

BLUECREST LAND LTD

Tuthill Yard, Therfield

Flood Risk Statement

**REPORT REF.
196661-ACE-XX-00-RP-C-0301**

July 2024

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DOCUMENT CONTROL SHEET

REV	ISSUE PURPOSE	AUTHOR	CHECKED	APPROVED	DATE
-	DRAFT	MG	GA	DRAFT	12 June 2024
-	FINAL	MG	GA	CC	17 July 2024

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1. Introduction

- 1.1 Ardent Consulting Engineers has been appointed by Quanta Homes to advise on flood risk matter associated with the proposed redevelopment site situated at Tuthill's Yard, in Therfield, Royston.
- 1.2 This Flood Risk Statement has been prepared with specific reference to the requirements of the National Planning Framework (NPPF – December 2023) and the Planning Practice Guidance (March 2014 – flood risk section updated in August 2022). The report demonstrates that the site can be suitably developed whilst complying with the requirements of the NPPF in terms of Flood Risk.

2. Site Characteristics

Existing Site

- 2.1 The application site is situated to the south-west of Royston, on the outskirts of a village known as Therfield, as indicated in Figure 2-1 below:

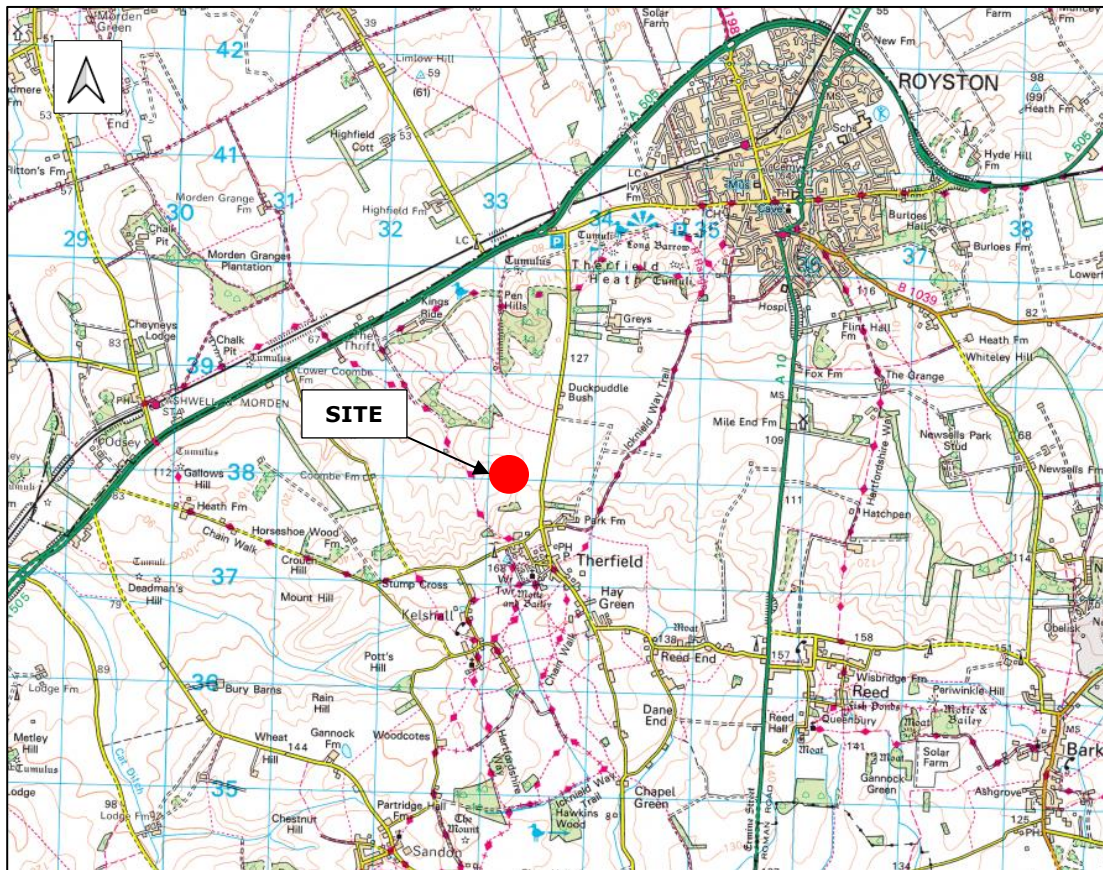


Figure 2-1: Site Location

- 2.2 The site is bounded by Kelshall Tops Road to the north, residential properties accessed from Tuthill Court and unnamed road to the east and agricultural fields/open space to the south and west.
- 2.3 The application site is situated on an Ordnance Survey grid reference of 533130mE, 237310mN. Closest post code is SG8 9PT.
- 2.4 The application boundary comprises an area of approximately 0.79 hectares, as illustrated in Figure 2-2 on the following page and in Appendix A.

