:41  
**To:** daisy.cooper.mp@parliament.uk  
**Cc:** George.Burges@stalbans.gov.uk; Strategic Land; Lynn Skelt  
**Subject:** The field behind and to The South of Tollgate Road, Colney Heath AL4 0PY

NOTE: Email originated outside of Vistry Group.

Dear Ms Cooper

The field noted above is one of five currently proposed as being a suitable site for the mass of unsustainable over development of the village of Colney Heath. Whilst I understand that you cannot become involved in planning matters there is a related issue that falls very much in your remit.

There is an historic underground stream that traverses East to West across this proposed development, this stream runs along the Northern boundary, the gardens to the houses on the South side of Tollgate Rao vary in length to run along side this stream. The stream is indicated by a depression in the ground and in periods of even moderate rainfall the area floods sometimes up to 300mm in depth.

Dr. Haydon Bailey, Chairman of The Geological Society of Hertfordshire advises that a subterranean streamflow survey would be necessary to confirm that the underground stream is an ancient watercourse but that given the geology and routing of the River Colne it is entirely feasible. I have suggested to both the developer and The Planning Officer that such a survey is undertaken before any further thought is given to this application.

There are two issues to be aware of, firstly that the Flood risk assessment included in the planning application only considered the River Colne to the Southend end of the field and not this area that regularly floods and secondly and rerouting of or any interference through construction must be conditioned against should the council, despite nearly 400 valid objections, be minded to take the indefensible decision to approve the application.

I look forward to your confirmation that you are able to ensure the necessary protection of this ancient watercourse.

Yours sincerely

Rob Ellis  
84 Tollgate Road

**Job Name:** Land to Rear of Tollgate Road, Colney Heath  
**Job No:** 332510999  
**Note No:** TN002  
**Date:** 22/08/2023  
**Prepared By:** Oliver Belson  
**Subject:** Response to 3<sup>rd</sup> Party Representations  
**Appended:** Cross Sections and Alignment Plans

---

## 1. Background

- 1.1. Stantec UK Ltd (Stantec) has been engaged in providing technical assessments to support the planning application reference 5/2022/1988. We have previously provided a response to 3<sup>rd</sup> Party objections dated 24/1/2023. The application is currently being appealed and further 3<sup>rd</sup> Party representations have been received.
- 1.2. Those pertinent to the contents of this technical note refer to “*The oral history given by local residents refers to an underground stream, probably a tributary of the River Colne, that runs parallel with the rear boundary of 42-100 Tollgate Road. It is further believed that this boundary was set to avoid interfering with the stream. The observed pattern of groundwater flooding and the EA low risk groundwater flood risk map tend to support this.*” (Ian Skelt, 44 Tollgate Road, dated 6<sup>th</sup> July 2023).
- 1.3. Representations from Mr Robert Ellis of 84 Tollgate Road give a chronology of the ‘discovery’ of the purported presence of a subterranean chalk stream at the site.
  - Advice received from the Geological Society of Hertfordshire that the watercourse identified by Mr Ellis “*was in all likelihood a chalk tributary of the River Colne*”
  - “*Dr. Bailey added on 06/02/23 that the watercourse would be concentrated to a particular course but as the flow is through gravels the watercourse is likely to be widespread. The spread and extent of the tributary can be witnessed on the ground in times of rainfall upstream.*”
- 1.4. Mr Ellis’ states that “*Stantec confirm that an underground stream flows through the North of the site in their technical note dated 24<sup>th</sup> January 2023, they state: “The underground/subterranean stream referred to in the email correspondence is in all likelihood referencing a sub-surface chalk stream within the main aquifer”.*”
- 1.5. In response to these statements, Stantec refute that the Technical Note confirmed that a subterranean stream or watercourse is present beneath the northern part of the site and can confirm that the feature referred to by 3<sup>rd</sup> party representations is a surface depression which collects rainwater and runoff, and is not a subterranean stream. Further details in relation to this are set out in Section 2 of this Technical Note.

## 2. Technical Summary

- 2.1. The River Colne, located to the south western boundary of the proposed site, flows at the groundwater level within the chalk aquifer along the Colne Valley floor where the river channel, containing alluvium, has cut through the glacial deposits (including Lowestoft Formation glacial clay and gravel deposits and Kesgrave glacial clay and gravel deposits) which overlie the chalk bedrock. As it is linked to and fed by chalk aquifer groundwater it is referred to as a chalk stream or river.

- 2.2. Away from the River Colne channel the chalk aquifer is overlain by glacial deposits as described above.
- 2.3. The feature shown on the Flood Risk Mapping inside the northern boundary of the proposed site, and as referenced by the 3<sup>rd</sup> party representations, is at an approximate ground level of 75.30m AOD in the east and 75.11m AOD in the western extent indicating that the ground surface falls gently to the northwest along the northern boundary.
- 2.4. It is of note that the ground level to the immediate south of the identified feature is some 100-200mm higher, creating a localised shallow dip in the surface. The site is otherwise ostensibly plateaued across the majority of the site, falling in the southwestern third toward the River Colne, which the topographical survey records the northern bank at approximately 70m AOD. The topography of the site is reflected in the Flood Risk zoning mapping.
- 2.5. As stated in our previous response there are no historical references to a stream or springs within the site or in proximity of the site on the historical Ordnance Survey mapping, nor were there any observed during the various site visits undertaken between March 2022 and July 2022.
- 2.6. The feature adjacent to the northern boundary referred to by 3<sup>rd</sup> parties appears to be an intermittent drainage feature in a shallow dip on the surface. The rate of drainage in this part of the site is determined by the local topography and the underlying ground conditions. These have been proven through intrusive ground investigations carried out in May 2022 to comprise glacial deposits of the Kesgrave Catchment Subgroup with granular (sand and gravel deposits) immediately underlying the surface with a relatively impermeable clay rich layer of the Kesgrave Catchment Subgroup beneath.
- 2.7. The rate of infiltration will be determined by the speed with which the rainwater can either infiltrate down through the ground immediately underlying this topographic dip or laterally through the granular Kesgrave deposit. Surface ponding will only occur when the accumulation of incident rainfall exceeds the under-drainage permeability of the glacial deposits.
- 2.8. It is certainly the case that subsurface groundwater will be present within the Kesgrave sand and gravel deposits, as observed during the ground investigation, restricted from draining downwards by the underlying clay dominated glacial deposits. Whilst the subsurface geological profile means groundwater could be present, it would not flow as a defined subterranean stream.

## DOCUMENT ISSUE RECORD

Technical Note No	Rev	Date	Prepared	Checked	Approved
332510999/TN002	00	22/08/23	O Belson	O Belson	A Hensler

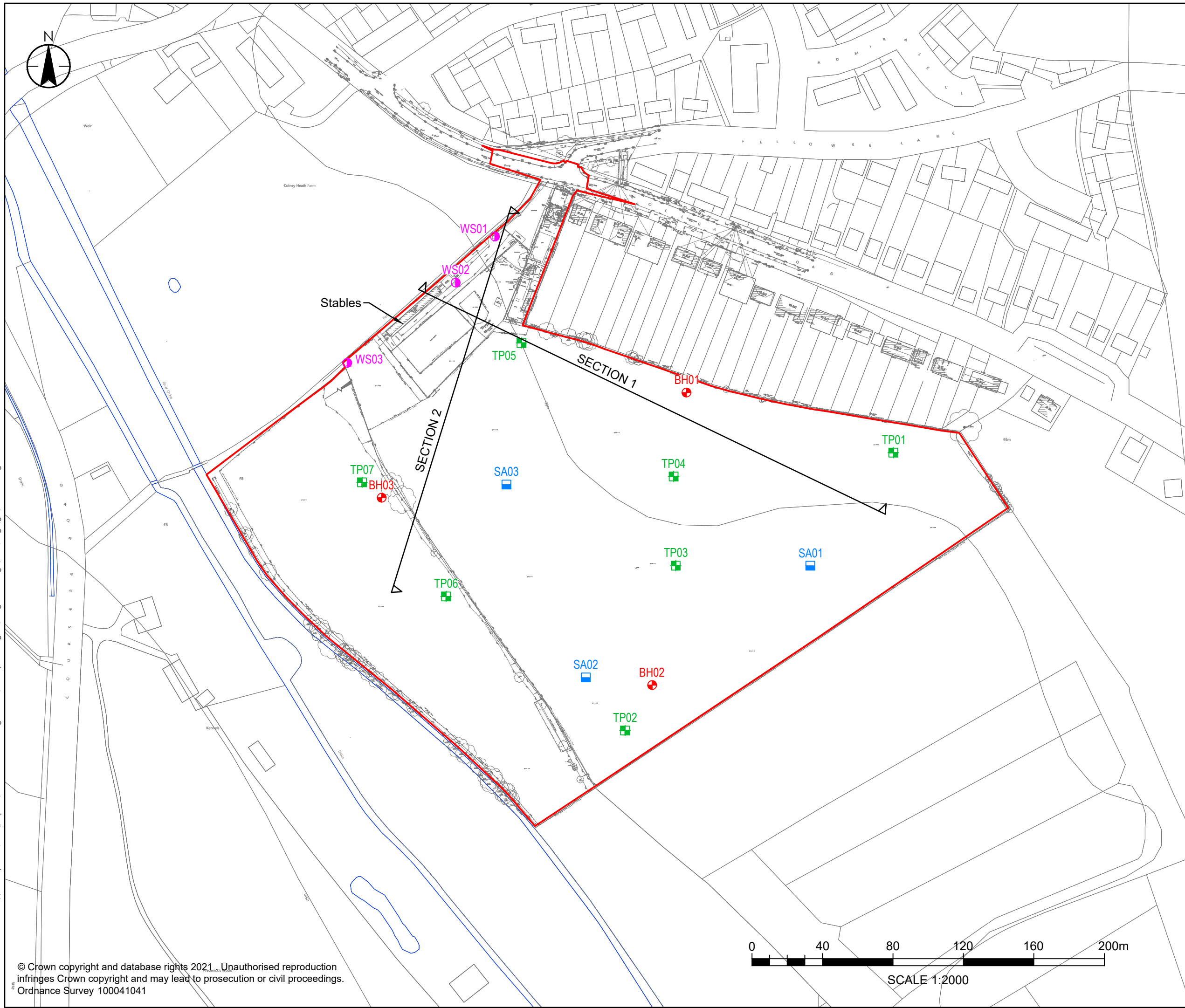
This report has been prepared by Stantec UK Limited ('Stantec') on behalf of its client to whom this report is addressed ('Client') in connection with the project described in this report and takes into account the Client's particular instructions and requirements. This report was prepared in accordance with the professional services appointment under which Stantec was appointed by its Client. This report is not intended for and should not be relied on by any third party (i.e. parties other than the Client). Stantec accepts no duty or responsibility (including in negligence) to any party other than the Client and disclaims all liability of any nature whatsoever to any such party in respect of this report.

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Office Address: 50/60 Station Road, Cambridge CB1 2JH T: +44 (0) 01223 882000 E: [cambridge.uk@stantec.com](mailto:cambridge.uk@stantec.com)



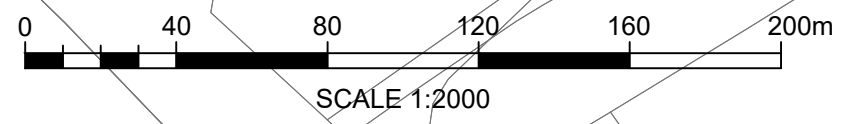
**Key**

- Approximate Site Boundary
- + Borehole
- + Trial Pit
- + Window Sample
- + Soakaway
- / Cross Sections  
(Refer to Figure 3)



Plotted: 12.12.2022 11:35:51 AM By: Colton, David  
ORIGINAL SHEET - ISCA3  
\\cam-vfips-001\cam\projects\332510999\land at tollgate road, colney heath\geo\03 figures & dwgs\cadd\dwgs\gri\332510999 figure 2

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Ordnance Survey 100041041



Client/Project:  
**Vistry Group**

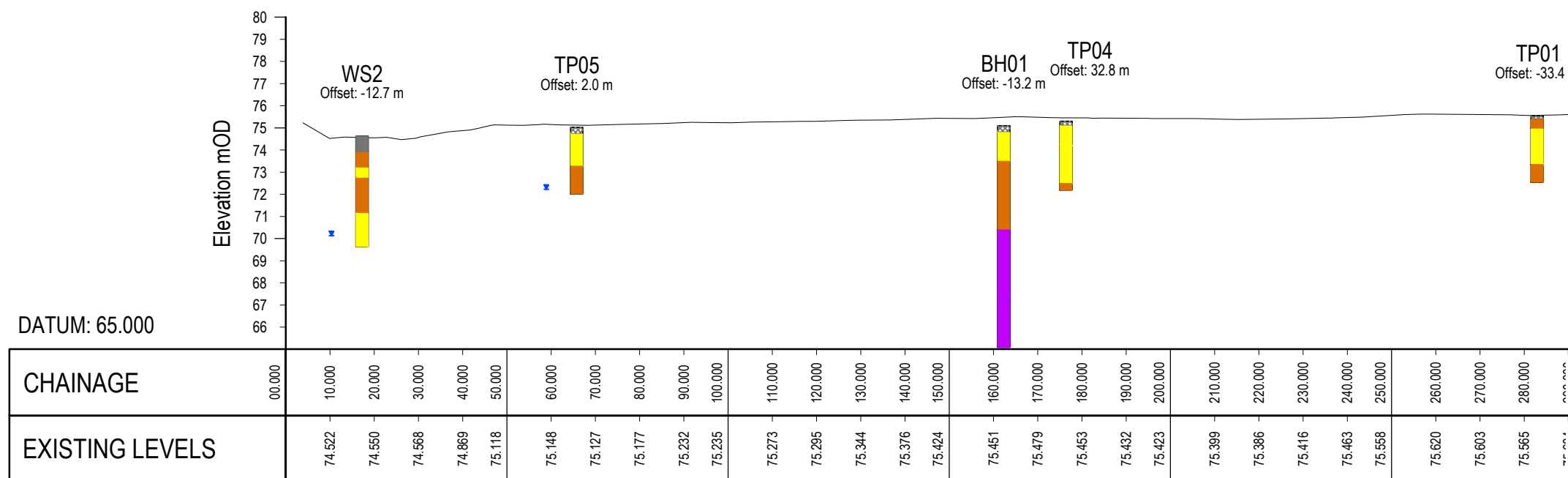
**Land at Tollgate Road,  
Colney Heath**

Prepared: davco	Checked: NC	Date: 2022.12.02
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Title  
**Site Layout Plan**

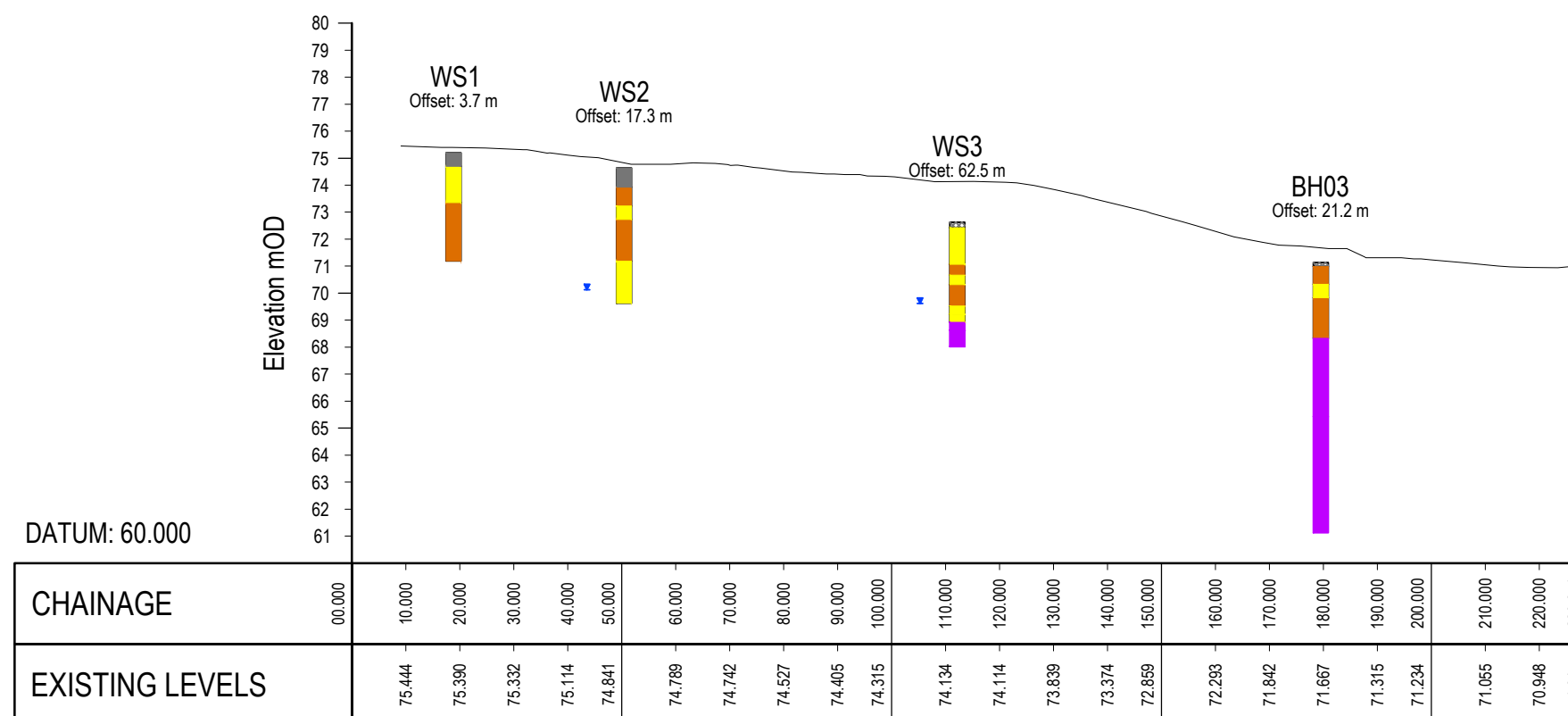
Revision: 0	Figure 2
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SECTION 1  
 SCALE: H 1:1250, V 1:250.



- Legend
- Made Ground
  - Topsoil
  - Kesgrave - Cohesive
  - Kesgrave - Granular
  - Lowestoft

SECTION 2  
 SCALE: H 1:1250, V 1:250.



Refer to Figure 2 for Cross Section Alignments

Client/Project:  
 Vistry Group  
 Land at Tollgate Road,  
 Colney Heath

Prepared: KC  
 Checked: OB  
 Date: 2023.08.22

Title  
 Geological Cross Sections

Revision: 0  
 Figure 3



## **Appendix E Details of Nearby Planning Application**

- Appeal Decision
- Flood Risk Assessment
- LLFA – No Objection
- EA – No Objection

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## Appeal Decisions

Inquiry held between 26 April – 6 May 2021

Site visits made on 1 April 2021 and 4 May 2021

by C Masters MA (Hons) MRTPI

an Inspector appointed by the Secretary of State for Communities and Local Government

Decision date: 14 June 2021

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### Appeal A: APP/B1930/W/20/3265925

Roundhouse Farm, Land Off Bullens Green Lane, Colney Heath

- The appeal is made under section 78 of the Town and Country Planning Act 1990 against a failure to give notice within the prescribed period of a decision on an application for outline planning permission.
  - The appeal is made by Canton Ltd against St Albans City & District Council.
  - The application Ref 5/2020/1992/LSM was dated 28 August 2020.
  - The development proposed is outline application for the erection of up to 100 dwellings, including 45% affordable and 10% self build, together with all ancillary works (All matters reserved except access) at Land off Bullens Green Lane, Colney Heath.
- 

### Appeal B: APP/C1950/W/20/3265926

Roundhouse Farm, Land Off Bullens Green Lane, Colney Heath

- The appeal is made under section 78 of the Town and Country Planning Act 1990 against a refusal to grant planning permission.
  - The appeal is made by Canton Ltd against the decision of Welwyn Hatfield Borough Council.
  - The application Ref 6/2020/2248/OUTLINE, dated 28 August 2020, was refused by notice dated 2 December 2020.
  - The development proposed is outline application for the erection of up to 100 dwellings, including 45% affordable and 10% self build, together with all ancillary works (All matters reserved except access) at Land off Bullens Green Lane, Colney Heath.
- 

### Decision

1. The appeals are allowed and planning permission is granted for the erection of up to 100 dwellings, including 45% affordable and 10% self build, together with all ancillary works (All matters reserved except access) at Land off Bullens Green Lane, Colney Heath, in accordance with the terms of the applications: 5/2020/1992 /LSM dated 28 August 2020 and 6/2020/2248/OUTLINE dated 28 August 2020, subject to the conditions set out on the attached schedule.

### Preliminary Matters

2. The boundary between St Albans City & District Council (SADC) and Welwyn Hatfield Borough Council (WHBC) transects the appeal site with the proposed access falling within WHBC off Bullens Green Lane and the western part of the site abutting Roestock Park and the Pumping Station falling within SADC. The planning applications, subject to these appeals, were essentially the same and were submitted to each of the planning authorities and considered collectively at the same public inquiry. For this reason, I have considered the proposed scheme in its entirety rather than as two separate and divisible schemes. I have thus determined the appeals on that basis.
-

3. In the context of appeal APP/B1930/W/20/3265925, this scheme was presented to planning committee on 18 January 2021 to request that members confirm how they would have determined the application had it not been subject to an appeal against non determination. At this committee meeting, it was resolved that the Council would have refused planning permission.
4. The reasons for refusal given by WHBC and putative reasons by SADC were similar, in respect to objections related to the suitability of the location, character and appearance, highways, ecology, archaeology, impacts on local infrastructure and services, Green Belt and heritage matters.
5. It was common ground that the Councils could not demonstrate a 5 year supply of housing sites. However, the parties disagreed on the extent of this shortfall. It was agreed that the variation between the two parties was not a matter which was material to the decision on these appeals. I will return to this matter below.
6. Since the appeals were submitted, the appellant has submitted an updated Ecological Impact Assessment. An agreed statement of common ground (SoCG) was submitted prior to the start of the inquiry which set out, amongst other things, principal matters of agreement and disagreement. This confirmed that objections relating to archaeology, ecology and impacts on local infrastructure and services could be addressed by suitably worded conditions/the completion of a Section 106 Agreement. Where necessary, I return to these matters within my report. In addition, appendix A to the SoCG included an agreed facilities plan illustrating the location and average distances to a number of services and facilities within Colney Heath and beyond. I return to this matter below.
7. At the start of the inquiry, a further SoCG was submitted in relation to highways matters. The Councils, Hertfordshire County Council (HCC) as highways authority and the appellant agreed that the appeals would have an acceptable impact on highways safety and therefore reason for refusal (RfR) number 3 on the WHBC decision and putative RfR number 4 of SADC were therefore withdrawn. Notwithstanding this position and in light of third party representations in relation to this issue, this topic was still subject to a round table discussion as part of the inquiry.
8. A replacement access drawing was submitted prior to the inquiry. It was subject to a separate consultation. Neither WHBC or SADC objected to the plan being substituted and all parties had an opportunity to comment on the drawing. Accordingly, I do not consider anybody would be prejudice by my taking this drawing into account and have considered the appeals on this basis.
9. The appellants submitted an unsigned Section 106 (S106) to the inquiry. This was discussed at a round table session and I allowed a short amount of time after the inquiry for the document to be signed. The signed version was received on 24 May 2021. The agreement made included a number of obligations and provision for payments to be made to WHBC, SADC and HCC. I return to this matter below.

#### Main Issues

10. The appeal site is located within an area of Green Belt. It was agreed between the appellant and the Councils that in the context of the Framework, the

proposals would present inappropriate development within the Green Belt, a matter that must attract substantial weight against the proposals. I concur with this view. As a result and against the background I have set out above, the main issues are:

- the effect of the proposal on the character and appearance of the area;
- the effect of the proposal on the openness of the Green Belt and the purposes of including land within it;
- the effect of the proposed development on the setting of the nearby listed building 68 Roestock Lane;
- whether the site is in an accessible location with regards to local services and facilities;
- whether the harm by reason of inappropriateness, and any other harm, is clearly outweighed by other considerations, so as to amount to the very special circumstances necessary to justify the development.

## Reasons

### *Effect on Character and Appearance*

11. The appeal site comprises a parcel of land of approximately 5 hectares on the eastern edge of Colney Heath. It is bounded by residential development to the northern boundary. There is a short terrace of cottages to the eastern corner along Bullens Green Lane before the boundary opens out into open countryside and beyond. To the south, the site is contained by Fellowes Lane where again residential dwellings are present on the south western corner. The western boundary comprises Roestock Park and the Pumping Station.
12. The parties agree that the site is not a valued landscape under the Framework paragraph 170 definition and that no other landscape designations are applicable to the appeal site. The Hertfordshire Landscape Strategy, 2005 notes the site is located within the Mimms Hall Valley, where the landscape character is described, amongst other things, as being strongly influenced by the major transport routes and the surrounding settlement which give it an urban-edge rather than rural character.
13. The A1 and railway line do not have any visual impact on the appeal site. From what I saw on the site visits, the character of the area is a mix of edge of settlement and countryside. Walking along the footpaths which traverse the site, the experience is one of being on the edge of a settlement rather than a wholly rural context. Whilst the open countryside to the south and east is clearly visible, the surrounding residential properties either facing the site or their rear gardens and associated boundary treatment is also clearly visible. These range in scale and form from bungalows fronting Fellowes Lane, glimpsed views of the 3 storey dwellings within Admiral Close and Hall Gardens and the rear elevations and gardens of properties along Roestock Gardens. Bullens Green Lane and Fellowes Lane serve to enclose the appeal site and provide a degree of containment from the wider countryside and beyond. My judgement leads me to conclude that the site strongly resonates with this urban edge definition provided by the 2005 Landscape Strategy.

14. Turning to consider the area beyond the appeal site itself, the sense of countryside prevails via the public footpath network and road network. These public footpaths continue within Bullens Green Wood and further beyond the appeal site at Tollgate Farm. Contrary to the views expressed by the Council, my experience of the views to the appeal site within Bullens Green Wood are of glimpse views of the appeal site. From the south and in the wider landscape context, the appeal site appears against the backdrop of the existing dwellings as a relatively self contained parcel of land on the edge of the settlement. These longer distance views of the appeal site reinforce the urban edge definition.
15. The Councils contend that the appeal site provides a positive element of the countryside that frames Colney Heath. I do not agree. The very clear sense of countryside is only evident when you travel beyond the appeal site south along Tollgate Road. Here the landscape character changes from mixed residential and open field to predominantly open fields with dotted farm buildings and isolated residential dwellings set within this open landscape. This is entirely different to my experience of the appeal site which I have outlined above.
16. The Councils raised specific concerns regarding alleged harm which would arise as a result of the new vehicular access off Bullens Green Lane and also the new pedestrian footpath and access point along Fellowes Lane. The new access road would be located towards the northern end of Bullens Green Lane, where the character of the existing area is already influenced by cars parked on the public highway, and the visibility of the residential properties beyond, all contributing to the edge of settlement character. Along Fellowes Lane, a new pedestrian access to the site would be introduced along with a public footpath. These characteristics are entirely compatible with the urban edge environment which currently exists.
17. The changes brought about by the built development and changes to the surrounding roads would result in visual changes to the area, which in my view would be localised in impact. Landscaping of the site which would be the subject of any reserved matters submission would mean that in the context of the existing immediate locality, the impacts of the development would be significantly reduced over time. Nevertheless, the proposed development would introduce built development here where currently no development exists which would cause some harm to the character and appearance of the area.
18. Taking into account all of the above factors, I conclude that the proposals would cause limited harm to the character and appearance of the area. I attach moderate weight to this factor. There would be conflict with policy D2 of the Welwyn Hatfield District Plan, 2005. Policy D2 requires all new development to respect and relate to the character and context of the areas. Proposals should as a minimum maintain and where possible should enhance or improve the character of the existing area.
19. The Council have also referred to policies D1, RA10 and RA11 in their reasons for refusal. Policy D1 requires a high standard of design in all new developments. Policy RA10 relates specifically to the Landscape Character Assessment outlined above, requiring proposals to contribute, where appropriate to the maintenance and enhancement of the local landscape character. Policy RA11 refers to the location of the site within the Watling Chase Community Forest boundary. The policy requires, amongst other things,

that proposals seek to include planting, leisure and landscape improvements, where this accords with Green Belt policies. I shall return to the matter of Green Belt below. However, in broad terms I see no reason why these policy objectives could not be readily achieved at reserved matters stage through an appropriately designed scheme and landscape strategy for the site.

20. For the same reasons, the proposals would conflict with policy 2 of the St Albans Local Plan, 1994. Policy 2 of the St Albans Local Plan 1994 identifies, amongst other things, Colney Heath as a Green Belt settlement whereby development will not normally be permitted except for the local housing needs, local services and facilities needs of the settlement and development must not detract from the character and setting of the settlement.
21. The Council have also referred me to policies 69, 70 and 74 of the St Albans Local Plan, 1994. There would be some conflict with policy 69. In relation to the requirements regarding scale and character in terms of plot ratios, height, size and scale, as well as the requirements in relation to materials, I can see no reason why these matters could not be satisfactorily addressed at the reserved matters stage. However the policy also cross references to the requirements of policy 2 outlined above which I have already identified a conflict with. Policy 70 goes onto set out a number of design criteria and layout criteria including but not limited to the dwelling mix, privacy between dwellings, parking and materials. Policy 74 relates specifically to landscaping and tree preservation. Again noting this is an outline scheme, and subject to the reserved matters submission, I can see no reason why the matters raised by policies 70 and 74 could not be appropriately addressed at the reserved matters stage.

#### *Purposes of including land within the Green Belt*

22. The Framework and in particular paragraph 133 makes it clear that the Government attaches great importance to the Green Belt and the protection of its essential characteristics. It was common ground between the parties that the proposals represent inappropriate development as identified by the Framework. In terms of the five purposes of the Green Belt identified at paragraph 134 of the Framework, it was also common ground that the key tests in the context of these appeals are the effect on openness, encroachment and urban regeneration. I deal with each of these matters in turn.

#### Openness of the Green Belt

23. The appeal site comprises an open agricultural field with a number of public footpaths which traverse the site. It is entirely free from built development. The appeal proposals would introduce built development to the site in the form of 100 dwellings with associated access roads and pavements, residential gardens, open space and driveways. The precise layout and form of the development would be determined at reserved matters stage. Even taking into account the potential for boundary treatment and landscaping which could include open green space and play space and could be integral to the layout of the residential development proposed, this would have the effect of a considerable reduction in the openness of the site. The proposals would lead to conflict with policy 1 of the St Albans District Council Local Plan, 1994. This policy identifies the extent of Green Belt within the Borough, and outlines the developments which would be permitted which broadly align with the

development identified by the Framework. This, harm, in addition to the harm by inappropriateness, carries substantial weight against the proposals.

#### Safeguarding the countryside from encroachment

24. It was generally agreed that the impact of the appeal proposal would be limited in terms of the impact on the wider integrity of the Green Belt. This is a view that I share. In terms of the impact of the development on the purpose of safeguarding the countryside from encroachment, my attention has been drawn to a number of background evidence documents including Green Belt studies. These include a report prepared by SKM Consultants in 2013 which included an assessment of Green Belt in both WHBC, SADC and Dacorum Borough Council. Here, the appeal site is assessed as part of parcel 34, a 419ha parcel of land. Reflective of the size and scale of the parcel of land, the report sets out a number of key characteristics of the land. With reference to the gap between Hatfield and London Colney, preventing the merger of St Albans and Hatfield, and preserving the setting of London Colney, Sleafshyde and Tyttenhanger Park, the report states that the parcel makes a significant contribution towards safeguarding the countryside and settlement pattern and gaps between settlements. These characteristics bear little or no relationship to the appeal site, and given the sheer size and scale of the land identified within the report when compared to the appeal site, I place only very limited correlation between the conclusions drawn here in relation to the function of the land or assessment of its function relative to the purposes of the Green Belt when compared to the appeal site.
25. The most recent Green Belt Assessment which was prepared in relation to the WHBC Local Plan review is noted as a Stage 3 review and was prepared by LUC in March 2019. Only the part of the appeal site which falls within Welwyn Hatfield forms part of the assessment, and is included within the much wider site area known as parcel 54. The report notes that whilst residential development is visible across much of the parcel, the parcel *as a whole* makes a significant contribution to the safeguarding of the countryside from encroachment. The report notes that the impact of the release of the parcel *as a whole* from the Green Belt would be moderate-high, however the impact on the integrity of the wider Green Belt would be limited. Again, I place only limited weight on the findings of this report relative to the appeal site as the assessment and conclusions drawn relate specifically to parcel 54 *as a whole* which includes a much wider area and excludes part of the appeal site in any event.
26. I have already set out in my assessment of character and appearance above that the appeal site has an urban edge/ edge of settlement character. I have made a clear distinction between the appeal site and its separation from the countryside beyond to the south and east of the appeal site. In this way, the appeal site is influenced by the surrounding residential development. As a result of these locational characteristics and influences, the consequences of the development at the appeal site would mean that the proposals would have only a localised effect on the Green Belt. The broad thrust of, function and purpose of the Green Belt in this location would remain and there would be no significant encroachment into the countryside. I therefore conclude that the appeal proposal would not result in harm in term of the encroachment of the Green Belt in this location. This is a neutral factor which weighs neither in favour nor against the appeal proposals.

To assist in urban regeneration, by encouraging the recycling of derelict and other urban land

27. The harm alleged here is limited to WHBC where the Council contend that the proposal would not assist in respect of this fifth purpose of the Green Belt. I am aware that the emerging plan proposes a number of urban regeneration sites, some of which already have planning permission. However, I have no substantive evidence to suggest that the development at this site would disincentivise the urban regeneration of sites elsewhere. Given the scale of development proposed to be located within the WHBC boundary I do not consider that the proposals would be likely to adversely impact on the regeneration of urban redevelopment sites elsewhere. There would as a result be no conflict with this purpose. Again, this is a neutral factor which weighs neither in favour nor against the appeal proposals.

*The effect of the proposed development on the setting of the nearby listed building 68 Roestock Lane*

28. Section 66(1) of the Planning (Listed Buildings and Conservation Areas) Act 1990 requires that special regard shall be had to the desirability of preserving a listed building or its setting or any features of special architectural or historic interest that it possesses. It is therefore necessary to consider the effect of the appeal proposals on the setting of the listed building itself.
29. The heritage asset concerned is a grade II listed residential dwelling. It is located adjacent to the northern boundary of the site. The house which was formerly two cottages, dates from the late C17 and has been subject to a number of modifications and extensions over the years. The dwelling is accessed from Roestock Lane. In this context, it is seen within its garden enclosure set back from the road adjacent to the Pumping Station and within the build fabric of residential development along Roestock Lane extending into Roestock Gardens.
30. From what I saw on my site visits, the significance of the heritage asset is in the main, locked into its built form and fabric. Given the mature vegetation which borders the rear garden, the extent of its setting that contributes to its significance is limited to the rear garden, and the way the front of the house addresses the main road. From Roestock Lane, the aesthetic value of the dwelling is evident through architectural detailing to the front elevation which is clearly visible.
31. The appeal proposals would see residential development introduced to the existing open agricultural field which abuts the rear boundary of the heritage asset. There would be no change to the built form or fabric of the dwelling, or the relationship of the heritage asset with its immediate garden. To my mind, these are the factors which provide the greatest contribution to the significance of the heritage asset.
32. The Council's heritage witness stated that the listed building has an historical association with the surrounding agricultural land and that the appeal site allows the listed building to have uninterrupted longer range views towards the south east. I do not agree. There is no evidence which confirms that the occupiers of the heritage asset were engaged directly with the appeal site. Neither does this serve to demonstrate any functional relationship between the appeal site and the heritage asset concerned. There is no evidence of an



- existing or former access that existed between the appeal site and the heritage asset. Whilst the property may well have been at times occupied by agricultural workers, I have no doubt that this would be common to many residential dwellings in the area at that time and would indeed be reflective of the historical associations with farming in years gone past in the immediate area and beyond.
33. Turning to consider the issue of views, I am unable to agree with the Councils contention that uninterrupted longer-range views across the appeal site from the property contribute to the significance of the listed building. The extensive and mature boundary vegetation to the property provides significant screening to the boundary of the property, such that these views would at best be described as limited. In any event, given my conclusions above regarding the linkage between the appeal site and the heritage asset, I am not convinced that longer-range views from the property make any contribution to the historical significance of the dwelling. As I have already set out, the main front of the dwelling addresses Roestock Lane. That situation would not be changed. Neither, given the existing screening, that could be augmented through reserved matters, would the significance the listed building derives from its garden setting be undermined by the proposals.
34. Looking at the issue of views of the dwelling from the appeal site, the appreciation of the architectural interest of the building is limited. The rear elevation has been subject to extensions over time. The property is seen in the context of the other immediate surrounding residential dwellings which lie adjacent to the appeal site, their rear gardens and extensive and mature vegetation to these boundaries, not as an isolated heritage asset with any functional or historical link to the appeal site. The reserved matters submission will afford the Councils the opportunity for enhancements to the landscape setting in the vicinity of the site boundary.
35. It is common ground between the parties that the harm to the significance of the designated heritage asset would be less than substantial. It is also common ground that the public benefits of the scheme outweigh the less than substantial harm. For the reasons I have outlined above, even the appellants assessment at the very lowest end of the broad spectrum of less than substantial harm overstates the schemes likely effect in this context. As I have already set out, the main aspect of the dwelling is from Roestock Lane. In such views, the appeal proposals would have a very limited effect on the current position.
36. I conclude that the proposals would not result in any harm to the setting or significance of the heritage asset concerned. As such, s.66(1) of the planning (Listed Buildings and Conservation Areas) Act 1990 is not engaged, and there would be no conflict with policy 86 of the St Albans District Local Plan (1994) which states, amongst other things, that where proposals effect the setting of a building of historic interest, the Council will have due regard to the desirability of preserving the building, its setting, or any features of architectural or historic interest which it possesses. Policy D1 is also referred to from the Welwyn Hatfield District Plan (2005). However, this policy concerns the provision of high quality design and is not of relevance to the heritage matters before me.

