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Level 2 Strategic Flood Risk Assessment

Braintree District Council

FINAL REPORT

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Contents

List of Tables

Glossary of Terms

Glossary	Definition
Annual exceedance probability (AEP)	Chance of occurrence in any one year, expressed as a percentage. For example, a 1% annual probability event has a 1 in 100 chance of occurring in any given year.
Areas Benefitting from Defences (ABD)	Hatched areas on the Environment Agency Flood Map for Planning (Rivers and Sea) behind flood defences, which, if the flood defences were not present, would flood, in the event of a river flood with a 1 per cent (1 in 100) chance of happening each year, or a flood from the sea with a 0.5 per cent (1 in 200) chance of happening each year.
Asset Information Management System (AIMS)	Environment Agency management system of assets associated with main rivers including defences, structures and channel types. Information regarding location, standard of service, dimensions and condition.
Climate Change	Long term variations in global temperature and weather patterns caused by natural and human actions. The Environment Agency has published guidance setting out the approach for assessing the impact of climate change with respect to flood risk, further detail about which is provided in the Level 1 SFRA.
Culvert	A channel or pipe that carries water below the level of the ground.
Exception Test	A method set out in the NPPF to help ensure that flood risk to people and property will be managed satisfactorily, while allowing necessary development to go ahead in situations where suitable sites at lower risk of flooding are not available. The two parts to the Test require proposed development to show that it will provide wider sustainability benefits to the community that outweigh flood risk, and that it will be safe for its lifetime, without increasing flood risk elsewhere and where possible reduce flood risk overall.
Flood Defence	Infrastructure used to protect an area against flooding such as floodwalls and embankments.
Resilience measures	Measures designed to reduce the impact of water that enters property and businesses and to promote fast drying and easy cleaning; for example raising electrical appliances, installing tiled flooring.
Flood Risk	The level of flood risk is the product of the frequency or likelihood of the flood events and their consequences (such as loss, damage, harm, distress and disruption).
Flood Zone	Areas defined by the probability of river and sea flooding, ignoring the presence of defences. Flood Zones are shown on the Environment Agency's Flood Map for Planning (Rivers and Sea), available on the Environment Agency's web site.
Fluvial	Relating to the actions, processes and behaviour of a watercourse (river or stream).
Freeboard	The height of a flood defence crest level (or building level) above a particular design flood level.
Functional Floodplain	Land where water has to flow or be stored in times of flood. It is defined by LPAs within SFRAs. Functional floodplain (also referred to as Flood Zone 3b) is not separately distinguished from Zone 3a on the Environment Agency Flood Map for Planning.
Groundwater	Water that is in the ground, this is usually referring to water in the saturated zone below the water table.
Lead Local Flood Authority (LLFA)	As defined by the Flood and Water Management Act, in relation to an area in England, this means the unitary authority or where there is no unitary authority, the county council for the area. Each of the London Boroughs is a LLFA for their respective areas.
Local Planning Authority (LPA)	Body that is responsible for controlling planning and development through the planning system.
Main river	Watercourse defined on a 'main river map' designated by Defra. The Environment Agency has permissive powers to carry out flood defence works, maintenance and operational activities for main rivers. However overall responsibility for maintenance lies with the riparian owner.
National Planning Policy Framework (NPPF)	The National Planning Policy Framework was published on 27 March 2012. It is a framework which sets out the Government's planning policies for England and how these are expected to be applied.
Ordinary watercourse	A watercourse that does not form part of a main river. This includes "all rivers and streams and all ditches, drains, cuts, culverts, dikes, sluices (other than public sewers within the meaning of the Water Industry Act 1991) and passages, through which water flows" according to the Land Drainage Act 1991.

Return Period	The average time period between rainfall or flood events with the same intensity and effect.
Risk	Risk is a factor of the probability or likelihood of an event occurring multiplied by consequence: Risk = Probability x Consequence. It is also referred to in this report in a more general sense.
Sequential Test	An approach to future site planning whereby new development is directed towards areas with the lowest probability of flooding before consideration of higher risk areas. The Sequential Test helps ensure that development can be safely and sustainably delivered and developers do not waste their time promoting proposals which are inappropriate on flood risk grounds.
Sewer Flooding	Flooding caused by a blockage or overflowing of a sewer or urban drainage system.
Surface Water	Rainwater (including snow and other precipitation) which is on the surface of the ground (whether or not it is moving), and has not entered a watercourse, drainage system or public sewer.
Sustainable drainage systems (SuDS)	Methods of management practices and control structures that are designed to drain surface water in a more sustainable manner than some conventional techniques.

Acronyms

Acronym	Meaning
AEP	Annual Exceedance Probability
ABD	Area Benefitting from Defences
AIMS	Asset Information Management System
AStGWF	Area Susceptible to Groundwater Flooding
FRA	Flood Risk Assessment
LLFA	Lead Local Flood Authority
LPA	Local Planning Authority
NPPF	National Planning Policy Framework
RoFSW	Risk of Flooding from Surface Water
SuDS	Sustainable urban Drainage Systems
SFRA	Strategic Flood Risk Assessment

1 Introduction

1.1 Terms of Reference

AECOM was commissioned by Braintree District Council (BDC) in August 2015 to review and revise the Level 1 and Level 2 Strategic Flood Risk Assessment (SFRAs) for the Braintree District administrative area. This report comprises the updated Level 2 SFRA.