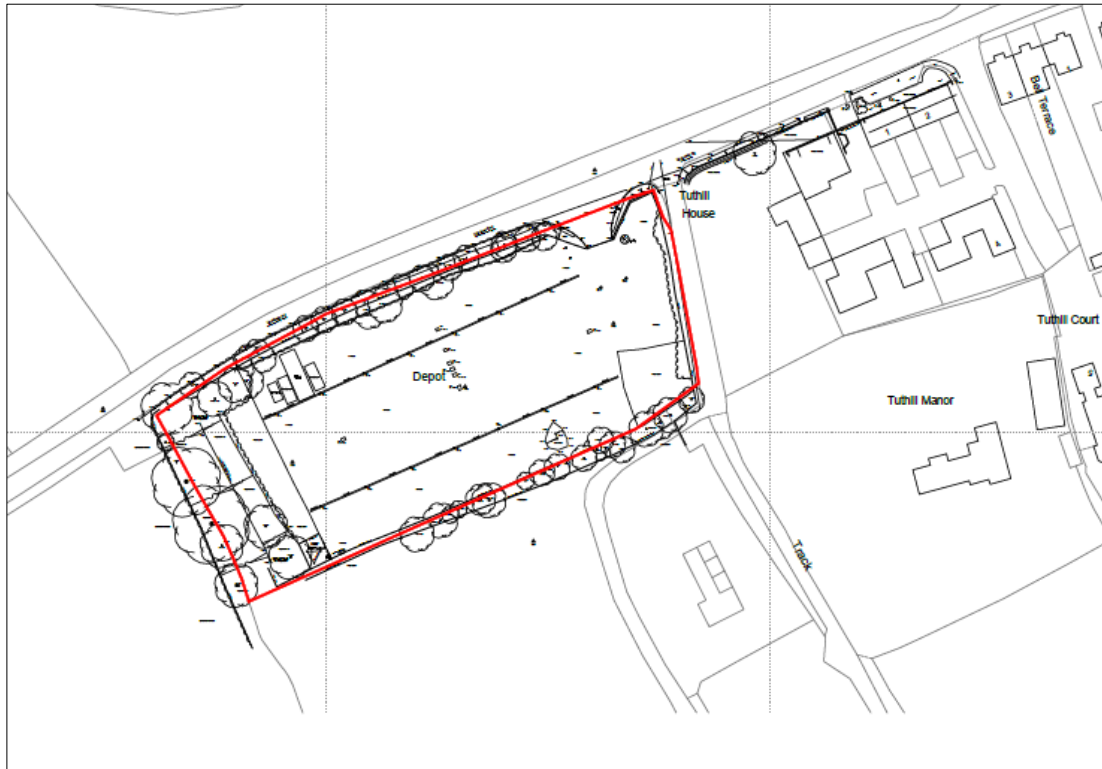


Figure 2-2: Site Location Plan

Development Proposals

- 2.5 A planning application is submitted to the local planning authority at North Hertfordshire District Council which seeks permission to redevelop the existing site and provide a residential scheme comprising three no. dwellings, with an internal access road, car parking provision and landscaping.
- 2.6 This submission follows refusal of a previous application for 3 no. residential units (planning application ref. 21/03533/FP). The application was refused in February 2023 and dismissed at appeal in February 2024 (planning application ref. AP/23/00022/REF). In response to the refusal, the applicant is seeking permission by making amends that are believed to address the inspectors comments.
- 2.7 A layout of the proposed site has been prepared by DAP Architecture, as illustrated in Figure 2-3 and in Appendix A.



Figure 2-3: Development Masterplan Layout

Geology

- 2.8 The British Geological Survey record plans for the Therfield area indicate the site is underlain by the Lewes Nodular Chalk and Seaford Chalk Formation, as illustrated in Figure 2-4 below.