*Whether the site is in an accessible location with regards to local services and facilities*

37. The Councils contend that the appeal site is in an unsuitable and isolated location and as a result, it would fail to provide satisfactory access to services and facilities by means other than the private motor car. The appeal site is located on the eastern edge of Colney Heath. The parties agreed a facilities plan which clearly demonstrates the location of the appeal site relative to services, facilities and public transport and included walking and cycling distances from the appeal site. I will firstly assess the availability of and access to services and facilities outside of Colney Heath by means other than the private car, before turning to consider the facilities and services available within Colney Heath itself and how accessible these maybe to potential future occupiers at the appeal site.
38. In terms of public transport and travel outside of Colney Heath, there are a number of bus stops available most notably on Roestock Lane, Fellowes Lane and Hall Gardens. These are all within an 800m walking distance of the site, a flat comfortable walk. These stops provide services to both Potters Bar, Welwyn Garden City, St Albans and Hatfield Tesco Extra where more extensive shopping, medical, education, employment and leisure facilities are located. Whilst I accept that the buses serving these stops are limited in number and frequency and could by no means support regular commuting, they nevertheless provide an alternative mode of transport to the private car and could provide an important alternative to those sectors of the community who do not have access to a private car. Although the reliability of the services was questioned, I have no robust evidence to suggest that the service is so severely unreliable that it would lead me to reach a different conclusion on this issue.
39. For travel further afield, the nearest train services are provided at Welham Green, approximately 3.5km away with direct and frequent services to London. Turning to consider cycling, the Council's witness raised a number of concerns in relation to the nature of the roads and suitability for cycling. HCC as highways authority advised that cycling facilities are adequate with safe routes and access to the national cycle route network. These include National Cycle Route 61 approximately 3km from the appeal site providing access to St Albans and cycle route 12 approximately 2km to the south east providing access to both Welham Green and Hatfield. The agreed facilities plan indicates that taking into account average cycling times, a number of services and facilities would be available between 6 and 12 minutes away. I saw evidence on my site visits of both Bullens Green Lane and Fellowes Lane being well used for recreational purposes, including walkers and cyclists. Taking into account the average cycle times and distances to facilities outside of Colney Heath as set out within the facilities plan, I concur with HCC that cycling provides a reasonable alternative in this location to the private car.
40. Turning to consider journeys possible on foot, Colney Heath itself has a number of facilities and services which one would expect in a settlement of this size. These include but are not limited to a public house, primary school which has some albeit limited capacity and pre school, church, takeaway, village hall, hairdressers, scout hut, post office and mini mart. The availability of the public rights of way (PROW) within the site mean that these facilities and services could be accessible through a choice of routes, utilising the connections to

either Roestock Lane or Fellowes Lane and then onwards to the High Street. This choice of routes adds to the quality of the walking experience in this location however I acknowledge the concerns expressed regarding the use of the underpass under the A1 and the quality of the pedestrian environment provided here. In common with other lower order settlements in both SADC and WHBC, residents are expected to travel to larger settlements highlighted above for medical facilities, larger scale supermarkets, employment and secondary education and beyond. To my mind, the facilities and services available within Colney Heath and the accessibility of these facilities both on foot and by cycle mean that a number of day to day needs could be met without reliance on the private car. As a result, the location of the appeal site cannot be described as isolated. These factors weigh in favour of the appeal proposals.

41. Overall and to conclude, taking into account the essence of the Framework test as to whether a genuine choice of transport modes is on offer, the appeal proposals would in my view represent a sustainable location for new residential development.
42. My attention has been drawn to policy 2 of the St Albans Local Plan 1994 which identifies, amongst other things, Colney Heath as Green Belt settlement whereby development will not normally be permitted except for the local housing needs, local services and facilities needs of the settlement and development must not detract from the character and setting of the settlement. Given the policy wording, there would be a conflict with this policy. In relation to WHDC, I also conclude that the proposals would accord with policies SD1 and H2 of the Welwyn Hatfield District Plan, 2005. Policy SD1 confirms that development will be permitted where it can be demonstrated that the principles of sustainable development are satisfied. Policy H2 applies a criteria based approach to windfall residential development, which includes, amongst other things, the location and accessibility of the site to services and facilities by transport modes other than the car.
43. Policy GBSP2 is also referred to however this is a policy relating to towns and specified settlements where development will be located and the settlement of Colney Heath is not identified by the policy however the supporting text to the policy identifies Bullen's Green and refers to development to support services and facilities. Overall, the proposals would not accord with this policy.
44. Policy R1 requires development to take place on land which has been previously used or development. It goes on to state that development will only be permitted on 'greenfield' land where it can be demonstrated that no suitable opportunities exist on previously used or developed land. The proposals would conflict with this policy.

*Whether very special circumstances exist*

45. Substantial weight is attached to any harm to the Green Belt by reason of inappropriateness. Very special circumstances will not exist unless the potential harm by reason of inappropriateness, and any other harm, is clearly outweighed by other considerations. It is widely acknowledged that the definition of very special circumstances do not in themselves have to be rare or

uncommon<sup>1</sup>. I now turn to consider the factors which I have taken into account in making this assessment.

#### *Provision of Market Housing*

46. Paragraph 59 of the Framework seeks to support the Government's objective of significantly boosting the supply of homes. In order to achieve this, the Framework notes that it is important that a sufficient amount and variety of land can come forward where it is needed, that the needs of groups with specific housing requirements are addressed and that land with permission is developed without unnecessary delay.
47. I am aware of the Written Ministerial Statement of December 2015 which indicates that unmet need is unlikely to clearly outweigh harm to Green Belt and any other harm so as to establish very special circumstances. However, in common with the appeal decision<sup>2</sup> referred to, I note that this provision has not been incorporated within the Framework which has subsequently been updated and similar guidance within the Planning Practice Guidance has been removed. I can therefore see no reason to give this anything other than little weight as a material consideration.
48. It is common ground that neither SADC or WHBC can demonstrate a five year supply of deliverable homes. Whilst there is disagreement between the parties regarding the extent of this shortfall, the parties also agreed that this is not a matter upon which the appeals would turn. I agree with this position. Even taking the Councils supply positions of WHBC 2.58 years and SADC at 2.4 years, the position is a bleak one and the shortfall in both local authorities is considerable and significant.
49. There is therefore no dispute that given the existing position in both local authority areas, the delivery of housing represents a benefit. Even if the site is not developed within the timeframe envisaged by the appellant, and I can see no compelling reason this would not be achieved, it would nevertheless, when delivered, positively boost the supply within both local authority areas. From the evidence presented in relation to the emerging planning policy position for both authorities, this is not a position on which I would envisage there would be any marked improvement on in the short to medium term. I afford very substantial weight to the provision of market housing which would make a positive contribution to the supply of market housing in both local authority areas.

#### *Provision of Self Build*

50. Turning to consider the issue of Self Build, as part of the overall dwelling numbers, the proposal would deliver up to 10 self build or custom build dwellings. The Government attaches great importance to the provision of this element of the supply. Notably, paragraph 61 of the Framework identifies that planning policies should reflect the housing needs of different sectors of the community including, but not limited to people wishing to commission or build their own homes. Footnote 26 gives further explanation with reference to the requirements of the Self Build and Custom Housebuilding Act 2015 (as amended). The Planning Practice Guidance advises that local authorities

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<sup>1</sup> Wychavon DC v Secretary of State for Communities and Local Government and Butler [2008] EWCA Civ 692.

<sup>2</sup> APP/C2741/W/19/3227359

should use the demand data from registers, supported by additional data from secondary sources, to understand and consider future need for this type of housing in their area. Furthermore, it goes onto note that the registers are likely to be a material consideration in decisions involving proposals for self and custom housebuilding.

51. In the case of these appeals, there are no development plan policies which relate specifically to the provision or delivery of self building housing in either authority. Emerging policy SP7 at WHBC identifies four allocations which would contribute towards self build plot provision although the allocations do not specify how many plots. Furthermore, neither authority has an up to date assessment of likely future demand for this type of housing in line with the Planning Practice Guidance. The appellant provided detailed evidence in relation to the Custom Build Register, none of which was disputed. Evidence also presented demonstrated that the statutory duty to provide for base period plot provision has also not been met in either authority, in some periods by a significant margin. Taking into account other secondary data sources, these shortfalls may well be on the conservative side.
52. In common with both market housing and affordable housing, the situation in the context of provision of sites and past completions is a particularly poor one. To conclude, I am of the view that the provision of 10 self build service plots at the appeal site will make a positive contribution to the supply of self build plots in both local planning authority areas. I am attaching substantial weight to this element of housing supply.

*Provision of affordable housing*

53. The uncontested evidence presented by the appellant on affordable housing for both local authorities illustrates some serious shortcomings in terms of past delivery trends. In relation to WHBC, the affordable housing delivery which has taken place since 2015/16 is equivalent to a rate of 23 homes per annum. The appellant calculates that the shortfall stands in the region of 4000 net affordable homes since the 2017 SHMA Update, a 97% shortfall in affordable housing delivery. If the shortfall is to be addressed within the next 5 years, it would require the delivery of 1397 affordable homes per annum. In SADC, the position is equally as serious. Since the period 2012/13, a total of 244 net affordable homes have been delivered at an average of 35 net dwellings per annum. Again, this equates to a shortfall also in the region of 4000 dwellings (94%) which, if to be addressed in the next 5 years, would require the delivery of 1185 affordable dwellings per annum.
54. The persistent under delivery of affordable housing in both local authority areas presents a critical situation. Taking into account the extremely acute affordable housing position in both SADC and WHBC, I attach very substantial weight to the delivery of up to 45 affordable homes in this location in favour of the proposals.

## Other Matters

### *Other Appeal Decisions*

55. I have been referred to no fewer than 21 other appeal decisions<sup>3</sup> in addition to 9 Secretary of State decisions<sup>4</sup> as part of the evidence before me in relation to these appeals. Both the appellant and the Councils have sought to draw comparisons and similarities between this extensive array of decisions before me for a variety of reasons. Two historical decisions at the appeal site, as acknowledged by the Councils, were determined under a different planning policy framework and accordingly I attach very limited weight to these. In relation to the appeal decision at the neighbouring site<sup>5</sup>, I do not have the full details of the evidence which was before that Inspector, the main issues were different to these appeals and the decision predates the current Framework.
56. Rarely will any other appeal decision provide an exact comparison to another situation. In some of the cases referred to, there are similarities in the size and scale of the proposal, in other cases there are entirely different planning policy positions, housing supply considerations, land use considerations, locational characteristics, main issues and other factors which have been weighed in the balance. Furthermore, it remained common ground that each appeal should be considered on its own merits as is the case here. It is for the decision maker in each case to undertake the planning balancing exercise and as a result, the weight I have attached to these other appeal cases is limited.

### *Other Matters*

57. I have considered the effect of the proposals on the occupiers of the neighbouring dwellings in terms of effect on living conditions, highways impacts, flooding and loss of agricultural land. There are no objections from either SADC, WHBC or HCC in relation to these matters. I acknowledge concerns expressed by local residents in relation to existing flooding which takes place on Bullens Green Lane, however I am satisfied that appropriately worded conditions in relation to surface water and drainage can satisfactorily address any impacts of the appeal proposals in this regard. Similarly, I have no evidence before me which would lead me to reach a different conclusion to the Councils in relation to the effect of the development on the living conditions of neighbouring properties.
58. In terms of highways impacts, I acknowledge that a number of local residents have expressed concerns regarding localised congestion and parking and overall highways impacts. I am also mindful of the concerns expressed by Colney Heath Parish Council in connection with the data used to support the appeal proposals. However, taking into account the likely vehicular traffic to be generated by the development and the conclusions reached by the supporting

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<sup>3</sup> Two historical appeal decisions at the appeal site E6/1973/3202 & E6/1954/0860, APP/B1930/W/19/3235642, APP/Y0435/W/20/3251121, APP/C2714/W/19/3227359, APP/D2320/W/20/3247136, APP/P0119/W/17/3191477, APP/P1615/W/18/3213122, APP/G2435/W/18/3214451 & 3214498, APP/W0530/W/19/3230103, APP/C1570/W/19/3234530 & 3234532, APP/X0360/W/19/3238048, APP/H1840/W/20/3255350, APP/P3040/W/17/3185493, APP/L3815/W/16/3165228, APP/D0840/A/13/2209757, APP/G1630/W/14/3001706, APP/G5180/W/16/3144248, APP/G5180/W/18/3206569, APP/E2001/W/20/3250240,

<sup>4</sup> APP/W4705/V/18/3208020, APP/Q3115/W/19/3230827, APP/C4235/W/18/3205559, APP/P1615/A/14/2218921, APP/A0665/W/14/2212671, APP/H1840/A/13/2199085 & 2199426, APP/P4605/W/18/3192918, APP/Q3630/A/05/119826, APP/W1850/W/20/3244410

<sup>5</sup> APP/B1930/W/15/3137409

transport assessments, I concur with the view that this will not have a severe impact on the operation of the wider highways network.

59. The site access would be located off Bullens Green Lane where it is currently subject to the national speed limit. The Highways Authority consider that the introduction of a transitional speed limit restriction may be necessary to the south of the site. As a result, two Grampian conditions are proposed to address this issue. I conclude that the development would not cause harmful levels of congestion or increase risk to highway safety.
60. I note the conclusions the Councils have drawn in relation to the loss of agricultural land and the inconsistencies between the development plan policies and the Framework in this regard and can see no reason to disagree with the conclusions drawn by the Councils in relation to this matter.
61. The Councils argued that the site is not a suitable location for housing as it does not form part of the emerging policy context for either SADC or WHBC. Whilst I acknowledge this to be the case, this in itself is not a reason that the appeals should fail. In neither SADC nor WHBC is there an emerging policy position to which any significant weight can be attached. The SADC Local Plan Review was adopted in 1994, some 27 years ago. The most recent replacement plan was withdrawn. As a result, there is currently no up to date strategic housing land requirement assessment which has been subject to any rigorous soundness assessment through the local plan examination process.
62. Turning to consider the position at WHBC, the adopted plan dates from 2005, some 16 years ago. The emerging plan was submitted for examination some 4 years ago. As was outlined during the inquiry, Interim Findings issued by the Inspector in October 2020 and subsequent round up notes issued by the Inspector in March 2021 set out that findings in relation to the FOAHN, windfall allowance and green belt boundaries at proposed development sites are yet to be issued. As a result, I am unable to conclude with any certainty when the WHBC Plan will be found sound and as such attach very limited weight to this emerging plan.

### *Biodiversity*

63. Policy R11 of the WHBC Local Plan requires, amongst other things, that all new development should demonstrate how it would contribute positively to the biodiversity of the site by meeting a number of identified criteria. In the case of these appeals, the criteria most relevant are (i) the retention and enhancement of natural features of the site and (ii) the promotion of natural areas and wildlife corridors where appropriate as part of the design. For SADC, my attention has been drawn to policy 106 of the SADC Local Plan 1994 however this policy deals specifically with the effect of planning applications on identified SSSIs, Nature Reserves, other sites of wildlife, geographical or geomorphological importance which is not applicable to the appeal site. This is a position confirmed by the Councils in their proof of evidence.
64. The appeals are supported by an amended Ecological Impact Assessment. Hertfordshire Ecology, as ecological advisors to both WHBC and SADC confirmed that subject to a suitably worded condition and obligations within the Section 106 agreement, both of which I set out later within this report, the appeal proposals adequately address the ecological impacts of the development

at the appeal site. I therefore conclude that the proposals would accord with policy R11 of the WHBC Local Plan in this regard.

### Planning Obligation

65. I have taken into account the various obligations identified within the executed Section 106 Agreement with regards to the statutory requirements in Regulation 122 of the Community Infrastructure Levy (CIL) as well as the tests identified at paragraph 56 of the Framework. The obligation would secure a number of provisions relating to HCC, SADC and WHBC. I deal with each of these individual matters in turn.
66. A number of clauses in relation to biodiversity measures are proposed. A biodiversity offsetting contribution is included within the obligation, which would contribute towards the creation of new habitats. This would be calculated by using the Biodiversity Net Gain Matrix which provides for a financial contribution based on the formula identified by the matrix which measures and takes into account biodiversity losses and gains resulting from the development. In support of this approach, the Councils have identified that adopting the use of this matrix approach allows for landscaping and open space proposals as well as on site mitigation to be taken into account at reserved matters stage. In addition, the parties have also referred me to an alternative appeal decision<sup>6</sup> to endorse the use of the Biodiversity Net Gain Matrix approach. Once calculated, a scheme would be submitted for approval to both Councils referred to as the biodiversity offsetting scheme. In addition to this offsetting, biodiversity onsite compensation would also be provided through the identification of biodiversity measures to be implemented within the site as part of an identified onsite compensation scheme. In both instances, the Councils would be approving the onsite and offsetting schemes with reference to the biodiversity metric formula approach.
67. A green space contribution, to be calculated based on the precise number of dwellings and mix, will deliver the creation of a wildflower meadow at Angerland public open space off Bishops Rise, South Hatfield. Officers confirmed that this was the closest facility to the appeal site to which improvement requirements have been identified.
68. I note the Councils expressed concerns that the appellant could rely on the green space contribution as part of the biodiversity offsetting scheme and biodiversity offsetting contribution. However the biodiversity offsetting scheme, by definition, requires a scheme to be approved by both Councils to include but not limited the identification of an appropriate receptor site(s). As a result, I consider that this matter is adequately addressed by the obligation and the concerns are unfounded.
69. Taking into account the information and evidence presented, I am content that the obligations in relation to biodiversity, including the offsetting contribution, offsetting scheme and onsite compensation are necessary, directly related to the development and fairly and reasonably related in scale and kind. I draw the same conclusion in relation to the green space contribution. These obligations therefore comply with Regulation 122 of the CIL Regulations and can be taken into account in the grant of planning permission.

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<sup>6</sup> APP/Y0435/W/20/3251121



70. In addition to the above, the obligation would secure the provision of affordable housing, apportioned equally between WHBC and SADC. The affordable housing scheme would also secure the mix of units and tenures. In a similar way, the obligation would secure the plots and associated provision for the self build and custom housebuilding plots on the site. A district community facilities contribution is sought, to provide improvements towards the Roestock Park Scout Hut. Obligations relating to the highways works necessary to implement the scheme, waste and recycling, bus stop improvements at Hall Gardens, travel plan, libraries contribution towards improvements to the Creator Space at Hatfield Library, education contribution for both primary and secondary school provision, youth contribution towards increased provision at Hatfield Youth Centre, indoor sports facilities contribution towards the University of Hertfordshire and/or Hatfield Swimming Pools, and medical facilities in the form of community healthcare, general medical services specified at Northdown Road and/or Burvill House Surgery and mental health contribution specified at Queensway Health Centre and Roseanne House are also included. Finally, a monitoring fee, not to exceed £5000 would be payable to WHBC to cover the reasonable and proper administrative costs of monitoring compliance with the obligations.
71. The delivery of up to 100 dwellings in this location will result in an increase in the local population, with subsequent impacts on schools, social infrastructure such as medical facilities, libraries, sports and transport. A number of the other obligations, for example the provision of self or custom build housing as well as the provision for affordable housing weigh in favour of the appeal proposals.
72. I conclude that all of the aspects of the obligations outlined above are necessary to make the development acceptable in planning terms, directly related to the development and fairly and reasonably related in scale and kind to the development. As a result, the obligations therefore comply with Regulation 122 of the CIL Regulations and can be taken into account in the grant of planning permission.
73. The obligation also includes a contribution towards outdoor sports facilities, specifically improving drainage at grass pitches at Welham Green recreation ground and/or towards repairs to the bowls ground in the same location. Welham Green is approximately 3.5km from the appeal site. There is an existing recreational facility next to the appeal site, as well as outdoor sports facilities, albeit within SADC, located locally within Colney Heath. I am not convinced that this contribution would be necessary to make the development acceptable in planning terms or directly related to the development. Accordingly, I do not find this part of the obligation would satisfy the necessary tests.

#### Conditions

74. A round table session was held at the inquiry to discuss a list of agreed planning conditions. I have considered this list of conditions with reference to the tests as set out at paragraph 55 of the Framework. Where necessary, I have amended the wording of the conditions in the interests of precision and clarity.

75. In the interests of certainty and highways safety, conditions outlining the approved plans, including the access arrangements and their implementation, as well as the visibility splays, are necessary. I have however not included the suggested condition relating to the parameter plan as I do not consider a condition relating to this is necessary or reasonable in this instance. As the proposals are in outline form only, it is however necessary to specify the reserved matters to be submitted for approval and associated time limits for their submission and subsequent implementation. Two highways related conditions are attached. The first relate to submission, approval and implementation of any necessary Traffic Regulations Order (TRO). The second relates to the provision of a safe and suitable pedestrian crossing and footway on Fellowes Lane. Both of these conditions are necessary in the interests of highways safety.
76. A condition requiring an archaeological written scheme of investigation is both necessary and reasonable in order to establish the presence or absence of archaeological remains. Conditions requiring the submission of a scheme relating to surface water drainage and also relating to the arrangements for surface water to be disposed of are necessary and reasonable to ensure the satisfactory storage and disposal of surface water from the site. To address any risk of flooding, a further condition is attached requiring the development to be completed in accordance with the Flood Risk Assessment and Drainage Strategy. In addition, to prevent contamination, conditions have been attached which require full details of any substance containers to be submitted and approved in writing and also specific details of works involving excavation. A condition relating to indoor and outdoor noise levels is both necessary and reasonable to protect the living conditions of future residents. Furthermore, a condition relating to accessible housing is justified in order to ensure the needs of accessible or wheelchair housing are met.
77. The submission of a construction management plan is required by condition 11. This is necessary in the interests of highways safety and also the living conditions of nearby residents. In order to promote sustainable transport a condition relating to the provision of electric vehicle charging points has been included. Conditions covering landscaping details, a landscaping and ecological management plan and requiring a tree protection plan and method statement are necessary to ensure that the appearance of the development is satisfactory, biodiversity impacts of the development are suitably addressed and that where necessary, to ensure that retained trees and hedgerows are protected during the course of construction.

## Conclusions

78. The proposals would cause harm by reason of inappropriateness and harm to openness. Both of these attract substantial weight. I have also attached moderate weight to harm to the character and appearance of the area. However, these appeals involves two local authority areas, both of which have acute housing delivery shortages and acute affordable housing need. The proposals would make a contribution towards addressing these needs in the form of market, self build and affordable housing in both WHBC and SADC. I have attached very substantial weight to the provision of both market housing and affordable housing. I have attached substantial weight to the provision of self build housing. These factors, when considered collectively demonstrate that very special circumstances do exist.

79. I conclude that in the case of these appeals, I find that the other considerations in this case clearly outweigh the harm that I have identified. Looking at the case as a whole, very special circumstances do exist to justify inappropriate development in the Green Belt. My findings on the other matters before me do not lead me to a different conclusion. As a result, I therefore conclude that the proposals would comply with both the Framework and the development plans taken as a whole. For the reasons given above, and having considered all other matters raised, the appeals are allowed.

*C Masters*

INSPECTOR

APPEARANCES

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He called:

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Other Participants at Round Table Discussions:

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Ruth Ambrose                                      St Albans Borough Council  
MA (Hons) MTP MRTPI

Martin Hicks                                      Hertfordshire Ecology

Martin Wells                                      Hertfordshire County Council Growth and Infrastructure  
Unit

Chris Martin                                      Hertfordshire County Council Children's Services  
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Lindsay McCauley                              Hertfordshire County Council Highways

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FOR THE APPELLANT:

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He called:

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## SCHEDULE OF CONDITIONS

1. Details of the appearance, landscaping, layout, and scale, (hereinafter called, the reserved matters) shall be submitted to and approved in writing by the Local Planning Authority before any development begins and the development shall be carried out as approved.
2. Application for approval of the reserved matters shall be made to the Local Planning Authority before the expiration of three years from the date of this permission.
3. The development hereby permitted shall be carried out in accordance with the following approved plans: drawing no. 17981 1002 (Site Location Plan), drawing no. 18770-FELL-5-500 Rev B (Revised Site Access) and drawing no. 18770-FELL-5-501 Rev A (Proposed Footpath Connection).
4. The development hereby permitted shall be begun before the expiration of two years from the date of approval of the last of the reserved matters to be approved, whichever is the later.
5. No development of the site shall commence until:
  - a) A scheme to reduce speeds (to support the access proposals designed to 30mph) on Bullens Green Lane, Colney Heath, is provided to and approved in writing by the Local Planning Authority. Any scheme is required to be designed in line with the requirements of Hertfordshire County **Council's** (HCC) Speed Management Strategy (SMS); and
  - b) Any necessary Traffic Regulation Order (TRO) is made in respect of part a) to this condition. **'Made'** means that the TRO has been approved and can be implemented.

No occupancy of the site can occur until the Traffic Regulation Order referred to above is implemented and brought into force. Evidence of the implemented scheme, in the form of a Certificate of Completion of the Section 278 of the Highways Act 1980, must be submitted to and approved in writing by the local planning authority.
6. No development of the site shall commence until a scheme for the provision of a safe and suitable pedestrian crossing and footway on Fellowes Lane, Colney Heath, in line with drawing number 18770-FELL-5-501 Rev A in principle, is provided and approved in writing by the Local Planning Authority and is designed in line with the requirements as set out in Hertfordshire County **Council's Roads** in Hertfordshire: Highway Design Guide (3rd edition). No occupation of any part of the development may occur before implementation of the approved scheme referred to in Part 1 of the condition.
7. No works involving excavations (e.g. piling or the implementation of a geothermal open/closed loop system) shall be carried until the following has been submitted to and approved in writing by the Local Planning Authority.
  - a) An Intrusive Ground Investigation to identify the current state of the site and appropriate techniques to avoid displacing any shallow contamination to a greater depth
  - b) A Risk Assessment identifying both the aquifer and the abstraction point(s) as potential receptor(s) of contamination including turbidity.

c) A Method Statement detailing the depth and type of excavations (e.g. piling) to be undertaken including mitigation measures (e.g. turbidity monitoring, appropriate piling design, off site monitoring boreholes etc.) to prevent and/or minimise any potential migration of pollutants including turbidity or existing contaminants such as hydrocarbons to public water supply. Any excavations must be undertaken in accordance with the terms of the approved method statement.

All works shall be carried out in accordance with approved reports listed above.

The applicant or developer shall notify Affinity Water of excavation works 15 days before commencement in order to implement enhanced monitoring at the public water supply abstraction and to plan for potential interruption of service with regards to water supply.

8. Development must not commence until an Archaeological Written Scheme of Investigation has been submitted to and approved in writing by the local planning authority. The scheme shall include an assessment of archaeological significance and research questions; and:
- a) The programme and methodology of site investigation and recording;
  - b) The programme and methodology of site investigation and recording as required by the evaluation;
  - c) The programme for post investigation assessment
  - d) Provision to be made for analysis of the site investigation and recording;
  - e) Provision to be made for publication and dissemination of the analysis and records of the site investigation;
  - f) Provision to be made for archive deposition of the analysis and records of the site investigation;
  - g) Nomination of a competent person or persons/organisation to undertake the works set out within the Archaeological Written Scheme of Investigation.
- The development must not take place other than in accordance with the approved programme of archaeological works set out in the Written Scheme of Investigation.

In the event that contamination is found at any time when carrying out the approved development that was not previously identified it must be reported in writing immediately to the Local Planning Authority.

An investigation and risk assessment and, where remediation is necessary, a remediation scheme must then be submitted to and approved in writing by the Local Planning Authority and implemented as approved. The Local Planning Authority must be given two weeks written notification of commencement of the remediation scheme works.

The investigation and risk assessment must assess the nature and extent of any contamination on the site, whether or not it originates on the site and must be undertaken by competent persons. A written report of the findings must be produced and the findings must include:

- (i) a survey of the extent, scale and nature of contamination;
- (ii) (ii) an assessment of the potential risks to:
  - human health;
  - property (existing or proposed) including buildings;
  - crops;
  - livestock;
  - pets;

- woodland and service lines and pipes;
- adjoining land;
- groundwaters and surface waters;
- ecological systems;
- archaeological sites and ancient monuments.

(iii) an appraisal of remedial options, and proposal of the preferred option(s).

The investigation and risk assessment must be conducted in accordance with DEFRA and the **Environment Agency's 'Model Procedures for the Management of Land Contamination, CLR 11'**.

Remediation Scheme

Following completion of measures identified in the approved remediation scheme, a verification report which demonstrates the effectiveness of the remediation carried out must be submitted to and approved in writing by the local planning authority.

9. Development must not commence until the final design of the drainage scheme is completed and sent to the local planning authority for approval. The surface water drainage system should be based on the submitted the Flood Risk Assessment and Drainage Strategy (prepared by Woods Hardwick, ref: 18770/FRA and DS, dated August 2020). The scheme must also include:
- a) Detailed, updated post-development calculations/modelling in relation to surface water for all rainfall events up to and including the 1 in 100 year return period, this must also include a +40% allowance for climate change;
  - b) A detailed drainage plan including the location and provided volume of all SuDS features, pipe runs and discharge points. If areas are to be designated for informal flooding these should also be shown on a detailed site plan;
  - c) Exceedance flow paths for surface water for events greater than the 1 in 100 year including climate change allowance;
  - d) Detailed engineered drawings of the proposed SuDS features including cross section drawings, their size, volume, depth and any inlet and outlet features including any connecting pipe runs. This should include details regarding the connection into the existing Thames Water surface water sewer;
  - e) The drainage scheme shall also confirm use of an oil/water interceptor;
- and
- f) Final detailed management plan to include arrangements for adoption and any other arrangements to secure the operation of the scheme throughout its lifetime.

The scheme shall be fully implemented and subsequently maintained, in accordance with the timing / phasing arrangements embodied within the scheme or within any other period as may subsequently be agreed, in writing, by the local planning authority.

10. Development must not commence until details of all substance containers are submitted to and approved in writing by the local planning authority. These details must include:
- a) Confirmation of bunding of 110% capacity; and
  - b) Confirmation of the presence of a leak detection system and methodology that includes immediate notification to Affinity Water



11. Development must not commence until a Construction Management Plan has been submitted to and approved in writing by the Local Planning Authority. Thereafter the construction of the development must only be carried out in accordance with the approved Plan. The Construction Management Plan must include details of:
- a) Construction vehicle numbers, type, routing;
  - b) Access arrangements to the site;
  - c) Traffic management requirements including arrangements for the PROW across the site during construction;
  - d) Construction and storage compounds (including areas designated for car parking, loading / unloading and turning areas);
  - e) Siting and details of wheel washing facilities;
  - f) Cleaning of site entrances, site tracks and the adjacent public highway;
  - g) Timing of construction activities (including delivery times and removal of waste) and to avoid school pick up/drop off times;
  - h) Provision of sufficient on-site parking prior to commencement of construction activities;
  - i) Post construction restoration/reinstatement of the working areas and temporary access to the public highway; and
  - j) Where works cannot be contained wholly within the site a plan should be submitted showing the site layout on the highway including extent of hoarding, pedestrian routes and remaining road width for vehicle movements.

12. No development above ground level shall take place until a scheme to protect the development from noise due to transport sources is submitted to and approved in writing by the local planning authority. The scheme must ensure that:

The indoor ambient noise levels in living rooms and bedrooms meet the standards within BS 8233: 2014. Relaxed noise levels in BS 8233: 2014 will not be accepted in living rooms and bedrooms unless it can be demonstrated that good acoustic design practices have been followed and the implementation of acoustic barriers/bunds to lower façade noise levels as much as reasonably practicable, have been implemented. Internal L<sub>Amax</sub> levels should not exceed 45dB more than ten times a night in bedrooms; If opening windows raises the internal noise levels above those within BS8233, the mechanical ventilation will need to be installed, with ventilation rates required to meet those found within The Noise Insulation Regulations 1975. Alternative methods (such as passive systems) and rates can be considered, however, evidence that overheating will not occur will need to be provided in the form of a SAP assessment conducted with windows closed, curtains/blinds not being used, showing the required ventilation rates to ensure that the medium risk category is not exceeded. Details must be provided of the ventilation system to be installed and to demonstrate that it will provide the ventilation rates shown in the SAP Assessment; and Outdoor amenity areas must meet the 55dB WHO Community Noise Guideline Level

The approved scheme must be implemented prior to first occupation, unless the Local Planning Authority otherwise agrees in writing.

13. No development above ground level shall take place until a scheme setting out the arrangements for the delivery of accessible housing will be supplied to the council in accordance with the following requirements:
- a) A schedule of units, together with appropriate plans and drawings, must be submitted to and be approved by the local planning authority setting out details of the number, layout and location of all units that will comply with Part M4(2) of the Building Regulations 2010. At least 20% of all new dwellings must meet Building Regulations Part M4(2) standards for **'accessible and adaptable dwellings'**;
  - b) All units specified as M4(2) in the agreed schedule and plans must be implemented in accordance with that approval and in compliance with the corresponding part of the Building Regulations in that regard;
  - c) The person carrying out the building work must inform the Building Control body which requirements apply; and
  - d) Written verification of the completion of all dwellings in accord with part (a) above will be supplied to the local planning authority within 30 days of the practical completion [of the block it forms part of].
14. Prior to the first occupation of the development hereby permitted the vehicular access must be provided and thereafter retained at the position shown on drawing no. 18770-FELL-5-500 Rev B in accordance with the agreed highway specification. Arrangement shall be made for surface water drainage to be intercepted and disposed of separately so that it does not discharge from or onto the highway carriageway.
15. Prior to the first occupation of the development hereby permitted a visibility splay must be provided in full accordance with the details indicated on drawing no. 18770-FELL-5-500 Rev B. The splay shall thereafter be maintained at all times free from any obstruction between 600mm and 2m above the level of the adjacent highway carriageway.
16. Prior to first occupation of the development hereby permitted, a minimum provision of 20% of the car parking spaces must be designated for plug-in Electric Vehicles (EV) and served by EV ready [domestic and/or fast] charging points.
17. The development permitted by this planning permission must be carried out in accordance with the Flood Risk Assessment and Drainage Strategy (prepared by Woods Hardwick, ref: 18770/FRA and DS, dated August 2020) and the following mitigation measures:
- a) Limiting the surface water run-off generated by the critical storm events so that it will not exceed the surface water run-off rate of 9.3 l/s during the 1 in 100 year event plus 40% of climate change event;
  - b) Providing storage to ensure no increase in surface water run-off volumes for all rainfall events up to and including the 1 in 100 year + climate change event providing a total storage volume in two attenuation basins;
  - c) Discharge of surface water from the private drainage network into the Thames Water surface water sewer system located in Bullens Green Lane. The mitigation measures shall be fully implemented prior to first occupation of the development hereby approved.

Surface water must not be disposed of via direct infiltration into the ground via a soakaway.

Notwithstanding the submitted 'Updated Arboricultural Assessment – Version 2 (by FPCR Environment and Design Ltd, July 2020), a detailed tree protection plan and method statement should be submitted as part of application(s) for reserved matters approval as required by Condition 1.

18. Full details of both soft and hard landscape works should be submitted as part of application(s) for reserved matters approval as required by Condition 1. The landscaping details to be submitted shall include:

- a) existing and proposed finished levels and contours
- b) trees and hedgerow to be retained;
- c) planting plans, including specifications of species, sizes, planting centres, number and percentage mix, and details of seeding or turfing;
- d) hard surfacing;
- e) means of enclosure and boundary treatments;
- f) Details of toddler play area including play equipment; and
- g) Any other structures (such as furniture, refuse or other storage units, signs, lighting)

19. A landscape and ecological management plan (LEMP) should be submitted as part of application(s) for reserved matters approval as required by Condition 1 and include:

- a) A description of the objectives;
- b) Habitat/feature creation measures proposed
- c) Maintenance of habitat/feature creation measures in the long term and those responsible for delivery;
- d) Lighting strategy (aim to ensure that illumination of the existing hedgerows does not exceed 0.5 lux); and
- e) A monitoring programme and the measures required to adapt the LEMP should objectives fail to be met.

The LEMP should cover all landscape areas within the site, other than small privately owned domestic gardens.

# Land off Bullen's Green Lane, Colney Heath St Albans

Flood Risk Assessment and Drainage Strategy

August 2020



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# Report Reference

18770/FRA and DS

# Revision History

Rev	Amendments	Prepared By	Checked By	Date
First Issue	N/A	YK	JGF	24/08/2019





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# Introduction



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# Introduction

**The following paragraphs state the purpose of this document, and its constraints. A summary of existing and future site details; together with relevant pre-planning correspondence is also provided.**

- 1.1 This Flood Risk Assessment (FRA) and Drainage Strategy has been prepared by Woods Hardwick Infrastructure LLP on behalf of Canton Ltd; in support of an Outline Planning Application for a proposed residential development comprising up to 100 residential dwellings on a site known as 'Land off Bullen's Green Lane, **Colney Heath**'. A copy of the Site Location Plan is provided in Appendix A.
- 1.2 The application boundary for the site covers an area of approximately 5.25ha of undeveloped land. In terms of flood risk, the proposed development is situated in Flood Zone 1, land which has less than a 1 in 1,000 annual probability of river or sea flooding.
- 1.3 Although the site is not shown as being at risk of flooding on the EA mapping, this report has been prepared on the basis that the total site area exceeds 1ha.
- 1.4 This document has been written in accordance with the guidance contained within the Flood Risk and Coastal Change section of the Government's Planning Practice Guidance (FRCC, PPG).
- 1.5 This FRA concludes that the proposed development will not lead to the impedance of flood flows and will not increase the risk of flooding on the site itself, adjacent properties or to third parties situated either upstream or downstream of the site.
- 1.6 This document includes a Surface Water Drainage Strategy that identifies a suitable sustainable strategy for the disposal of surface water from the proposed development site that conforms with the guidance contained within the following documents:
  - CIRIA C753 SuDS Manual (2015)
  - Hertfordshire Council's LLFA Summary Guidance for Developers
- 1.7 The drainage principles were agreed during a pre-application meeting with the Lead Local Flood Authority (LLFA) in July 2020.
- 1.8 The proposed Drainage Strategy is based on a maximum allowance of 40% climate change in accordance with the Supplementary Planning Document for Sustainable Drainage Systems.
- 1.9 A suitable foul water outfall by way of direct connection to Thames Water assets located north east of the site in Bullens Green Lane has also been identified for the proposed development.

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- 1.10 From the findings of this report, the development proposals are considered appropriate for the site location; therefore, should be fully supported through the Planning process in terms of Flood Risk, Foul and Surface Water Drainage.

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# Existing Site and Proposed Development



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# Existing Site and Proposed Development

**The following paragraphs provide detail on the existing and proposed future residential development site; in relation to location, land uses, topography, as well as accessibility by travel and utilities.**

- 2.1 The proposed development site, which sits within both St Albans District Council and Welwyn Hatfield Borough Council, is located in the eastern part of Colney Heath, approximately 3km south west of Hatfield Town Centre and over 6km south east of St Albans Town Centre.
- 2.2 By road, Colney Heath is accessible from the A1(M) via the A414 North Orbital Road at Junction 3. The A414 North Orbital Road runs south of St Albans and provides a link between the A1 and M1. Colney Heath is also accessible from the M25 Junction 22 via Coursers Road.
- 2.3 The existing site covers an area of approximately 5.25ha of undeveloped agricultural land.
- 2.4 **The site is bounded by Bullen's Green Lane and Fellows Lane to the east and south, respectively.** Roestock Park abuts part of the western site boundary whilst existing residential properties abut the northern site boundary.
- 2.5 A Topographic Survey of the site was carried out by Woods Hardwick in June 2020. During the survey, information was recorded on the location and type of land features observed, including type of surface finishes, land boundaries, access routes, existing building outlines, vegetation and the geometric constraints of adjacent open channel ditches. All surveyed elevations were recorded at heights in metres above Ordnance Datum (mAOD). Ground levels and spot levels are also indicated on the drawing where they were recorded onsite. A copy of the Topographical Survey is provided in Appendix B.
- 2.6 In terms of existing drainage utilities, the Thames Water Wastewater Plans identifies the presence of existing Thames Water foul and surface water sewers serving the residential properties to the north and south of the site. There are no existing public sewers identified within the site boundary.
- 2.7 The topographical survey identifies existing sections of ditches adjacent to the site boundaries. However, the ditches do not appear to have an outfall beyond the site. It is considered likely that the ditches would have been put in place to drain the site with surface water eventually soaking into the ground. A drawing showing the existing drainage regime has been prepared and provided in Appendix C.
- 2.8 A Drainage Survey was carried out by Midland Survey Ltd in July 2020, following a pre-application meeting with the LLFA. The surveyors traced the Thames Water (TW) surface water networks to the north and south west of the site. Whilst the surveyors were unable to trace the entire routes due to third party land they confirmed it was highly likely that the network to the north discharges to the existing ditch north of Roestock Lane and the network to the south west discharges to the River Colne located west of the site.