1.2 Project Background

The National Planning Policy Framework[1] (NPPF) and associated Planning Practice Guidance for Flood Risk and Coastal Change (PPG)[2] emphasise the active role Local Planning Authorities (LPAs) should take to ensure that flood risk is understood and managed effectively and sustainably throughout all stages of the planning process. The NPPF outlines that Local Plans should be supported by a Strategic Flood Risk Assessment (SFRA) and LPAs should use the findings to inform strategic land use planning. The overall approach of the NPPF to flood risk is broadly summarised within Paragraph 100 of the framework:

"Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere. Local Plans should be supported by a Strategic Flood Risk Assessment and develop policies to manage flood risk from all sources, taking account of advice from the Environment Agency and other relevant flood risk management bodies, such as lead local flood authorities and internal drainage boards. Local Plans should apply a sequential, risk-based approach to the location of development to avoid where possible flood risk to people and property and manage any residual risk, taking account of the impacts of climate change, by:

- ***applying the Sequential Test;***
- ***if necessary, applying the Exception Test;***
- ***safeguarding land from development that is required for current and future flood management;***
- ***using opportunities offered by new development to reduce the causes and impacts of flooding; 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 facilitate the relocation of development, including housing, to more sustainable locations."***

1.2.1 Level 1 SFRA

An updated Level 1 SFRA report was prepared for BDC in November 2016[3]. The purpose of the Level 1 SFRA was to collate and analyse the most up to date readily available flood risk information for all sources of flooding, and provide an overview of flood risk issues across the study area.

The Level 1 SFRA provides guidance on:

- The application of the Sequential Test by BDC when allocating future development sites to inform their Local Plans, as well as by developers promoting development on windfall sites.
- Managing and mitigating flood risk, the application of sustainable drainage systems (SuDS), and the preparation of site-specific Flood Risk Assessments (FRAs).
- Potential flood risk management objectives and policy considerations which may be developed and adopted by the BDC as formal policies within their developing Local Plan.

1.3 Level 2 SFRA

Using the strategic flood risk information presented within the Level 1 SFRA, BDC undertook the Sequential Test to document the process whereby future development is steered towards areas of lowest flood risk. Where it was not possible to accommodate potential development sites outside those areas identified to be at risk of flooding, the Exception Test is required, as set out in Table 1-1. This Level 2 SFRA Report provides information to support the application of the Exception Test for future development sites.

[1] Department for Communities and Local Government. 2012. *National Planning Policy Framework*. Available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2

[2] Department for Communities and Local Government. 2014. *Planning Practice Guidance: Flood Risk and Coastal Change.* Available at: http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/

[3] AECOM, November 2016, Braintree Level 1 Strategic Flood Risk Assessment

Table 1-1 Flood Risk Vulnerability and Flood Zone 'Compatibility' (PPG, 2014)

Flood Risk Vulnerability Classification		Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone	1	✓	✓	✓	✓	✓
	2	✓	✓	Exception Test Required	✓	✓
	3a	Exception Test Required	✓	×	Exception Test Required	✓
	3b	Exception Test Required	✓	×	×	×

✓ - Development is appropriate × - Development should not be permitted

1.3.1 Exception Test

The purpose of the Exception Test is to ensure that where it may be necessary to locate development in areas at risk of flooding, new development is only permitted in Flood Zone 2 and Flood Zone 3 where the flood risk is clearly outweighed by other sustainability factors and where the development will be safe during its lifetime, considering climate change.

The NPPF states that for the Exception Test to be passed:

- *Part 1 - "It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by the SFRA where one has been prepared; and*
- *Part 2 - A site-specific Flood Risk Assessment must demonstrate that 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."*

Both elements of the test have to be passed for development to be allocated or permitted.

In order to provide the information necessary to support the application of the Exception Test, a Level 2 SFRA considers the detailed nature of the flood characteristics within a flood zone, which can typically include consideration of aspects such as the probability of flooding and anticipated flood depths.

During the preparation of the Preferred Options stage of the New Local Plan, BDC have undertaken the Sequential Test and identified a number of potential development sites which will be required to undergo the Exception Test, and therefore require a Level 2 assessment of flood risk. These areas are listed in Table 1-2 and comprise 16 development sites.

Table 1-2 Level 2 SFRA potential development sites

Settlement	BDC Site Reference	Site Name	Area (ha)
Black Notley	BLAN115	Land at Bakers Lane and London Road, Black Notley	3.97
	BLAN116	Land at Bakers Lane (between London Rd and Row Green, Black Notley	2.96
Bures	BURE165	Land at Colchester Road, Bures	5.32
Braintree	BOCN132	Land bounded by A131, Broad Road and River Blackwater, Braintree	65.61
	BLAN110	Land East of Friaries, Bakers Lane, Braintree	1.01
	BLAN114 and BLAN117	Land east of Great Notley/South of Braintree	117.90 and 0.28
	BOCN137	Towerlands Park, between Panfield Lane and Deanery Hill	42.99
Coggleshaw	COGG506	Dutch Nursery, West Street, Coggeshall	2.50
Feering	FEER 230	Land at Inworth Road, Feering	1.97
	FEER 232	Land south of Feering, west of A12 (between Coggeshall Road and New Lane)	17.26

Settlement	BDC Site Reference	Site Name	Area (ha)
	FEER233	Land south of Feering, west of A12 (south of Feering Hill/London Road)	57.24
Halstead	HATR299 and HATR298	Harrison Works, Kings Road, Halstead	0.81 and 0.45
	HASA287	Land East of the High Street, Halstead	1.64
Witham	WITC421	Land south of Newlands Street/off Kings Chase (Previously known as Gimsons), Witham	3.05
	HATF316	Land at Woodend Farm, including Mayfield Nursery, London Road, Witham	2.76
	HATF315	Land at Woodend Farm, London Road, Witham	15.90

1.3.2 Level 2 SFRA Deliverables

Section 2 of this report provides a description of each of the datasets that has been used in the Level 2 SFRA reporting and presented in the mapping and site assessments.