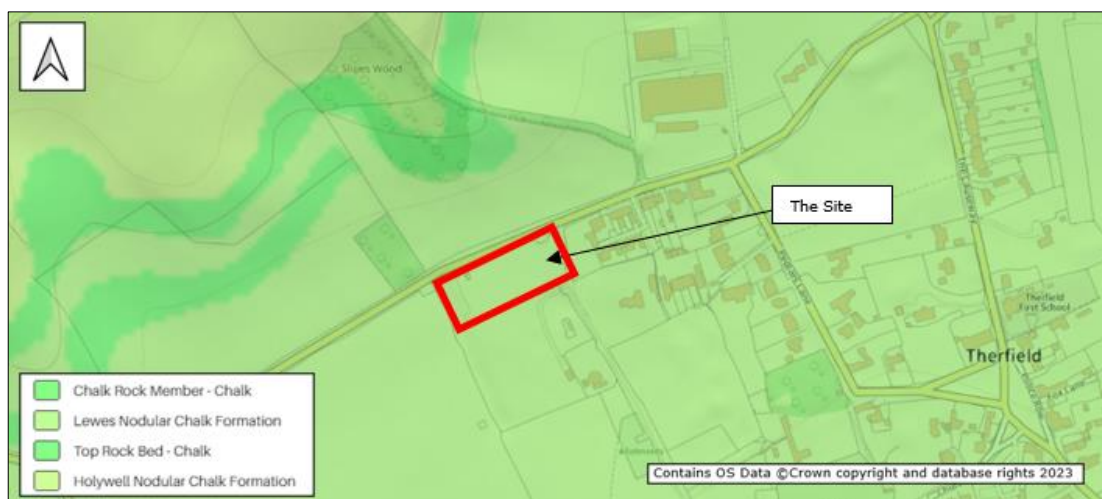


Figure 2-4: Extract of BGS's Bedrock Geology (Source: BGS)

- 2.9 The BGS describes the superficial deposit as the Lowestoft Formation which forms an extensive sheet of chalky till, together with outwash sands and gravels, silts and clays. See Figure 2-5 for details.



Figure 2-5: Superficial deposits at the proposed site location (Source: BGS)

Topographical Survey

- 2.10 A detailed topographical survey of the site has been prepared by Survey Solutions in October 2018 and all finished ground levels relate to an Ordnance Survey GPS network/datum. The topographical survey confirms that there is a significant area associated with the existing site comprising the courtyard's hardstanding area, as illustrated on Figure 2-6.
- 2.11 The application boundary comprises an area of approximately 0.79 hectares. A detailed version of the survey has been included in Appendix B.