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- 2.9 The OS map indicates there is an existing drain which crosses the site. However, both the topographical and subsequent drainage survey could not find any evidence of this drain.
- 2.10 Notwithstanding this, the Ground Investigation Report prepared by Paddock Geo Engineering notes that the historic land drain running across the centre of the site was infilled in the last twenty years. A plastic suspected land drain pipe was observed at 0.9m depth.
- 2.11 Development proposals comprise up to 100 residential dwellings, with associated infrastructure. The main vehicular access will be provided via a new access road off Bullens Green Lane. A copy of the Illustrative Sketch Layout is provided in Appendix D.

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# Flood Risk



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# Flood Risk

**The following paragraphs will identify whether or not there are any flood risks associated with the future development which may affect the proposals impact on the surrounding environment.**

- 3.1 Following the increased frequency of flooding during recent years, much work has been undertaken at a national level to assess the relationship between new development and flood risk. This work resulted in the publication of Planning Policy Statement 25 (PPS25) in early 2007 with an update being released in March 2010.
- 3.2 Alongside the release of the National Planning Policy Framework in March 2012 the Technical Guidance to the NPPF (TGNPPF) was released serving as a flood risk-based addendum to the national planning guidance. These documents replaced PPS25; however, many of the principles set out in PPS25 remain relevant. The TGNPPF has since been replaced by the Planning Practice Guidance which continues to follow the same principles.
- 3.3 Table 1 of the FRCC, PPG seeks to define Flood Risk Zones. An extract of this table is shown in Figure 3.1 which follows.
- 3.4 The definition of the flood zones noted in Figure 3.1, reaffirms the guidance and categorisation included within PPS25 and TGNPPF.
- 3.5 **Table 2 of the FRCC, PPG defines 'Flood Risk Vulnerability Classification'. Residential dwellings are classified under the 'More Vulnerable' category, as such the proposed development is considered to be a 'More Vulnerable' type of development.**
- 3.6 The Environment Agency (EA) Flood Map demonstrates that the site lies within Flood Zone 1 and is therefore classified as having less than a 1 in 1,000 annual probability of flooding from rivers or seas. A copy of the EA Flood Map covering the immediate surrounding area for the proposed development is shown in Appendix E.
- 3.7 Table 3 of the FRCC, PPG compares the suitability of a development within a particular Flood Zone based on its corresponding Flood Risk Vulnerability Classification. Developments like the proposed **which are classified as 'More Vulnerable', are deemed appropriate for development within Flood Zone 1.** Therefore, there is no need to carry out a Sequential Test or Exception Test.

<b>Flood Zone</b>	<b>Definition</b>
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Figure 3.1: Flood Zone Definitions - Planning Practice Guidance Extract

### **Risk of Flooding to the Development from Known Sources**

- 3.8 Notwithstanding the above, presented below is a summary and analysis of the potential for the site to flood from known sources.

#### **Flooding from Rivers and/ or Watercourses**

- 3.9 The topographical survey identifies sections of existing ditches adjacent to the site boundaries.
- 3.10 The nearest EA watercourse is the River Colne, which is located over 0.5km south west of the site.
- 2.12 The EA Flood Map enclosed in Appendix E shows that the proposed development land is situated in Flood Zone 1, land which has less than a 1 in 1,000 annual probability of river or sea flooding.

#### **Flooding from the Sea**

- 3.11 The nearest sea to the site is the North Sea, which is located some 90km to the east. Given this distance and the fact that the site lies above 74m AOD; the proposed residential scheme is not considered to be at risk of flooding from this source.

#### **Flooding from Land**

- 3.12 The potential for overland flows needs to be considered to ensure that neither the development nor adjacent land and/ or property, including that which may be under the responsibility of a third party is placed at an unacceptable risk of flooding.
- 3.13 From the EA Surface Water Flood Map for the site, which is enclosed in Appendix F, parts of the site are shown to be at low to high risk of surface water flooding. The area associated with high risk of surface water flooding on site is significantly small. Only areas adjacent to the north eastern and south western site boundaries are identified to be at medium risk of surface water flooding. In both scenarios flood depths are below 300mm.
- 3.14 It would appear that the surface water flooding shown on the EA maps is due to surface water runoff emanating on the site following existing flow route/natural depressions towards the lower areas within the site.

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- 3.15 It should be noted that, the SFRA for the area did not identify any historic surface water flood incidents in the vicinity of the site.
- 3.16 Notwithstanding the above, any surface water flows which may emanate on site will be managed within the drainage strategy following the development of the site.

#### **Flooding from Groundwater**

- 3.17 A Ground Investigation (GI) for the site was carried out by Paddock Geo Engineering (PGE) in July 2020, which included groundwater monitoring and Infiltration testing using the BRE Digest 365 methodology in machine excavated pits. A copy of the relevant extracts from the PGE Report Trial is included in Appendix G.
- 3.18 From the results of the intrusive ground sampling carried out by PGE; it can be concluded that the sub-strata composition of the site typically consists of topsoil/made ground underlain by Lowestoft Formation.
- 3.19 The report also notes that Groundwater was encountered within two of the shallow trial pits and within four of the six boreholes undertaken at depth of 0.9m to 4m, typically as seepages within the sand band and pockets of gravel. Subsequent groundwater monitoring of the standpipes indicates groundwater levels of between 1.40m and 4.30m.
- 3.20 The Level 1 Strategic Flood Risk Assessment (SFRA) for the area shows that the site does not lie within an area susceptible to groundwater flooding. In addition, the SFRA did not identify any historic groundwater flooding incidents in the vicinity of the site.
- 3.21 Based on the above information, it is anticipated that groundwater flooding should not be an issue to the proposed development.

#### **Flooding from Sewers**

- 3.22 A copy of the Thames Water Wastewater Plan illustrating the site extents and the immediate surrounding areas on Ordnance Survey (OS) mapping; together with approximate locations of Thames Water assets is enclosed in Appendix H.

- 3.23 From the plan, it can be seen that there are no Thames Water assets located within the site extent. However, Thames Water Wastewater Plans identifies the presence of existing Thames Water foul and surface water sewers serving the residential properties to the north and south of the site.
- 3.24 As previously mentioned, the OS map indicates there is an existing drain which crosses the site. However, it is noted this was infilled in the last twenty years.
- 3.25 Based on the evidence provided above, the proposed site is not considered to be at risk of flooding from this source.

#### **Flooding from Reservoirs, Canals and Other Artificial Sources**

- 3.26 The EA Reservoir Flood Map was acquired by Woods Hardwick Infrastructure LLP on the 13<sup>th</sup> July 2020 **from the EA's website. A copy of this mapping is enclosed in** Appendix I. No part of the site or any immediate neighbouring land is shown to be at risk of flooding from reservoirs.
- 3.27 It should be noted that an occurrence of flooding from reservoirs is considered by the EA to be extremely rare. There has been no loss of life in the UK from reservoir flooding since 1925.

#### **Risk of Flooding from the Proposed Development**

- 3.28 Presented below is a summary and analysis of the potential for the site to exacerbate the risk of flooding to third parties both upstream and downstream.

#### **Encroachment onto Floodplain**

- 3.29 As outlined above, the site does not lie within the floodplain, there is therefore no risk of encroachment upon the floodplain.

#### **Impedance of Flood Flows**

- 3.30 As the site lies out of the floodplain there is no risk of the site impeding flood flows.



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### Contribution of Flood Flows by Development Drainage

- 3.31 As previously mentioned, the existing site covers an area of approximately 5.25ha of undeveloped open land.
- 3.32 The proposed development comprises up to 100 residential dwellings with associated infrastructure such as access roads, footways, and car parking. These elements will all contribute to the **development's surface water discharge.**
- 3.33 If considered appropriate at the detailed design stage, flooding routing measures will be incorporated to ensure that flood waters in excess of those for which the site has been designed to accommodate, will be routed away from the more vulnerable areas of the site.
- 3.34 The surface and foul water disposal strategies for the site are described in greater detail in the **following 'Chapter 4 - Proposed Development Drainage Strategy'.**

### Climate Change

- 3.35 There is an increasing body of scientific evidence that suggests that the global climate is changing as a result of human activity. Past, present and future emissions of greenhouse gases are expected to cause significant climate change during this century.
- 3.36 The nature of climate change will vary for the UK. Projections of future climate change indicate that more frequent short-duration, high-intensity rainfall and more frequent periods of long-duration rainfall can be expected. These kinds of changes will have implications on river-flooding and also localised flash flooding.
- 3.37 The Planning Practice Guidance requires developments to consider the potential impacts of climate change. **In February 2016 the EA released new guidance titled 'Flood risk assessments: climate change allowances' (FRA:CC), in which the peak rainfall intensity allowance in small and urban catchments is assessed.**
- 3.38 **Considering the above, the climate change allowance that the proposed development's drainage strategy will be based on, is set at a value of +40% ('Upper End' value i.e. 90th Percentile, taken from Table 2 of the FRA: CC, representing the total potential change anticipated for 2070 to 2115).**

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# Proposed Development Drainage Strategy



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# Proposed Development Drainage Strategy

**The following paragraphs will provide detail on the proposed site generated foul and surface water disposal methods, design criteria, maintenance regimes and potential third-party legal agreements.**

- 4.1 In addition to ensuring that the development is not at risk of flooding from external sources, it is also important to ensure that the scheme itself does not exacerbate flood risk for others. It is therefore essential that the arrangements for storm and foul water disposal are fully assessed to guarantee that the effects are mitigated and that there will be no impact on the existing land drainage regime.

## **Surface Water Drainage Strategy**

- 4.2 All of the recent guidance on the arrangements for storm water disposal from new developments has encouraged the application of a hierarchy for surface water disposal. This has now been formalised in the Building Regulations Part H. The hierarchy is also the basis of the advice on surface water disposal recommended by Bedford Borough Council, in their role as Lead Local Flood Authority (LLFA) in the BBC **publication**, 'Supplementary Planning Document for Sustainable Drainage Systems (February 2018).
- 4.3 The first choice for surface water disposal which should be pursued is via infiltration. Only where it has been determined that the ground conditions are not suitable should the second choice of disposal to a ditch and/ or watercourse be considered. If there is no alternative the third and last choice of disposal to the public sewer can be considered.

## **Method of Surface Water Discharge**

### **Infiltration**

- 3.39 Infiltration testing was carried out onsite by PGE for 7 trial pits in accordance with the BRE 365 methodology. The results indicate that significant infiltration was not noted within any of these trial pits.
- 3.40 It is therefore considered that the use of infiltration techniques such as traditional soakaways will not be suitable for surface water discharge at the proposed site. For full copies of the infiltration data and trial pit logs, see Appendix G.
- 3.41 It is also noted that there is an Affinity Water abstraction point immediately north west of the site, therefore infiltration is not appropriate in this area.

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#### **Ditch and/ or Watercourse**

- 4.4 As previously mentioned, the nearest watercourse to the site is the River Colne, which is located over 0.5km south west of the site.
- 4.5 The topographical survey identified existing sections of ditches adjacent to the site boundaries. However, the ditches are too shallow to be a feasible solution and they do not appear to have an outfall beyond the site.
- 4.6 In light of the above, it is therefore considered that surface water disposal to a ditch/watercourse will not be a feasible option.

#### **Discharge to Public Sewer**

- 4.7 In accordance with the hierarchy for surface water disposal, the next option to be explored is disposal to the public sewer.
- 4.8 It is therefore proposed to discharge surface water runoff from the development site to the existing Thames Water public surface sewer located in Bullens Green Lane, north east of the site.
- 4.9 Thames Water have already confirmed they would accept a connection to the public surface water sewer at MH1150 in Roestock Gardens, at a maximum rate of 9.3l/s which is equivalent to the previously calculated QBAR rate. However, a new connection at this manhole would require crossing third party land. As such, Woods Hardwick have written to Thames Water, requesting a new point of connection at MH3010 in Bullens Green Lane, north east of the site. Their response is currently awaited. Copies of the correspondence with Thames Water are contained in Appendix J.
- 4.10 At the detailed design stage, the proposed surface water network will be designed and tested within the relevant software package, to ensure that surface water flows generated from the site will not exceed this prescribed rate during a 1 in 100 year plus 40% climate change rainfall event.

### Discharge Strategy

#### Rainfall Data

- 4.11 The Flood Estimation Handbook (FEH) methodology has been used in order to determine the requirements of the drainage network.

#### Runoff Rate

- 4.12 The impermeable area of the site has been calculated from the Illustrative Sketch Layout. This impermeable area comprises surfaces occupied by the proposed houses, garages, private drives, the access roads including adjacent footpaths.

#### Attenuation Volume Requirement

- 4.13 The site is currently undeveloped, therefore the proposed development will generate an increase in impermeable area. Based upon the illustrative layout drawing submitted with the application, the proposed development would generate an impermeable area of 3.15ha.
- 4.14 Woods Hardwick recently contacted Thames Water, requesting confirmation that they would accept a new connection to the public sewer network in Bullens Green Lane, north east of the site. Their response is currently awaited.
- 4.15 Notwithstanding the above, a minimum rate of 5l/s has been used for the storage calculations at this stage. This is considered to be a robust approach as the minimum rate is lower than the calculated QBAR rate for the site; 9.6l/s. A copy of the Greenfield Calculation is provided in Appendix K.
- 4.16 It is necessary to ensure that sufficient attenuation is provide to accommodate the runoff from 3.15ha of impermeable surfacing during 1 in 100-year (+40% climate change) storm event. The drainage calculations demonstrate that the proposed attenuation basin is capable of accepting flows from the 100 year rainfall event, including 40% allowance for climate change.
- 4.17 It should be noted that the final discharge rate and storage volume requirement will be dependent upon the **Thames Water's response and the** final impermeable area. At the detailed design stage, calculations will be re-run and the strategy will be refined as necessary. Depending upon the final proposals it may therefore be necessary to provide additional storage volumes.

---

### Method of Attenuation

- 4.18 In accordance with current guidelines and best practice, the Developer's best endeavours will be made to ensure that appropriate Sustainable Urban Drainage Systems (SuDS) are used wherever practicable. There are a number of primary methods available, the appropriateness of which has been considered and summarised in Table 4.1 below;

**Table 4.1: SuDS Feasibility Consideration**

<b>SuDS System</b>	<b>Feasibility</b>	<b>Comments</b>
Green Roofs	X	Cost is likely to adversely affect the scheme's viability.
Permeable Paving	✓	Lined permeable paving is proposed within the private areas for surface water treatment.
Soakaways	X	Infiltration testing confirm that the use of soakaways is not viable for the proposed development.
Rainwater Harvesting	✓	Feasible and will be utilised where practicable, although not accounted for within currently proposed drainage strategy or attenuation calculations.
Swales	✓	Swales are proposed alongside to the main road for surface water treatment.
Attenuation Basin	✓	An attenuation basin is currently proposed on this scheme to provide surface water storage and treatment.
Geo-cellular Storage Crates	X	Not currently proposed as the proposed attenuation basin offers a more sustainable solution.

- 4.19 Based upon the assessment above, which takes into account the topography of the site and the underlying conditions, it is proposed to provide surface water storage within the proposed attenuation basins. The attenuation basins, which will be placed at the north western extent of the site, will provide a total of 2092m<sup>3</sup> of surface water storage. The south western basin, will be constructed to a maximum depth of 1.5m, whilst the north eastern basin is only 0.6m deep and acts as an overflow for the main pond. Both basins will have side slopes of 1 in 3 and at 0.6m depth, the north eastern basin is expected to be dry most of the time and will provide a multi-functional space.
- 4.20 In addition to the above, swales are proposed alongside the main road, and permeable paving within private areas for surface water treatment. These features are currently not accounted for within the drainage calculations. The Proposed Drainage Strategy Drawing and associated Flow Calculations are provided in Appendix L and M, respectively.

### Surface Water Conveyance

- 4.21 Surface water runoff from the proposed impermeable areas will generally be routed towards the surface water pumping station in the northern extent of the site via a gravity fed piped network.
- 4.22 Two offline basins will be located in the north eastern extent of the site to provide surface water storage.
- 4.23 The swine road will drain **'over the edge' or via kerb outlets into the shallow swales** alongside the carriageway.
- 4.24 From the pumping station, surface water flows will be pumped towards the existing public surface water sewer in Bullens Green Lane, north east of the site. The pumping station will also act as a flow control to ensure that discharge rates do not exceed the discharge rate prescribed by Thames Water.
- 4.25 As previously mentioned, the final discharge rate and storage volume will be dependent upon the **Thames water's response and the final impermeable area**. At the detailed design stage, the proposed surface water sewer network will be tested against a 1 in 100-year (+40% climate change) rainfall event using the XP Solutions MicroDrainage or Flow software, where the discharge rate at the outfall position must be shown to not exceed the agreed rate.
- 4.26 Notwithstanding the above, the current calculations are based on a minimum rate of 5l/s, which is lower than the QBAR rate.

### Surface Water Drainage Maintenance

- 4.27 The arrangements for further maintenance of the surface water drainage system needs to be fully considered and, in that respect, it is anticipated that the onsite piped drainage network would be adopted by Thames Water Services Ltd through a Section 104 Agreement (Water Industry Act 1991).
- 4.28 It is anticipated that the attenuation basins, swales and permeable paving will be maintained by a management company.
- 4.29 A summary of the likely maintenance requirements for the proposed drainage network is provided in Table 4.2 below.



Table 4.2: Recommended Maintenance for Swales / Attenuation Basins

Swales / Attenuation Basin		
Monitoring	Frequency	Responsibility
To be visually inspected after heavy rainfall events to ensure they are free of debris and litter.	As required	Management Company
<b>Regular Maintenance</b>		
Litter and debris removal from the site	Monthly	Management Company
Amenity grass cutting at 35-50mm	As required	
Inspect and clear inlets, outlets, control structures and overflows	Monthly	
<b>Occasional Maintenance</b>		
Remove Leaf Accumulation	As required	Management Company
Remove sediments from inlets and structures	As required	
<b>Remedial Work</b>		
Inspect and repair damage to inlets, outlets, banks and overflows	As required	Management Company

- 4.1 It should be noted that the maintenance schedule document should be considered indicative only. The frequency and type of maintenance tasks to be carried out should be reviewed as necessary to ensure that the schedule remains relevant to the nature and location of the proposed residential development.

#### **Foul Water Drainage Strategy**

- 4.39 A Pre-Planning Enquiry was submitted to Thames Water, requesting confirmation that the existing foul network to the north east of the site has sufficient capacity to accommodate the foul discharge from the proposed development, via a pumped connection to the public foul network in Bullens Green Lane, north east of the site. In their response dated 20<sup>th</sup> August 2020, Thames Water confirmed that they would accept a new connection at MH3011 in Bullens Green Lane at 2.3l/s.
- 4.40 A suitable foul sewer network to discharge the residential development, will be designed in accordance with Thames **Water's adoptable standards, providing a direct point of connection** between the development site and the agreed Thames Water foul outfall. Further details of this design will be provided at the detailed design stage.
- 4.41 In accordance with relevant drainage policy, Thames Water are obliged to accept foul water flows from a proposed development, subject to the site receiving planning consent. In anticipation that such a consent will be granted for the proposed residential scheme, it is expected that Thames Water will make the necessary arrangements to ensure that the required provision within their public foul sewer network and treatment works will be available at the time that the Applicant **wishes to connect the site's foul sewers to the designated outfall.**

---

#### **Foul Water Drainage Maintenance**

- 4.42 In anticipation that the proposed residential development will be connected to the Thames Water public foul sewer network; it is considered reasonable to expect that Thames Water Services will act in their full capacity as the wastewater provider for the local area, to ensure that maintenance of their public sewers will be carried out as required from the point at which the existing private sewer outfalls connect to the public sewer network.

---

# Summary and Conclusion



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# Summary and Conclusions

**The following paragraphs summarise the findings of this Flood Risk Assessment and Drainage Strategy. Details of foul and surface water outfalls, SuDS features and legal agreements are also provided.**

- 5.1 This Flood Risk Assessment (FRA) and Drainage Strategy has been prepared by Woods Hardwick Infrastructure LLP on behalf of Canton Ltd; in support of an Outline Planning Application for a proposed residential development comprising up to 100 residential dwellings on a site known as 'Land off Bullens Green Lane, Colney Heath'.
- 5.2 **The site comprises an area of approximately 5.25 ha and is shown on the EA's Flood map for planning** as lying within Flood Zone 1.
- 5.3 All potential sources of flooding to the proposed development have been considered and it has been demonstrated that the site will not be at any significant risk of flooding. Access and egress to the site will be maintained during extreme storm events.
- 5.4 It has been demonstrated that the proposed development will not exacerbate the risk of flooding to third parties either upstream or downstream from the site.
- 5.5 The Surface Water Drainage Strategy has been developed in accordance with the hierarchy for sustainable surface water disposal. The results from the intrusive ground investigation confirm that the underlying soil conditions are not suitable for infiltration techniques. Conveyance of surface water to the nearest ditch or watercourse was also considered; however, the adjacent ditches do not appear to have an outfall beyond the site. As such, in this particular instance it is considered more appropriate to discharge surface water runoff from the development site to the existing Thames water public sewer located in Bullens Green Lane, north east of the site.
- 5.6 Thames Water have already confirmed they would accept a connection to the public surface water sewer at MH1150 in Roestock Gardens, at a maximum rate of 9.3l/s which is equivalent to the previously calculated QBAR rate. However, a new connection at this manhole would require crossing third party land. As such, Woods Hardwick have written to Thames Water, requesting a new point of connection at MH3010 in Bullens Green Lane, north east of the site. Their response is currently awaited.
- 5.7 At this stage, a minimum rate of 5l/s has been used for the storage calculations. This is considered to be a robust approach as the minimum rate is lower than the calculated QBAR rate for the site; 9.6l/s. However, it should be noted that the final discharge rate and storage volume requirement **will be dependent upon the Thames Water's response and the final impermeable area. At the detailed design stage, calculations will be re-run and the strategy will be refined as necessary.** Depending upon the final proposals it may therefore be necessary to provide additional storage volumes.

- 
- 5.8 Surface water runoff from the site will generally be routed towards the surface water pumping station in the northern extent of the site via a gravity fed piped network. From here, surface water flows will be pumped towards the existing public surface water sewer in Bullens Green Lane, north east of the site. Two offline basins will be located in the north eastern extent of the site to provide surface water storage. In addition, swales are proposed alongside the main road, and permeable paving within private areas for surface water treatment.
- 5.9 **It is proposed to discharge the site's foul flows, via a pumped connection, to the public foul network** in Bullens Green Lane, north east of the site.
- 5.10 At the detailed design stage, a suitable foul sewer network will be designed to demonstrate the conveyance of foul flows to the designated Thames Water foul outfall. Following the detailed design of this sewer network, an appropriate means of connection to the public sewer will be progressed via a Section 106 (Water Industry Act 1991) Agreement. In turn, the adoption of any element of proposed foul sewer will be offered for Thames Water adoption will be progressed via a Section 104 (Water Industry Act 1991) Agreement.
- 5.11 From the information provided within this report, it is concluded that there is no reason in terms of drainage or flood risk why the residential development proposed at 'Land off Bullen's Green Lane, Colney Heath'; **should not** be fully supported through the planning process.

---

# Appendix A

## Site Location Plan





**NOTES**

1. Contractors must check all dimensions on site. Only figured dimensions are to be worked from. Discrepancies must be reported to the Architect or Engineer before proceeding. © This drawing is copyright.
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REV	DESCRIPTION	DRN	CHD	DATE	
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<input type="checkbox"/>	CONSTRUCTION	<input type="checkbox"/>	AS BUILT		

SCALE 1:1250@ A2 DATE MAY 20

DRAWN RR CHK TF

DRAWING NO. 17981-1002 REV B

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Colney Heath

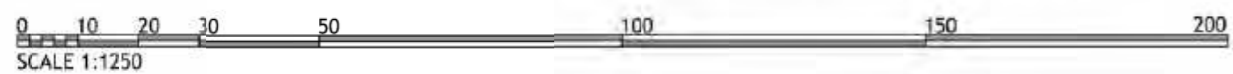
DETAILS Site Location Plan

**Woods Hardwick**  
Architecture | Engineering | Planning | Surveying

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---

# Appendix B

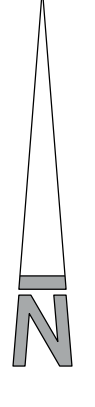
## Topographic Survey



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# Appendix C

## Existing Drainage Plan



- NOTES**
- Contractors must check all dimensions on site. Only figured dimensions are to be worked from. Discrepancies must be reported to the Architect or Engineer before proceeding.  
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  - Until technical approval has been obtained from the relevant authorities, all drawings are issued as preliminary and not for construction. Should the Contractor commence site work prior to approval given it is entirely at his own risk.

**SAFETY, HEALTH AND ENVIRONMENTAL**

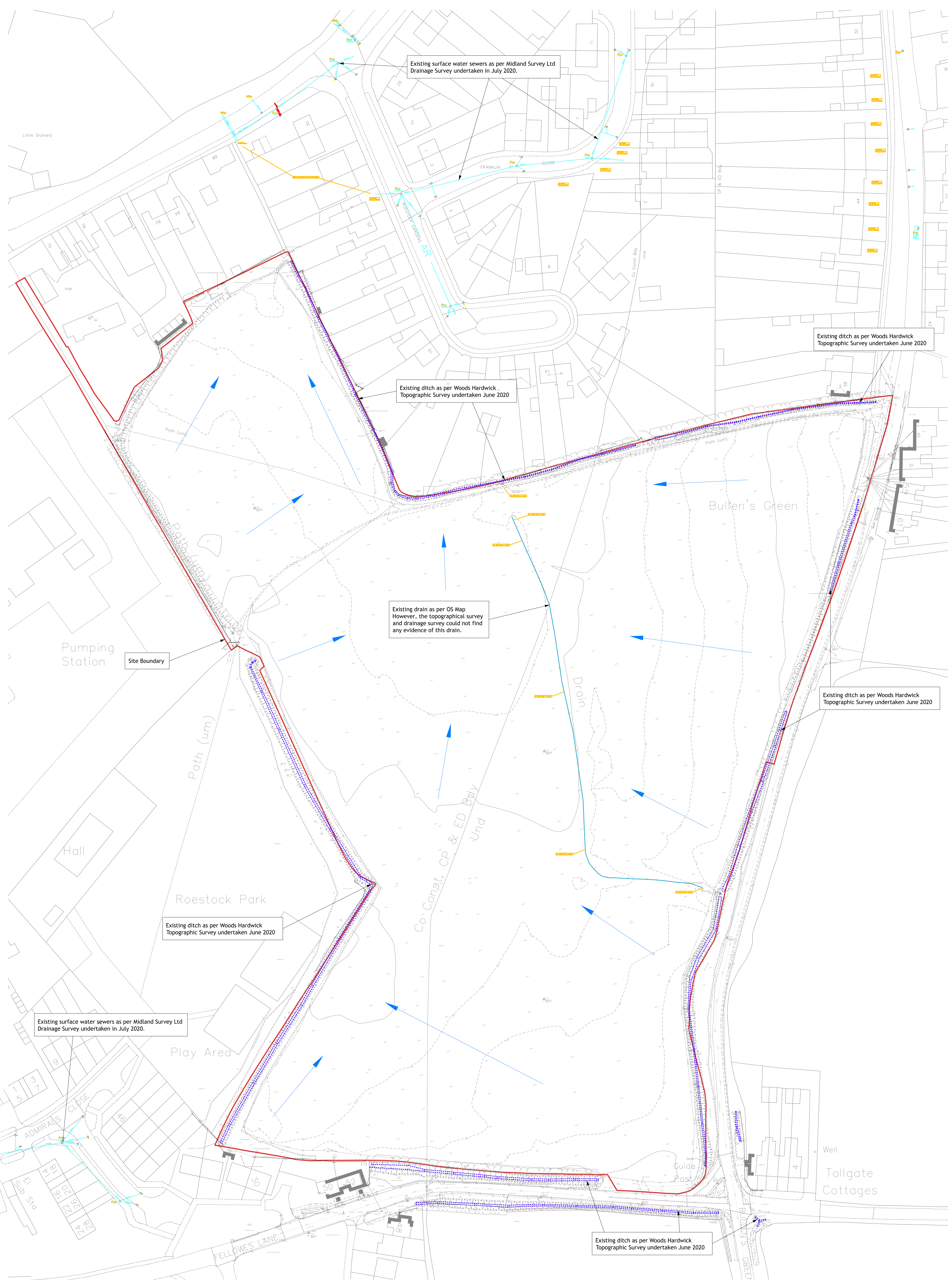
In addition to the hazards, risks normally associated with the type of work detailed on this drawing, note the following significant risks and information.

**Construction:**

- There is an existing HV cable which crosses the site.

For information relating to end use, maintenance, demolition, see the health and safety file.

It is assumed that all works will be carried out by a competent Contractor, where appropriate, to an approved method statement.



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REV	DESCRIPTION	DRN	CHD	DATE	
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<input type="checkbox"/>	CONSTRUCTION	<input type="checkbox"/>	AS BUILT		

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DRAWN: YK      CHK: JGF

DRAWING NO.: 18770-FELL-5-200      REV: -

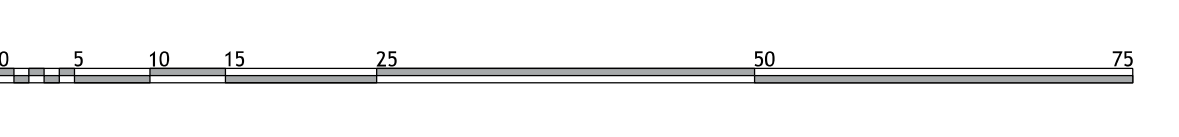
TITLE: Land North of Fellows Lane Colney Heath

DETAILS: Existing Drainage Plan

**Woods Hardwick**  
Architecture | Engineering | Planning | Surveying

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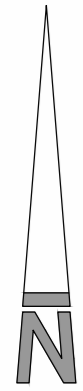


PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS DRAWING

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# Appendix D

## Illustrative Sketch Layout



**NOTES**

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**Key:**

-  Existing Trees & RPAs
-  Existing Listed Building
-  Denotes Existing PRoW
-  Denotes Existing 'walked route'
-  Denotes Existing Drainage
-  Denotes Existing HV Cable
-  Proposed Landscape Buffer
-  Proposed Trees
-  Proposed Green Space
-  Denotes Proposed Site Access
-  Potential Play Space
-  Proposed Location of New Pump Station
-  Denotes Proposed Attenuation
-  Denotes Key/Focal Buildings
-  Denotes New Footpath Route

# DRAFT

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SCALE 1:1000 @ A2 DATE July 2020

DRAWN AJS CHK TF

DRAWING NO. 17981/1005 REV E

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Colney Heath

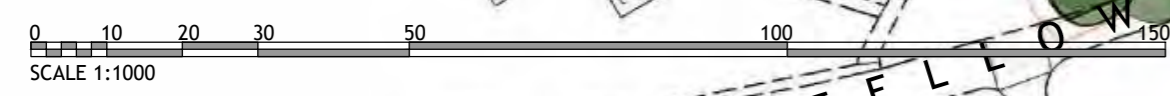
DETAILS Proposed Illustrative Layout

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Architecture | Engineering | Planning | Surveying

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---

# Appendix E

## Environment Agency - Flood Map for Planning



# Flood map for planning

Your reference  
**18770**

Location (easting/northing)  
**521199/205881**

Created  
**12 Jul 2020 23:47**

**Your selected location is in flood zone 1, an area with a low probability of flooding.**

## **This means:**

- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

## **Notes**

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

The Open Government Licence sets out the terms and conditions for using government data.  
<https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>



**Flood map for planning**

Your reference

**18770**

Location (easting/northing)








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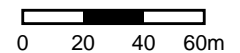
Scale

**1:2500**

Created

**12 Jul 2020 23:47**

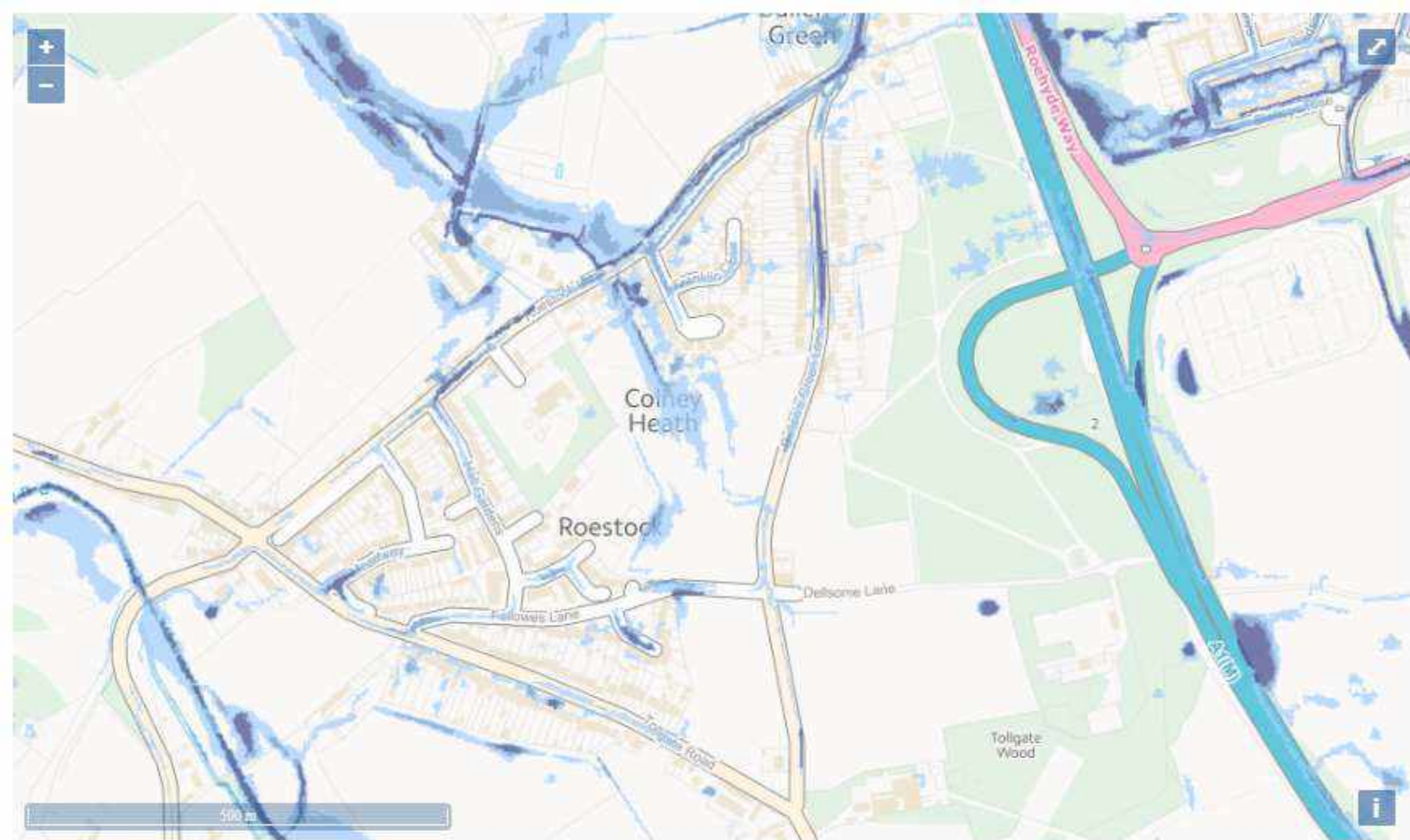
-  Selected point
-  Flood zone 3
-  Flood zone 3: areas benefiting from flood defences
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Flood storage area



---

# Appendix F

## Environment Agency - Surface Water Flood Map



Extent of flooding from surface water:

High Medium Low Very low

---

# Appendix G

## Paddock Geo Engineering Site Investigation Report Extracts

**Land off Fellows Lane, Colney Heath,  
Hertfordshire, AL4 0QQ**

**GROUND INVESTIGATION**



**Canton Ltd**

**July 2020**

**P20-164gi**

---

**Milton Keynes:** The Log Cabin, Manor Farm, Whaddon Road, Newton Longville, Milton Keynes, MK17 0AU

**Swindon/Oxford:** 21 Tyrell Close, Stanford in the Vale, Oxon, SN7 8EY

**T:** 44 (0) 1908 764032

**M:** 44 (0) 7377 422528

**E:** [matt@paddockgeoengineering.co.uk](mailto:matt@paddockgeoengineering.co.uk)

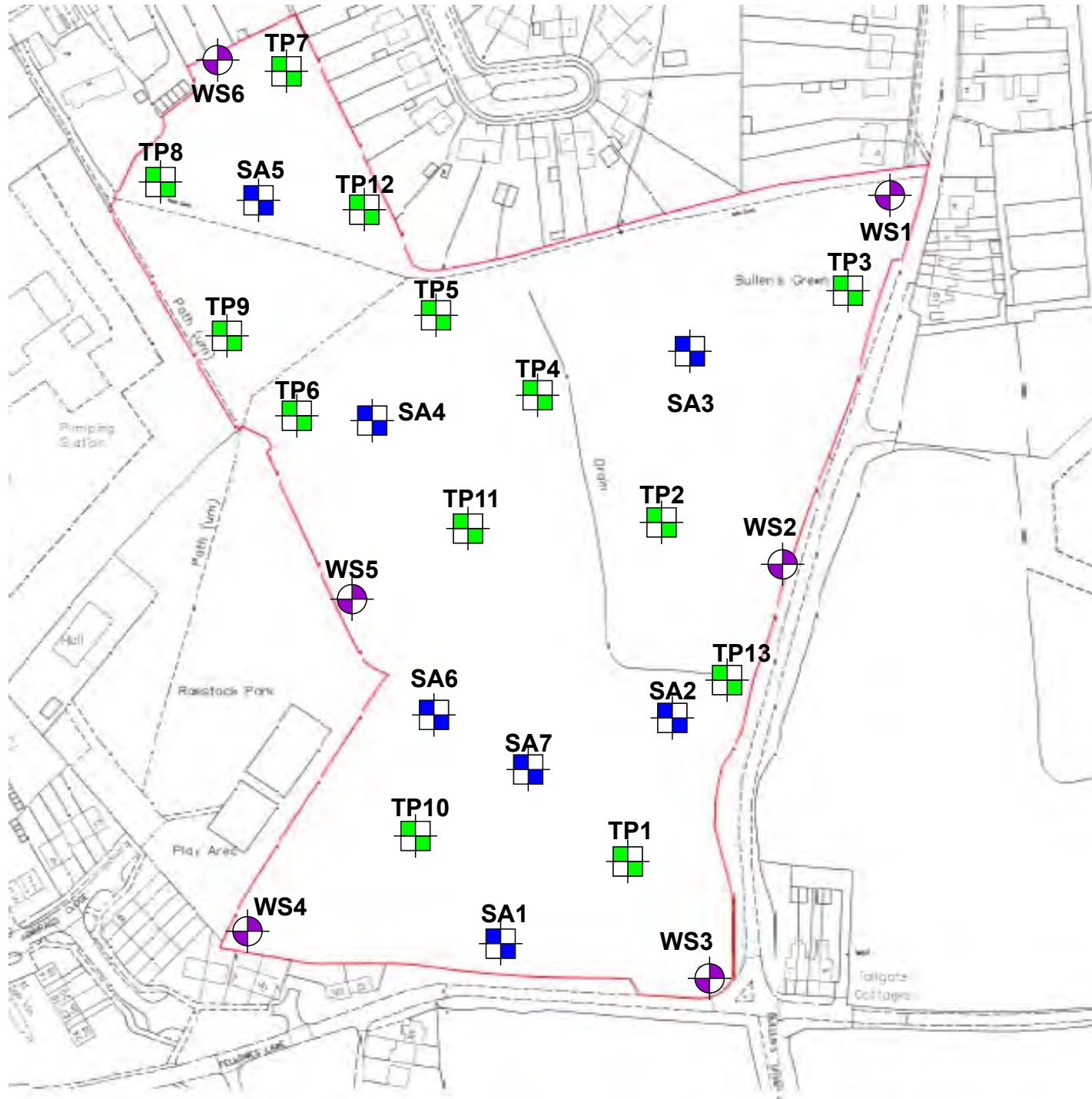
**W:** [www.paddockgeoengineering.co.uk](http://www.paddockgeoengineering.co.uk)