Section 3 presents the Level 2 assessment for each of the potential development sites.

2. Level 2 SFRA Methodology

This Section describes the additional datasets, (other than those already presented in the Level 1 SFRA), which have been used to inform the Level 2 SFRA.

2.1 Fluvial Flood Risk

The Environment Agency has provided hydraulic models of the River Brain, River Blackwater, River Colne and River Stour for use in this Level 2 SFRA. The River Colne and River Stour are both 1D models and therefore only provide flood extent information without flood depth and velocity information on the floodplain. The River Blackwater hydraulic model has sections of 1D as well as 1D-2D elements. The Environment Agency are currently undertaking new modelling studies for these watercourses, however, outputs were not available for use in this report.

BDC has not identified any sites adjacent to the fluvial River Brain.

2.1.1 Climate Change Allowances

In accordance with NPPF, developments must demonstrate how flood risk will be managed now and over the developments lifetime, taking climate change into account.

In February 2016 the Environment Agency published revised guidance on climate change allowances in an update to the document 'Adapting to Climate Change: Advice to Flood and Coastal Erosion Risk Management Authorities'. This version of the document reflects an assessment completed by the Environment Agency between 2013 and 2015 using United Kingdom Climate Projections 2009 (UKCP09) data, to produce more representative climate change allowances for river basin districts across England. The allowances for the Anglian river basin district are of relevance to Braintree and are set out in Section 3.4.5 of the Braintree Level 1 SFRA.

The Environment Agency is currently undertaking new modelling studies for the River Brain, River Blackwater and the River Stour. It is anticipated that these studies will take account of the new climate change allowances, and will provide climate change flood outlines for use in future BDC planning documents and site specific FRAs. However, in the interim period it has been agreed with the Environment Agency that for the purpose of this Level 2 SFRA, where additional information is required with regard to potential sites shown to be at risk of fluvial flooding, the East Anglia, Essex, Norfolk and Suffolk (ENS) guidance[4] intermediate assessment of climate change impacts on fluvial flooding will be applied to provide a better understanding of the impact of climate change on development allocation.

Four of the sites identified for Level 2 SFRA assessment (see Table 1-2) are located within flood zones covered by the existing hydraulic models provided by the Environment Agency. At these four sites, existing water levels for a range of return period events were reviewed and a stage discharge relationship review completed to estimate the 1% Annual Exceedance Probability (AEP) plus 35% and 1% AEP plus 65% climate change scenarios. The review concluded that the following can be used as a conservative approach to climate change scenarios at these four sites:

- The use of the existing modelled 0.1% AEP (Flood Zone 2) as a proxy for the 'higher central' allowance (1% AEP plus 35%);
- The existing 0.1% AEP plus 20% scenario can been used to provide an indication of the 'upper end' allowance (% AEP plus 65%).

The stage discharge relationship review providing justification for this approach is described for the three applicable sites in section 2.1.1.1 to section 2.1.1.3 below.

Developers should note that the Environment Agency guidance[7] should be used as a guide only and it is anticipated that there will be greater emphasis for site specific FRAs to include additional modelling scenarios to determine the future flood risk with respect to climate change where hydraulic modelling data is not available.

It is recommended that developers contact the Environment Agency at the pre-planning application stage to confirm site specific flood risk assessment approach, on a case by case basis.

[4] Environment Agency (Sept 2016), East Anglia, Essex, Norfolk and Suffolk Area – Flood Risk Assessments: Climate change allowances

2.1.1.1 Climate Change Flood Extent - COGG506 Dutch Nursery, Coggeshall

This site is shown to be located adjacent to and partially within Flood Zone 2. Modelled peak flow and water levels were extracted from the Environment Agency River Blackwater hydraulic model adjacent to the site at node BWT13850. Flows for the 1% AEP plus 35% and 1% AEP plus 65% climate change were estimated based on the trend in the stage-discharge relationship for the modelled flood events (Figure 2-1 and Table 2-1 below).