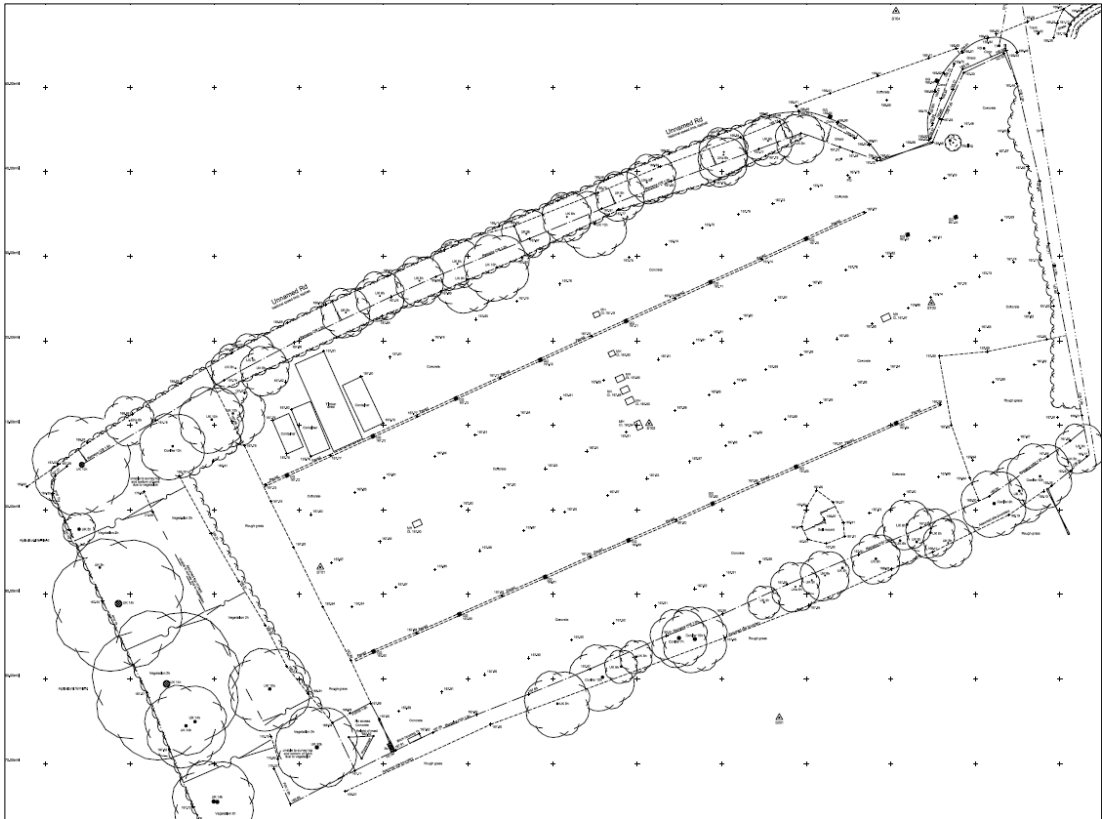


Figure 2-6: Extract of Topographical Survey

Existing Sewer Infrastructure

- 2.12 The public sewer asset record plan for the local area has been obtained from the Sewerage Undertaker for the region, Anglian Water Services Ltd which illustrates that there are no strategic foul or surface water public sewers which traverse the site, as illustrated in Figure 2-7 below.



Figure 2-7: Public Sewer Asset Record Plan

- 2.13 A copy of the public sewer asset record plans has been provided in Appendix C of this report for further reference.

3. Policy Context

National Planning Policy Framework (December 2023)

- 3.1 The National Planning Policy Framework (NPPF) was introduced on 27 March 2012. This document was revised most recently in December 2023; where paragraphs 165 to 175 inclusive, establish the Planning Policy relating to flood risk management. The Technical Guide to the NPPF was superseded by the Planning Practice Guidance (PPG) in March 2014, and most recently updated in August 2022.
- 3.2 It 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 residual risk, by:
- applying the sequential test and then, if necessary, the exception test as set out below;
 - safeguarding land from development that is required, or is likely to be required, for current or future flood management;
 - 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,
 - 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.
- 3.3 The Planning Practice Guidance (PPG) provides the methodology required to undertake the Sequential and Exception Tests.

Flood and Water Management Act (2010)

- 3.4 The Flood and Water Management Act places a duty on all flood risk management authorities to co-operate with each other. The Act also provides lead local flood authorities and the Environment Agency with a power to request information required in connection with their flood risk management functions.
- 3.5 The LLFAs are responsible for developing, maintaining, and applying a strategy for local flood risk management in their areas, and for maintaining a register of flood risk assets. They also have lead responsibility for managing the risk of flooding from surface water, groundwater, and ordinary watercourses.

Hertfordshire LLFA Summary Guidance for Developers (2021)

- 3.6 This guidance provides a summary of information and a developer's checklist to assist you with producing a satisfactory Surface Water Drainage Assessment and Flood Risk Assessment (FRA) for your development in accordance with national planning policy.
- 3.7 This guidance should be read alongside the Local Flood Risk Management Strategy 2 (LFRMS2) which includes the LLFAs SuDS Policies.
- 3.8 It covers matters relating to surface water drainage only and does not outline other considerations we may take into account such as works affecting Ordinary Watercourses.
- 3.9 A surface water drainage assessment should be carried out to demonstrate that the proposed development will not create an increased risk of flooding from surface water to the development site and the surrounding area. It should be carried out in accordance with the National Planning Policy Framework and the Practice Guide, giving preference to infiltration over discharge to a watercourse, which in turn is preferable to discharge to surface water sewer.

North Hertfordshire District Surface Water Management Plan, (2017)

- 3.10 A SWMP is a framework through which key stakeholders with responsibility for surface water and drainage in their area, work together to understand the

causes of surface water flooding and agree the most cost-effective way of managing surface water flood risk.

3.11 The key objectives of the SWMP are:

- To continue and enhance the successful working relationship between all stakeholders and to provide a future framework for this forum;
- Enhance the understanding of local flood risk across North Hertfordshire District;
- Establish the areas at significant risk⁹ of flooding and the potential impacts;
- Aid in understanding the mechanism of flooding. It may be that while local knowledge suggests one singular cause, there may be multiple factors with interconnectivity between sources;
- Identify various mitigation options (taking into account both the current and future situations, including the impacts of climate change) and prioritise the options; and
- Develop an Action Plan to reduce the flood risk within the North Hertfordshire District.