**Exploratory Point  
Location Plan**

**Land off Fellows Lane,  
Colney Heath, Hertfordshire,  
AL4 0QQ.**

**Canton Ltd**

**July 2020**



-  Infiltration testing Locations
-  Trial Pit Locations
-  Window Sample Borehole Locations



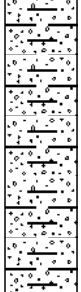
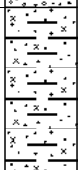




**Not to scale.  
All positions are approximate.  
Based on proposed plan provided  
by the client.**

<b>Excavation Method</b> Percussion Liner Sampling Techniques	<b>Dimensions</b>	<b>Ground Level (mOD)</b>	<b>Client</b> Canton Ltd	<b>Job Number</b> P20-164
	<b>Location</b>	<b>Dates</b> 17/06/2020	<b>Engineer</b> MC	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.10	C				(0.50)	Scrub vegetation onto grey silty gravelly SAND with occasional rootlets. Gravel is flint. (TOPSOIL)			
0.70	SV 31kPa				0.50	Soft orange brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to sub-rounded coal, flint, and sandstone. (WEATHERED LOWESTOFT FORMATION)			
0.70	D								
0.80	C		3,2/2,3,4,4						
1.00-1.45	SPT(C) N=13								
1.20	SV 73kPa								
1.20	D								
1.60	SV 70kPa				(2.80)				
1.60	D								
2.00-2.45	SPT(C) N=21		3,4/5,4,6,6						
2.20	D								
2.60	D								
3.00-3.45	SPT(C) N=22		2,3/5,6,5,6						
3.20	SV 62kPa				3.30	Orange brown clayey SAND. (WEATHERED LOWESTOFT FORMATION)			
3.20	D				(0.20)				
3.50	SV 81kPa				(0.20)				
3.70	D				3.70				
3.70	D				(0.50)	Firm orange brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to sub-rounded coal, flint, and sandstone. (WEATHERED LOWESTOFT FORMATION)			
4.00-4.45	SPT(C) N=9		Water strike(1) at 4.00m. 2,1/2,3,2,2		4.20	Loose orange and red brown occasionally mottled grey and black clayey silty SAND. (WEATHERED LOWESTOFT FORMATION)			
4.20	D								
4.60	SV 42kPa				(0.80)				
4.60	D					Firm grey mottled orange brown variably silty CLAY and silty SAND. (LOWESTOFT FORMATION)			
					5.00	Complete at 5.00m			

<b>Remarks</b> Monitoring standpipe installed upon completion. Groundwater encountered within sand band at 4.0m depth.	<b>Scale (approx)</b>	<b>Logged By</b>
	1:50	SF
	<b>Figure No.</b> P20-164.WS1	















					<b>Site</b> Land off Fellows Lane, Colney Heath, Hertfordshire, AL4 0QQ			<b>Number</b> <b>WS2</b>	
<b>Excavation Method</b> Percussion Liner Sampling Techniques		<b>Dimensions</b>		<b>Ground Level (mOD)</b>	<b>Client</b> Canton Ltd		<b>Job Number</b> P20-164		
		<b>Location</b>		<b>Dates</b> 17/06/2020	<b>Engineer</b> MC		<b>Sheet</b> 1/1		
<b>Depth (m)</b>	<b>Sample / Tests</b>	<b>Water Depth (m)</b>	<b>Field Records</b>	<b>Level (mOD)</b>	<b>Depth (m) (Thickness)</b>	<b>Description</b>	<b>Legend</b>	<b>Water</b>	<b>Instr</b>
0.20	C				(0.40) 0.40	Scrub vegetation onto grey silty gravelly SAND with occasional rootlets. Gravel is flint. (TOPSOIL)			
0.70 0.80 1.00-1.45	D C SPT(C) N=18		3,3/3,4,5,6		(2.00)	Very stiff brown slightly sandy slightly gravelly CLAY with roots. 50mm diameter root at 0.6m depth and roots up to 15mm diameter up to 2.2m depth. Gravel is fine to coarse angular to sub-rounded flint and coal. (WEATHERED LOWESTOFT FORMATION) ...from 1.0m depth, becoming orange brown mottled grey.			
1.20 1.60 1.80 2.00-2.45 2.20 2.60 2.80	D SV 172kPa D SPT(C) N=22 D SV 96kPa D		4,5/5,6,5,6		(1.10)	Firm grey mottled orange brown slightly sandy silty CLAY. (WEATHERED LOWESTOFT FORMATION)			
3.00-3.45 3.20 3.80 4.00-4.45 4.20 4.60 4.80	SPT(C) N=27 D D SPT(C) N=29 D SV 86kPa D		4,4/5,7,8,7  9,8/8,8,5,8		3.50 (0.90) 4.40 (0.60) 5.00	Orange brown, brown and grey clayey SAND. (WEATHERED LOWESTOFT FORMATION)  ...from 4.0m depth, becoming slightly gravelly. Gravel is fine and angular flint.  Stiff dark grey silty CLAY. (LOWESTOFT FORMATION)	   		
						Complete at 5.00m			
<b>Remarks</b> No groundwater encountered. Monitoring standpipe installed upon completion.							<b>Scale (approx)</b> 1:50	<b>Logged By</b> SF	<b>Figure No.</b> P20-164.WS2

<b>Excavation Method</b> Percussion Liner Sampling Techniques	<b>Dimensions</b>	<b>Ground Level (mOD)</b>	<b>Client</b> Canton Ltd	<b>Job Number</b> P20-164
	<b>Location</b>	<b>Dates</b> 17/06/2020	<b>Engineer</b> MC	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.20	C				0.20	Grass onto grey brown slightly sandy slightly gravelly silty CLAY with frequent rootlets. (TOPSOIL)			
0.50	D					Very stiff brown mottled grey and orange brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse rounded to sub-rounded flint. (WEATHERED LOWESTOFT FORMATION) ...from 1.0m depth, becoming orange brown slightly mottled grey.			
0.80	SV 42kPa								
0.90	D		3,4/3,4,5,5		(1.80)				
1.00-1.45	SPT(C) N=17								
1.20	SV 47kPa								
1.20	D								
1.80	D				2.00	Firm orange brown mottled grey slightly gravelly sandy silty CLAY. Gravel is fine to coarse angular to sub-rounded flint. (WEATHERED LOWESTOFT FORMATION)  ...from 3.0m depth, becoming grey mottled orange brown.			
2.00-2.45	SPT(C) N=16		3,3/4,4,4,4						
2.20	SV 62kPa								
2.20	D								
2.80	SV 59kPa				(1.70)				
2.80	D								
3.00-3.45	SPT(C) N=17		3,3/4,4,4,5		3.70	Brown and orange brown clayey SAND. (WEATHERED LOWESTOFT FORMATION)		▽1	
3.20	D								
3.30	SV 69kPa								
3.80	D								
4.00-4.45	SPT(C) N=14		Water strike(1) at 4.00m. 5,5/3,4,4,3		(1.20)				
4.20	D								
4.90	D				4.90	Soft brown slightly sandy silty CLAY. (WEATHERED LOWESTOFT FORMATION)  Complete at 5.00m			
					5.00				

<b>Remarks</b> Groundwater within sand band at 4.0m depth. Monitoring standpipe installed upon completion.	<b>Scale (approx)</b>	<b>Logged By</b>
	1:50	SF
	<b>Figure No.</b> P20-164.WS3	

					<b>Site</b> Land off Fellows Lane, Colney Heath, Hertfordshire, AL4 0QQ			<b>Number</b> <b>WS4</b>	
<b>Excavation Method</b> Percussion Liner Sampling Techniques		<b>Dimensions</b>		<b>Ground Level (mOD)</b>	<b>Client</b> Canton Ltd		<b>Job Number</b> P20-164		
		<b>Location</b>		<b>Dates</b> 17/06/2020	<b>Engineer</b> MC		<b>Sheet</b> 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.20	C				0.20	Grass onto grey slightly sandy slightly gravelly silty CLAY with frequent rootlets. (TOPSOIL)			
0.50	D								
0.80	SV 70kPa				(1.10)	Stiff grey mottled orange brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse angular to sub-rounded coal, flint and sandstone. (WEATHERED LOWESTOFT FORMATION)			
0.80	C								
0.90	D		2,3/2,3,5,12						
1.00-1.45	SPT(C) N=22				1.30	Medium dense orange brown sandy GRAVEL. Gravel is fine to coarse sub-angular to sub-rounded flint. (WEATHERED LOWESTOFT FORMATION)			
1.20	SV 68kPa								
1.20	D								
1.60	D				(0.90)	Orange brown SAND. (WEATHERED LOWESTOFT FORMATION)			
2.00-2.45	SPT(C) N=26		12,11/11,5,5,5		2.20	Stiff grey mottled orange brown sandy CLAY. (LOWESTOFT FORMATION)			
2.20	D		Water strike(1) at 2.20m.		(0.40)	Firm grey mottled orange brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular flint and chalk. (LOWESTOFT FORMATION)			
2.50	D				2.60	Complete at 4.00m			
2.80	SV 64kPa				(0.40)				
2.80	D				3.00				
3.00-3.45	SPT(C) N=13		2,2/3,3,3,4		(1.00)				
3.20	D								
3.30	SV 49kPa								
3.80	D				4.00				
4.00-4.45	SPT(C) N=7		2,2/2,2,1,2						

**Remarks**  
 Groundwater seepages within sand band 2.20-2.60m depth.  
 Monitoring standpipe installed upon completion.

**Scale (approx)**  
 1:50

**Logged By**  
 SF

**Figure No.**  
 P20-164.WS4

<b>Excavation Method</b> Percussion Liner Sampling Techniques	<b>Dimensions</b>	<b>Ground Level (mOD)</b>	<b>Client</b> Canton Ltd	<b>Job Number</b> P20-164
	<b>Location</b>	<b>Dates</b> 17/06/2020	<b>Engineer</b> MC	<b>Sheet</b> 1/1


Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50	SV 26kPa				0.40	Grass onto grey slightly sandy slightly gravelly silty CLAY with frequent rootlets. (TOPSOIL)			
0.80	D				(1.10)	Stiff orange brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded flint, coal and occasional chalk and sandstone. (WEATHERED LOWESTOFT FORMATION)			
1.00-1.45	SPT(C) N=24		3,3/4,6,6,8		1.50	Medium dense orange brown slightly gravelly SAND. Gravel is fine to coarse sub-angular to sub-rounded flint. (WEATHERED LOWESTOFT FORMATION)			
1.20	D		Water strike(1) at 1.50m.		(0.80)	Firm orange brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded flint and occasional chalk and sandstone. (WEATHERED LOWESTOFT FORMATION)			
1.60	D				2.30	Firm orange brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded flint and occasional chalk and sandstone. (WEATHERED LOWESTOFT FORMATION)			
2.00-2.45	SPT(C) N=15		7,6/7,3,3,2		3.00	Soft grey brown and orange brown slightly gravelly sandy CLAY. Gravel is fine to coarse sub-angular to sub-rounded flint. (LOWESTOFT FORMATION)			
2.20	D				(0.70)	...from 3.50m depth, becoming firm.			
2.60	D				3.00	Soft grey brown and orange brown slightly gravelly sandy CLAY. Gravel is fine to coarse sub-angular to sub-rounded flint. (LOWESTOFT FORMATION)			
2.80	SV 49kPa				(2.00)	...from 4.0m depth, becoming stiff.			
3.00-3.45	SPT(C) N=6		1,1/0,1,1,4		5.00	Complete at 5.00m			
3.20	D								
3.60	SV 73kPa								
3.60	D								
4.00-4.45	SPT(C) N=21		2,3/3,4,7,7						
4.20	D								
4.80	D								

<b>Remarks</b> Groundwater seepages within sand 1.50-2.30m depth. Monitoring standpipe installed upon completion.	<b>Scale (approx)</b>	<b>Logged By</b>
	1:50	SF
	<b>Figure No.</b> P20-164.WS5	

<b>Excavation Method</b> Percussion Liner Sampling Techniques	<b>Dimensions</b>		<b>Ground Level (mOD)</b>	<b>Client</b> Canton Ltd	<b>Job Number</b> P20-164
	<b>Location</b>		<b>Dates</b> 17/06/2020	<b>Engineer</b> MC	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.10	C				(0.30) 0.30	Scrub vegetation onto grey slightly sandy slightly gravelly silty CLAY with frequent rootlets. Gravel is flint. (TOPSOIL)			
0.60	SV 55kPa					Firm orange brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded flint, coal and occasional chalk and sandstone. (WEATHERED LOWESTOFT FORMATION)			
0.80 0.90	C D								
1.60 1.60	SV 59kPa D				(2.70)	...from 2.0m depth, becoming stiff.			
2.60 2.60	SV 109kPa D				3.00	Very stiff grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to sub-rounded flint and chalk. (LOWESTOFT FORMATION)			
3.60 3.60	SV 55kPa D				(2.00)				
4.60 4.60	SV 88kPa D				5.00	Complete at 5.00m			

<b>Remarks</b> No groundwater encountered. Monitoring standpipe installed upon completion.	<b>Scale (approx)</b>	<b>Logged By</b>
	1:50	SF
	<b>Figure No.</b> P20-164.WS6	

					<b>Site</b> Land off Fellows Lane, Colney Heath, Hertfordshire, AL4 0QQ		<b>Trial Pit Number</b> <b>TP1</b>	
<b>Excavation Method</b> Machine Excavated Trial Pits		<b>Dimensions</b> 1.70m x 0.35m		<b>Ground Level (mOD)</b>	<b>Client</b> Canton Ltd		<b>Job Number</b> P20-164	
		<b>Location</b>		<b>Dates</b> 17/06/2020- 19/06/2020	<b>Engineer</b> MC		<b>Sheet</b> 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	C				(0.30)	Crops onto dark brown grey slightly sandy slightly gravelly clayey loamy SILT with frequent roots and rootlets. Gravel of fine to coarse angular to sub-rounded flint. (TOPSOIL)		
0.80 0.80 1.00	C D SV 78kPa				0.30	Firm orange brown slightly sandy slightly gravelly silty CLAY. Gravel of fine to medium sub-angular to rounded flint. (WEATHERED LOWESTOFT FORMATION)		
1.60 1.80	D SV 72kPa				(2.10)			
2.20	D				2.40	Complete at 2.40m		



**Remarks**

No groundwater encountered.  
 Trial pit sides remained stable upon completion.

<b>Scale (approx)</b> 1:25	<b>Logged By</b> MC	<b>Figure No.</b> P20-164.TP1
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<b>Excavation Method</b> Machine Excavated Trial Pits	<b>Dimensions</b> 1.70m x 0.35m	<b>Ground Level (mOD)</b>	<b>Client</b> Canton Ltd	<b>Job Number</b> P20-164
	<b>Location</b>	<b>Dates</b> 17/06/2020- 19/06/2020	<b>Engineer</b> MC	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30	C				(0.35)	Crops onto dark brown grey slightly sandy slightly gravelly clayey loamy SILT with frequent roots and rootlets. Gravel of fine to coarse angular to sub-rounded flint. (TOPSOIL)		
0.90 1.00	D SV 91kPa				0.35	Firm to stiff orange brown mottled grey slightly sandy slightly gravelly silty CLAY. Gravel of fine to medium sub-angular to rounded flint. (WEATHERED LOWESTOFT FORMATION)		
1.40	SV 102kPa				(1.85)			
1.50	D							
2.10	D				2.20	Complete at 2.20m		



**Remarks**

Trial pit sides remained stable upon completion.  
 No groundwater encountered.

<b>Scale (approx)</b>	<b>Logged By</b>	<b>Figure No.</b>
1:25	MC	P20-164.TP2

<b>Excavation Method</b> Machine Excavated Trial Pits	<b>Dimensions</b> 1.70m x 0.35m	<b>Ground Level (mOD)</b>	<b>Client</b> Canton Ltd	<b>Job Number</b> P20-164
	<b>Location</b>	<b>Dates</b> 17/06/2020- 19/06/2020	<b>Engineer</b> MC	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	C				(0.30)	Crops onto dark brown grey slightly sandy slightly gravelly clayey loamy SILT with frequent roots and rootlets. Gravel of fine to coarse angular to sub-rounded flint. (TOPSOIL)		
0.70 0.80	D SV 78kPa				0.30 (0.60)	Firm brown to orange brown slightly sandy gravelly silty CLAY with rootlets to 0.50m depth. Gravel of fine to coarse angular to rounded flint. (WEATHERED LOWESTOFT FORMATION)		
1.10	D				0.90 (1.30)	Firm orange brown mottled grey slightly gravelly silty CLAY. Gravel of fine to coarse sub-angular to rounded flint. (WEATHERED LOWESTOFT FORMATION)		
1.80 1.90	SV 67kPa D				2.20	Soft to firm orange brown slightly gravelly very sandy CLAY. Gravel of fine to coarse sub-angular to rounded flint. (WEATHERED LOWESTOFT FORMATION)		▼1
2.40	B		Water strike(1) at 2.20m, fell to 2.40m in 5 mins.		(0.30) 2.50	Complete at 2.50m		▼1




**Remarks**

Trial pit sides remained stable upon completion.  
Groundwater encountered at 2.20m depth, filling trial pit to 2.40m upon completion of excavation.

<b>Scale (approx)</b> 1:25	<b>Logged By</b> MC	<b>Figure No.</b> P20-164.TP3
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					<b>Site</b> Land off Fellows Lane, Colney Heath, Hertfordshire, AL4 0QQ		<b>Trial Pit Number</b> <b>TP4</b>		
<b>Excavation Method</b> Machine Excavated Trial Pits		<b>Dimensions</b> 1.60m x 0.35m		<b>Ground Level (mOD)</b>		<b>Client</b> Canton Ltd		<b>Job Number</b> P20-164	
		<b>Location</b>		<b>Dates</b> 17/06/2020- 19/06/2020		<b>Engineer</b> MC		<b>Sheet</b> 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.30 0.30	C D				(0.40)	Crops onto dark brown grey slightly sandy slightly gravelly silty CLAY with frequent roots and rootlets. Gravel of fine to coarse angular to sub-rounded flint. (TOPSOIL)			
0.50	C				0.40 (0.25)	Firm grey occasionally orange brown slightly sandy slightly gravelly silty CLAY. Gravel of fine to coarse sub-angular to rounded flint. (WEATHERED LOWESTOFT FORMATION)			
0.80 0.80	SV 84kPa D				0.65	Firm orange brown mottled grey slightly sandy silty CLAY with occasional to rare gravel sized sandy pockets throughout. (WEATHERED LOWESTOFT FORMATION)			
1.40	SV 101kPa				(1.55)				
1.80 2.00	D SV 91kPa				2.20	...from 2.0m depth, becoming silty CLAY.			
						Complete at 2.20m			



**Remarks**

No groundwater encountered.  
 Trial pit sides remained stable upon completion.

<b>Scale (approx)</b> 1:25	<b>Logged By</b> MC	<b>Figure No.</b> P20-164.TP4
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					<b>Site</b> Land off Fellows Lane, Colney Heath, Hertfordshire, AL4 0QQ		<b>Trial Pit Number</b> <b>TP5</b>		
<b>Excavation Method</b> Machine Excavated Trial Pits		<b>Dimensions</b> 1.60m x 0.35m		<b>Ground Level (mOD)</b>		<b>Client</b> Canton Ltd		<b>Job Number</b> P20-164	
		<b>Location</b>		<b>Dates</b> 17/06/2020- 19/06/2020		<b>Engineer</b> MC		<b>Sheet</b> 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.40	D				(0.50)	Crops onto dark brown grey slightly sandy slightly gravelly silty CLAY with frequent roots and rootlets. Gravel of fine to coarse angular to sub-rounded flint. (TOPSOIL)			
0.70	D				0.50	Firm orange brown slightly sandy slightly gravelly silty CLAY. Gravel of fine to medium sub-angular to rounded flint. (WEATHERED LOWESTOFT FORMATION)			
0.90	SV 84kPa								
1.60	SV 101kPa				(1.80)				
1.60	D								
2.20	D				2.30	Complete at 2.30m			



**Remarks**

Trial pit sides remained stable upon completion.  
 No groundwater encountered.

<b>Scale (approx)</b> 1:25	<b>Logged By</b> MC	<b>Figure No.</b> P20-164.TP5
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					<b>Site</b> Land off Fellows Lane, Colney Heath, Hertfordshire, AL4 0QQ			<b>Trial Pit Number</b> <b>TP6</b>	
<b>Excavation Method</b> Machine Excavated Trial Pits		<b>Dimensions</b> 1.60m x 0.35m		<b>Ground Level (mOD)</b>	<b>Client</b> Canton Ltd		<b>Job Number</b> P20-164		
		<b>Location</b>			<b>Dates</b> 17/06/2020- 19/06/2020		<b>Engineer</b> MC		<b>Sheet</b> 1/1
<b>Depth (m)</b>	<b>Sample / Tests</b>	<b>Water Depth (m)</b>	<b>Field Records</b>	<b>Level (mOD)</b>	<b>Depth (m) (Thickness)</b>	<b>Description</b>		<b>Legend</b>	<b>Water</b>
0.20	C				0.30	Crops onto dark brown grey slightly sandy slightly gravelly silty CLAY with frequent roots and rootlets. Gravel of fine to coarse angular to sub-rounded flint. (TOPSOIL)			
0.80 0.80 0.80	SV 78kPa C D				1.70	Firm to stiff orange brown mottled grey slightly gravelly silty CLAY with occasional gravel sized sand pockets. Gravel of fine to medium sub-angular to rounded flint. (WEATHERED LOWESTOFT FORMATION)			
1.80 1.80	SV 84kPa D				2.00	Complete at 2.00m			



<b>Remarks</b> Trial pit sides remained stable upon completion. No groundwater encountered.		
<b>Scale (approx)</b> 1:25	<b>Logged By</b> MC	<b>Figure No.</b> P20-164.TP6

<b>Excavation Method</b> Machine Excavated Trial Pits	<b>Dimensions</b> 1.60m x 0.35m	<b>Ground Level (mOD)</b>	<b>Client</b> Canton Ltd	<b>Job Number</b> P20-164
	<b>Location</b>	<b>Dates</b> 17/06/2020- 19/06/2020	<b>Engineer</b> MC	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	C				(0.35)	Crops onto dark brown grey slightly sandy slightly gravelly silty CLAY with frequent roots and rootlets. Gravel of fine to coarse angular to sub-rounded flint. (TOPSOIL)		
0.50	SV 39kPa				0.35	Soft to firm orange brown to mottled grey slightly sandy slightly gravelly silty CLAY. Gravel of fine to coarse sub-angular to rounded flint. (WEATHERED LOWESTOFT FORMATION)		
0.60 0.70	C D				(0.55)			
1.20	D				0.90	Firm brown to grey slightly sandy very gravelly CLAY. Gravel of fine to coarse angular to rounded flint. (WEATHERED LOWESTOFT FORMATION)		
1.40	SV 20kPa				(0.40)			
1.80	SV 20kPa				1.30	Very soft to soft orange brown occasionally grey sandy to very sandy silty CLAY with very clayey sand lenses throughout. (WEATHERED LOWESTOFT FORMATION)		
1.90	D				(1.10)			
2.30	SV 26kPa				2.40	Complete at 2.40m		



**Remarks**

No groundwater encountered.  
 Trial pit sides remained stable upon completion.

<b>Scale (approx)</b>	<b>Logged By</b>	<b>Figure No.</b>
1:25	MC	P20-164.TP6

<b>Excavation Method</b> Machine Excavated Trial Pits	<b>Dimensions</b> 1.60m x 0.35m	<b>Ground Level (mOD)</b>	<b>Client</b> Canton Ltd	<b>Job Number</b> P20-164
	<b>Location</b>	<b>Dates</b> 17/06/2020- 19/06/2020	<b>Engineer</b> MC	<b>Sheet</b> 1/1


Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	D				(0.30)	Crops onto dark brown grey slightly sandy slightly gravelly silty CLAY with frequent roots and rootlets. Gravel of fine to coarse angular to sub-rounded flint. (TOPSOIL)		
0.80 0.80 0.80	SV 91kPa C D				0.30	Firm to stiff orange brown mottled grey slightly gravelly silty CLAY. Gravel of fine to medium sub-angular to rounded flint. (WEATHERED LOWESTOFT FORMATION)		
1.20 1.40	D SV 110kPa				(2.00)	...from 1.0m depth, gravelly silty CLAY with gravel of flint and occasional chalk.		
2.00 2.10	D SV 97kPa				2.30	Complete at 2.30m		



**Remarks**

No groundwater encountered.  
 Trial pit sides remained stable upon completion.

<b>Scale (approx)</b>	<b>Logged By</b>	<b>Figure No.</b>
1:25	MC	P20-164.TP8



					<b>Site</b> Land off Fellows Lane, Colney Heath, Hertfordshire, AL4 0QQ		<b>Trial Pit Number</b> <b>TP9</b>		
<b>Excavation Method</b> Machine Excavated Trial Pits		<b>Dimensions</b> 1.60m x 0.35m		<b>Ground Level (mOD)</b>		<b>Client</b> Canton Ltd		<b>Job Number</b> P20-164	
		<b>Location</b>		<b>Dates</b> 17/06/2020- 19/06/2020		<b>Engineer</b> MC		<b>Sheet</b> 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.20	C				(0.30)	Crops onto dark brown grey slightly sandy slightly gravelly silty CLAY with frequent roots and rootlets. Gravel of fine to coarse angular to sub-rounded flint. (TOPSOIL)			
0.50	SV 39kPa				0.30	Soft to firm orange brown mottled grey slightly sandy slightly gravelly silty CLAY. Gravel of fine to coarse sub-angular to rounded flint. (WEATHERED LOWESTOFT FORMATION)			
0.60	D								
1.00	SV 75kPa				(1.50)				
1.30	D								
1.80	SV 44kPa				1.80	Complete at 1.80m			
1.80	D								




**Remarks**

Trial pit sides remained stable upon completion.  
 No groundwater encountered.

<b>Scale (approx)</b> 1:25	<b>Logged By</b> MC	<b>Figure No.</b> P20-164.TP9
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					<b>Site</b> Land off Fellows Lane, Colney Heath, Hertfordshire, AL4 0QQ		<b>Trial Pit Number</b> <b>TP10</b>		
<b>Excavation Method</b> Machine Excavated Trial Pits		<b>Dimensions</b> 1.60m x 0.35m		<b>Ground Level (mOD)</b>		<b>Client</b> Canton Ltd		<b>Job Number</b> P20-164	
		<b>Location</b>		<b>Dates</b> 17/06/2020- 19/06/2020		<b>Engineer</b> MC		<b>Sheet</b> 1/1	
<b>Depth (m)</b>	<b>Sample / Tests</b>	<b>Water Depth (m)</b>	<b>Field Records</b>	<b>Level (mOD)</b>	<b>Depth (m) (Thickness)</b>	<b>Description</b>		<b>Legend</b>	<b>Water</b>
0.30	D				(0.40)	Crops onto dark brown grey slightly sandy slightly gravelly silty CLAY with frequent roots and rootlets. Gravel of fine to coarse angular to sub-rounded flint. (TOPSOIL)			
0.90 0.90 0.90	SV 88kPa C D				0.40	Firm to stiff orange brown mottled grey slightly gravelly to gravelly silty CLAY. Gravel of fine to medium sub-angular to rounded flint. (WEATHERED LOWESTOFT FORMATION)			
1.90	D				(1.70)				
2.20	D				2.10 (0.20) 2.30	Medium dense orange brown slightly clayey to clayey very gravelly SAND. Gravel of fine to coarse angular to rounded flint. (WEATHERED LOWESTOFT FORMATION)			
						Complete at 2.30m			
						<b>Remarks</b> No groundwater encountered. Trial pit sides remained stable upon completion.			
<b>Scale (approx)</b> 1:25			<b>Logged By</b> MC		<b>Figure No.</b> P20-164.TP10				

					<b>Site</b> Land off Fellows Lane, Colney Heath, Hertfordshire, AL4 0QQ		<b>Trial Pit Number</b> <b>TP11</b>		
<b>Excavation Method</b> Machine Excavated Trial Pits		<b>Dimensions</b> 1.60m x 0.35m		<b>Ground Level (mOD)</b>		<b>Client</b> Canton Ltd		<b>Job Number</b> P20-164	
		<b>Location</b>		<b>Dates</b> 17/06/2020- 19/06/2020		<b>Engineer</b> MC		<b>Sheet</b> 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.40	D				(0.50)	Crops onto dark brown grey slightly sandy slightly gravelly silty CLAY with frequent roots and rootlets. Gravel of fine to coarse angular to sub-rounded flint. (TOPSOIL)			
0.90 0.90	SV 109kPa D				0.50	Stiff orange brown occasional mottled grey slightly gravelly silty CLAY. Gravel of fine to coarse sub-angular to rounded flint. (WEATHERED LOWESTOFT FORMATION)			
1.60 1.60	SV 104kPa D				(1.70)				
2.00	SV 117kPa								
2.10	D				2.20	Complete at 2.20m			




**Remarks**

Trial pit sides remained stable upon completion.  
 No groundwater encountered.

<b>Scale (approx)</b> 1:25	<b>Logged By</b> MC	<b>Figure No.</b> P20-164.TP11
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					<b>Site</b> Land off Fellows Lane, Colney Heath, Hertfordshire, AL4 0QQ		<b>Trial Pit Number</b> <b>TP12</b>		
<b>Excavation Method</b> Machine Excavated Trial Pits		<b>Dimensions</b> 1.60m x 0.35m		<b>Ground Level (mOD)</b>		<b>Client</b> Canton Ltd		<b>Job Number</b> P20-164	
		<b>Location</b>		<b>Dates</b> 17/06/2020- 19/06/2020		<b>Engineer</b> MC		<b>Sheet</b> 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.70 0.70	SV 65kPa D				(0.50) 0.50	Crops onto dark brown grey slightly sandy slightly gravelly silty CLAY with frequent roots and rootlets. Gravel of fine to coarse angular to sub-rounded flint. (TOPSOIL)			
1.60 1.60	SV 62kPa D				(1.80)	Firm to stiff orange brown slightly gravelly to gravelly silty CLAY. Gravel of fine to coarse sub-angular to rounded flint. (WEATHERED LOWESTOFT FORMATION)			
2.00	SV 75kPa					...from 2.0m depth, becoming sandy.			
2.20	D				2.30	Complete at 2.30m			



**Remarks**

No groundwater encountered.  
 Trial pit sides remained stable upon completion.

<b>Scale (approx)</b> 1:25	<b>Logged By</b> MC	<b>Figure No.</b> P20-164.TP12
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					<b>Site</b> Land off Fellows Lane, Colney Heath, Hertfordshire, AL4 0QQ			<b>Trial Pit Number</b> <b>TP13</b>	
<b>Excavation Method</b> Machine Excavated Trial Pits		<b>Dimensions</b> 1.80m x 1.30m		<b>Ground Level (mOD)</b>		<b>Client</b> Canton Ltd		<b>Job Number</b> P20-164	
		<b>Location</b>		<b>Dates</b> 17/06/2020- 19/06/2020		<b>Engineer</b> MC		<b>Sheet</b> 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.70 0.70	C D				(0.90)	Vegetation onto brown to dark brown slightly sandy slightly gravelly silty CLAY with roots and rootlets. Gravel of clayware pipe, plastic and flint. (MADE GROUND)			
1.20 1.20	C D				0.90 (0.40) 1.30	Firm orange brown occasionally grey slightly gravelly silty CLAY. Gravel of fine to coarse sub-angular to rounded flint. (WEATHERED LOWESTOFT FORMATION) ...at 0.90m depth, black ribbed plastic drainage pipe.			
						Complete at 1.30m			



**Remarks**

Trial pit sides remained stable upon completion.  
 Significant water inflow at 0.90m depth from historical black ribbed plastic drainage pipe.

<b>Scale (approx)</b> 1:25	<b>Logged By</b> MC	<b>Figure No.</b> P20-164.TP13
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					<b>Site</b> Land off Fellows Lane, Colney Heath, Hertfordshire, AL4 0QQ		<b>Trial Pit Number</b> <b>SA1</b>		
<b>Excavation Method</b> Machine Excavated Trial Pits		<b>Dimensions</b> 1.30m x 0.35m		<b>Ground Level (mOD)</b>		<b>Client</b> Canton Ltd		<b>Job Number</b> P20-164	
		<b>Location</b>		<b>Dates</b> 17/06/2020- 19/06/2020		<b>Engineer</b> MC		<b>Sheet</b> 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.30	C				0.35	Crops onto dark brown grey slightly sandy slightly gravelly clayey loamy SILT with frequent roots and rootlets. Gravel of fine to coarse angular to sub-rounded flint. (TOPSOIL)			
0.80	D				1.55	Stiff pale to orange brown gravelly CLAY with roots to 1.10m depth. Gravel of fine to coarse rounded to sub-angular flint. (WEATHERED LOWESTOFT FORMATION) ...from 0.60m depth, becoming dark orange brown to grey brown.			
1.30	D								
1.80	D				1.90	Complete at 1.90m			



**Remarks**


No groundwater encountered.  
 Trial pit sides remained stable upon completion.  
 Infiltration testing undertaken.

<b>Scale (approx)</b> 1:25	<b>Logged By</b> MC	<b>Figure No.</b> P20-164.SA1
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					<b>Site</b> Land off Fellows Lane, Colney Heath, Hertfordshire, AL4 0QQ			<b>Trial Pit Number</b> <b>SA2</b>
<b>Excavation Method</b> Machine Ecvated Trial Pits		<b>Dimensions</b> 1.30m x 0.35m		<b>Ground Level (mOD)</b>	<b>Client</b> Canton Ltd		<b>Job Number</b> P20-164	
		<b>Location</b>		<b>Dates</b> 17/06/2020- 19/06/2020	<b>Engineer</b> MC		<b>Sheet</b> 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.40	D				(0.20) 0.20	Crops onto dark brown grey slightly sandy slightly gravelly clayey loamy SILT with frequent roots and rootlets. Gravel of fine to coarse angular to sub-rounded flint. (TOPSOIL)		
0.60	SV 89kPa				(0.60)	Stiff grey to orange brown slightly gravelly silty CLAY with rootlets to 0.50m depth. Gravel of fine to medium rounded to sub-angular flint. (WEATHERED LOWESTOFT FORMATION)		
1.00 1.00	SV 96kPa D				0.80  (0.70)	Stiff orange brown mottled grey slightly gravelly silty CLAY. Gravel of fine to medium rounded to sub-angular flint. (WEATHERED LOWESTOFT FORMATION)		
					1.50	Complete at 1.50m		



<b>Remarks</b> Infiltration testing undertaken. Trial pit sides remained stable upon completion. No groundwater encountered.		
<b>Scale (approx)</b> 1:25	<b>Logged By</b> MC	<b>Figure No.</b> P20-164.SA2

					<b>Site</b> Land off Fellows Lane, Colney Heath, Hertfordshire, AL4 0QQ		<b>Trial Pit Number</b> <b>SA3</b>		
<b>Excavation Method</b> Machine Excavated Trial Pits		<b>Dimensions</b> 1.30m x 0.35m		<b>Ground Level (mOD)</b>		<b>Client</b> Canton Ltd		<b>Job Number</b> P20-164	
		<b>Location</b>		<b>Dates</b> 17/06/2020- 19/06/2020		<b>Engineer</b> MC		<b>Sheet</b> 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.30	C				(0.40)	Crops onto dark brown grey slightly sandy slightly gravelly clayey loamy SILT with frequent roots and rootlets. Gravel of fine to coarse angular to sub-rounded flint. (TOPSOIL)			
0.70 0.70	SV 93kPa D				0.40  (1.10)	Firm to stiff orange brown mottled grey slightly gravelly to gravelly silty CLAY with rootlets to 0.60m depth. Gravel of fine to medium sub-angular to rounded flint. (WEATHERED LOWESTOFT FORMATION)			
1.20	SV 102kPa								
1.40	D				1.50	Complete at 1.50m			



**Remarks**

No groundwater encountered.  
 Trial pit sides remained stable upon completion.  
 Infiltration testing undertaken.

<b>Scale (approx)</b> 1:25	<b>Logged By</b> MC	<b>Figure No.</b> P20-164.SA3
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<b>Excavation Method</b> Machine Excavated Trial Pits	<b>Dimensions</b> 1.30m x 0.35m	<b>Ground Level (mOD)</b>	<b>Client</b> Canton Ltd	<b>Job Number</b> P20-164
	<b>Location</b>	<b>Dates</b> 17/06/2020- 19/06/2020	<b>Engineer</b> MC	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D				(0.70)	Crops onto dark brown grey slightly sandy slightly gravelly clayey loamy SILT with frequent roots and rootlets to 0.50m depth. Gravel of fine to coarse angular to sub-rounded flint. (TOPSOIL)		
1.00	D				0.70	Stiff grey to orange brown slightly gravelly silty CLAY. Gravel of fine to coarse sub-angular to rounded flint. (WEATHERED LOWESTOFT FORMATION)		
1.30	SV 78kPa				(1.30)	...from 1.20m depth, becoming orange brown occasionally grey.		
1.80 1.80	SV 78kPa D				2.00	Complete at 2.00m		




**Remarks**

No groundwater encountered.  
Trial pit sides remained stable upon completion.  
Infiltration testing undertaken.