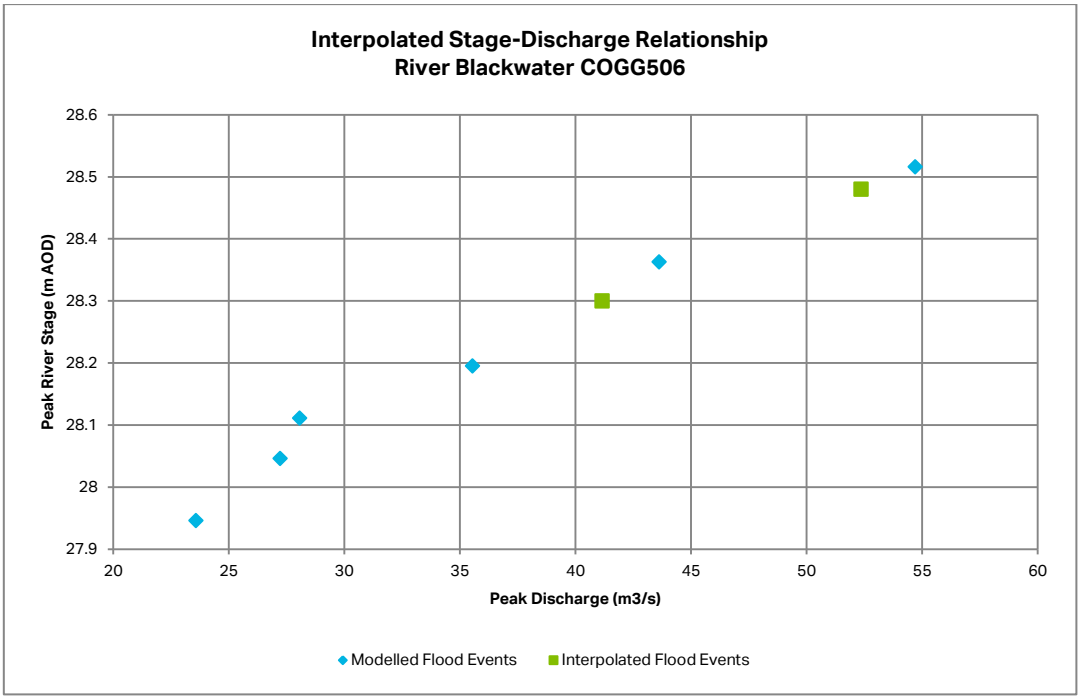

Figure 2-1 Stage-discharge relationship for the River Blackwater at Dutch Nursery, Coggeshall

Table 2-1 Analysis of existing modelled flood water levels (COGG506)

Flood Event	Flow (m3/s)	River Stage (m AOD)
1 in 20 year	23.589	27.946
1 in 75 year	27.224	28.046
1 in 100 year	28.070	28.111
1 in 100 year plus 20% climate change	35.548	28.195
1 in 1000 year	43.629	28.363
1 in 1000 year plus 20% climate change	54.701	28.516
Interpolated Events		
1 in 100 year plus 35% climate change	41.160	28.300
1 in 100 year plus 65% climate change	52.370	28.480

The analysis demonstrates that based on an interpolation of the existing River Blackwater modelled flood levels for a range of return periods, utilising the 0.1% AEP as a proxy for the 1% AEP plus 35% allowance for climate change is appropriate at this site (Table 2-1). This scenario has been mapped in Site Assessments (Section 3) of this report. Additionally, utilising the 1 in 1000 year plus 20% climate change event as a proxy for the 1 in 100 year event including a 65% allowance for climate change is appropriate at this site (Table 2-1).

2.1.1.2 Climate Change Flood Extent - BURE165 Land at Colchester Road, Bures

The site is located within Flood Zone 1, 2 and 3a associated with the River Stour. Modelled peak flow and water levels were extracted for the River Stour model adjacent to the site at node SDFR679. Flows for the 1 in 100 year plus 35% and 1 in 100 year plus 65% climate change were estimated based on the trend in the stage-discharge relationship for the modelled flood events (Figure 2-2 and Table 2-2 below).

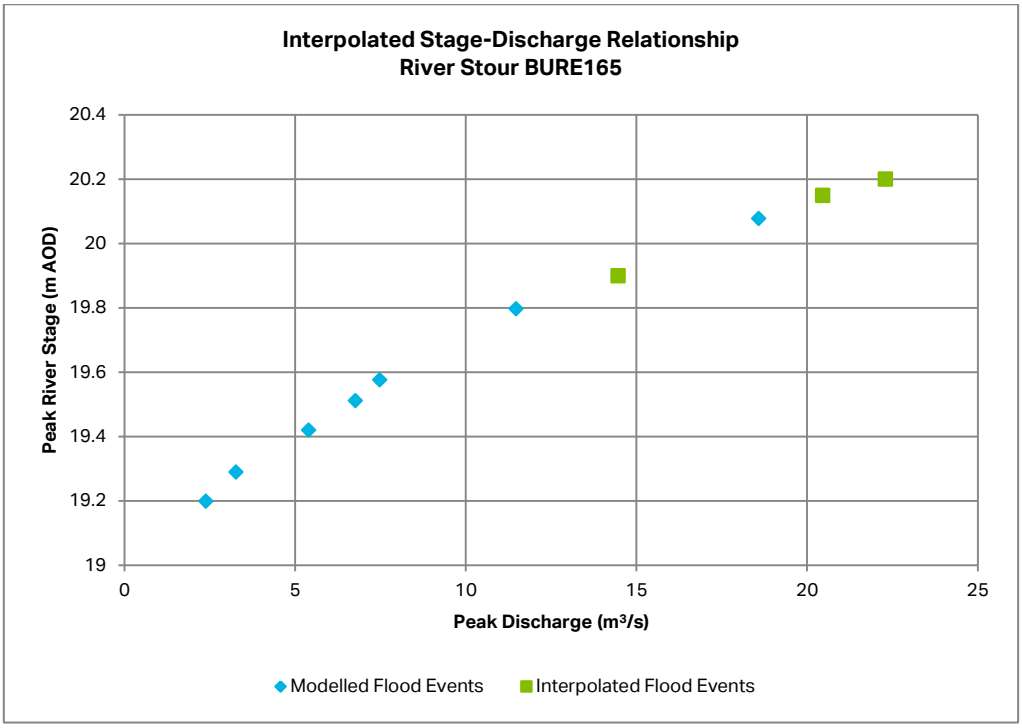

Figure 2-2 Stage-discharge relationship for the River Stour modelled flood events at Colchester Road