3.12 The Surface Water Management Plan identified six hotspots for a detailed flood risk assessment. The site lies outside of those hotspots.

Hertfordshire Strategic Flood Risk Assessment, Level 1, (2022)

3.13 The SFRA is an important document that informs the plan making process, as the potential predicted impacts from climate change and the spread of built development have often increased the severity and frequency to which flooding occurs. This means that the risk of flooding should be assessed in order to inform the planning process.

3.14 The Level 1 SFRA is primarily a desk-based study that identifies areas of flood risk within Hertfordshire.

- 3.15 Paragraph 162 of the NPPF provides a clear definition of the Sequential Test, which 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."

- 3.16 Only where there are no reasonable sites in areas where there is a lower risk of flooding should consideration be given to the suitability of sites in areas where flooding may occur.

- 3.17 Paragraph 163 of the NPPF provides a definition of when the exception test may have to be applied:

"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"

- 3.18 For the Exception Test to be passed, the Sequential Test should already have been applied.

- 3.19 A site-specific FRA is required are as follows:

- All development in Flood Zones 2 and 3;
- All proposals in Flood Zone 1 involving:
 - sites of 1 hectare or more;
 - land which has been identified by the Environment Agency as having critical drainage problems;

- land identified in a strategic flood risk assessment as being at increased flood risk in future; or
- land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.

3.20 SuDS are implemented through soft engineering options and should be designed to take into account the surface water run-off quantity, rates and also water quality ensuring their effective operation. The incorporation of SuDS should attempt to contribute to reduce flood risk to the site and surrounding area, reduce pollution and provide landscape and wildlife benefits.

Climate Change Allowance

3.21 Climate change allowance for rainfall intensity, in the Planning Practice Guidance, were updated in May 2022. Climate change allowances are now broken down into management catchments. To allow for the predicted impacts of climate change on surface water runoff within Upper and Bedford Ouse Management Catchment peak rainfall allowances, the following increases detailed in Table 3-1 below to rainfall intensity should be allowed for. For residential developments the minimum lifetime is 100 years and the upper end allowances should be used.

Table 3-1: Upper and Bedford Ouse Management Catchment Peak Rainfall Allowances

3.3% (1 in 30-year) Annual Exceedance Rainfall Event (%)		
Epoch	Central Allowance	Upper End Allowance
2050s	20	35
2070s	25	35
1% (1 in 100-year) Annual Exceedance Rainfall Event (%)		
Epoch	Central Allowance	Upper End Allowance
2050s	20	40
2070s	25	40

3.22 Therefore, under the NPPF an allowance of 40% for the effects of climate change for the 1% annual exceedance rainfall event would achieve the policy requirements in designing the drainage elements the proposed residential redevelopment (the design event).

4. Sequential and Exception Test

Sequential Test

- 4.1 The objective of the Sequential Test is to steer new developments toward areas with the lowest probability of flooding. Where there are no reasonably available sites in lower flood risk areas, local planning authorities in their decision making should take into account the flood risk vulnerability of land uses and consider reasonably available sites in higher flood risk areas.
- 4.2 As the site is shown to be located within Flood Zone 1 of the Environment Agency flood mapping it should not be necessary for the site to undergo the Sequential Test.

Exception Test

- 4.3 Table 2 'Flood risk vulnerability classification' of the PPG describes the proposed residential development as 'More Vulnerable'. Table 3 of the PPG replicated overleaf in Table 2-1, confirms that the Exception Test is not required for 'More Vulnerable' uses in Flood Zone 1.

Table 4-1 Extract from PPG - Table 3 Flood Risk Vulnerability

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	X	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	X	X	X	✓ *
Key:					
✓ Exception test is not required					
X Development should not be permitted					

5. Sources of Flooding

5.1 The NPPF requires flood risk from the following sources to be assessed, each of which are assessed separately below:

- Fluvial sources (river flooding);
- Tidal sources (flooding from the sea);
- Pluvial sources (flooding resulting from overland flows);
- Groundwater sources;
- Sewer Flooding;
- Historic Flooding;
- Artificial sources, canals, reservoirs etc.; and,
- It also requires the risk from increases in surface water discharge to be assessed (surface water management).