<b>Scale (approx)</b> 1:25	<b>Logged By</b> MC	<b>Figure No.</b> P20-164.SA4
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					<b>Site</b> Land off Fellows Lane, Colney Heath, Hertfordshire, AL4 0QQ			<b>Trial Pit Number</b> <b>SA6</b>	
<b>Excavation Method</b> Machine Excavated Trial Pits		<b>Dimensions</b> 1.30m x 0.35m		<b>Ground Level (mOD)</b>		<b>Client</b> Canton Ltd		<b>Job Number</b> P20-164	
		<b>Location</b>		<b>Dates</b> 17/06/2020- 19/06/2020		<b>Engineer</b> MC		<b>Sheet</b> 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.30	D				(0.40)	Crops onto dark brown grey slightly sandy slightly gravelly clayey loamy SILT with frequent roots and rootlets. Gravel of fine to coarse angular to sub-rounded flint. (TOPSOIL)			
0.70	D				(0.50)	Firm grey slightly sandy slightly gravelly silty CLAY. Gravel of fine to coarse sub-angular to rounded flint. (WEATHERED LOWESTOFT FORMATION)			
1.50	D				(1.10)	Firm to stiff orange brown slightly gravelly silty CLAY with occasional gravel sized pockets of sand. Gravel of fine to coarse sub-angular to rounded flint. (WEATHERED LOWESTOFT FORMATION)			
					2.00	Complete at 2.00m			




**Remarks**

No groundwater encountered.  
 Trial pit sides remained stable upon completion.  
 Infiltration testing undertaken.

<b>Scale (approx)</b> 1:25	<b>Logged By</b> MC	<b>Figure No.</b> P20-164.SA6
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					<b>Site</b> Land off Fellows Lane, Colney Heath, Hertfordshire, AL4 0QQ		<b>Trial Pit Number</b> <b>SA7</b>	
<b>Excavation Method</b> Machine Excavated Trial Pits		<b>Dimensions</b> 1.30m x 0.35m		<b>Ground Level (mOD)</b>	<b>Client</b> Canton Ltd		<b>Job Number</b> P20-164	
		<b>Location</b>		<b>Dates</b> 17/06/2020- 19/06/2020	<b>Engineer</b> MC		<b>Sheet</b> 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00	SV 106kPa				0.50	Crops onto dark brown grey slightly sandy slightly gravelly clayey loamy SILT with frequent roots and rootlets. Gravel of fine to coarse angular to sub-rounded flint. (TOPSOIL)		
1.40	SV 117kPa				1.00	Firm to stiff orange brown mottled grey slightly sandy slightly gravelly silty CLAY. Gravel of fine to coarse sub-angular to rounded flint. (WEATHERED LOWESTOFT FORMATION)		
					1.50	Complete at 1.50m		



**Remarks**

No groundwater encountered.  
 Trial pit sides remained stable upon completion.  
 Infiltration testing undertaken.

<b>Scale (approx)</b> 1:25	<b>Logged By</b> MC	<b>Figure No.</b> P20-164.SA7
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## Infiltration Test to BRE365 - SA1 TEST 1

### Field Data

**Location:** SA1  
**Weather:** Overcast  
**Engineer:** MC  
**Date:** 17/06/2020

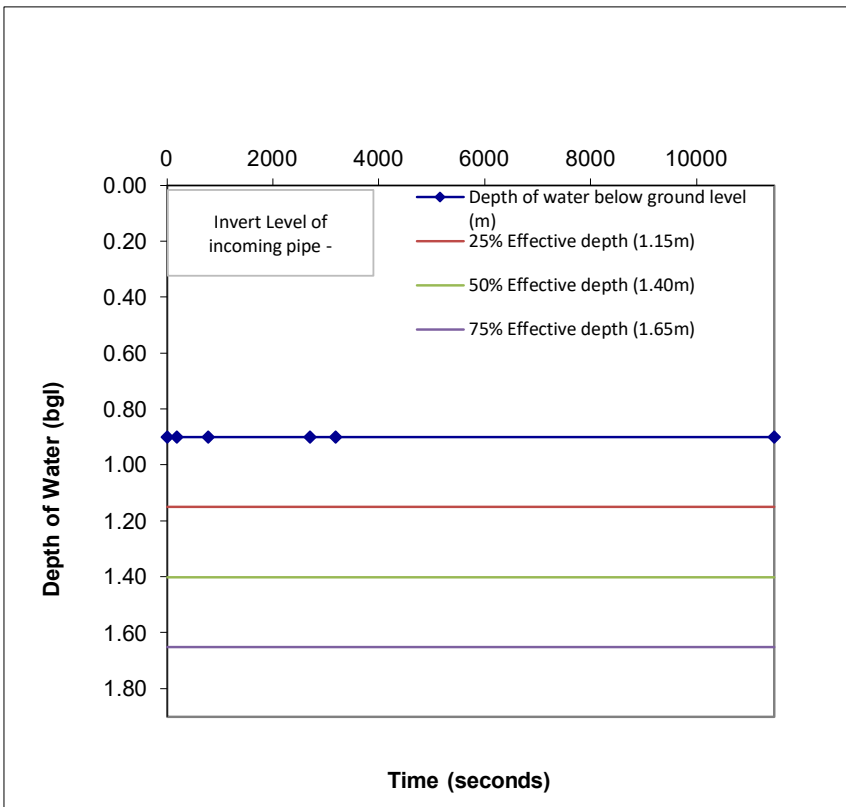
**TEST 1**

Time	Time Elapsed (min)	Time Elapsed (sec)	Depth of Water below GL (m)
10:35	0.0	0	0.90
10:38	3.0	180	0.90
10:48	13.0	780	0.90
11:20	45.0	2700	0.90
11:28	53.0	3180	0.90
13:46	191.0	11460	0.90

**Strata Tested** Weathered Lowestoft Formation

1.3m	SA1 - 1.9 m depth Assume invert level of incoming drain is 0.9m bgl. Effective depth = 1m	<b>Pit Depths (m bgl)</b>
		<b>Length</b> 1.3 <b>Width</b> 0.35 <b>Depth</b> 1.9 <b>25% Effective Depth</b> 1.15 <b>75% Effective Depth</b> 1.65 <b>Inlet Depth</b> 0.9
0.35m		

Linear extrapolated values for calculation



### CALCULATION:

$$\text{Soil Infiltration Rate}(f) = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Where:

$$V_{p75-25} = \text{effective storage volume between 75\% and 25\% effective depth}$$

$$1.3 \times 0.35 \times (1.65 - 1.15) = \mathbf{0.2275}$$

$$a_{p50} = \text{internal area of TP upto 50\% effective depth + base of TP}$$

$$2(1.3 \times 0.35) + 2(0.35 \times 0.35) + (1.3 \times 0.35) = \mathbf{2.105}$$

$$t_{p75-25} = \text{the time for water level to fall from 75\% - 25\% effective depth}$$

$$= \gggg \text{ secs}$$

$$f = \mathbf{N/A} \text{ m/s}$$

### Comment

Insufficient infiltration over three hours - Soakaway Failed



**Client:** Canton Ltd  
**Project No:** P20-164  
**Project:** Land off Fellows Lane,  
 Colney Heath, Hertfordshire,  
 AL4 0QQ

# Infiltration Test to BRE365 - SA2 TEST 1

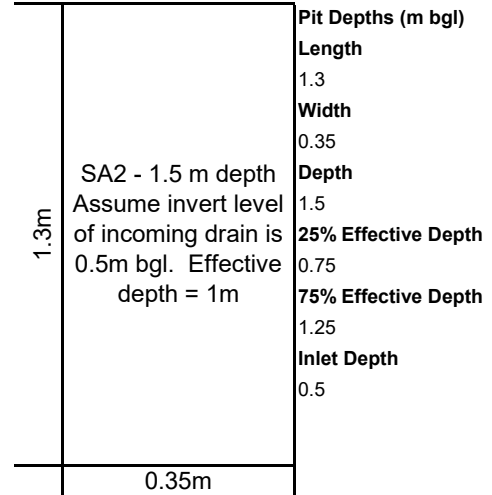
## Field Data

**Location:** SA2  
**Weather:** Overcast  
**Engineer:** MC  
**Date:** 17/06/2020

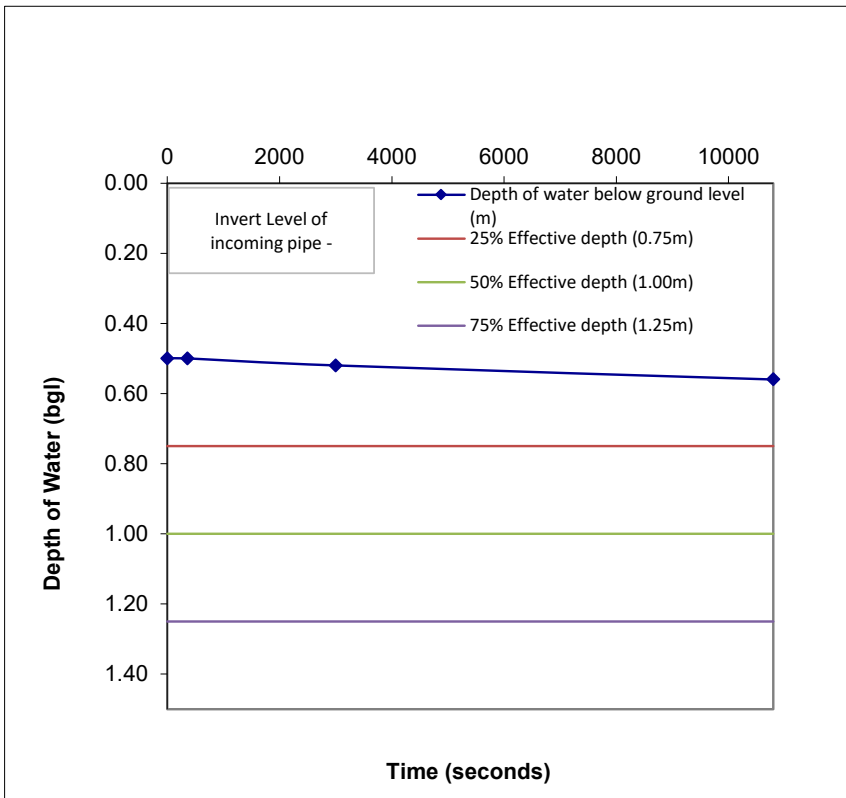
**TEST 1**

Time	Time Elapsed (min)	Time Elapsed (sec)	Depth of Water below GL (m)
11:20	0.0	0	0.50
11:26	6.0	360	0.50
12:10	50.0	3000	0.52
14:20	180.0	10800	0.56

**Strata Tested** Weathered Lowestoft Formation



Linear extrapolated values for calculation



### CALCULATION:

$$\text{Soil Infiltration Rate}(f) = V_{p75-25} / (a_{p50} \times t_{p75-25})$$

Where:

$V_{p75-25}$  = effective storage volume between 75% and 25% effective depth  
 $1.3 \times 0.35 \times (1.25 - 0.75)$   
 $= 0.2275$

$$a_{p50} = \text{internal area of TP upto 50\% effective depth} + \text{base of TP}$$

$$2(1.3 \times 1.0) + 2(0.35 \times 1.0) + (1.3 \times 0.35)$$

$$= 2.105$$

$t_{p75-25}$  = the time for water level to fall from 75% - 25% effective depth  
 $= >>>>$  secs

$$f = \text{N/A} \quad \text{m/s}$$

### Comment

Insufficient infiltration over three hours - Soakaway Failed



**Client:** Canton Ltd  
**Project No:** P20-164  
**Project:** Land off Fellows Lane,  
 Colney Heath, Hertfordshire,  
 AL4 0QQ

## Infiltration Test to BRE365 - SA3 TEST 1

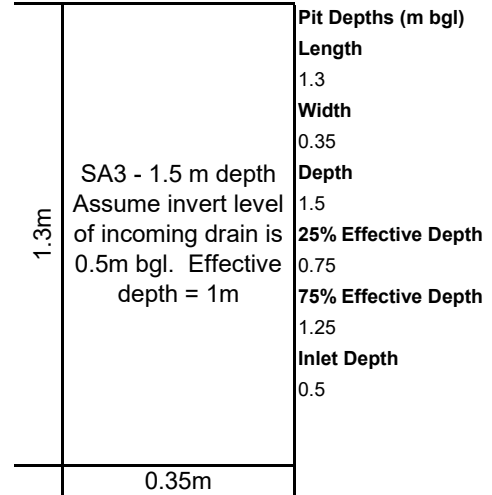
### Field Data

**Location:** SA3  
**Weather:** Overcast  
**Engineer:** MC  
**Date:** 17/06/2020

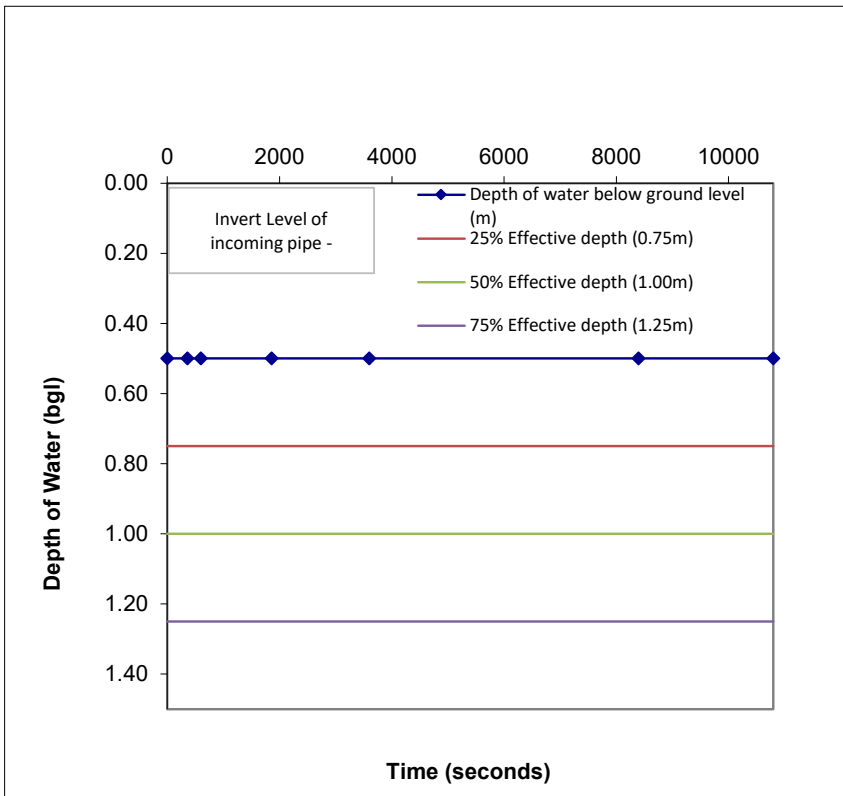
**TEST 1**

Time	Time Elapsed (min)	Time Elapsed (sec)	Depth of Water below GL (m)
12:00	0.0	0	0.50
12:06	6.0	360	0.50
12:10	10.0	600	0.50
12:31	31.0	1860	0.50
13:00	60.0	3600	0.50
14:20	140.0	8400	0.50
15:00	180.0	10800	0.50

**Strata Tested** Weathered Lowestoft Formation



Linear extrapolated values for calculation



### CALCULATION:

$$\text{Soil Infiltration Rate}(f) = V_{p75-25} / (ap_{50} \times t_{p75-25})$$

Where:

$V_{p75-25}$  = effective storage volume between 75% and 25% effective depth  
 $1.3 \times 0.35 \times (1.25 - 0.75)$   
 $= 0.2275$

$$ap_{50} = \text{internal area of TP upto 50\% effective depth + base of TP}$$

$$2(1.3 \times 1.0) + 2(0.35 \times 1.0) + (1.3 \times 0.35)$$

$$= 2.105$$

$t_{p75-25}$  = the time for water level to fall from 75% - 25% effective depth  
 $= >>>>$  secs

$$f = \text{N/A} \quad \text{m/s}$$

### Comment

Insufficient infiltration three hours - Soakaway Failed



**Client:** Canton Ltd  
**Project No:** P20-164  
**Project:** Land off Fellows Lane,  
 Colney Heath, Hertfordshire,  
 AL4 0QQ

## Infiltration Test to BRE365 - SA4 TEST 1

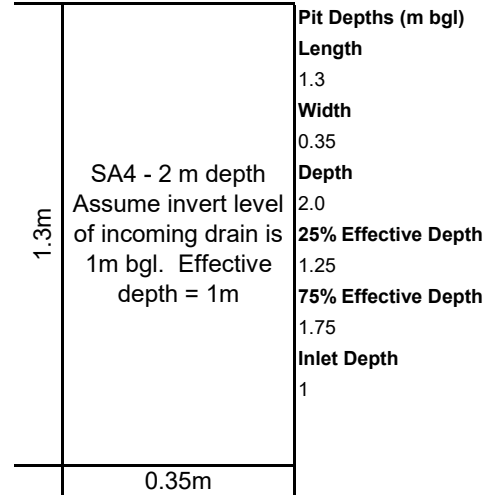
### Field Data

**Location:** SA4  
**Weather:** Overcast  
**Engineer:** MC  
**Date:** 17/06/2020

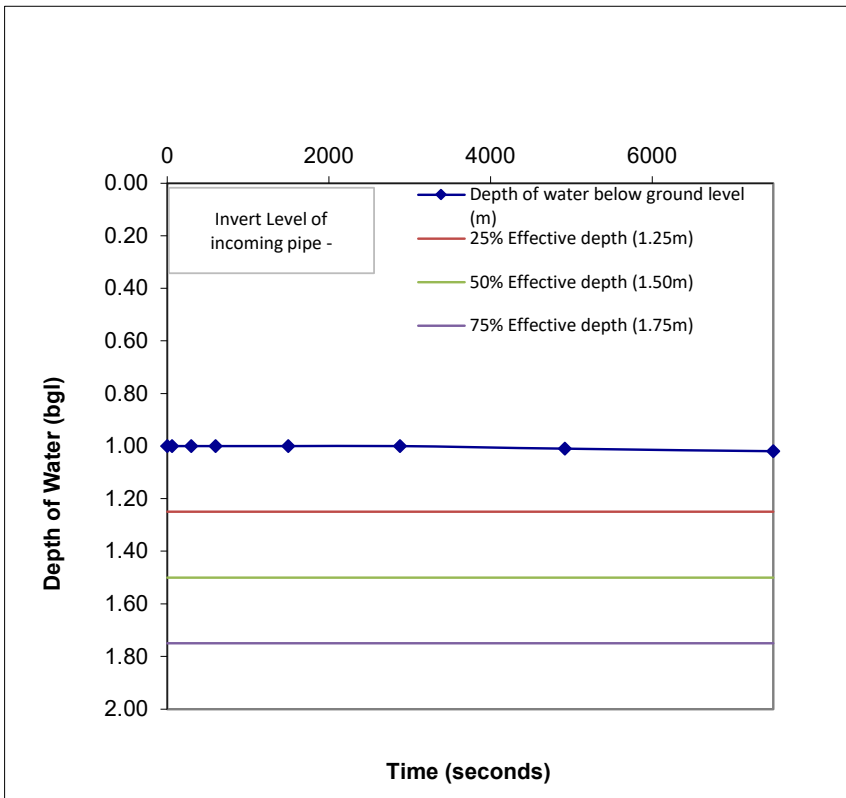
**TEST 1**

Time	Time Elapsed (min)	Time Elapsed (sec)	Depth of Water below GL (m)
13:00	0.0	0	1.00
13:01	1.0	60	1.00
13:05	5.0	300	1.00
13:10	10.0	600	1.00
13:25	25.0	1500	1.00
13:48	48.0	2880	1.00
14:22	82.0	4920	1.01
15:05	125.0	7500	1.02

**Strata Tested** Weathered Lowestoft Formation



Linear extrapolated values for calculation



### CALCULATION:

$$\text{Soil Infiltration Rate}(f) = \frac{V_{p75-25}}{(ap_{50} \times t_{p75-25})}$$

Where:

$V_{p75-25}$  = effective storage volume between 75% and 25% effective depth  
 $1.3 \times 0.35 \times (1.75 - 1.25)$   
 = **0.2275**

$$ap_{50} = \text{internal area of TP upto 50\% effective depth} + \text{base of TP}$$

$$2(1.3 \times 1.5) + 2(0.35 \times 1.5) + (1.3 \times 0.35)$$

$$= \mathbf{2.105}$$

$t_{p75-25}$  = the time for water level to fall from 75% - 25% effective depth  
 = >>>> secs

$$f = \mathbf{N/A} \quad \text{m/s}$$

### Comment

Insufficient infiltration over two hours - Soakaway Failed



**Client:** Canton Ltd  
**Project No:** P20-164  
**Project:** Land off Fellows Lane,  
 Colney Heath, Hertfordshire,  
 AL4 0QQ

# Infiltration Test to BRE365 - SA5 TEST 1

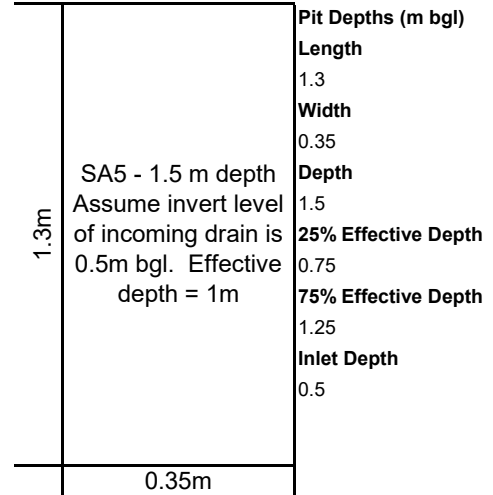
## Field Data

**Location:** SA5  
**Weather:** Overcast  
**Engineer:** MC  
**Date:** 17/06/2020

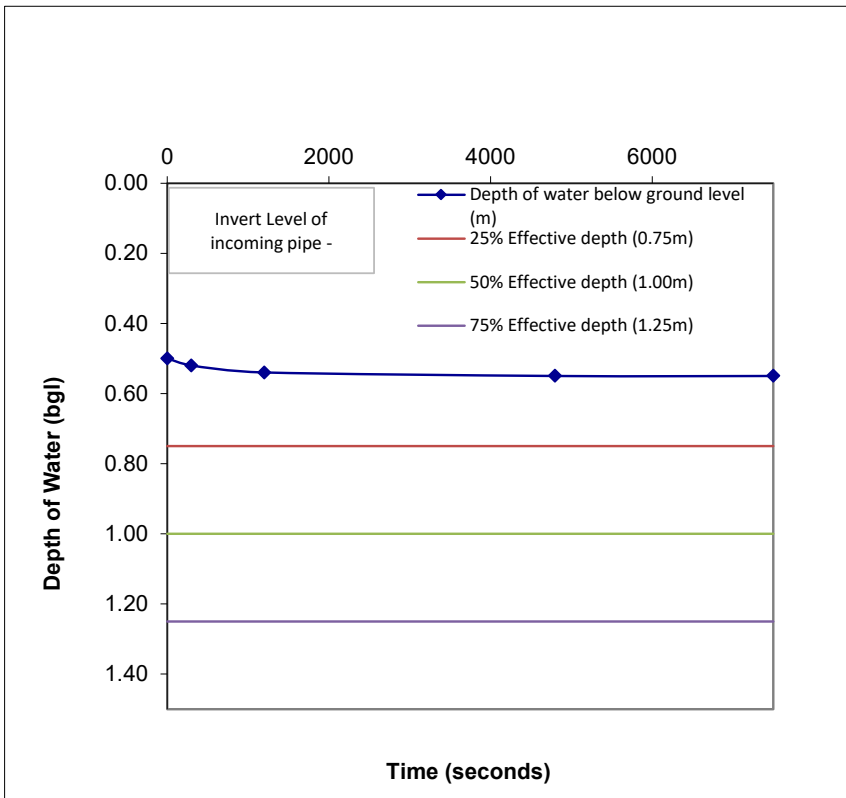
**TEST 1**

Time	Time Elapsed (min)	Time Elapsed (sec)	Depth of Water below GL (m)
13:05	0.0	0	0.50
13:10	5.0	300	0.52
13:25	20.0	1200	0.54
14:25	80.0	4800	0.55
15:10	125.0	7500	0.55

**Strata Tested** Weathered Lowestoft Formation



Linear extrapolated values for calculation



### CALCULATION:

$$\text{Soil Infiltration Rate}(f) = V_{p75-25} / (ap_{50} \times t_{p75-25})$$

Where:

$$V_{p75-25} = \text{effective storage volume between 75\% and 25\% effective depth}$$

$$1.3 \times 0.35 \times (1.25 - 0.75) = \mathbf{0.2275}$$

$$ap_{50} = \text{internal area of TP upto 50\% effective depth + base of TP}$$

$$2(1.3 \times 1.0) + 2(0.35 \times 1.0) + (1.3 \times 0.35) = \mathbf{2.105}$$

$$t_{p75-25} = \text{the time for water level to fall from 75\% - 25\% effective depth}$$

$$= \mathbf{>>>>} \text{ secs}$$

$$f = \mathbf{N/A} \text{ m/s}$$

### Comment

Insufficient infiltration over two hours - Soakaway Failed



**Client:** Canton Ltd  
**Project No:** P20-164  
**Project:** Land off Fellows Lane,  
 Colney Heath, Hertfordshire,  
 AL4 0QQ

# Infiltration Test to BRE365 - SA6 TEST 1

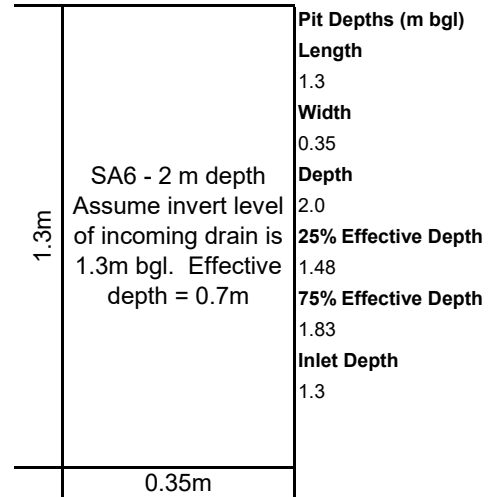
## Field Data

**Location:** SA6  
**Weather:** Overcast  
**Engineer:** MC  
**Date:** 17/06/2020

**TEST 1**

Time	Time Elapsed (min)	Time Elapsed (sec)	Depth of Water below GL (m)
13:22	0.0	0	1.30
13:25	3.0	180	1.30
13:30	8.0	480	1.30
13:45	23.0	1380	1.30
13:55	33.0	1980	1.30
14:26	64.0	3840	1.30
15:22	120.0	7200	1.30
16:24	182.0	10920	1.30

**Strata Tested** Weathered Lowestoft Formation



Linear extrapolated values for calculation

## CALCULATION:

$$\text{Soil Infiltration Rate}(f) = \frac{V_{p75-25}}{(ap_{50} \times t_{p75-25})}$$

Where:

$V_{p75-25}$  = effective storage volume between 75% and 25% effective depth  
 $1.3 \times 0.35 \times (1.825 - 1.475)$

$$= 0.15925$$

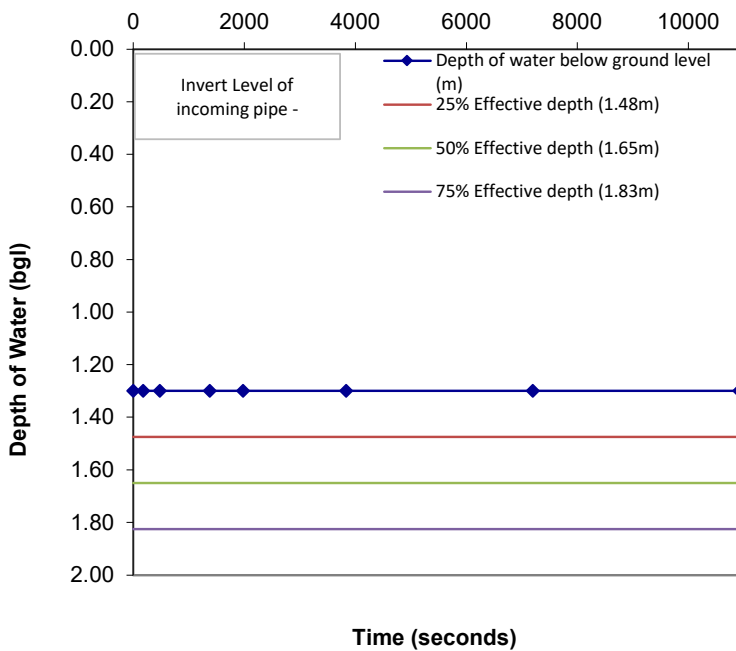
$ap_{50}$  = internal area of TP upto 50% effective depth + base of TP  
 $2(1.3 \times ) + 2(0.35 \times ) + (1.3 \times 0.35)$   
 $= 1.61$

$t_{p75-25}$  = the time for water level to fall from 75% - 25% effective depth  
 $= >>>>$  secs

$$f = \text{N/A} \quad \text{m/s}$$

## Comment

Insufficient infiltration over three hours - Soakaway Failed



**Client:** Canton Ltd  
**Project No:** P20-164  
**Project:** Land off Fellows Lane,  
 Colney Heath, Hertfordshire,  
 AL4 0QQ

## Infiltration Test to BRE365 - SA7 TEST 1

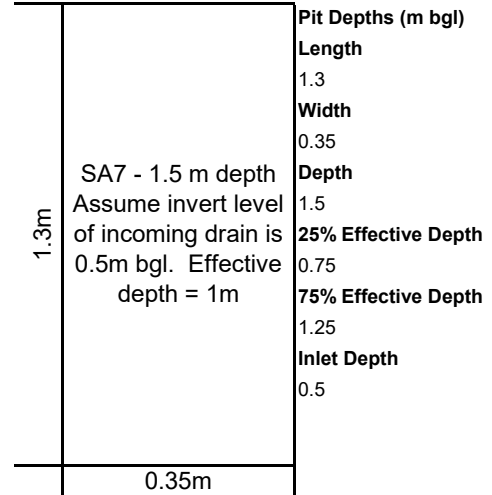
### Field Data

**Location:** SA7  
**Weather:** Overcast  
**Engineer:** MC  
**Date:** 17/06/2020

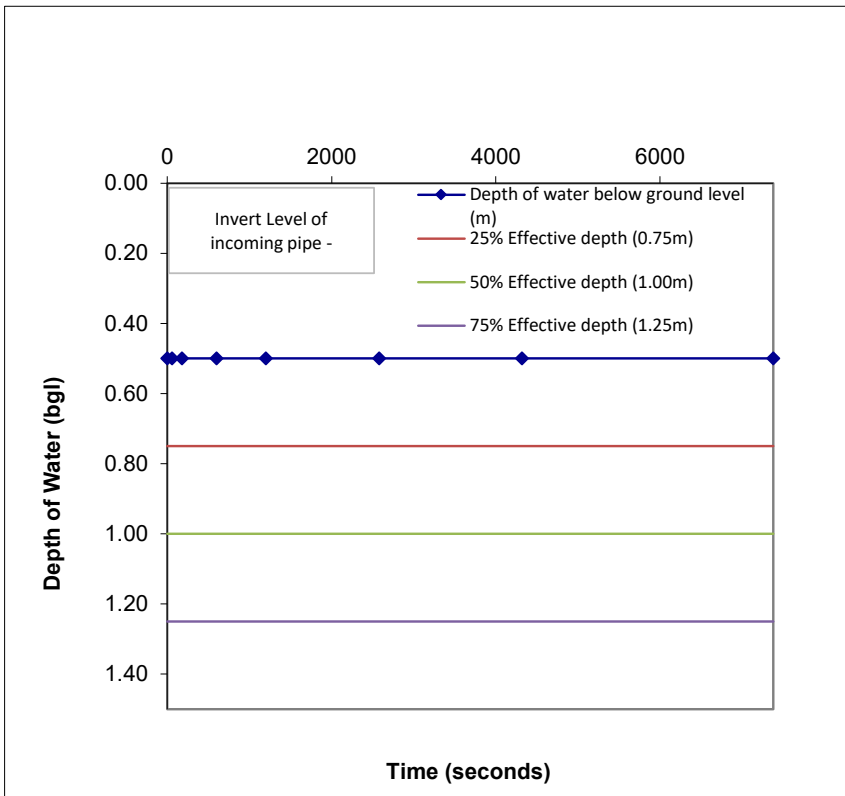
**TEST 1**

Time	Time Elapsed (min)	Time Elapsed (sec)	Depth of Water below GL (m)
14:15	0.0	0	0.50
14:16	1.0	60	0.50
14:18	3.0	180	0.50
14:25	10.0	600	0.50
14:35	20.0	1200	0.50
14:58	43.0	2580	0.50
15:27	72.0	4320	0.50
16:18	123.0	7380	0.50

**Strata Tested** Weathered Lowestoft Formation



Linear extrapolated values for calculation



### CALCULATION:

$$\text{Soil Infiltration Rate}(f) = V_{p75-25} / (ap_{50} \times t_{p75-25})$$

Where:

$V_{p75-25}$  = effective storage volume between 75% and 25% effective depth  
 $1.3 \times 0.35 \times (1.25 - 0.75)$

$$= \mathbf{0.2275}$$

$ap_{50}$  = internal area of TP upto 50% effective depth + base of TP  
 $2(1.3 \times 1.0) + 2(0.35 \times 1.0) + (1.3 \times 0.35)$   
 $= \mathbf{2.105}$

$t_{p75-25}$  = the time for water level to fall from 75% - 25% effective depth  
 $= \mathbf{>>>>}$  secs

$$f = \mathbf{N/A} \quad \text{m/s}$$

### Comment

Insufficient infiltration over two hours - Soakaway Failed



**Client:** Canton Ltd  
**Project No:** P20-164  
**Project:** Land off Fellows Lane,  
 Colney Heath, Hertfordshire,  
 AL4 0QQ



---

# Appendix H

## Thames Water - Wastewater Plan and Manhole Records



Woods Hardwick Ltd  
BEDFORD  
MK40 3NH

**Search address supplied** Roundhouse Farm  
Bullen's Green Lane  
North Mymms  
Welwyn Hatfield  
Hertfordshire  
AL4 0QT

**Your reference** 18770\_Colney Heath

**Our reference** ALS/ALS Standard/2020\_4193250

**Search date** 12 June 2020

## Knowledge of features below the surface is essential for every development

The benefits of this knowledge not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility of any development.

Did you know that Thames Water Property Searches can also provide a variety of utility searches including a more comprehensive view of utility providers' assets (across up to 35-45 different providers), as well as more focused searches relating to specific major utility companies such as National Grid (gas and electric).

Contact us to find out more.



Thames Water Utilities Ltd  
Property Searches, PO Box 3189, Slough SL1 4WW  
DX 151280 Slough 13



[searches@thameswater.co.uk](mailto:searches@thameswater.co.uk)  
[www.thameswater-propertysearches.co.uk](http://www.thameswater-propertysearches.co.uk)



0845 070 9148

**Search address supplied:** Roundhouse Farm, Bullen's Green Lane, North Mymms, Welwyn Hatfield, Hertfordshire, AL4 0QT

Dear Sir / Madam

**An Asset Location Search is recommended when undertaking a site development.** It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This search provides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

## Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0845 070 9148, or use the address below:

Thames Water Utilities Ltd  
Property Searches  
PO Box 3189  
Slough  
SL1 4WW

Email: [searches@thameswater.co.uk](mailto:searches@thameswater.co.uk)

Web: [www.thameswater-propertysearches.co.uk](http://www.thameswater-propertysearches.co.uk)

## Waste Water Services

**Please provide a copy extract from the public sewer map.**

The following quartiles have been printed as they fall within Thames' sewerage area:

TL2006SE  
TL2105NW  
TL2106SW  
TL2005NE

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

## Clean Water Services

**Please provide a copy extract from the public water main map.**

Following examination of our statutory maps, Thames Water has been unable to find

any plans of water mains within this area. If you require a connection to the public water supply system, please write to:

New Connections / Diversions  
Thames Water  
Network Services Business Centre  
Brentford  
Middlesex  
TW8 0EE

Tel: 0845 850 2777  
Fax: 0207 713 3858  
Email: [developer.services@thameswater.co.uk](mailto:developer.services@thameswater.co.uk)

The following quartiles have not been printed as they are out of Thames' water catchment area. For details of the assets requested please contact the water company indicated below:

TL2006SE	Affinity Water
TL2105NW	Affinity Water
TL2106SW	Affinity Water
TL2005NE	Affinity Water

Affinity Water Ltd  
Tamblin Way  
Hatfield  
AL10 9EZ

Tel: 0345 3572401

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

## Payment for this Search

A charge will be added to your suppliers account.