Table 2-2 Analysis of existing modelled flood water levels – River Stour at Colchester Road

Flood Event	Flow (m^3/s)	River Stage (m AOD)
1 in 10 year	2.383	19.199
1 in 20 year	3.269	19.290
1 in 50 year	5.399	19.420
1 in 75 year	6.761	19.512
1 in 100 year	7.476	19.576
1 in 100 year plus 20% climate change	11.472	19.797
1 in 1000 year	18.583	20.078
Interpolated Events		
1 in 100 year plus 35% climate change	14.469	19.900
1 in 100 year plus 65% climate change	20.463	20.150
1 in 1000 year plus 20% climate change	22.300	20.200

The analysis demonstrates that based on an interpolation of the existing River Stour modelled flood water levels for a range of return periods, utilising the 1 in 1000 year event as a proxy for the 1 in 100 year event including a 35% allowance for climate change is appropriate at this site (Table 2-2). This scenario has been mapped in Site Assessments (Section 3) of this report.

Existing modelling results for the River Stour are not available for the 1 in 1000 year plus 20% climate change event, however for consistency between site assessments within the Level 2 SFRA, the flows for this scenario have been interpolated. A review of the interpolated flows for the 1 in 100 year plus 65% climate change event and the interpolated flows for the 1 in 1000 year plus 20% climate change flows indicates that the latter would produce the most conservative flood water levels for the site (Table 2-2).

2.1.1.3 Climate Change Flood Extent - - HATR299 and HATR298, Halstead

Sites HATR299 and HATR298 are located within a close proximity of each other and therefore covered by the same flow data point for the River Colne. The HATR299 site is located within Flood Zones 1, 2 and 3a associated with the River Colne, and the majority of HATR298 is located within Flood Zone 3b associated with

the River Colne. Modelled peak flow and water levels were extracted for the River Colne model adjacent to the site at node CO101350. Flows for the 1 in 100 year plus 35% and 1 in 100 year plus 65% climate change were estimated based on the trend in the stage-discharge relationship for the modelled flood events (Figure 2-3 and Table 2-3 below).

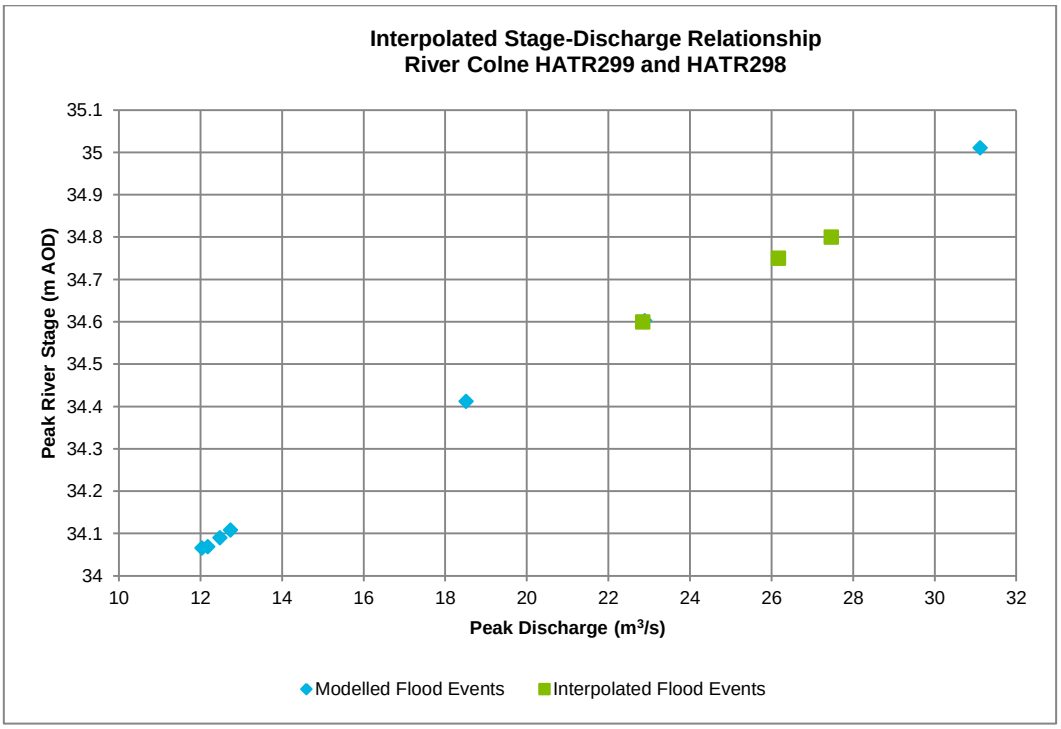

Figure 2-3 Stage-discharge relationship for the River Colne modelled flood events (HATR299 and HATR298)