Flood Zone Designation

5.2 Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. The NPPF Planning Practice Guidance defines Flood Zones as follows:

- Flood Zone 1: Low Probability. Land having a less than 0.1% annual probability of river or sea flooding.
- Flood Zone 2: Medium Probability. Land having between a 1% and 0.1% annual probability of river flooding; or land having between a 0.5% and 0.1% annual probability of sea flooding.
- Flood Zone 3a: High Probability. Land having a 1% or greater annual probability of river flooding; or Land having a 0.5% or greater annual probability of sea.
- Flood Zone 3b: The Functional Floodplain. This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise:

- I. having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or
- II. land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding).

Fluvial Flooding

- 5.3 According to the Environment Agency's Flood Map for Planning (see Figure 5-1), the site lies within Flood Zone 1, meaning a low probability of fluvial and/or tidal flooding.

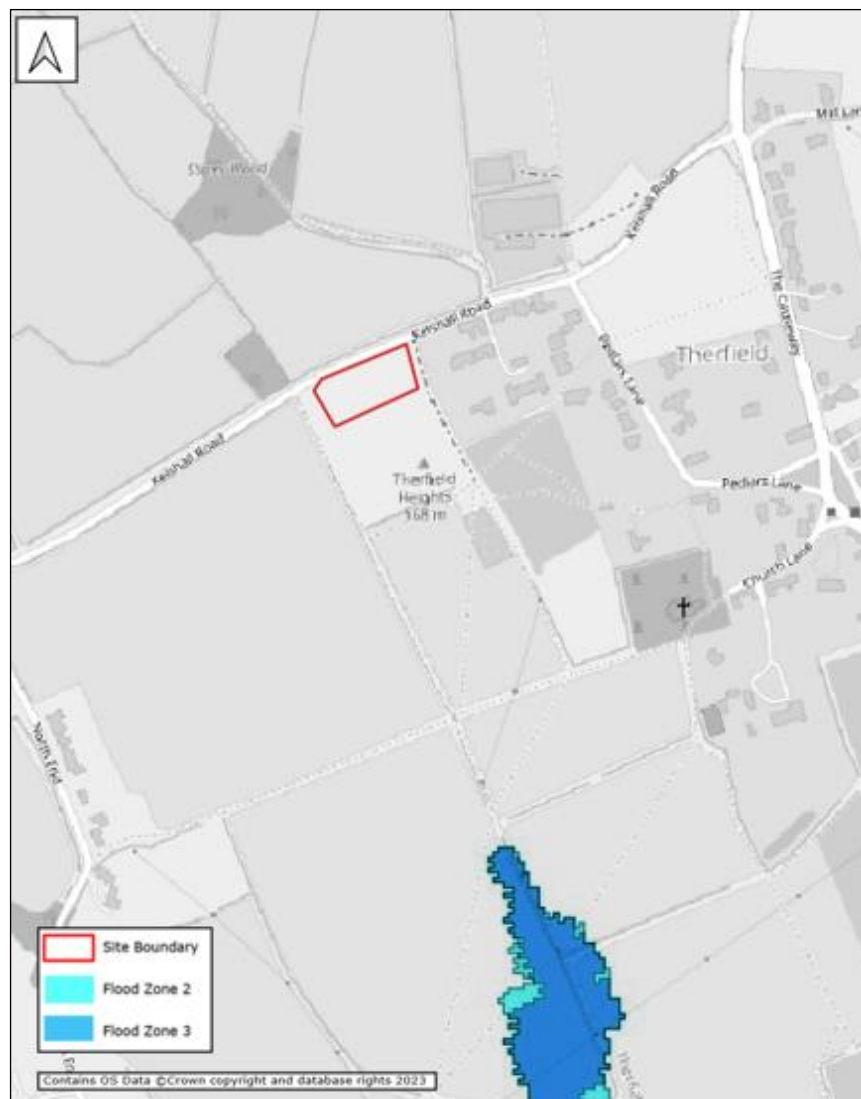


Figure 5-1: Indicative Fluvial/Tidal Floodplain Extent

Pluvial Flooding

- 5.4 According to the Environment Agency's indicative mapping for the local area, the site is not susceptible to any pluvial/surface water flooding.
- 5.5 The Surface Water Management Plan confirms that the site is not located within an identified hotspot area.

Historic Flooding

- 5.6 The 2022 SFRA confirms the Site is not shown to be within the historic flooding area.