## Further contacts:

### Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)  
Thames Water  
Clearwater Court  
Vastern Road  
Reading  
RG1 8DB

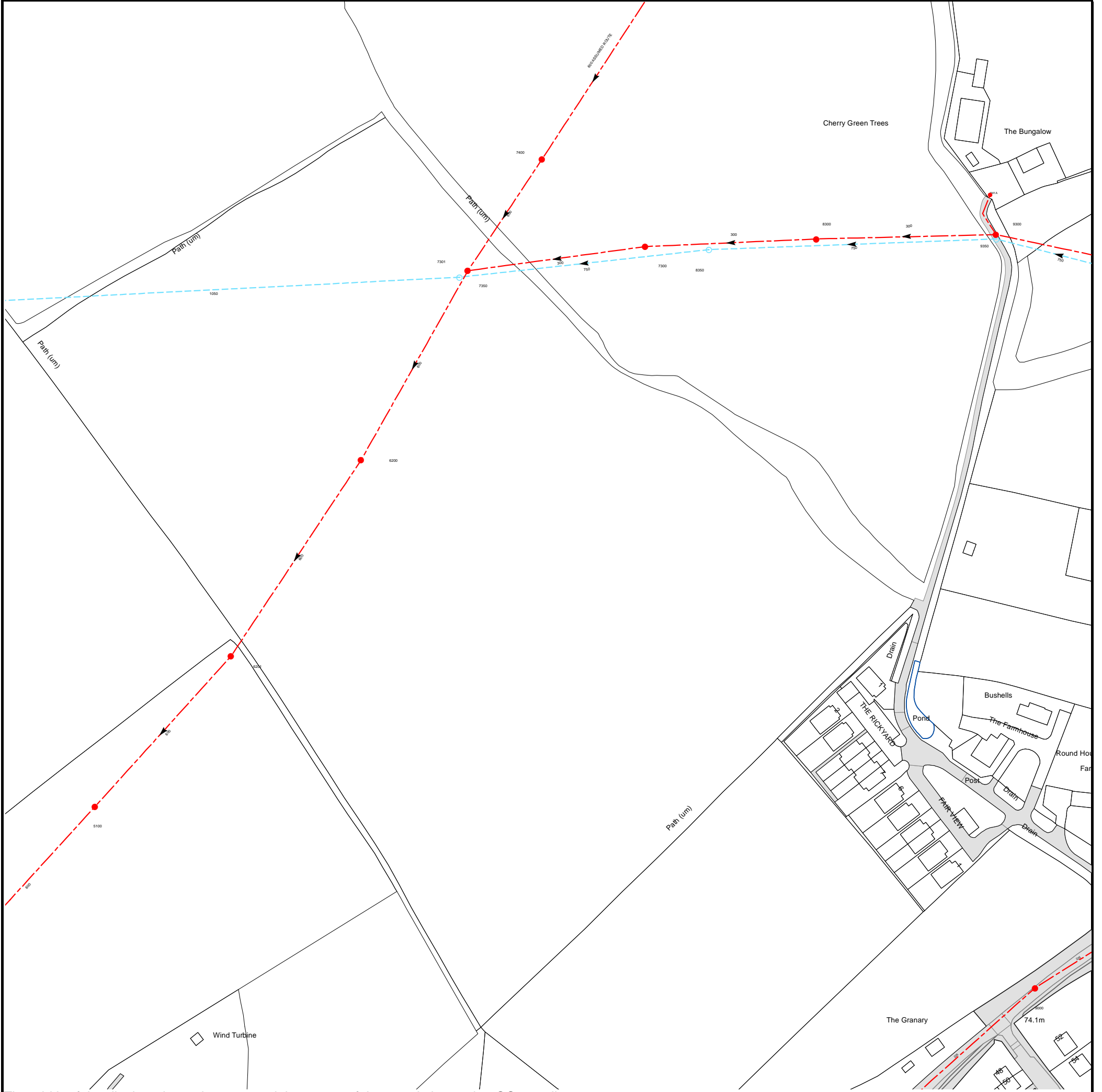
Tel: 0800 009 3921  
Email: [developer.services@thameswater.co.uk](mailto:developer.services@thameswater.co.uk)

### Clean Water queries

Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)  
Thames Water  
Clearwater Court  
Vastern Road  
Reading  
RG1 8DB

Tel: 0800 009 3921  
Email: [developer.services@thameswater.co.uk](mailto:developer.services@thameswater.co.uk)



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 520750,206250

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

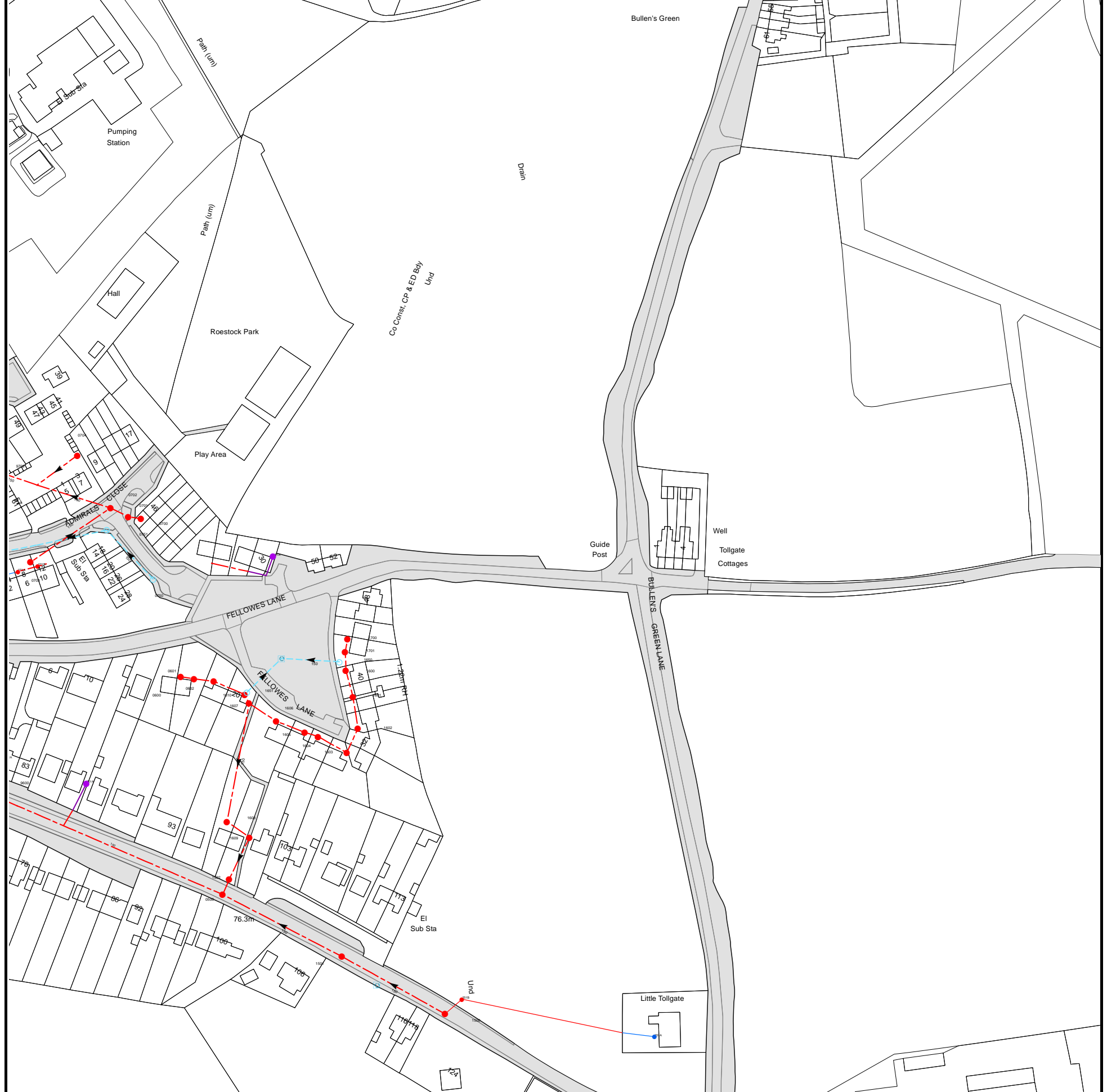
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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

<b>Manhole Reference</b>	<b>Manhole Cover Level</b>	<b>Manhole Invert Level</b>
9000	74.2	72.1
5100	75.01	69.58
6201	74.89	69.67
6200	73.74	69.83
7350	72.31	69.18
7301	72.28	69.92
8350	72.84	70.16
7300	72.33	70.51
8300	74.18	70.94
9350	74.61	71.14
9300	74.6	71.35
941A	n/a	n/a
7400	71.96	69.99

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The width of the displayed area is 500m and the centre of the map is located at OS coordinates 521250,205750

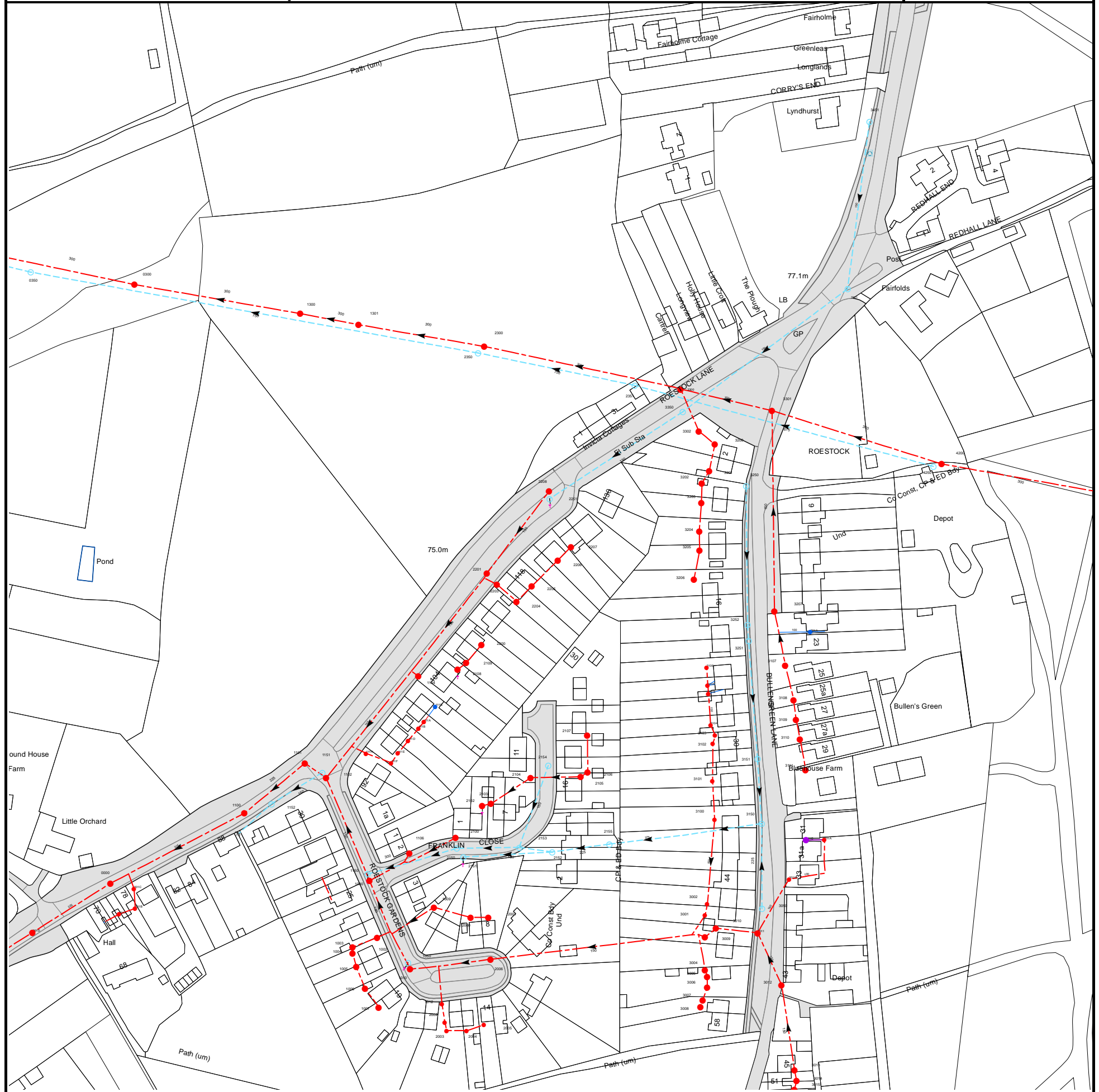
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
251A	n/a	n/a
1500	76.88	75.03
251B	n/a	n/a
1550	n/a	75.97
1501	76.54	74.59
1603	75.93	75.06
1602	75.74	75.14
1601	75.78	75.24
1600	75.77	75.27
1650	75.9	74.9
1701	75.88	75.33
1700	75.88	75.38
171A	n/a	n/a
0751	75.82	74.47
0700	76.01	74.56
0701	75.89	74.44
0702	75.78	74.34
0704	75.99	74.98
071A	n/a	n/a
0703	76.06	74.82
071B	n/a	n/a
061A	n/a	n/a
0750	76	74.98
0600	75.72	75.07
0601	75.73	74.99
0602	75.76	74.91
0500	76.37	74.31
1608	76.34	74.6
1502	76.31	74.41
1610	75.75	74.85
1651	75.72	74.82
1607	75.79	74.78
1609	76.42	74.52
1606	75.77	74.84
1652	n/a	74.54
1605	75.79	74.89
1604	75.89	74.94

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The width of the displayed area is 500m and the centre of the map is located at OS coordinates 521250,206250

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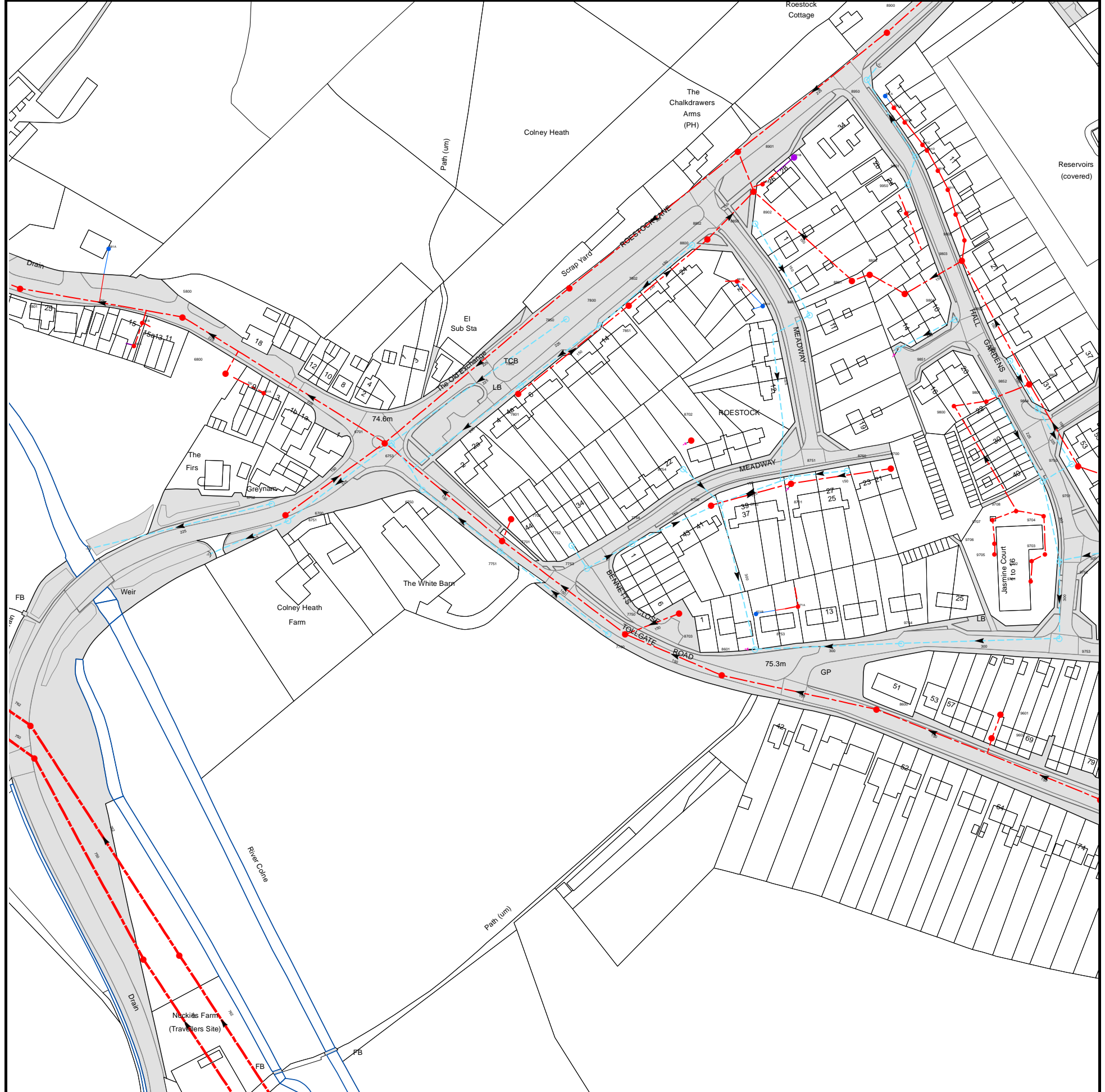
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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
4200	79.57	76.7
2105	75.71	74.56
2107	75.83	n/a
2106	75.75	74.59
2155	76.02	75.26
3009	77	74.57
3001	76.71	74.69
3106	76.97	76.51
3002	76.7	74.8
3105	76.87	76.33
311B	n/a	n/a
3104	76.76	75.93
3101	76.73	75.73
3102	76.88	75.88
3100	76.72	75.4
3103	76.79	75.9
3010	77.06	74.69
3151	77.12	76.07
3150	76.91	76.11
3050	77.1	76.32
3107	77.38	76.23
3108	77.35	76.4
3109	77.38	76.51
3110	77.5	76.57
3111	77.69	76.73
3251	77.07	76.21
321A	n/a	n/a
3252	77.09	76.22
3207	77.42	75.82
2204	75.55	74.57
2205	75.56	74.73
2203	75.43	74.28
3206	77.26	76.65
2201	75.33	73.76
2206	75.78	75.01
3205	77.12	76.49
2207	76.63	75.87
3204	77.17	76.38
3203	77.02	76.17
2251	75.28	n/a
2208	76.55	75
3250	77.32	76.54
3202	77.04	76.04
3201	77.01	75.96
4250	79.32	76.61
3200	76.95	75.68
3302	76.74	75.51
3350	76.64	75.29
3301	76.83	74.63
3300	76.33	73.95
2351	76.5	73.85
2350	75.34	72.51
1301	75.57	72.52
2300	n/a	n/a
3351	77.28	75.38
3451	77.08	75.82
3450	n/a	n/a
3015	77.35	76.33
3014	77.37	76.15
3013	77.51	76.1
2004	75.09	74.27
2003	75	74.18
2005	75.16	74.39
2002	74.98	74.13
1007	75.57	74.83
3008	76.89	76.29
1012	74.83	73.94
3007	76.86	76.1
1006	74.68	73.9
3006	76.95	76.07
3012	77.14	75.24
3005	76.96	75.95
3004	76.96	75.92
1010	74.58	73.48
1005	74.55	73.85
1050	74.61	73.69
2006	74.93	73.78
1004	74.49	73.76
1003	74.39	73.74
1002	74.6	73.62
1102	74.06	72.68
111H	n/a	n/a
1150	74.3	73.5
1000	74.35	73.05
111F	n/a	n/a
111E	n/a	n/a
111D	n/a	n/a
1106	74.57	73.75
1104	74.83	73.5
111B	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
111A	n/a	n/a
1009	75.01	73.96
111G	n/a	n/a
2100	74.88	73.92
2150	74.78	73.98
2108	74.93	74.15
2151	75	74.21
2109	75.21	74.16
2000	75.15	74.25
2200	75.3	74.33
2102	75.02	74.15
2001	75.18	74.4
2103	75.08	74.15
2153	75.24	74.24
2104	75.51	74.41
2154	75.5	74.82
2152	75.69	74.86
001D	n/a	n/a
001A	n/a	n/a
001B	n/a	n/a
001C	n/a	n/a
0000	74.08	72.36
1100	73.96	72.56
1152	n/a	n/a
1151	74.08	73.28
1101	n/a	n/a
1300	75.3	72.4
0300	74.32	71.87
0350	73.65	71.45
3011	76.94	74.97
301A	n/a	n/a
311C	n/a	n/a
311A	n/a	n/a

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The width of the displayed area is 500m and the centre of the map is located at OS coordinates 520750,205750

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
8950	74.46	73.94
8900	74.18	71.81
9853	75.48	74.54
9851	75.62	74.06
9850	75.35	74.31
8851	75.46	73.87
881A	n/a	n/a
9804	75.33	73.16
881B	n/a	n/a
8801	75.4	73.05
8803	n/a	n/a
9803	75.19	73.36
9805	75.26	73.86
8850	75.29	74.2
991G	n/a	n/a
991H	n/a	n/a
8902	75.13	72.02
991F	n/a	n/a
9950	74.85	74.24
891C	n/a	n/a
991E	n/a	n/a
891B	n/a	n/a
9951	74.72	74.06
8901	74.85	71.65
991D	n/a	n/a
991C	n/a	n/a
991B	n/a	n/a
991A	n/a	n/a
891A	n/a	n/a
5801	73.08	70.25
581A	n/a	n/a
5800	73.35	70.56
6800	73.62	72.26
681A	n/a	n/a
6752	73.82	72.22
6700	74.03	71.37
6751	74.09	72.14
6701	74.66	70.94
6753	n/a	n/a
6750	74.75	73.27
7751	74.99	73.74
7701	74.92	72.07
7702	75.25	73.5
7801	75.1	73.9
7852	75.24	74.18
7850	74.97	74.12
7800	75	71.29
7752	74.98	74.45
7851	75.42	74.4
7802	75.47	73.41
7754	75.11	73.58
8754	75.31	73.79
8702	75.41	73.71
8852	n/a	n/a
8800	75.42	72.78
9702	76.1	75.04
9705	76.05	74.91
9703	76.07	74.93
9706	76.06	74.81
9707	76.06	74.59
9704	76.04	74.64
9708	75.91	74.24
8700	75.56	74.36
8752	75.38	73.18
8701	75.56	74.04
9751	76	74.02
8751	75.54	73.48
8750	75.69	73.74
9700	75.61	74.42
9709	75.85	73.77
9750	75.9	74.18
9854	75.78	74.38
9800	75.88	73.93
9801	75.73	73.64
9852	75.57	74.26
9802	75.69	73.6
C123	70.64	67.13
CC123	71.73	67.17
CC124	71.65	67.29
C124	71.61	67.27
7753	75.08	74.06
7750	75.56	74.3
7700	75.42	72.42
8703	75.35	73.85
8601	74.49	72.63
8753	75.46	72.98
871B	n/a	n/a
871A	n/a	n/a
8600	75.64	72.97
9754	75.54	73.4

Manhole Reference	Manhole Cover Level	Manhole Invert Level
9602	75.84	74.67
9601	75.99	75.06
9701	76.07	75.27
9753	75.8	73.83
9752	76.05	73.86
9600	76.25	73.65
961A	n/a	n/a
581C	n/a	n/a
581B	n/a	n/a



















The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.










# ALS Sewer Map Key

## Public Sewer Types (Operated & Maintained by Thames Water)

-  **Foul:** A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
-  **Surface Water:** A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
-  **Combined:** A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
-  **Trunk Surface Water**
-  **Trunk Foul**
-  **Storm Relief**
-  **Trunk Combined**
-  **Vent Pipe**
-  **Bio-solids (Sludge)**
-  **Proposed Thames Surface Water Sewer**
-  **Proposed Thames Water Foul Sewer**
-  **Gallery**
-  **Foul Rising Main**
-  **Surface Water Rising Main**
-  **Combined Rising Main**
-  **Sludge Rising Main**
-  **Proposed Thames Water Rising Main**
-  **Vacuum**





## Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

-  Air Valve
-  Dam Chase
-  Fitting
-  Meter
-  Vent Column




## Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

-  Control Valve
-  Drop Pipe
-  Ancillary
-  Weir






## End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol, Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

-  Outfall
-  Undefined End
-  Inlet






## Other Symbols

Symbols used on maps which do not fall under other general categories








-  /  Public/Private Pumping Station
-  Change of characteristic indicator (C.O.C.I.)
-  Invert Level
-  Summit

### Areas

Lines denoting areas of underground surveys, etc.

-  Agreement
-  Operational Site
-  Chamber
-  Tunnel
-  Conduit Bridge

## Other Sewer Types (Not Operated or Maintained by Thames Water)

-  Foul Sewer
-  Surface Water Sewer
-  Combined Sewer
-  Gully
-  Culverted Watercourse
-  Proposed
-  Abandoned Sewer

### Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plans are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
- 5) 'na' or '0' on a manhole level indicates that data is unavailable.
- 6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.

## Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
4. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
5. In case of dispute TWUL's terms and conditions shall apply.
6. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
8. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800

If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to her at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

## Ways to pay your bill

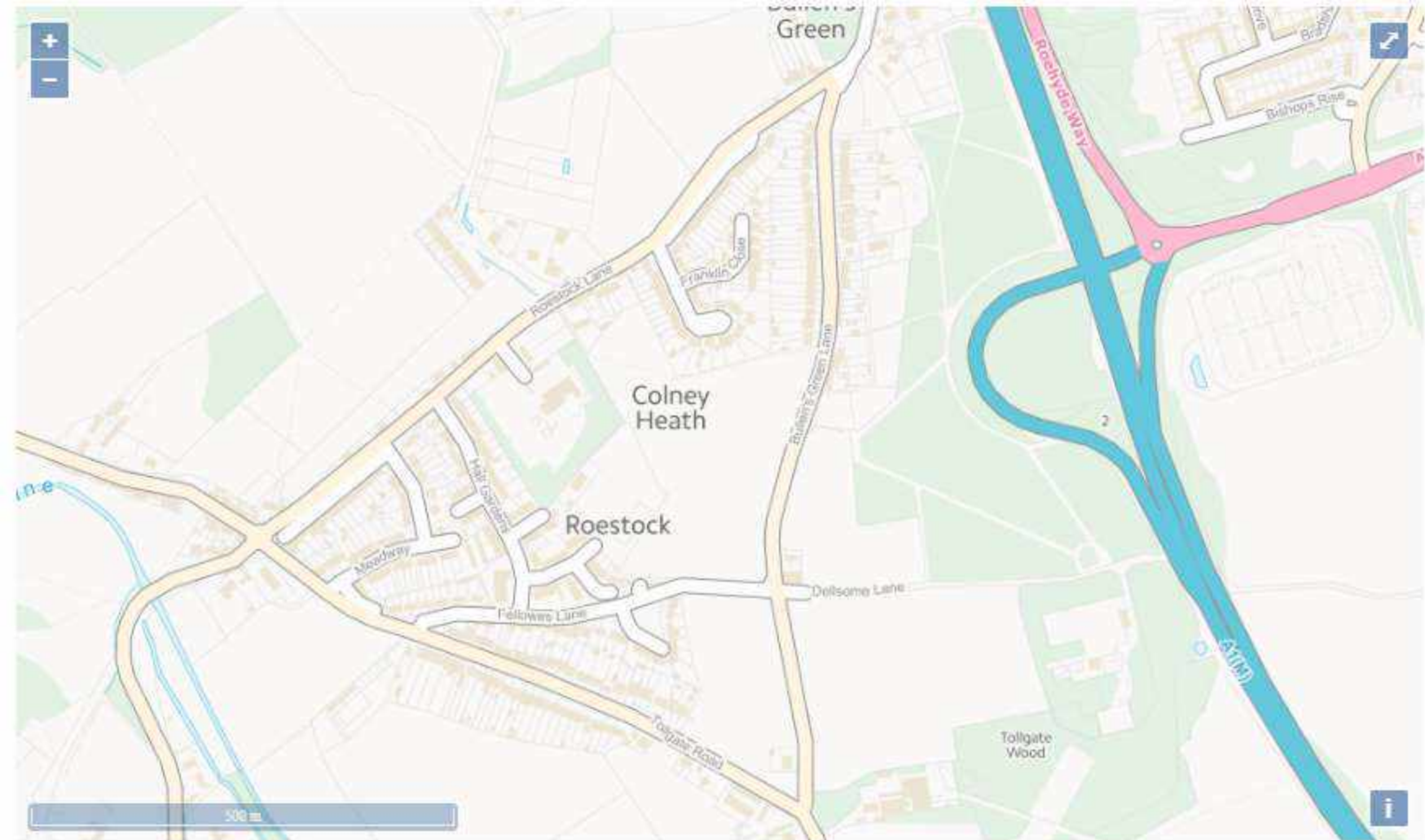
Credit Card	BACS Payment	Telephone Banking	Cheque
Call <b>0845 070 9148</b> quoting your invoice number starting CBA or ADS / OSS	Account number <b>90478703</b> Sort code <b>60-00-01</b> A remittance advice must be sent to: <b>Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.</b> or email <a href="mailto:ps.billing@thameswater.co.uk">ps.billing@thameswater.co.uk</a>	By calling your bank and quoting: Account number <b>90478703</b> Sort code <b>60-00-01</b> and your invoice number	Made payable to ' <b>Thames Water Utilities Ltd</b> ' Write your Thames Water account number on the back. Send to: <b>Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW</b> or by DX to <b>151280 Slough 13</b>

Thames Water Utilities Ltd Registered in England & Wales No. 2366661 Registered Office Clearwater Court, Vastern Rd, Reading, Berks, RG1 8DB.

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# Appendix I

## Environment Agency - Reservoir Flood Map



Extent of flooding from reservoirs

● Maximum extent of flooding

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# Appendix J

## Thames Water Correspondence



Miss Jasmine Katsoulis  
Woods Hardwick  
15-17 Goldington Road  
Bedford  
MK40 3NH



20 Aug. 20

## Pre-planning enquiry: Confirmation of sufficient capacity

Dear Miss Katsoulis

Thank you for providing information on your development: **Roundhouse Farm, Colney Heath, Bullen's Green Lane, North Mymms, Welwyn Hatfield, Hertfordshire, AL4 0QT.**

***Residential development comprising 100 units. Foul water to be pumped into MH3011 at 2.31l/s. Surface water to be attenuated to the greenfield rate 9.3l/s and discharged into MH1150.***

We're pleased to confirm that there will be sufficient foul and surface water capacity in our sewerage network to serve your development, so long as your phasing follows the timescale you've suggested.

This confirmation is valid for 12 months or for the life of any planning approval that this information is used to support, to a maximum of three years.

### Source Protection Zone

The development site boundary falls within a Source Protection Zone for groundwater abstraction. These zones may be at particular risk from polluting activities on or below the land surface. To prevent pollution, the Environment Agency and Thames Water (or other local water undertaker) will use a tiered, risk-based approach to regulate activities that may impact groundwater resources, this may potentially affect your drainage or surface water strategies where infiltration systems are proposed. The applicant is encouraged to read the Environment Agency's approach to groundwater protection (available at <https://www.gov.uk/government/publications/groundwater-protection-position-statements>) and may wish to discuss the full implications for their development with a suitably qualified environmental consultant.

**You'll need to keep us informed of any changes to your design – for example, an increase in the number or density of homes. Such changes could mean there is no longer sufficient capacity.**

### What happens next?

Please make sure you submit your connection application, giving us at least 21 days' notice of the date you wish to make your new connection/s.

If you've any further questions, please contact me on 0203 577 8082.

Yours sincerely

Artur Jaroma

Thames Water

## Yolanda Kwaramba

---

**From:** Yolanda Kwaramba  
**Sent:** 20 August 2020 10:42  
**To:** 'DEVELOPER.SERVICES@THAMESWATER.CO.U'  
**Cc:** John Freeman  
**Subject:** FW: RE: RE: RE: RE: RE: FW: Thames Water Pre-Planning Enquiry Request. TW ref. DS6075257 [Filed 20 Aug 2020 14:20]  
**Attachments:** DS6075257 PDEV AL4 OQT Roundhouse Farm.pdf; 18.08.2020 Greenfield Calculation.PNG

Artur,

Further to our telephone conversation, please could you revise your response taking into account the following;

1. Preferred surface water point of connection - MH3010 in Bullens Green Lane.
2. The QBAR rate is 9.6l/s based on a site area of 5.25ha - see attached calculation.

I look forward to hearing from you soon.

Many thanks.

---

**From:** [DEVELOPER.SERVICES@THAMESWATER.CO.U](mailto:DEVELOPER.SERVICES@THAMESWATER.CO.U) <[DEVELOPER.SERVICES@THAMESWATER.CO.U](mailto:DEVELOPER.SERVICES@THAMESWATER.CO.U)>  
**Sent:** 20 August 2020 09:50  
**To:** Jasmine Katsoulis <[j.katsoulis@WoodsHardwick.com](mailto:j.katsoulis@WoodsHardwick.com)>  
**Subject:** RE: RE: RE: RE: RE: RE: FW: Thames Water Pre-Planning Enquiry Request. TW ref. DS6075257

Dear Sir/Madam

Following your Pre-Planning Enquiry for the above site, please find our formal response enclosed.

Please note, Thames Water do not envisage any capacity concerns to the waste water infrastructure at this stage of your development.

Should you have any further queries, please do not hesitate to contact me again.

Kind Regards

**Artur Jaroma**

Developer Services – Sewer Adoptions Engineer  
Office: 0800 009 3921  
Mobile: 077476 47276

Get advice on making your sewer connection correctly at [connectright.org.uk](http://connectright.org.uk)

Clearwater Court, Vastern Road, Reading, RG1 8DB  
Find us online at [developers.thameswater.co.uk](http://developers.thameswater.co.uk)

Original Text



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# Appendix K

## Greenfield Calculations



**ICP SUDS**

**ICP SUDS Input (FSR Method)**

Return Period (Years)

Area (ha)

SAAR (mm)

Soil

Growth Curve

**Partly Urbanised Catchment (QBAR)**

Urban

Region

**Results**

QBAR rural (l/s)

QBAR urban (l/s)

**Return Period Flood**

- IH 124
- ICP SUDS
- ADAS 345
- FEH
- ReFH2
- Greenfield Volume
- Greenfield Volume (ReFH2)

Region	QBAR (l/s)	Q (100yrs) (l/s)	Q (1 yrs) (l/s)	Q (30 yrs) (l/s)	Q (100 yrs) (l/s)
Region 1	9.6	23.7	8.1	18.1	23.7
Region 2	9.6	25.2	8.3	18.2	25.2
Region 3	9.6	19.9	8.2	16.8	19.9
Region 4	9.6	24.6	7.9	18.7	24.6
Region 5	9.6	34.1	8.3	23.0	34.1
Region 6/Region 7	9.6	30.5	8.1	21.7	30.5
Region 8	9.6	23.2	7.5	18.2	23.2
Region 9	9.6	20.9	8.4	16.9	20.9
Region 10	9.6	19.9	8.3	16.2	19.9

---

# Appendix L

## Proposed Drainage Strategy



- NOTES**
- Contractors must check all dimensions on site. Only figured dimensions are to be worked from. Discrepancies must be reported to the Architect or Engineer before proceeding.  
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  - Until technical approval has been obtained from the relevant authorities, all drawings are issued as preliminary and not for construction. Should the Contractor commence site work prior to approval being given it is entirely at his own risk.

**SAFETY, HEALTH AND ENVIRONMENTAL**

In addition to the hazards, risks normally associated with the type of work detailed on this drawing, note the following significant risks and information.

- Construction:**
- There is an existing HV cable which crosses the site.
- For information relating to end use, maintenance, demolition, see the health and safety file.
- It is assumed that all works will be carried out by a competent Contractor, where appropriate, to an approved method statement.

- Site Boundary
- - - Proposed Surface Water Network
- - - Proposed Foul Water Network
- Proposed Permeable Paving
- Proposed Swale

REV	DESCRIPTION	DRN	CHD	DATE	
■	PRELIMINARY	□	INFORMATION	□	TENDER
□	CONSTRUCTION	□	AS BUILT		

SCALE 1:500 @ A1      DATE 20.08.2020

DRAWN YK      CHK JGF

DRAWING NO. 18770-FELL-5-201      REV -

TITLE Land North of Fellows Lane  
Colney Heath

DETAILS Proposed Drainage Strategy  
Sheet 1 of 2

**Woods Hardwick**  
Architecture | Engineering | Planning | Surveying

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15-17 Goldington Road  
Bedford MK40 3NH  
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**BIRMINGHAM**  
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Birmingham B24 9FE  
T: +44 (0) 121 6297784

ONLINE: mail@woodshardwick.com | woodshardwick.com

PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS DRAWING

Proposed Attenuation Basin (north eastern)  
Volume - 682m³.  
Depth - 0.6m

Proposed surface water point of connection  
Existing surface water manhole  
Approx location taken from Thames Water Sewer Records  
MH No. 3010  
CL 77.06m AOD  
IL 74.69m AOD

Proposed foul water point of connection  
Existing foul water manhole  
Approx location taken from Thames Water Sewer Records  
MH No. 3011  
CL 76.94m AOD  
IL 74.97m AOD

Proposed surface water / foul water pumping station.  
Routes and points of connection to be confirmed.

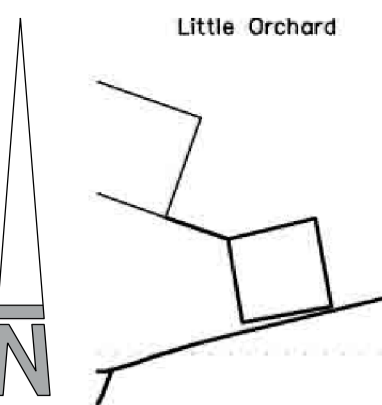
Proposed Attenuation Basin (south western)  
Volume - 1410m³.  
Depth - 1.5m

Pumping Station

See Sheet 1  
(18770-FELL-5-202)

See Sheet 1  
(18770-FELL-5-202)

Roestock Park





- NOTES**
- Contractors must check all dimensions on site. Only figured dimensions are to be worked from. Discrepancies must be reported to the Architect or Engineer before proceeding.  
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  - Until technical approval has been obtained from the relevant authorities, all drawings are issued as preliminary and not for construction. Should the Contractor commence site work prior to approval being given it is entirely at his own risk.

**SAFETY, HEALTH AND ENVIRONMENTAL**

In addition to the hazards, risks normally associated with the type of work detailed on this drawing, note the following significant risks and information.

Construction:

- There is an existing HV cable which crosses the site.

For information relating to end use, maintenance, demolition, see the health and safety file.

It is assumed that all works will be carried out by a competent Contractor, where appropriate, to an approved method statement.