Table 2-3 Analysis of existing modelled flood water levels – River Colne at Harrison Works (HATR299 and HATR298)

Flood Event	Flow (m^3/s)	River Stage (m AOD)
1 in 10 year	12.037	34.066
1 in 20 year	12.18	34.069
1 in 50 year	12.474	34.09
1 in 100 year	12.732	34.108
1 in 100 year plus 20% climate change	18.509	34.412
1 in 1000 year	22.889	34.603
1 in 1000 year (undefended)	31.117	35.011
Interpolated Events		
1 in 100 year plus 35% climate change	22.840	34.600
1 in 100 year plus 65% climate change	26.170	34.750
1 in 1000 year plus 20% climate change	27.470	34.800

The analysis demonstrates that based on an interpolation of the existing modelled flood levels for the River Colne for a range of return periods, utilising the 1 in 1000 year event as a proxy for the 1 in 100 year event including a 35% allowance for climate change is appropriate at these sites (Table 2-3). Existing modelling results for the River Colne are not available for the 1 in 1000 year plus 20% climate change event. A review of the interpolated flows for the 1 in 100 year plus 65% climate change event and the interpolated flows for the 1 in 1000 year plus 20% climate change flows indicates that the latter would produce the most conservative flood water levels for the sites (Table 2-3). These two scenarios have been mapped in Site Assessments (Section 3) of this report.

2.1.2 Maximum Flood Depth

During a flood event, the water depth can vary considerably across a flooded area. It is important to identify areas of a site are more likely to experience greater depths of water and to try to locate high vulnerability developments in areas with a lower flood depth. In addition flood depth is required to inform finished floor levels and to identify access and egress routes during a flood event.

For the purposes of this SFRA, maximum flood depth data has been extracted from existing Environment Agency hydraulic models for each potential site requiring a level 2 assessment. Mapping of maximum flood depth for the 0.1% AEP scenario and 0.1% plus climate change scenario have been generated for each Level 2 site assessment included in Section 3.

2.1.3 Hazard Rating

Flood hazard is a function of flood velocity and flood depth as defined in Defra guidance (FD2320/TR2)[5]. Hydraulic modelling data is required to provide flood velocity data and only two dimensional (2D) hydraulic modelling contains this information. Within in the study area, only small sections of the River Brain and River Blackwater are modelled using 2D techniques. Consequently, using the best available information, it is not possible to provide flood hazard mapping based on flood velocity and depth to inform this SFRA.

In agreement with the Environment Agency, depth hazard mapping has been used as a substitute to determine the areas of greatest flood hazard from fluvial sources. The depth hazard categories have been mapped using the method set out in Defra guidance[8].

Table 2-4 Key to Depth Hazard

Depth of Flooding At Risk	Hazard Rating
0.30m - 0.50m	Danger for Some
0.50m - 1.50m	Danger for Most
>1.50m	Danger for All

Site BURE165 is located adjacent to the Cambridge Brook (a main river) and at the extent of the River Stour floodplain in the 1% AEP event. The River Stour model is a 1D hydraulic model and the Cambridge Brook is not directly represented in the model. A review of the flood extent on the site associated with the projected flood water levels for the 1% AEP plus 65% climate change event showed that there would be minimal flooding on the site associated solely with flooding from the River Stour. Instead, the flood hazard for this site is better represented in the Environment Agency Risk of Flooding from Surface Water maps, as it includes the hazard associated with the Cambridge Brook.

Position Statement **January 2017**

It should be noted that the Environment Agency is currently updating their hydraulic model for the River Colne and River Stour, which will include a flood hazard output. The flood hazard modelling will supersede the depth hazard mapping method used in this Level 2 SFRA. The Level 2 SFRA may need to be updated to incorporate the revised information. Developers and site promoters are required to consult with the Environment Agency for the most up-to-date hazard data to be included in site specific FRAs.

2.1.4 Rate of Onset and Flood Duration

The rate-of-onset and flood duration are important factors when assessing the emergency planning component of the safety of a development. At the time of completing this Level 2 SFRA, information on the rate of onset and duration of flooding were not available for the Environment Agency's hydraulic models for the River Colne, River Stour, River Blackwater and River Brain. However the depth and hazard information provided is considered adequate to inform the Exception Test at this stage. Catchment characteristics and mechanisms of flooding should be taken into consideration when developing site-specific Flood Warning and Evacuation Plans.

[5] Defra/Environment Agency (2005), Flood Risk Assessment Guidance for New Development, R&D Technical Report FD2320/TR2

2.2 Surface Water Runoff

Although the Exception Test is primarily concerned with the definitions of Flood Zones and thereby the risk from fluvial sources, it is important that surface water management is considered at an early stage in the assessment of the potential development sites identified by BDC.

In order to support this, the following information has been provided as part of the site assessments presented in Section 3:

- A high level assessment of potential surface water flow paths has been made, using the Environment Agency Risk of Flooding from Surface Water mapping (RoFSW), further detail about which is provided in Section 3.5.2 of the Level 1 SFRA.
- Estimated Greenfield runoff rates have been provided for each site based on the Institute of Hydrology IH124 Methodology[6]. A tool on the HR Wallingford UK Sustainable Drainage website[7] has been used to provide these rates for a range of return periods. (It is noted that this tool applies a minimum flow of 5l/s to any site[8]. In order to provide more accurate Greenfield Runoff Rates, the growth factors have been applied to the QBAR runoff rate to provide runoff rates for the 1 in 1 year, 1 in 30 year and 1 in 100 year runoff rates).
- A high level identification of where surface water could be discharged with reference to Ordnance Survey (OS) mapping and a strategic understanding of the underlying geology[9]. Generally the aim should be to discharge surface water runoff as high up the following hierarchy of drainage options as reasonably practicable. A Red, Amber, Green assessment has been provided to determine the potential for each at a particular development site:
  - Discharge into the ground (shallow infiltration);
  - To a surface water body e.g. watercourse;
  - To a surface water sewer, highway drain, or another drainage system;
  - To a combined sewer.