Groundwater Flooding

- 5.7 As detailed in Surface Water management Plan, North Hertfordshire District is predominantly underlain by chalk formations and much of it is water bearing aquifers. This is overlain by superficial deposits, mainly composed of clays and silts which will provide some capping to the aquifers underneath.
- 5.8 As a result, there is a risk of artesian conditions within the chalk aquifers below clay deposits and where superficial deposits become sandier in nature, there is a risk that high groundwater levels could lead to flooding.
- 5.9 According to 2022 SFRA (see Figure 5-2), the site is located within the High susceptibility to Groundwater Flooding, based on the 1km squares.

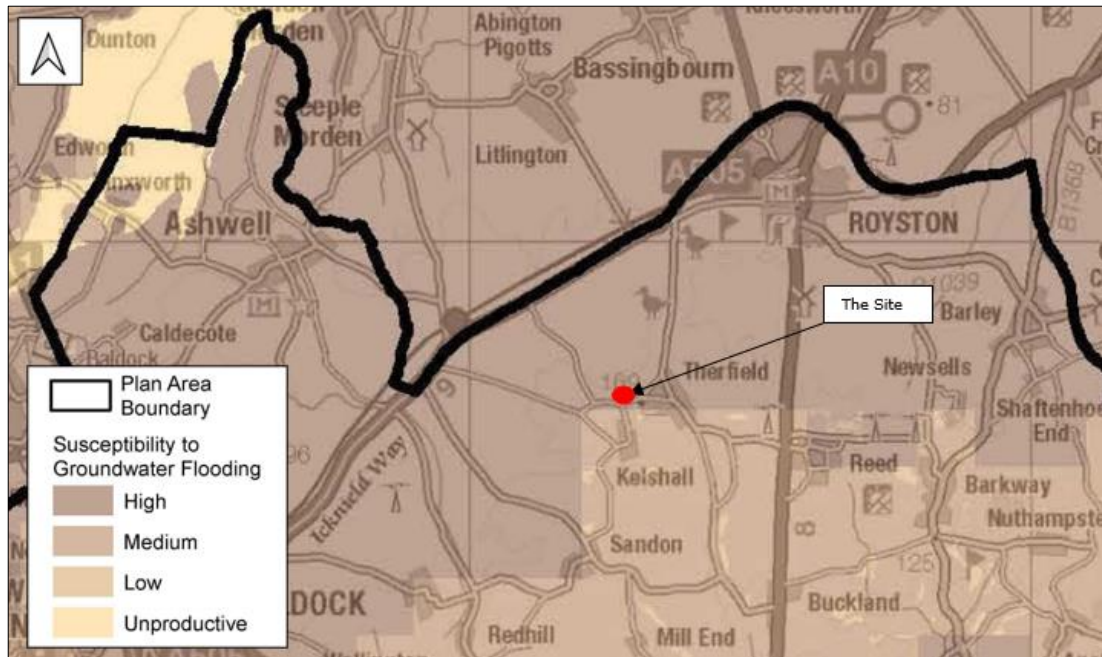


Figure 5-2: Groundwater Flooding (SFRA, 2022)

5.10 According to the records held on the British Geological Survey website, a borehole (BGS Reference TL33NW9) was drilled to a depth of 121.92m to the east of the application site. Groundwater was encountered at a depth of 100.6m below the ground's surface level therefore it is concluded that the site is not at risk of any groundwater flooding, even allowing for seasonal variances. A copy of the borehole record has been included within Appendix D of this report for further reference.

5.11 Considering the above the groundwater food risk is categorised as low.

Artificial Sources

5.12 A further search of the Environment Agency's mapping confirms that the site is not shown to be susceptible from flooding as a result of a breach of a nearby reservoir flooding.

Sewer Floding

5.13 According to the 2022 SFRA, Water Companies keep a record of property flooding called the DG5 Flood Risk register. Between 1997 and 2007 there were 291 records of sewer flooding within Hertfordshire, of which 77 were attributed to surface water and 25 to combined sewers. As the records are only referenced

to broad areas by postcode district it is not possible to provide a spatial representation of this.

- 5.14 In view of this assessment, it is concluded that the scheme is not at risk of flooding from any source including fluvial, tidal, a breach of any nearby reservoir, groundwater or pluvial/surface water.