— Site Boundary  
- - - Proposed Surface Water Network  
- - - Proposed Foul Water Network  
 Proposed Permeable Paving  
 Proposed Swale

REV	DESCRIPTION	DRN	CHD	DATE	
<input checked="" type="checkbox"/>	PRELIMINARY	<input type="checkbox"/>	INFORMATION	<input type="checkbox"/>	TENDER
<input type="checkbox"/>	CONSTRUCTION	<input type="checkbox"/>	AS BUILT		

SCALE 1:500 @ A2      DATE 20.08.2020

DRAWN YK      CHK JGF

DRAWING NO. 18770-FELL-5-202      REV -

TITLE Land North of Fellows Lane  
Colney Heath

DETAILS Proposed Drainage Strategy  
Sheet 2 of 2

**Woods Hardwick**  
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ONLINE: mail@woodshardwick.com | woodshardwick.com

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# Appendix M

## Drainage Calculations

**Design Settings**

Rainfall Methodology	FEH-99	Time of Entry (mins)	6.00
Return Period (years)	100	Maximum Time of Concentration (mins)	30.00
Additional Flow (%)	40	Maximum Rainfall (mm/hr)	50.0
C (1km)	-0.029	Minimum Velocity (m/s)	1.00
D1 (1km)	0.300	Connection Type	Level Soffits
D2 (1km)	0.302	Minimum Backdrop Height (m)	0.200
D3 (1km)	0.294	Preferred Cover Depth (m)	1.200
E (1km)	0.324	Include Intermediate Ground	✓
F (1km)	2.454	Enforce best practice design rules	✓
CV	0.750		

**Nodes**

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.102	6.00	75.500	1200	521186.287	205760.078	1.500
2	0.000		75.500	1200	521194.056	205764.144	1.552
3	0.100	6.00	75.492	1350	521199.897	205765.339	1.729
18	0.133	6.00	75.276	1350	521160.812	205822.575	1.575
19	0.000		75.698	1350	521192.336	205812.006	2.195
4	0.191	6.00	75.809	1500	521199.897	205810.705	2.577
20	0.102	6.00	75.800	1200	521262.129	205837.776	1.425
21	0.095	6.00	75.797	1200	521266.210	205850.397	1.501
5	0.066	6.00	75.236	1500	521217.365	205866.193	2.273
6	0.000		75.000	1500	521224.373	205888.455	2.089
7	0.043	6.00	75.000	1800	521223.408	205901.064	2.192
22	0.278	6.00	75.504	1350	521166.496	205895.913	1.575
8	0.000		74.944	1800	521214.333	205919.481	2.182
9	0.018	6.00	75.018	1800	521212.514	205926.227	2.270
23	0.089	6.00	76.000	1200	521290.517	205922.086	1.500
24	0.094	6.00	75.980	1350	521294.862	205935.646	1.640
25	0.000		75.583	1350	521256.954	205947.794	1.575
26	0.000		75.467	1350	521246.550	205948.409	1.575
27	0.128	6.00	75.342	1350	521234.203	205945.549	1.650
28	0.023	6.00	75.208	1350	521222.068	205939.864	1.650
10	0.000		75.107	1800	521214.321	205933.750	2.374
11	0.064	6.00	74.845	1800	521199.220	205944.285	2.149
12	0.000		74.800	1800	521190.659	205962.357	2.144
29	0.000	6.00	74.500	1800	521139.727	205976.078	1.500
30	0.103	6.00	74.700	1800	521153.158	205964.357	1.800
31	0.040	6.00	74.700	1800	521165.217	205973.998	1.831
13	0.000		74.800	1800	521189.355	205972.213	2.365
14	0.000		74.809	1800	521194.505	205981.642	2.395
15	0.047	6.00	74.911	1800	521201.709	205984.839	2.513
32	0.157	6.00	75.300	1200	521247.550	205994.839	1.500
16	0.000		75.151	1800	521220.488	205988.936	2.791
17	0.000		75.200	1800	521222.762	205978.513	2.861

**Links (Input)**

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	2	8.769	0.600	74.000	73.948	0.052	168.0	300	6.12	50.0
1.001	2	3	5.962	0.600	73.948	73.913	0.035	168.0	300	6.20	50.0
1.002	3	4	45.366	0.600	73.763	73.382	0.381	119.1	450	6.61	50.0
2.000	18	19	33.249	0.600	73.701	73.503	0.198	168.0	375	6.40	50.0
2.001	19	4	7.672	0.600	73.503	73.457	0.046	168.0	375	6.49	50.0
1.003	4	5	58.173	0.600	73.232	73.038	0.194	300.0	600	7.30	50.0
3.000	20	21	13.264	0.600	74.375	74.296	0.079	168.0	225	6.22	50.0
3.001	21	5	51.336	0.600	74.296	73.413	0.883	58.1	225	6.72	50.0
1.004	5	6	23.339	0.600	72.963	72.911	0.052	450.0	675	7.62	50.0
1.005	6	7	12.646	0.600	72.911	72.883	0.028	450.0	675	7.79	50.0
1.006	7	8	20.531	0.600	72.808	72.762	0.046	450.0	750	8.05	50.0
4.000	22	8	53.328	0.600	73.929	73.137	0.792	67.3	375	6.40	50.0
1.007	8	9	6.987	0.600	72.762	72.748	0.014	500.0	750	8.14	50.0
1.008	9	10	7.737	0.600	72.748	72.733	0.015	500.0	750	8.25	50.0
5.000	23	24	14.239	0.600	74.500	74.415	0.085	168.0	300	6.20	50.0
5.001	24	25	39.807	0.600	74.340	74.008	0.332	119.9	375	6.60	50.0
5.002	25	26	10.422	0.600	74.008	73.892	0.116	89.8	375	6.69	50.0
5.003	26	27	12.674	0.600	73.892	73.767	0.125	101.4	375	6.81	50.0
5.004	27	28	13.401	0.600	73.692	73.558	0.134	100.0	450	6.92	50.0
5.005	28	10	9.869	0.600	73.558	73.457	0.101	97.7	450	7.00	50.0
1.009	10	11	18.413	0.600	72.733	72.696	0.037	500.0	750	8.49	50.0
1.010	11	12	19.997	0.600	72.696	72.656	0.040	500.0	750	8.76	50.0
1.011	12	13	9.942	0.600	72.656	72.435	0.221	45.0	750	8.80	50.0
6.000	29	30	17.826	0.600	73.000	72.900	0.100	178.3	750	6.14	50.0
6.001	30	31	15.439	0.600	72.900	72.869	0.031	500.0	750	6.35	50.0
6.002	31	13	24.204	0.600	72.869	72.585	0.284	85.2	750	6.48	50.0
1.012	13	14	10.744	0.600	72.435	72.414	0.021	500.0	750	8.95	50.0
1.013	14	15	7.882	0.600	72.414	72.398	0.016	500.0	750	9.05	50.0
1.014	15	16	19.221	0.600	72.398	72.360	0.038	500.0	750	9.31	50.0
7.000	32	16	27.698	0.600	73.800	73.635	0.165	168.0	300	6.38	50.0
1.015	16	17	10.668	0.600	72.360	72.339	0.021	500.0	750	9.45	50.0

**Pipeline Schedule**

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	8.769	168.0	300	Circular_Default Sewer Type	75.500	74.000	1.200	75.500	73.948	1.252
1.001	5.962	168.0	300	Circular_Default Sewer Type	75.500	73.948	1.252	75.492	73.913	1.279
1.002	45.366	119.1	450	Circular_Default Sewer Type	75.492	73.763	1.279	75.809	73.382	1.977
2.000	33.249	168.0	375	Circular_Default Sewer Type	75.276	73.701	1.200	75.698	73.503	1.820
2.001	7.672	168.0	375	Circular_Default Sewer Type	75.698	73.503	1.820	75.809	73.457	1.977
1.003	58.173	300.0	600	Circular_Default Sewer Type	75.809	73.232	1.977	75.236	73.038	1.598
3.000	13.264	168.0	225	Circular_Default Sewer Type	75.800	74.375	1.200	75.797	74.296	1.276

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	1200	Manhole	Adoptable	2	1200	Manhole	Adoptable
1.001	2	1200	Manhole	Adoptable	3	1350	Manhole	Adoptable
1.002	3	1350	Manhole	Adoptable	4	1500	Manhole	Adoptable
2.000	18	1350	Manhole	Adoptable	19	1350	Manhole	Adoptable
2.001	19	1350	Manhole	Adoptable	4	1500	Manhole	Adoptable
1.003	4	1500	Manhole	Adoptable	5	1500	Manhole	Adoptable
3.000	20	1200	Manhole	Adoptable	21	1200	Manhole	Adoptable





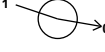
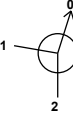









**Pipeline Schedule**








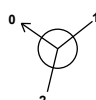





Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
3.001	51.336	58.1	225	Circular_Default Sewer Type	75.797	74.296	1.276	75.236	73.413	1.598
1.004	23.339	450.0	675	Circular_Default Sewer Type	75.236	72.963	1.598	75.000	72.911	1.414
1.005	12.646	450.0	675	Circular_Default Sewer Type	75.000	72.911	1.414	75.000	72.883	1.442
1.006	20.531	450.0	750	Circular_Default Sewer Type	75.000	72.808	1.442	74.944	72.762	1.432
4.000	53.328	67.3	375	Circular_Default Sewer Type	75.504	73.929	1.200	74.944	73.137	1.432
1.007	6.987	500.0	750	Circular_Default Sewer Type	74.944	72.762	1.432	75.018	72.748	1.520
1.008	7.737	500.0	750	Circular_Default Sewer Type	75.018	72.748	1.520	75.107	72.733	1.624
5.000	14.239	168.0	300	Circular_Default Sewer Type	76.000	74.500	1.200	75.980	74.415	1.265
5.001	39.807	119.9	375	Circular_Default Sewer Type	75.980	74.340	1.265	75.583	74.008	1.200
5.002	10.422	89.8	375	Circular_Default Sewer Type	75.583	74.008	1.200	75.467	73.892	1.200
5.003	12.674	101.4	375	Circular_Default Sewer Type	75.467	73.892	1.200	75.342	73.767	1.200
5.004	13.401	100.0	450	Circular_Default Sewer Type	75.342	73.692	1.200	75.208	73.558	1.200
5.005	9.869	97.7	450	Circular_Default Sewer Type	75.208	73.558	1.200	75.107	73.457	1.200
1.009	18.413	500.0	750	Circular_Default Sewer Type	75.107	72.733	1.624	74.845	72.696	1.399
1.010	19.997	500.0	750	Circular_Default Sewer Type	74.845	72.696	1.399	74.800	72.656	1.394
1.011	9.942	45.0	750	Circular_Default Sewer Type	74.800	72.656	1.394	74.800	72.435	1.615
6.000	17.826	178.3	750	Circular_Default Sewer Type	74.500	73.000	0.750	74.700	72.900	1.050
6.001	15.439	500.0	750	Circular_Default Sewer Type	74.700	72.900	1.050	74.700	72.869	1.081
6.002	24.204	85.2	750	Circular_Default Sewer Type	74.700	72.869	1.081	74.800	72.585	1.465
1.012	10.744	500.0	750	Circular_Default Sewer Type	74.800	72.435	1.615	74.809	72.414	1.645
1.013	7.882	500.0	750	Circular_Default Sewer Type	74.809	72.414	1.645	74.911	72.398	1.763
1.014	19.221	500.0	750	Circular_Default Sewer Type	74.911	72.398	1.763	75.151	72.360	2.041
7.000	27.698	168.0	300	Circular_Default Sewer Type	75.300	73.800	1.200	75.151	73.635	1.216
1.015	10.668	500.0	750	Circular_Default Sewer Type	75.151	72.360	2.041	75.200	72.339	2.111

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
3.001	21	1200	Manhole	Adoptable	5	1500	Manhole	Adoptable
1.004	5	1500	Manhole	Adoptable	6	1500	Manhole	Adoptable
1.005	6	1500	Manhole	Adoptable	7	1800	Manhole	Adoptable
1.006	7	1800	Manhole	Adoptable	8	1800	Manhole	Adoptable
4.000	22	1350	Manhole	Adoptable	8	1800	Manhole	Adoptable
1.007	8	1800	Manhole	Adoptable	9	1800	Manhole	Adoptable
1.008	9	1800	Manhole	Adoptable	10	1800	Manhole	Adoptable
5.000	23	1200	Manhole	Adoptable	24	1350	Manhole	Adoptable
5.001	24	1350	Manhole	Adoptable	25	1350	Manhole	Adoptable
5.002	25	1350	Manhole	Adoptable	26	1350	Manhole	Adoptable
5.003	26	1350	Manhole	Adoptable	27	1350	Manhole	Adoptable
5.004	27	1350	Manhole	Adoptable	28	1350	Manhole	Adoptable
5.005	28	1350	Manhole	Adoptable	10	1800	Manhole	Adoptable
1.009	10	1800	Manhole	Adoptable	11	1800	Manhole	Adoptable
1.010	11	1800	Manhole	Adoptable	12	1800	Manhole	Adoptable
1.011	12	1800	Manhole	Adoptable	13	1800	Manhole	Adoptable
6.000	29	1800	Manhole	Adoptable	30	1800	Manhole	Adoptable
6.001	30	1800	Manhole	Adoptable	31	1800	Manhole	Adoptable
6.002	31	1800	Manhole	Adoptable	13	1800	Manhole	Adoptable
1.012	13	1800	Manhole	Adoptable	14	1800	Manhole	Adoptable
1.013	14	1800	Manhole	Adoptable	15	1800	Manhole	Adoptable
1.014	15	1800	Manhole	Adoptable	16	1800	Manhole	Adoptable
7.000	32	1200	Manhole	Adoptable	16	1800	Manhole	Adoptable
1.015	16	1800	Manhole	Adoptable	17	1800	Manhole	Adoptable

**Manhole Schedule**

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1	521186.287	205760.078	75.500	1.500	1200				
						0	1.000	74.000	300
2	521194.056	205764.144	75.500	1.552	1200				
						1	1.000	73.948	300
						0	1.001	73.948	300
3	521199.897	205765.339	75.492	1.729	1350				
						1	1.001	73.913	300
						0	1.002	73.763	450
18	521160.812	205822.575	75.276	1.575	1350				
						0	2.000	73.701	375
19	521192.336	205812.006	75.698	2.195	1350				
						1	2.000	73.503	375
						0	2.001	73.503	375
4	521199.897	205810.705	75.809	2.577	1500				
						1	2.001	73.457	375
						2	1.002	73.382	450
						0	1.003	73.232	600
20	521262.129	205837.776	75.800	1.425	1200				
						0	3.000	74.375	225
21	521266.210	205850.397	75.797	1.501	1200				
						1	3.000	74.296	225
						0	3.001	74.296	225
5	521217.365	205866.193	75.236	2.273	1500				
						1	3.001	73.413	225
						2	1.003	73.038	600
						0	1.004	72.963	675
6	521224.373	205888.455	75.000	2.089	1500				
						1	1.004	72.911	675
						0	1.005	72.911	675
7	521223.408	205901.064	75.000	2.192	1800				
						1	1.005	72.883	675
						0	1.006	72.808	750
22	521166.496	205895.913	75.504	1.575	1350				
						0	4.000	73.929	375
8	521214.333	205919.481	74.944	2.182	1800				
						1	4.000	73.137	375
						2	1.006	72.762	750
						0	1.007	72.762	750

**Manhole Schedule**

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
9	521212.514	205926.227	75.018	2.270	1800		1	1.007	72.748	750
							0	1.008	72.748	750
23	521290.517	205922.086	76.000	1.500	1200					
							0	5.000	74.500	300
24	521294.862	205935.646	75.980	1.640	1350		1	5.000	74.415	300
							0	5.001	74.340	375
25	521256.954	205947.794	75.583	1.575	1350		1	5.001	74.008	375
							0	5.002	74.008	375
26	521246.550	205948.409	75.467	1.575	1350		1	5.002	73.892	375
							0	5.003	73.892	375
27	521234.203	205945.549	75.342	1.650	1350		1	5.003	73.767	375
							0	5.004	73.692	450
28	521222.068	205939.864	75.208	1.650	1350		1	5.004	73.558	450
							0	5.005	73.558	450
10	521214.321	205933.750	75.107	2.374	1800		1	5.005	73.457	450
							2	1.008	72.733	750
							0	1.009	72.733	750
11	521199.220	205944.285	74.845	2.149	1800		1	1.009	72.696	750
							0	1.010	72.696	750
12	521190.659	205962.357	74.800	2.144	1800		1	1.010	72.656	750
							0	1.011	72.656	750
29	521139.727	205976.078	74.500	1.500	1800					
							0	6.000	73.000	750
30	521153.158	205964.357	74.700	1.800	1800		1	6.000	72.900	750
							0	6.001	72.900	750
31	521165.217	205973.998	74.700	1.831	1800		1	6.001	72.869	750
							0	6.002	72.869	750

**Manhole Schedule**

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
13	521189.355	205972.213	74.800	2.365	1800		1	6.002	72.585	750
						2	1.011	72.435	750	
						0	1.012	72.435	750	
14	521194.505	205981.642	74.809	2.395	1800		1	1.012	72.414	750
						0	1.013	72.414	750	
15	521201.709	205984.839	74.911	2.513	1800		1	1.013	72.398	750
						0	1.014	72.398	750	
32	521247.550	205994.839	75.300	1.500	1200		0	7.000	73.800	300
						1	7.000	73.635	300	
16	521220.488	205988.936	75.151	2.791	1800		2	1.014	72.360	750
						0	1.015	72.360	750	
17	521222.762	205978.513	75.200	2.861	1800		1	1.015	72.339	750

**Simulation Settings**

Rainfall Methodology	FEH-99	E (1km)	0.324	Skip Steady State	✓
C (1km)	-0.029	F (1km)	2.454	Drain Down Time (mins)	240
D1 (1km)	0.300	Summer CV	0.750	Additional Storage (m³/ha)	20.0
D2 (1km)	0.302	Winter CV	0.840	Check Discharge Rate(s)	x
D3 (1km)	0.294	Analysis Speed	Normal	Check Discharge Volume	x

**Storm Durations**

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

<b>Return Period (years)</b>	<b>Climate Change (CC %)</b>	<b>Additional Area (A %)</b>	<b>Additional Flow (Q %)</b>
100	40	0	0

**Node 17 Online Pump Control**

Flap Valve	x	Design Depth (m)	1.750	Switch off depth (m)	0.100
Replaces Downstream Link	✓	Design Flow (l/s)	5.0		
Invert Level (m)	72.339	Switch on depth (m)	0.500		

<b>Depth (m)</b>	<b>Flow (l/s)</b>	<b>Depth (m)</b>	<b>Flow (l/s)</b>
0.001	5.000	2.800	5.000

**Node 29 Depth/Area Storage Structure**

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	73.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m <sup>2</sup> )	Inf Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Inf Area (m <sup>2</sup> )
0.000	671.0	0.0	0.900	1040.0	0.0	0.901	2035.0	0.0	1.500	2590.0	0.0

**Node 18 Carpark Storage Structure**

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	74.436	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	7	Depth (m)	
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	0.600
Porosity	1.00	Length (m)	10.000		

**Node 20 Carpark Storage Structure**

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	74.960	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	8	Depth (m)	
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	0.600
Porosity	1.00	Length (m)	10.000		

**Node 22 Carpark Storage Structure**

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	74.664	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	5	Depth (m)	
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	0.600
Porosity	1.00	Length (m)	10.000		

**Node 23 Carpark Storage Structure**

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	75.160	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	0.600
Porosity	1.00	Length (m)	10.000		

**Node 32 Carpark Storage Structure**

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	74.460	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	3	Depth (m)	
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	0.600
Porosity	1.00	Length (m)	10.000		

**Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 56.80%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute winter	1	10	75.500	1.500	97.2	3.7365	1.4148	FLOOD
15 minute winter	2	10	75.405	1.457	90.2	1.6479	0.0000	FLOOD RISK
15 minute summer	3	10	75.332	1.569	180.0	4.0615	0.0000	FLOOD RISK
15 minute winter	18	14	75.168	1.467	307.1	72.7454	0.0000	FLOOD RISK
15 minute winter	19	13	75.118	1.615	180.0	2.3113	0.0000	SURCHARGED
15 minute summer	4	10	75.176	1.944	349.2	6.3168	0.0000	SURCHARGED
15 minute winter	20	16	75.464	1.089	149.0	48.2323	0.0000	SURCHARGED
15 minute winter	21	15	75.434	1.138	90.6	2.7278	0.0000	SURCHARGED
15 minute summer	5	10	75.054	2.091	384.6	4.9095	0.0000	FLOOD RISK
15 minute winter	6	10	75.000	2.089	352.0	3.6913	7.3093	FLOOD
15 minute summer	7	10	74.974	2.166	345.0	6.3605	0.0000	FLOOD RISK
15 minute winter	22	14	75.230	1.301	314.6	58.0977	0.0000	FLOOD RISK
15 minute winter	8	11	74.944	2.182	546.3	5.5532	4.0423	FLOOD
15 minute summer	9	11	74.930	2.182	536.2	5.8974	0.0000	FLOOD RISK
15 minute winter	23	13	75.361	0.861	97.5	17.0819	0.0000	SURCHARGED
15 minute winter	24	12	75.326	0.986	149.6	2.5419	0.0000	SURCHARGED
15 minute winter	25	11	75.197	1.189	134.7	1.7020	0.0000	SURCHARGED
15 minute winter	26	11	75.161	1.269	137.0	1.8163	0.0000	SURCHARGED
15 minute winter	27	11	75.121	1.429	211.7	4.2612	0.0000	FLOOD RISK
15 minute winter	28	11	75.017	1.459	232.7	2.4949	0.0000	FLOOD RISK
15 minute winter	10	10	74.915	2.182	765.5	5.5536	0.0000	FLOOD RISK
15 minute summer	11	10	74.845	2.149	770.8	6.7479	9.1366	FLOOD
15 minute summer	12	10	74.792	2.136	778.8	5.4369	0.0000	FLOOD RISK
600 minute winter	29	585	74.111	1.111	100.3	1221.0760	0.0000	SURCHARGED
15 minute summer	30	10	74.651	1.751	1056.8	6.4579	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute winter	1	1.000	2	90.2	1.282	1.055	0.6175	
15 minute winter	2	1.001	3	90.6	1.287	1.060	0.4198	
15 minute summer	3	1.002	4	180.9	1.438	0.611	7.1879	
15 minute winter	18	2.000	19	-180.3	-1.635	-1.170	3.6673	
15 minute winter	19	2.001	4	-180.0	-1.632	-1.168	0.8462	
15 minute summer	4	1.003	5	262.2	1.228	0.662	16.3860	
15 minute winter	20	3.000	21	70.0	1.760	1.751	0.5275	
15 minute winter	21	3.001	5	72.0	1.851	1.053	2.0417	
15 minute summer	5	1.004	6	329.6	1.029	0.750	8.3315	
15 minute winter	6	1.005	7	355.2	0.997	0.808	4.5143	
15 minute summer	7	1.006	8	350.7	0.797	0.605	9.0361	
15 minute winter	22	4.000	8	192.3	2.170	0.788	5.8819	
15 minute winter	8	1.007	9	550.5	1.251	1.001	3.0751	
15 minute summer	9	1.008	10	541.2	1.230	0.985	3.4052	
15 minute winter	23	5.000	24	116.2	1.650	1.359	1.0027	
15 minute winter	24	5.001	25	134.7	1.597	0.737	4.3906	
15 minute winter	25	5.002	26	137.0	1.490	0.649	1.1495	
15 minute winter	26	5.003	27	139.3	1.436	0.701	1.3979	
15 minute winter	27	5.004	28	212.7	1.532	0.658	2.1233	
15 minute winter	28	5.005	10	233.9	1.777	0.715	1.5637	
15 minute winter	10	1.009	11	769.4	1.748	1.399	8.1039	
15 minute summer	11	1.010	12	778.8	1.770	1.417	8.8011	
15 minute summer	12	1.011	13	785.1	1.784	0.425	4.3757	
600 minute winter	29	6.000	30	-100.3	-0.413	-0.108	7.8456	
15 minute summer	30	6.001	31	-987.6	-2.244	-1.796	6.7950	

**Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 56.80%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m <sup>3</sup> )	Flood (m <sup>3</sup> )	Status
15 minute summer	31	10	74.700	1.831	981.4	5.4600	8.9198	FLOOD
15 minute summer	13	10	74.754	2.319	958.2	5.9021	0.0000	FLOOD RISK
15 minute summer	14	10	74.754	2.340	191.4	5.9548	0.0000	FLOOD RISK
15 minute summer	15	10	74.754	2.356	276.1	6.8764	0.0000	FLOOD RISK
15 minute winter	32	13	74.813	1.013	214.6	33.5694	0.0000	SURCHARGED
15 minute summer	16	10	74.753	2.393	140.6	6.0902	0.0000	SURCHARGED
15 minute summer	17	10	74.755	2.416	64.8	6.1478	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m <sup>3</sup> )	Discharge Vol (m <sup>3</sup> )
15 minute summer	31	6.002	13	-964.2	-2.191	-0.720	10.6527	
15 minute summer	13	1.012	14	185.3	0.759	0.337	4.7287	
15 minute summer	14	1.013	15	239.3	0.618	0.435	3.4690	
15 minute summer	15	1.014	16	-141.5	0.367	-0.257	8.4596	
15 minute winter	32	7.000	16	137.3	1.950	1.605	1.9505	
15 minute summer	16	1.015	17	64.8	0.545	0.118	4.6952	
15 minute summer	17	Pump		5.0				74.6



# Woods Hardwick

Architecture   Engineering   Planning   Surveying

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Mark Kemp



Ruth Ambrose  
St Albans City and District Council  
Civic Centre  
St Peters Street,  
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AL1 3JE

**Lead Local Flood Authority**  
**Post Point CHN 215**  
**Hertfordshire County Council**  
**County Hall, Pegs Lane**  
**HERTFORD SG13 8DN**

Contact Rosie Brown  
Email [FRMConsultations@hertfordshire.gov.uk](mailto:FRMConsultations@hertfordshire.gov.uk)

Date 14 December 2020

**RE: 5/2020/1992 – Roundhouse Farm, Bullens Green Lane, Colney Heath**

Dear Ruth,

Thank you for re-consulting us on the above application for the Outline application (access sought) - Construction of up to 100 dwellings together with all ancillary works at Roundhouse Farm, Bullens Green Lane, Colney Heath, St Albans, AL4 0FU.

We understand that the previously submitted Flood Risk Assessment and Drainage Strategy (prepared by Woods Hardwick, ref: 18770/FRA and DS, dated August 2020) has not been amended therefore, our comments will remain the same as previous (19.10.20).

We can confirm that we the Lead Local Flood Authority (LLFA) have no objection in principle on flood risk grounds and can advise the Local Planning Authority (LPA) that the proposed development site can be adequately drained and can mitigate any potential existing surface water flood risk if carried out in accordance with the submitted drainage strategy.

We note that the Environment Agency (EA) has provided comments on this application (dated: 12.10.2020) and has required that in order to protect groundwater quality, no infiltration-based sustainable drainage systems should be constructed on land affected by contamination. In addition, infiltration tests have been carried out on site and determined that infiltration is not suitable at this location.

We understand that the applicant is therefore proposing to discharge surface water runoff from the development site to the existing Thames Water public surface sewer located in Bullens Green Lane to the north east of the site. Thames Water have provided confirmation that they have capacity within their surface water network for the proposed discharge rate of 9.3l/s as long as the phasing follows the timescales suggested.

We therefore recommend the following conditions to the LPA should planning permission be granted.

### **Condition 1**

The development permitted by this planning permission shall be carried out in accordance with the the Flood Risk Assessment and Drainage Strategy (prepared by Woods Hardwick, ref: 18770/FRA and DS, dated August 2020) and the following mitigation measures:

1. Limiting the surface water run-off generated by the critical storm events so that it will not exceed the surface water run-off rate of 9.3 l/s during the 1 in 100 year event plus 40% of climate change event.
2. Providing storage to ensure no increase in surface water run-off volumes for all rainfall events up to and including the 1 in 100 year + climate change event providing a total storage volume in two attenuation basins.
3. Discharge of surface water from the private drainage network into the Thames Water surface water sewer system located in Bullens Green Lane.

The mitigation measures shall be fully implemented prior to occupation and subsequently in accordance with the timing / phasing arrangements embodied within the scheme, or within any other period as may subsequently be agreed, in writing, by the local planning authority.

### **Reason**

1. To prevent flooding by ensuring the satisfactory disposal and storage of surface water from the site.
2. To reduce the risk of flooding to the proposed development and future occupants.

### **Condition 2**

No development shall take place until the final design of the drainage scheme is completed and sent to the LPA for approval. The surface water drainage system will be based on the submitted the Flood Risk Assessment and Drainage Strategy (prepared by Woods Hardwick, ref: 18770/FRA and DS, dated August 2020). The scheme shall also include:

The surface water drainage scheme should include;

1. Detailed, updated post-development calculations/modelling in relation to surface water for all rainfall events up to and including the 1 in 100 year return period, this must also include a +40% allowance for climate change.

2. A detailed drainage plan including the location and provided volume of all SuDS features, pipe runs and discharge points. If areas are to be designated for informal flooding these should also be shown on a detailed site plan.
3. Exceedance flow paths for surface water for events greater than the 1 in 100 year including climate change allowance.
4. Detailed engineered drawings of the proposed SuDS features including cross section drawings, their size, volume, depth and any inlet and outlet features including any connecting pipe runs. This should include details regarding the connection into the existing Thames Water surface water sewer.
5. Final detailed management plan to include arrangements for adoption and any other arrangements to secure the operation of the scheme throughout its lifetime.

The scheme shall be fully implemented and subsequently maintained, in accordance with the timing / phasing arrangements embodied within the scheme or within any other period as may subsequently be agreed, in writing, by the local planning authority.

#### **Reason**

1. To prevent flooding by ensuring the satisfactory storage of/disposal of surface water from the site.
2. To reduce the risk of flooding to the proposed development and future users.

#### **Condition 3**

Upon completion of the drainage works for each site in accordance with the timing / phasing, a management and maintenance plan for the SuDS features and drainage network must be submitted to and approved in writing by the Local Planning Authority. The scheme shall include;

1. Provision of complete set of built drawings for site drainage.
2. Maintenance and operational activities.
3. Arrangements for adoption and any other measures to secure the operation of the scheme throughout its lifetime.

#### **Reason**

To prevent flooding by ensuring the satisfactory storage of/disposal of surface water from the site.

#### **Informative to the LPA**

We understand that the Environment Agency has provided comments and required no infiltration-based sustainable drainage systems constructed on land affected by contamination in order to protect groundwater quality. This is due to the proposed

development site being located within Source Protection Zone 1 (SPZ1) and very close to the groundwater abstraction for the public water supply.

Please note if the LPA decides to grant planning permission we wish to be notified for our records should there be any subsequent surface water flooding that we may be required to investigate as a result of the new development.

Yours sincerely,

Rosie Brown

Flood & Water Project Officer  
Environmental Resource Planning

Ruth Ambrose  
St Albans District Council  
Development Control  
Civic Centre St. Peters Street  
St. Albans  
Hertfordshire  
AL1 3LA

**Our ref:** NE/2020/132344/01-L01  
**Your ref:** 5/2020/1992  
**Date:** 12 October 2020

Dear Ruth,

**Roundhouse Farm, Bullens Green Lane, Colney Heath, St Albans, AL4 0FU.**

**Outline application (access sought) - construction of up to 100 dwellings together with all ancillary works.**

Thank you for consulting us on the above application on 25 September 2020.

We have reviewed the following submitted documents:

- Preliminary Contamination Risk Assessment (P20-164pra), prepared by Paddock Geo Engineering Ltd and dated July 2020.
- Flood Risk Assessment and Drainage Strategy (18770/FRA and DS), prepared by Woods Hardwick and dated August 2020.

Groundwater is particularly sensitive in this location because the proposed development site is within Source Protection Zone 1 (SPZ1) and very close to the groundwater abstraction for the public water supply.

Based on the submitted reports, we are satisfied that there is a low risk of pollution to the water environment from land contamination associated with the previous site use. However, we consider there to be a potential risk to groundwater posed by the proposed infiltration drainage and piling/foundations, should these be modified from the exact submitted information during the course of detailed design and submission of reserved matters.

We consider that planning permission could be granted to the proposed development as submitted if the following planning conditions are included as set out below. Without these conditions, we would object to the proposal in line with paragraph 170, 178 and 179 of the National Planning Policy Framework (NPPF), Groundwater Position Statements within [‘The Environment Agency’s approach to groundwater protection’](#) as well as Policy 106 (Nature Conservation) and Policy 84A (Drainage Infrastructure) of the St Alban’s Local Plan (1994).

We ask to be consulted on the details submitted for approval to discharge these conditions and on any subsequent amendments/alterations.

Cont/d..

### **Condition 1 - Piling/Foundation Works**

Piling or any other foundation designs using penetrative methods shall not be carried out other than with the written consent of the local planning authority. The development shall be carried out in accordance with the approved details.

#### **Reason**

To protect and prevent the pollution of controlled waters from mobilised contaminants in line with NPPF paragraphs 170, 178, 179, EA Groundwater Protection Position Statement N8 (Physical disturbance of aquifers in SPZ1) and Policy 106 (Nature Conservation) of the St Alban's Local Plan (1994).

#### **Advice**

Piling or any other foundation designs using penetrative methods can result in risks to potable supplies from things such as pollution/turbidity, drilling through different aquifers and creating preferential pathways. Please note that this planning application is 'Outline' and this condition may restrict the depth of foundations, which may therefore limit the height of any residences. Please refer to 'Piling in layered ground: risks to groundwater and archaeology' (<https://www.gov.uk/government/publications/piling-in-layered-ground-risks-to-groundwater-and-archaeology>), for more information.

We strongly recommend you also consult Affinity Water on piling/foundation proposals, who operate the nearby public water supply abstraction.

### **Condition 2 - Surface Water Discharge**

No drainage systems for the infiltration of surface water to the ground are permitted other than with the written consent of the local planning authority. Any proposals for such systems must be supported by an assessment of the risks to controlled waters. The development shall be carried out in accordance with the approved details.

#### **Reason**

To protect and prevent the pollution of controlled waters from mobilised contaminants in line with NPPF paragraphs 170, 178, 179, EA Groundwater Protection Position Statements G12 (Discharge of clean roof water to ground) and G13 (Sustainable drainage systems) and Policy 84A (Drainage Infrastructure) of the St Alban's Local Plan (1994).

#### **Advice**

Controlled waters are particularly sensitive in this location because the proposed development site is within SPZ1. As a result, we do not believe that the use of infiltration Sustainable Drainage Systems are appropriate in this location.

#### **Advice to Applicant**

#### **Water Resources**

Increased water efficiency for all new developments potentially enables more growth with the same water resources. Developers can highlight positive corporate social responsibility messages and the use of technology to help sell their homes. For the homeowner lower water usage also reduces water and energy bills.

We endorse the use of water efficiency measures especially in new developments. Use of technology that ensures efficient use of natural resources could support the environmental benefits of future proposals and could help attract investment to the area. Therefore, water efficient technology, fixtures and fittings should be considered as part of new developments.

## **Residential Developments**

All new residential development are required to achieve a water consumption limit of a maximum of 125 litres per person per day as set out within [the Building Regulations &c. \(Amendment\) Regulations 2015](#).

However, we recommend that in areas of serious water stress (as identified in our report 'Water stressed areas - final classification' available at <https://www.gov.uk/government/publications/water-stressed-areas-2013-classification>) a higher standard of a maximum of 110 litres per person per day is applied. This standard or higher may already be a requirement of the local planning authority.

## **Pre Application Advice**

Regarding future applications, if you would like us to review a revised technical report prior to a formal submission, outside of a statutory consultation, and/or meet to discuss our position, this will be chargeable in line with our planning advice service. If you wish to request a document review or meeting, please contact our team email address at [HNL SustainablePlaces@environment-agency.gov.uk](mailto:HNL SustainablePlaces@environment-agency.gov.uk).

Further information on our charged planning advice service is available at; <https://www.gov.uk/government/publications/planning-advice-environment-agency-standard-terms-and-conditions>.

## **Final comments**

Thank you for contacting us regarding the above application. Our comments are based on our available records and the information submitted to us. Please quote our reference number in any future correspondence. Please provide us with a copy of the decision notice for our records. This would be greatly appreciated.

Should you have any queries regarding this response, please contact me.

Yours sincerely,

**Hannah Malyon**  
**Sustainable Places Planning Advisor**

Direct dial - 02084 749666

E-mail - [HNL SustainablePlaces@environment-agency.gov.uk](mailto:HNL SustainablePlaces@environment-agency.gov.uk)

## Appendix F Drainage Details

- Greenfield runoff calculation
- Drawing 332510999/4001/102
- Drawing 332510999/4001/103



# FEH Greenfield Runoff Per Hectare

Using 2008 QMED Equation



<b>Project Title</b>	Land at Tollgate Road, Colney Heath
<b>Project No</b>	332510999

Methodology as set out in SuDS Manual 24.3.2

[SUFS Manual Chapter 24](#)

## 1 Retrieve FEH Catchment Information

Export catchment data from FEH CDROM as .csv file and save in FEH data export

Catchment Descriptors	<b>BFIHOST19</b>	0.500	see note 1
	<b>SAAR</b>	659.0	see note 1
	<b>FARL</b>	1.0	see note 2

## 2 Derive QBAR (mean annual flood)

Define area	<b>Site Area</b>	1.0	ha	
	<b>Applied Area</b>	50.0	ha	see note 3
FEH Index Flood (SuDS Manual Equation 24.2)	<b>QMED (Q<sub>2</sub>)</b>	2.5	l/s	see note 4
Calculate QBAR by dividing QMED by 2yr growth factor	<b>QBAR</b>	2.8	l/s	see note 5

## 3 Select appropriate growth factors

FSR Hydrological Region		6
100yr Growth Curve Factor	<b>GQ<sub>100</sub></b>	3.19
30yr Growth Curve Factor	<b>GQ<sub>30</sub></b>	2.40
10yr Growth Curve Factor	<b>GQ<sub>10</sub></b>	1.62
2yr Growth Curve Factor	<b>GQ<sub>2</sub></b>	0.88
1yr Growth Curve Factor	<b>GQ<sub>1</sub></b>	0.85

(refer to FSR Hydrological Region tab)



Figure 24.1 Hydrological regions

## 4 Derive Flood Frequency

Greenfield Runoff per 1ha

100yr Peak Runoff Rate	<b>Q<sub>100</sub></b>	9.0	l/s	<b>Q<sub>100</sub></b>	9.01	l/s/ha
30yr Peak Runoff Rate	<b>Q<sub>30</sub></b>	6.8	l/s	<b>Q<sub>30</sub></b>	6.78	l/s/ha
10yr Growth Curve Factor	<b>Q<sub>10</sub></b>	4.6	l/s	<b>Q<sub>10</sub></b>	4.57	l/s/ha
QBAR Peak Runoff Rate	<b>QBAR</b>	2.8	l/s	<b>QBAR</b>	2.82	l/s/ha
2yr Peak Runoff Rate	<b>Q<sub>2</sub></b>	2.5	l/s	<b>Q<sub>2</sub></b>	2.49	l/s/ha
1yr Peak Runoff Rate	<b>Q<sub>1</sub></b>	2.4	l/s	<b>Q<sub>1</sub></b>	2.40	l/s/ha

Location of FEH Data (as Hyperlink)

[\\cam-vfps-001\cam\Projects\332510999 Land at Tollgate](#)

## DOCUMENT ISSUE RECORD

Rev	Comments	Prepared	Date	Checked	Date
1	Greenfield runoff calculation and check on HR Wallingford value	MD	07/09/2023		

Sheet created by Alex Bearne

Last updated 03.01.18 Recommended Review 01.07.18

Notes This spreadsheet has been created to allow derivation of greenfield runoff rates using the FEH statistical method applied in a manner consistent with the recommendations of the SuDS Manual. If you have recommendations to improve this spreadsheet please contact the owner.

Note 1 FEH Web version 3 allows extraction of BFIHOST and SAAR values for each square kilometre grid. If you do not think the BFIHOST value is representative of your site then it is possible to derive it manually. This should only very occasionally be necessary. BFI can be derived manually using the methodology set out in the Flood Estimation Handbook (see *Manual Derivation of BFIHOST tab*).

Note 2 FARL value is a measure of attenuation from reservoirs and lakes for the majority of studies this should be set to 1 (representing no attenuation). If your site includes a large water body with an attenuating affect on runoff please consult a hydrologist.  
*FARL is a measurement of studies water bodies in the catchment so that their attenuation effects so this term becomes 1.0 and therefore drops out.* (see page 23 of the Preliminary rainfall runoff management for developments EA/Defra 2013)  
[Rainfall runoff management for developments.pdf](#)

Note 3 If the site area is less than 50 hectare the spreadsheet will calculate QMED for 50ha and scale the results automatically to the defined Site Area

Note 4 QMED is calculated using the statistical equation as revised by Kjeldsen in 2008

$$Q_{MED} = 8.3062AREA^{0.8510} \cdot 0.1536^{(1000/SAAR)} \cdot FARL^{3.4451} \cdot 0.0460^{BFIHOST^2}$$

[Rainfall runoff management for developments.pdf](#)

It is reproduced as Equation 24.2 in the SUDS Manual (pg 512)

Note 5 QBAR is calculated by dividing QMED by the growth factor for the 2 year event, as per the methodology set out in paragraph 6.2.2 of 'Rainfall runoff management for developments'. QBAR is then used as the index flood for the basis of applying the growth factors.