This information provides a starting point for developers when identifying the issues that will need to be considered when developing a surface water drainage strategy for a particular site.

2.2.1 Surface Water Depth and Hazard maps

The Surface Water depth and hazard maps have been created using Environment Agency Open data. The data used is listed below.

- Risk of Flooding from Surface Water Depth: 1% AEP (Environment Agency Risk of Flooding from Surface Water Depth 1 percent annual chance. Retrieved from https://data.gov.uk/dataset/risk-of-flooding-from-surface-water-depth-1-percent-annual-chance).
- Risk of Flooding from Surface Water Hazard: 1% AEP (Environment Agency Risk of Flooding from Surface Water Hazard 1 percent annual chance. Retrieved from https://data.gov.uk/dataset/risk-of-flooding-from-surface-water-hazard-1-percent-annual-chance).

[6] The Institute of Hydrology carried out a number of studies on revising the runoff equations produced in the original Flood Studies Report (1975). IH124 was specifically produced to address the runoff from small catchments (Institute of Hydrology, 1994). Although shown to be slightly less accurate than more recent FEH based methods, it is still considered to be an acceptable approach for assessing greenfield runoff rates. The IH124 estimates greenfield runoff based on the mean annual flood flow from a rural catchment, the area of the catchment, the standard average annual rainfall and a runoff coefficient based on the SOIL category. Further information can be found here: http://www.uksuds.com/surfacewaterstorage_js.htm

[7] http://www.uksuds.com/greenfieldrunoff_js.htm

[8] Historically 5l/s was applied to an outlet where Qbar was lower than 5l/s, as most devices would require an outlet orifice size smaller than 50mm,which would increase the susceptibility of blockage and failure. There are now vortex flow control devices which can be designed to a lower discharge rate, with 600mm shallow design head and still provide a more than 50mm orifice diameter. Furthermore it is expected by Essex CC that development should incorporate an appropriately designed SuDs system which should remove materials which are likely to cause blockages before water reaches any flow control devices.

[9] With reference to strategic BGS geological mapping accessed via http://mapapps.bgs.ac.uk/geologyofbritain/home.html

3. Level 2 Strategic Assessment of Flood Risk

3.1 Level 2 Site Assessments

The purpose of the Level 2 SFRA is to determine the potential for a site to pass the Exception Test, and to provide recommendations for the issues that would need to be considered by the LPA and potential developers as the sites come forward for development.

This Section provides the Level 2 assessments for each of the potential development sites identified by BDC. For each potential development site, the datasets described in Section 2 have been used alongside the data included in the Level 1 SFRA, to assess the flood risk to the site; any further information that would be required as part of a site specific FRA for the site has been identified; and, recommendations for measures to avoid, manage and mitigate flood risk have been provided in accordance with the guidance presented in Section 5 of the Level 1 SFRA Report.

The potential development sites are presented in the order set out in Table 3-1.

Table 3-1 Level 2 SFRA potential development sites for assessment

Settlement	BDC Site Reference	Site Name	Area (ha)
Black Notley	BLAN115	Land at Bakers Lane and London Road, Black Notley	3.97
	BLAN116	Land at Bakers Lane (between London Rd and Row Green, Black Notley	2.96
Bures	BURE165	Land at Colchester Road, Bures	5.32
Braintree	BOCN132	Land bounded by A131, Broad Road and River Blackwater, Braintree	65.61
	BLAN110	Land East of Friaries, Bakers Lane, Braintree	1.01
	BLAN114 and BLAN117	Land east of Great Notley/South of Braintree	117.90 and 0.28
	BOCN137	Towerlands Park, between Panfield Lane and Deanery Hill	42.99
Coggleshaw	COGG506	Dutch Nursery, West Street, Coggeshall	2.50
Feering	FEER 230	Land at Inworth Road, Feering	1.97
	FEER 232	Land south of Feering, west of A12 (between Coggeshall Road and New Lane)	17.26
	FEER233	Land south of Feering, west of A12 (south of Feering Hill/London Road)	57.24
Halstead	HATR299 and HATR298	Harrison Works, Kings Road, Halstead	0.81 and 0.45
	HASA287	Land East of the High Street, Halstead	1.64
Witham	WITC421	Land south of Newlands Street/off Kings Chase (Previously known as Gimsons), Witham	3.05
	HATF316	Land at Woodend Farm, including Mayfield Nursery, London Road, Witham	2.76
	HATF315	Land at Woodend Farm, London Road, Witham	15.90

Site Assessment Summary – Land at Bakers Lane and London Road

Location:	SHLAA Ref / Ref:	Area (ha):	Proposed Use:	Vulnerability Classification:
Black Notley	BLAN115	3.97	Residential	More Vulnerable

Fluvial Flood Risk

Flood Zone 1 (<0.1 AEP) :	Flood Zone 2 (0.1% AEP) :	Flood Zone 3 (1% AEP):	Flood Zone 3b (5% AEP):
100%	0%	0%	0%

Flood Zones and Flood Defences

The site is located entirely in Flood Zone 1 (<0.1 AEP) (Figure A). An unnamed ordinary watercourse is located around the north and east edge of the site. The watercourse is connected to a culverted watercourse that flows through the south of the site. There are no modelled flood zones for this watercourse however the watercourse could still pose a flood risk to the site (see Surface water Flood Risk Section below).