6. Summary

- 6.1 Ardent Consulting Engineers has been appointed by Quanta Homes to advise on flood risk and surface water management matters associated with the proposed redevelopment site situated at Tuthill's Yard, in Therfield, Royston.
- 6.2 This FRA has been prepared with specific reference to the requirements of the National Planning Framework (NPPF – December 2023) and the Planning Practice Guidance (March 2014 – flood risk section updated in August 2022). The report demonstrates that the site can be suitably redeveloped whilst complying with the requirements of the NPPF in terms of Flood Risk.
- 6.3 The proposal is for residential development, categorised as 'more vulnerable'.
- 6.4 According to the EA flood maps, the Site is located within Flood Zone 1, area deemed to be suitable for development, as defined by the NPPF.
- 6.5 As the site is shown to be within Flood Zone 1 and site is not susceptible to any fluvial/pluvial/surface water flooding, the Sequential Test will not need to be undertaken.
- 6.6 The remaining potential sources of flood risk discussed in the report are considered low/ negligible.
- 6.7 In conclusion, this FRA demonstrates that the proposals are consistent with the aims of the NPPF and the Planning Practice Guidance to the NPPF along with the aims of local flood risk policy. The Site will not be at significant risk of flooding or increase the flood risk to others.

Appendix A



Stage 3



1:1250
0m 10m 20m 30m 60m 90m

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PLANNING ISSUE

P01	First Issue by Scene	ANE	11.03.24
Rev	Description	Initials	Date

Tuthill's Yard

// Site Location Plan

Client Name Bluecrest Land

Address Tuthill's Yard,
Therefield, Royston
SG8 9TT

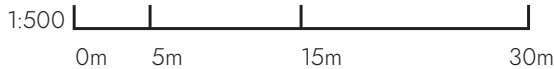
Drawn By	ANE	Checked By	BKM
Scale	1:1250 @ A4	Date	11/03/2024
Scene Ref.	1549	Rev no.	P01
Dwg no.	THSYD-SCN-XX-XX-DR-A-01.001-A3		



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P01	Original Issue by Scene	OBL	16.05.24
Rev	Description	Initials	Date



Stage 3

Tuthills Yard

// Proposed Site Layout Plan

Client Name	Quanta Homes LTD
Address	Tuthill's Yard, Therefiend, Royston, SG8 9TT

Drawn by	OBL	Checked by	BKM
Scale	1:500 @ A3	Date	16/05/24
Scene Ref.	1549	Rev no.	P01
Drawing no.	THSYD-SCN-XX-XX-DR-A-01.002-A3		



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Appendix B

Appendix C



Appendix D

RECORD OF WELL (SHAFT OR BORE)

221/66
 TL33/39
 269

At Tutthill Farm TL 3322 3735Town or Village TherfieldCounty Herts Six-inch quarter sheet 48E/W.For Mr. H.J. FordhamExact site of well 350 yds. N.W. by N. of St. Marks Church (situated onGE.D.'s field slip

Attach a tracing from
 a map, or a sketch-
 map, if possible.

Level of ground surface above sea-level (O.D.) 545 feet.Is well-top at ground level? If not, state how far above ; feet.
below ; feet.Shaft ft., diameter ft. Details of headings Bore 400 ft.; diameter of bore: at top ins.; at bottom 2 1/2 ins.Lengths, diameters, perforations, etc., of lining tubes Water struck at depths, below well-top, of (feet)

TEST DETAILS Rest-level of water 330 ft. above well-top. Suction at ft. Yield on hours
below well-top. days
 Month pumping 200 gallons per hour (max. capacity of pump g.p.h.),
 Year with depression of feet. Recovery to in mins.
 hours.

WORKING CONDITIONS Rest-level of water in (month), (year), ft. above well-top.
below well-top.
 Highest in (month), (year), ft. above well-top.
below well-top.
 Lowest in (month), (year), ft. above well-top.
below well-top.
 Suction at ft. Rate of pumping galls. per for hours per day.
 with average depression of ft. Recovery to in mins.
 hours.

Quality of water (attach copy of analysis if available) Well made by Thomas Martin of Harpenden Date of well c. 1923Information from

ADDITIONAL NOTES.

Upper knittle Lower chalk.
Visited Handpump dismantled.
Sealed under back yard.
No have now.

OD + 545'

168 29/9/60

LOG OF STRATA OVERLEAF.

GEOLOGICAL SURVEY AND MUSEUM,
 SOUTH KENSINGTON,
 LONDON, S.W.7.

Date received.	G.S.M. Office File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map. on 6" Map.	