- NOTES**
- UTILITIES NOTE: THE POSITION OF ANY EXISTING PUBLIC OR PRIVATE SEWERS, UTILITY SERVICES, PLANT OR APPARATUS SHOWN ON THIS DRAWING IS BELIEVED TO BE CORRECT, BUT NO WARRANTY TO THIS IS EXPRESSED OR IMPLIED. OTHER SUCH PLANT OR APPARATUS MAY ALSO BE PRESENT BUT NOT SHOWN. THE CONTRACTOR IS THEREFORE ADVISED TO UNDERTAKE THEIR OWN INVESTIGATION WHERE THE PRESENCE OF ANY EXISTING SEWERS, SERVICES, PLANT OR APPARATUS MAY AFFECT THEIR OPERATIONS.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
  - ALL LEVELS ARE IN METRES RELATIVE TO ORDNANCE DATUM NEWLYN UNLESS NOTED OTHERWISE.
  - ALL COORDINATES ARE IN METRES RELATIVE TO ORDNANCE SURVEY NATIONAL GRID.
  - THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK OR PREPARING SHOP DRAWINGS.
  - THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEERS AND ARCHITECTS DRAWINGS AND SPECIFICATIONS.

- LEGEND**
- RIVER COLNE
  - 20 YR FLOOD EVENT EXTENTS
  - 100YR FLOOD EVENT EXTENTS
  - 100YR + 20%CC FLOOD EVENT EXTENTS
  - 1000YR FLOOD EVENT EXTENTS
  - EX OIL - EXISTING OIL PIPELINE
  - EA FLOOD ZONE 2
  - EA FLOOD ZONE 3
  - PROPOSED S.W. DRAIN - SIZE TBC
  - PROPOSED HEADWALL
  - PROPOSED S.W. CHAMBER
  - PROPOSED F.W. DRAIN - SIZE TBC
  - PROPOSED F.W. CHAMBER
  - PROPOSED F.W. PUMPING MAIN - SIZE TBC
  - OVERLAND FLOW ARROW

RPW	CB	AS	2202.08.28
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Issue Status  
**FOR PLANNING**

This document is suitable only for the purpose noted above. Use of this document for any other purpose is not permitted.

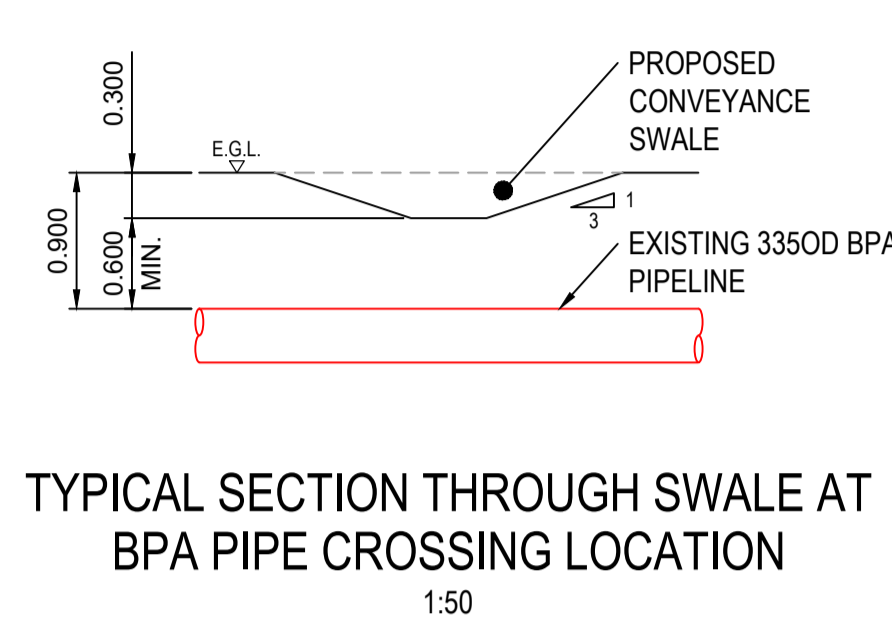
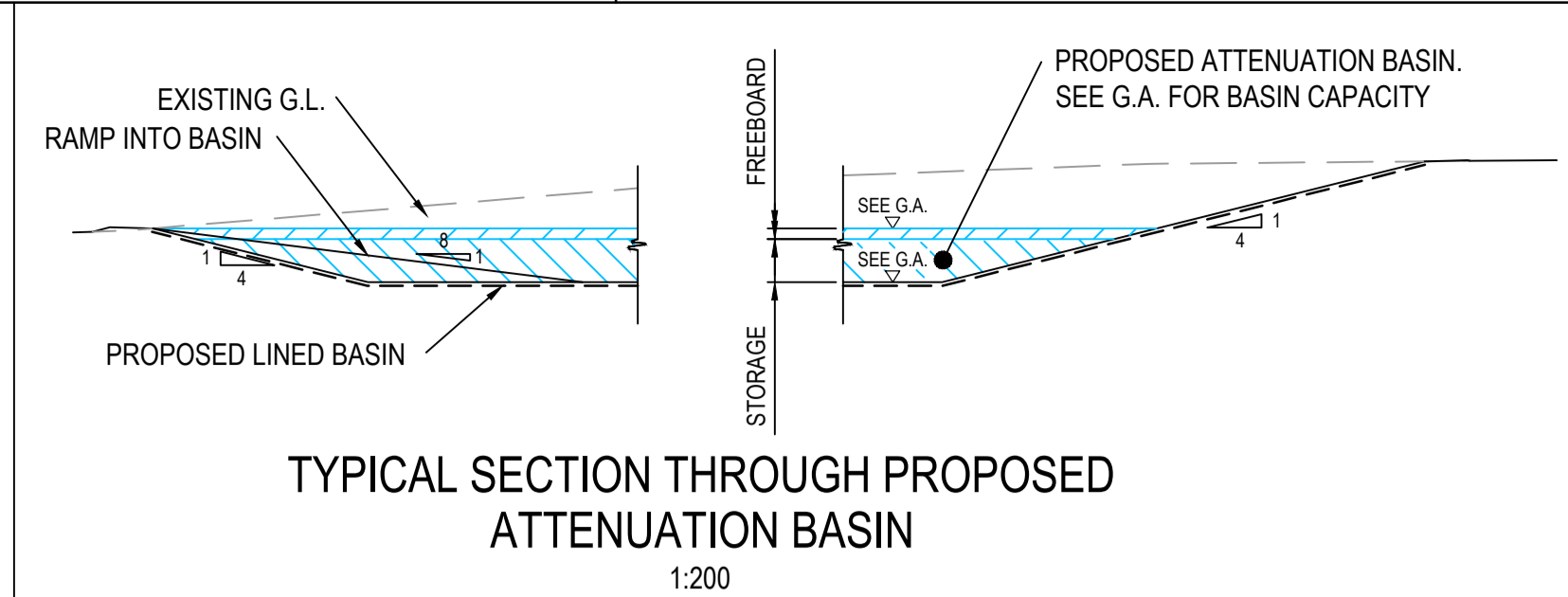
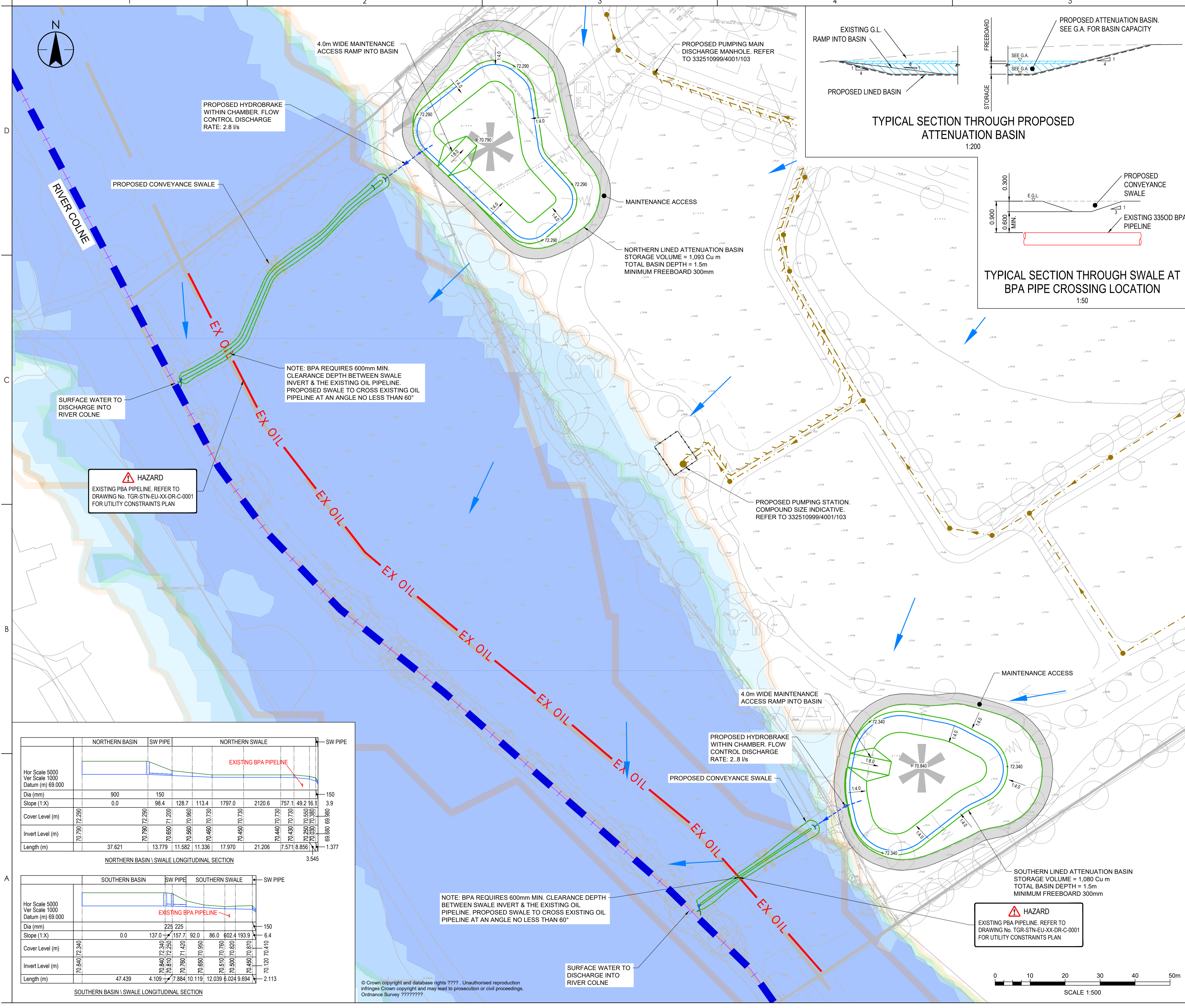


Client/Project  
VISTRY GROUP

LAND AT TOLLGATE ROAD, COLNEY HEATH

Title  
**OUTLINE DRAINAGE STRATEGY SHEET 1**

Project No. 332510999  
Revision  
Scale 1:500 @A1  
Drawing No.



**NORTHERN BASIN \ SWALE LONGITUDINAL SECTION**

	NORTHERN BASIN	SW PIPE	NORTHERN SWALE	SW PIPE
Hor Scale 5000 Ver Scale 1000 Datum (m) 69.000	[Profile Graph]			
Dia (mm)	900	150		150
Slope (1:X)	0.0	98.4	128.7 113.4 1797.0	2120.6 757.1 49.2 16.1
Cover Level (m)	70.790 72.290	70.790 72.290	70.650 71.200 70.650 70.950 70.460 70.730	70.440 70.730 70.430 70.730 70.650 70.650 70.630 70.380
Invert Level (m)	70.790 72.290	70.650 71.200	70.460 70.730	70.450 70.730
Length (m)	37.621	13.779	11.582 11.336 17.970	21.206 7.571 8.856 1.377

**SOUTHERN BASIN \ SWALE LONGITUDINAL SECTION**

	SOUTHERN BASIN	SW PIPE	SOUTHERN SWALE	SW PIPE
Hor Scale 5000 Ver Scale 1000 Datum (m) 69.000	[Profile Graph]			
Dia (mm)		225 225		150
Slope (1:X)	0.0	137.0 157.7 92.0	86.0 602.4 193.9	6.4
Cover Level (m)	70.840 72.340	70.810 72.250 70.760 71.420 70.650 70.950 70.510 70.760 70.500 70.820 70.450 70.870	70.120 70.410	
Invert Level (m)	70.840 72.340	70.810 72.250 70.760 71.420 70.650 70.950 70.510 70.760 70.500 70.820 70.450 70.870	70.120 70.410	
Length (m)	47.439	4.109 7.884 10.119 12.039 6.024 9.694		2.113

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## Appendix G Documents from CHPC

- Flooding Proof of Evidence
- Relevant Planning Matters

# COLNEY HEATH PARISH COUNCIL

Highfield Park Village Centre, Hill End Lane, Herts AL4 0RA  
Telephone 01727 825 314  
Website [www.colneyheathparishcouncil.gov.uk](http://www.colneyheathparishcouncil.gov.uk)  
Email [clerk@colneyheathparishcouncil.gov.uk](mailto:clerk@colneyheathparishcouncil.gov.uk)



Land to the Rear of 42-100 Tollgate Road & 42 Tollgate Road, Colney Heath

**CD 9.19**

date	Issue version	Revision
22 Aug 2023	1	Issue to Planning Inspectorate

## **FLOODING**

### **Proof of Evidence**

by

**John Clemow**

Colney Heath Parish Councillor

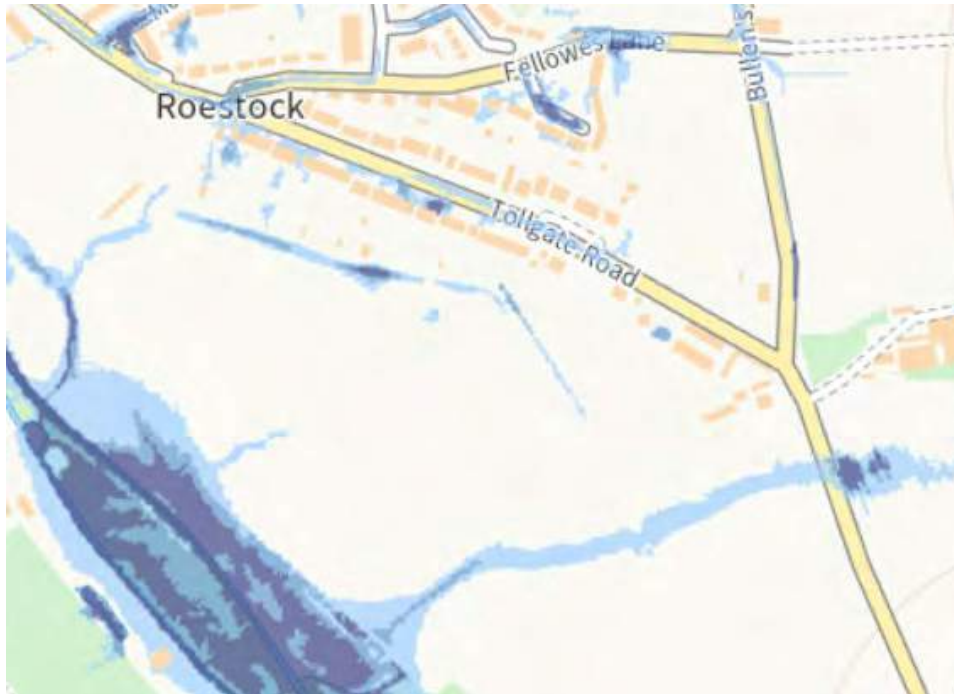
For Colney Heath Parish Council Rule 6 Party

Planning Inquiry

PINS Ref : APP/B1930/W/23/3323099

LPA REF: [5/2022/1988](#)

- 1 The SoCG CD 8.3 notes in 2.4 *The majority of Appeal Site is located within Flood Zone 1, with the south western part located within Flood Zones 2 and 3.*
- 2 The SoCG fails to note or consider the area to the rear of the houses in Tollage Road which shown on the EA surface flood risk map. Therefore, CHPC must challenge the SoCG as it fails to include this area. The EA flood map clearly shows the area to the rear of the houses.



### 3 **Surface water flooding**

- 3.1 The EA flood risk assessment map (downloaded on 30<sup>th</sup> July 2023) indicates the risk of flooding to the rear of the houses 42-100 Tollgate Road.



- 3.2 CHPC does not have access to the site so must rely on the appellants data.
- 3.2a Vistry Phase 2 Ground Investigation Report  
*4.6.2 As shown in the table below, monitoring recorded a relatively high groundwater table beneath the site, with groundwater present at approximately 3.0 to 4.0m bgl in the north and east of the site, and at around 0.6 to 2.0 bgl in the south and west of the site.*  
*4.6.3 These results show that groundwater is typically shallower as you approach the River Colne that forms the southwestern site boundary.*
- 3.2b Vistry Mineral Assessment  
*3.3.7 It should be noted that the groundwater monitoring was undertaken in early summer only, when groundwater levels would have likely been at their lowest. Groundwater levels are generally at their highest in late winter/early spring.*
- 3.3 The ground condition studies were undertaken in the early summer and following a drier than the normal spring on 3<sup>rd</sup>-6<sup>th</sup> and 25<sup>th</sup> May, and on 10<sup>th</sup> June. Therefore, fails to reflect winter flooding levels or those following heavy rain.
- 3.4 The upper Colne valley has several areas prone to flooding and/or water flow in addition to the area to the rear of Tollgate houses, one is shown on the EA map to the east of the site crossing Tollage Road running down to the river Colne. Two others can be found on Colney Heath common the nearest 425m to the west of the site this remains wet for much of the year and spreads over a wide area.
- 3.5 Due to the lack of data and understanding of the area to the rear of the houses in Tollgate Road it is not known if any mitigation is possible, the possible impacts from flooding on the dwellings in Tollgate Road and finally how much of the proposed area will be developable. If only limited mitigation or remedial works are possible this will reduce the developable area and so result in poor use of Green Belt land which is contrary to NPPF para 119 and 124.

#### 4 **River flooding**

- 4.1 The risks relate from changes and in the timing and rates of flow of water into the river due to limited water holding capacity on site and non-porous areas resulting in water entering the river more quickly. There is also a risk



of debris or contamination washing into the river and downstream from the roads, homes, and gardens. Just downstream from the site is Colney Heath common containing many rare plants and area of rare acidic grassland.

Any contamination could cause harm and damage this area is subject to a 5 year management plan. (CD 16.13 HMWT Colney Heath Management Plan 2022).

- 4.2 CHPC are also very concerned over low height difference between the area which floods regularly and the proposed development area the concerns are for four reasons.
- 1) The data supplied indicates the high levels of groundwater in the site this also a particular concern that soil has limited additional water holding capacity so following heavy rain there is a significant risk of run off resulting in flooding.
  - 2) The impacts from the construction of bunds in Fredericks Wood on the opposite side of the riverbank which is subject to planning application 5/2022/0425 and appeal App/B1930/X/22/3297501. See below - Recent construction in the area related to flood risks.
  - 3) Impact of climate change resulting in heavier rainstorms as reported on BBC news including Norway, Germany and Italy and several locations in UK. The reported magnitude of some these storms even with the plus 40% allowance for climate change does cause us considerable concerns.
  - 4) If developed the risk to the internationally rare river Colne chalk stream, with less than 200 worldwide is extremely high.

- 4.3 The risks are from changes in the timing and rates of flow of water into the river. Risk debris or contamination washing into the river and flowing downstream from the roads, homes, and gardens.

## 5 **Impact on flows into the river Colne.**

- 5.1 Higher winter flows increasing the risk both up and down stream of houses flooding due to increased flow rates into river resulting from the change of porous open grass land to hard waterproof surfaces. The houses upstream, Kennel Cottage and downstream in Park Lane and St Marks Close and all have a long history of flooding.

- 5.2 An additional concern is that the sustainable drainage system (SuDS) with its lagoons does not have the capacity to handle prolonged period of heavy rain and would rapidly flow into the river.
- 5.3 Also, as the proposed lagoons are lined, they would offer little or no filtration of the surface water before it enters the river Colne chalk stream there by risking contamination of the river.
- 5.4 The river Colne in Colney Heath has seen a significant reduction in summer water flow rates and in many years the flow has stopped altogether, while this not uncommon for a chalk stream the period now lasts longer and has resulted in the loss of some species.
- 5.5 Climate change is a factor, however CHPC believe the current levels of water extraction is also a significant factor.
- 5.6 This is exacerbated by a former industrial site in Sandridge which processed bromate compounds, the site has now closed and redeveloped for housing. While the site was in operation a large amount of bromate was released into the aquifer.
- 5.7 The carcinogenic bromate is harmful to health and international maximum limits apply in drinking water. The levels in ground water are significantly above these levels so remedial action is currently being undertaken.
- 5.8 The bromate plume is moving towards Hatfield and the Hertford however it is currently managed by pumping from the Bishop's Rise PS. None this water goes into the public water supply but is processed to remove much of the bromate before entering the sewer network. The current extraction rate is up to 9 million/litres per day for the remedial action.
- 5.9 The short fall in water supply is made up by from the existing pumping stations in the area, Roestock and Church Lane, as well water piped in from elsewhere.
- 5.10 The concern is the division of surface water into proposed lagoons will not replace the water held in the soil which is then released over longer periods into the river and aquifer.
- 5.11 While the area is, in percentage terms, quite small with the development of 100 dwellings at Bullens Green Lane which diverts some of its surface water into the main sewer together, they impact on river already under

considerable stress in summer months from high water extraction in the area.



Photo taken winter 2021-22 from inside Osier beds wood looking toward Colney Heath village in the far distance the flood plain is under water.



River Colne flooding at Colney Heath Farm on 21st October 2021  
This image was taken from the public footpath linking Tollgate and Coursers Road Colney Heath. This also shows the low height difference between the flooding areas and proposed development area.

## **6 Recent construction in the area related to flood risks**

- 6.1 The current EA flood risk assessment predates the construction of bunds in Fredericks wood across the river to the application site.
- 6.2 The impact from the construction of bunds in Fredericks Wood on the opposite side of the riverbank which is subject to planning application 5/2022/0425 and appeal App/B1930/X/22/3297501.
- 6.3 If granted it could have significant impact on flooding along the river by reducing the width of the flood plain in an area which already floods so increasing the flooding levels. Application 5/2022/0425 contained no evidence or assessment on the impact on flooding in the area.
- 6.4 However, if refused, without significant remedial work the risk still exists. Following a FOI by CHPC to the Environment Agency (EA) they are not currently proposing any requirement for the removal of the dumped soil.

## **7 Environmental Factors**

- 7.1 The river Colne is an internationally rare chalk stream, with less than 200 worldwide. Considerable efforts are being made to improve the river with schemes in the rivers Colne, Ver, Chess and Misbourne and downstream in Watford by Watford Borough Council and The Colne Catchment Action Network.

## **8 Relevant Planning Matter**

We note the representation made in the document “Relevant Planning Matter” regarding the failure to comply with paragraph 162 national planning policy framework.

## COLNEY HEATH PARISH COUNCIL

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Land to the Rear of 42-100 Tollgate Road & 42 Tollgate Road, Colney Heath

**CD 9.16**

date	Issue version	Revision
22 Aug 2023	1	Issue to Planning Inspectorate

## RELEVANT PLANNING MATTER

Colney Heath Parish Council Rule 6 Party

Planning Inquiry

PINS Ref : APP/B1930/W/23/3323099

LPA REF: [5/2022/1988](#)

<b>SUMMARY</b>	
<p>One or more of the reasons for refusing the appeal is that the appellant has not complied with the NPPF as they have failed to:</p> <ul style="list-style-type: none"> <li>• Complete Sequential Testing Assessment (STA) ( NPPF P161)</li> <li>• Take account of all sources of flooding</li> <li>• Consider the whole development area</li> <li>• To undertake research into other sites that are reasonably available in the wider area.</li> <li>• Prove a wider sustainability benefits to the community (NPPF P164(a)). and that it will be safe for a lifetime (NPPF P164(b))</li> </ul>	
<b>1</b>	<b>Relevant Planning Matter</b>
1.1	<p>Whilst the LPA did not include flood risk as a reason for refusal, under appeal procedures the Inspector is allowed to consider all relevant planning matters in reaching a decision. Accordingly, the following evidence relating to development and flood risk is submitted to the Inspector for consideration in their determination of this appeal.</p>
1.2	<p>In the application the Appellant failed to comply with the National Planning Policy Framework (NPPF) and the Planning Policy Guidance (PPG) as it applies to flooding. The LPA condoned the failure and failed to consider flooding as an issue when recommending the refusal of this application. The Planning Inspector is requested to exercise discretion and allow the failure to comply to be considered as a justification to refuse the appeal</p>
<b>2</b>	<b>Potential reasons for refusal</b>
	<p>The appeal should be refused as the Appellant has failed to:</p> <ol style="list-style-type: none"> <li>a. Complete an Sequential Testing Assessment (STA) ( NPPF P161)</li> <li>b. Take account of all sources of flooding (NPPF P161)</li> <li>c. Consider the whole development area (NPPF P159)</li> <li>d. To undertake research into other lesser flood risk sites that are reasonably available in the wider area (NPPF P162)</li> <li>e. Prove a wider sustainability benefits to the community (NPPF P164(a)). and that it will be safe for a lifetime (NPPF P164(b))</li> </ol>

3	<b>Avoiding inappropriate development</b>
3.1	<p>In relation to flooding the NPPF demands that developments are directed away from flooding high risk areas to lower risk areas. Para 159 states:</p> <p><i><b>159.</b> Inappropriate <u>development</u> in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.</i></p> <p>The key words being “Development”. The recent precedents are that this covers the whole of the development site not just a “built area” that is confined to low risk (FZ1) areas.</p>
3.2	<p>The precedents include the following references:</p> <p>APP/W2465/W/21/3283279 [‘Leicester Appeal’]  APP/D0840/W/21/3281713 [‘St Austell Appeal’]  APP/W2465/W/21/3283279 [‘Leicester Appeal’]  APP/D1265/W/22/3296683 [‘Dorset Appeal’]  APP/N1920/W/23/3314268 (Bushey Appeal)  APP/E2734/W/18/3219294 (Bishop Monkton Appeal)  APP/W3520/W/22/3308189 (Needham Market Appeal)</p>
4	<b>Sequential Test Assessment</b>
4.1	<p>The NPPF mandates a Sequential Test Assessment (STA) should apply. Para 161 states:</p> <p><i><b>161.</b> <u>All plans should apply a sequential, risk-based approach to the location of development – taking into account all sources of flood risk and the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property. They should do this, and manage any residual risk, by:</u></i></p> <p><i>(a) applying the sequential test and then, if necessary, the exception test as set out below;</i></p> <p><i>(b) safeguarding land from development that is required, or likely to be required, for current or future flood management;</i></p> <p><i>(c) using opportunities provided by new development and improvements in green and other infrastructure to reduce the causes and impacts of flooding, (making as much use as possible of natural flood management</i></p>

	<p><i>techniques as part of an integrated approach to flood risk management); and</i></p> <p><i>(d) where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to relocate development, including housing, to more sustainable locations.</i></p>
4.2	<p>The key words “All plans should apply a Sequential (STA) Risk Based Approach” and “Taking into account all sources of flooding”. In this application the Appellant has not applied a STA before or during the application or since the refusal. This despite the fact that the development has fluvial flooding in the site in the areas of FZ3, FZ2 and groundwater flooding in FZ1</p>
4.3	<p>Even where a flood risk assessment shows the development can be made safe throughout its lifetime without increasing risk elsewhere, the sequential test still needs to be satisfied. (PPG Paragraph: 023 Reference ID: 7-023-20220825)</p> <p>It is said that the Appellant conducted a single test (therefore not sequential) in the summer of 2022 during one of the driest periods on record.</p>
5	<p><b>All sources of flooding</b></p> <p>The Appellant has not taken into account all sources of flooding by relying on the built area being solely within FZ1.</p> <p>The Environment Mapping for Planning Site clearly shows there is extensive groundwater flooding in the FZ1 area in particular a line running parallel to the rear boundary of the houses on the south side of Tollgate Road including behind number 42 Tollgate Road (the house to be demolished for an access road) and across the area to be used as an access to the development. The Figure 1 of the Appellants Stantec Technical Note of 24 January 2023 confirms this.</p>
6	<p><b>Responsibility for conducting STA</b></p> <p>The responsibility for conducting an STA is solely that of the applicant/appellant. The LPA have a role in defining the area and extent of the assessment. In this case there was an agreement between the Appellant and the LPA that a STA was not necessary because the built area was only in FZ1. While unspoken there appears to be an opinion that Para 162 can be applied to disaggregated areas</p>



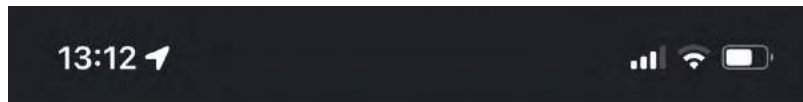
	<p>within the site. Recent precedents suggest that this is not the case. There is a recognition that detailed survey is required as the appellant has agreed to a post approval condition for a site survey. The LPA stance is recorded in paras 8.15.2 – 8.15.4 of the Planning Officer Report to the Planning Committee.</p>
7	<p><b>Reasonably available sites</b></p> <p>An STA has not been completed as the Appellant has not complied with NPPF para 162 that places a responsibility on the applicant to search for reasonably available sites with less flood risk</p> <p><i>162. The aim of the sequential test is to steer new development to areas with the lowest risk of flooding from any source. <u>Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding.</u> The strategic flood risk assessment will provide the basis for applying this test. The sequential approach should be used in areas known to be at risk now or in the future from any form of flooding.</i></p> <p>There is no evidence that the Appellant has researched reasonably available sites.</p>
8	<p><b>Para 162 - Search area</b></p> <p>The search area for reasonably available sites is not confined to the Development Site. It may extend for up to 15 miles from the proposed development and include other local authority areas potentially including all of the South West Hertfordshire Housing Market Area (HMA), namely Dacorum, St Albans, Three Rivers, and Watford and other adjacent Local Authority areas. Consideration may have to be given to multiple smaller sites to meet the requirement.</p>
8	<p><b>Exception Test – Post STA</b></p> <p>In the event that it is not possible to locate a reasonably available site with a lower risk of flooding an exception test may be applied. NPPF Para 163 to 165 state:</p> <p><i>163. If it is not possible for development to be located in areas with a lower risk of flooding (taking into account wider sustainable development objectives), the exception test may have to be applied. The need for the exception test will depend on the potential vulnerability of the site and of the development proposed, in line with the Flood Risk Vulnerability Classification set out in Annex 3.</i></p>

	<p><b>164.</b> <i>The application of the exception test should be informed by a strategic or site-specific flood risk assessment, depending on whether it is being applied during plan production or at the application stage. To pass the exception test it should be demonstrated that:</i></p> <p><i>(a) the <u>development would provide wider sustainability benefits to the community</u> that outweigh the flood risk; and</i></p> <p><i>(b) the development will be <u>safe for its lifetime</u> taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.</i></p> <p><b>165.</b> <u>Both elements of the exception test should be satisfied for development to be allocated or permitted.</u></p>
9	<p>The Planning Policy Guidance states, “<i>The Exception Test is not a tool to justify development in flood risk areas when the Sequential Test has already shown that there are reasonably available, lower risk sites, appropriate for the proposed development. It would only be appropriate to move onto the Exception Test in these cases where, accounting for wider sustainable development objectives, application of relevant local and national policies would provide a clear reason for refusing development in any alternative locations identified</i>”. (PPG Paragraph: 031 Reference ID: 7-031-20220825)</p>
10	<p><b>Appellant and LPA agreement</b></p> <p>The negotiation and decision between the Appellant and the LPA that there would not be an STA for this application in favour of a post planning approval test condition does not comply with the NPPF.</p> <p>The post approval condition is:</p> <p><i>“No development shall be commenced until detailed ground investigations have been conducted across the site and submitted to the Local Planning Authority. The ground investigations should identify seasonal groundwater levels (to reflect that the initial testing conducted in summer) and ensure that areas of shallow groundwater will not compromise the development or vice versa. Where shallow groundwater is identified, appropriate measures to mitigate groundwater flood risk should be proposed to ensure the the risk of groundwater flooding is not increased on or off the site.” (Para 8:15:4 of the Planning Officers report to the Planning Committee.)</i></p>

	This condition effectively condones the failure to comply with the requirements of NPPF paragraphs 159 and 161 – 165. The agreement fails to direct the development to an area of lesser risk and removes the topic of “Flooding” from consideration until after planning approval has been granted when there is less scrutiny
11	<b>Role of EA in the Appellant and LPA Agreement</b>
11.1	As required the LPA consulted the Environment Agency (EA) (Para 160 NPPF) and the above agreement appears to have been influenced by the response of the Sustainable Places Planning Officer at the EA in a written response to the LPA.
11.2	The following extract applies: <i>“The documents and email submitted provide us with confidence that it will be possible to suitably manage the risks posed to groundwater resources by this development. Further detailed information will however be required before any development is undertaken. It is our opinion that it would place an unreasonable burden on the developer to ask for more detailed information prior to the granting of planning permission but respect that this is a decision for the local planning authority. In light of the above, the proposed development will be acceptable if a planning condition is included requiring submission and subsequent agreement of further details as set out below. Without this we would object to this proposal in line with paragraph 170 of the National Planning Policy Framework because it cannot be guaranteed that the development will not present unacceptable risk to groundwater resources.”</i>
11.3	It should be noted that documents and email referred to did not include any details from objectors especially regarding the groundwater flooding. The author appears to be focussed on contamination of groundwater.
11.4	It is not clear whether the EA or indeed the LPA can absolve the applicant of there responsibilities under paragraphs 159 and 161 – 164. It is also noted that condition referred to by the author appears to focus solely on the assessment of the ground and not the other aspects of an STA.
11.5	Later in the same document under the heading of “Advice to LPA” there is detailed advice on the roles and responsibilities for completion of an

	STA. It is also confirmed that there is a potential risk of groundwater flooding on the site.
12	<b>Underground Chalk Stream</b>
12.1	The local oral history of the site contends that there is an underground chalk stream near to and parallel with the rear (southern) boundary of 42-100 Tollgate Road. It further contends that this rear boundary took account of the location of the stream.
12.2	This being the area indicated in figure 1 of the Stantec Technical Note of 24 January 2023 and the Environment Agency Flood Map for groundwater shown below. Photographs of flooding in this area are shown below.
12.3	Based on the photographs the appellant “suspects” local ponding of water in a depression in the surface of the site. (Stantec Technical Note of 24 January 2023). Local residents “suspect” that it is a chalk stream that this a tributary of the River Colne, the linear nature of the flooding/ponding in the photographs tend to support this.
12.4	Based on the photographs the appellant “suspects” local ponding of water in a depression in the surface of the site. (Stantec Technical Note of 24 January 2023). Local residents “suspect” that it is a chalk stream that this a tributary of the River Colne, the linear nature of the flooding/ponding in the photographs tend to support this.
12.5	Chalk streams are fed mainly by chalk groundwater, streams whose flows are affected be chalk groundwater in this way they are known as “winterbournes” where seasonal variations in the water table result in a flow in winter and early spring but no flow in summer and autumn. (The Stantec Test was in the summer)
12.6	If such a stream exists and it is a tributary of the river Colne disruption or pollution to the areas of the stream will have a negative effect on the River Colne and associated wildlife. An STA will prove or disprove if the feature is a tributary of River Colne. It should be noted that the proposed access route to the development crosses the area of flooding and, if it is a stream, will seriously disrupt, obstruct or otherwise be detrimental to the stream.
12.7	Chalk streams are part of a globally rare and internationally important habitat, Approximately 85% of the global chalk streams are found in the

	UK and about 10% in Hertfordshire. Chalk streams have no protection and face a number of threats to their survival including over-abstraction, water pollution disruption to flow global warming, etc. There is grave concern that, if the Development commences before an STA to prove or disprove the existence or otherwise of a subterranean stream, significant damage may be done to such a rare and important geological and ecological environment.
	<b>Conclusion</b>
	The appeal be refused.



## Learn more about this area's flood risk

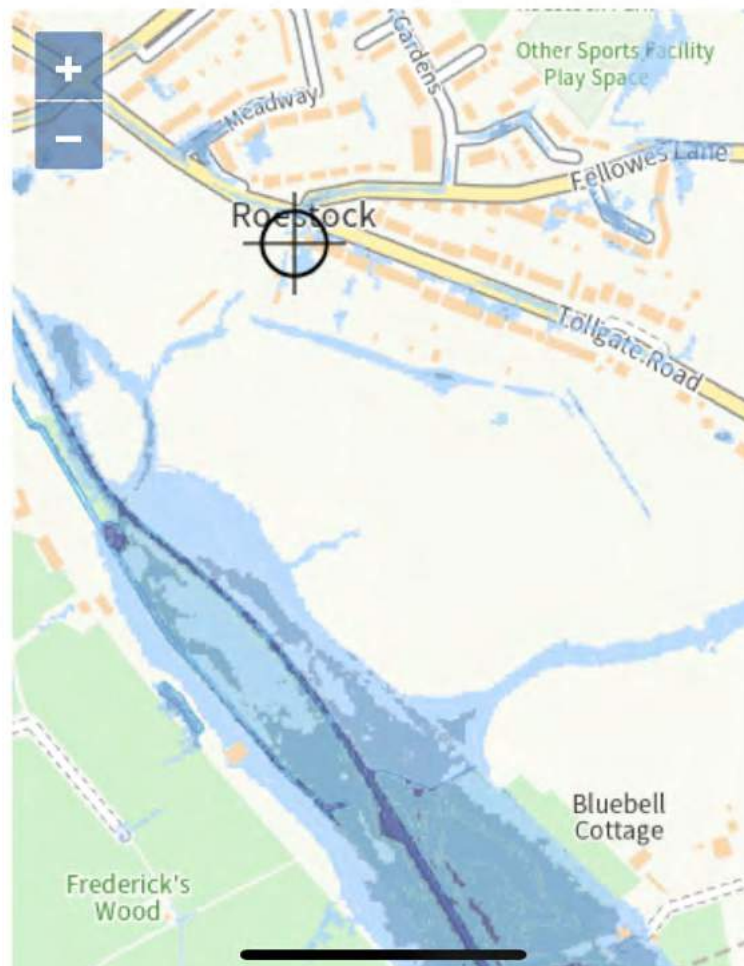
Select the type of flood risk information you're interested in. The map will then update.

Flood risk

Low risk: depth

Location

Enter a place or postcode





**Photographs of “groundwater” flooding to rear boundary of 42-100 Tollgate Road**