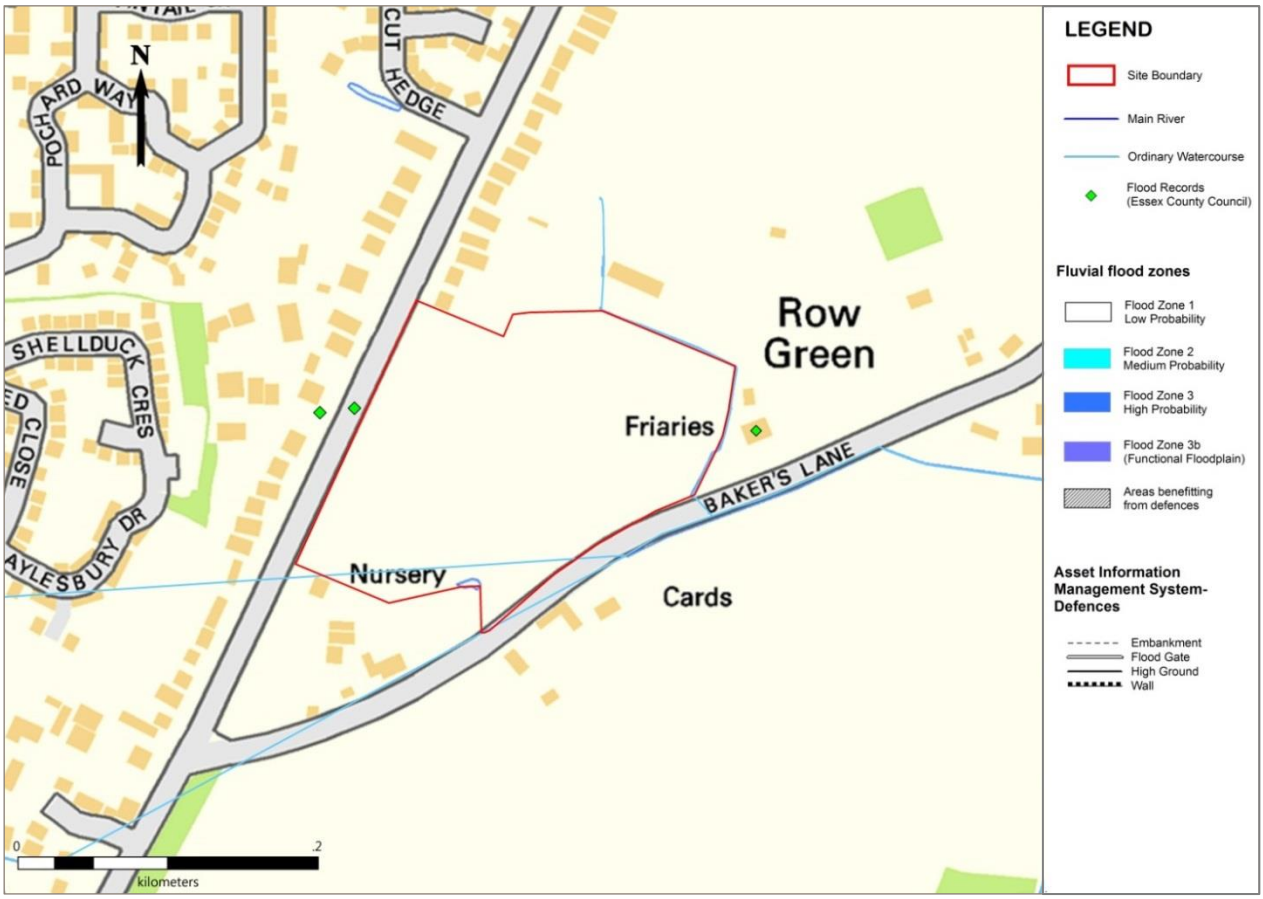

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Figure A Flood Zones

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The Environment Agency RoFSW mapping (Figure B) indicates that a large proportion of the north eastern section of the site is at high risk of surface water flooding. There is a contributing flow path that flows from west to east along the northern boundary of the site and from south to north across the eastern half of the development site. The flow paths appear to correspond to the ordinary watercourses that have not been covered by hydraulic modelling in this area. Therefore developers are required to consider fluvial flood risk on this site, although it appears to be within Flood Zone 1.

These flow paths should be considered carefully in the development of the site layout to ensure that residential dwellings are not placed at surface water flood risk, and that the position of any new development does not divert the flow path to a neighbouring area. The Environment Agency's Surface Water depth modelling (Figure C) identifies the potential for depths of 0-600mm on the site during the 1% AEP event. The site has a low to moderate surface water flood risk hazard rating during a 1% AEP event (Figure D).

Site Assessment Summary – Land at Bakers Lane and London Road

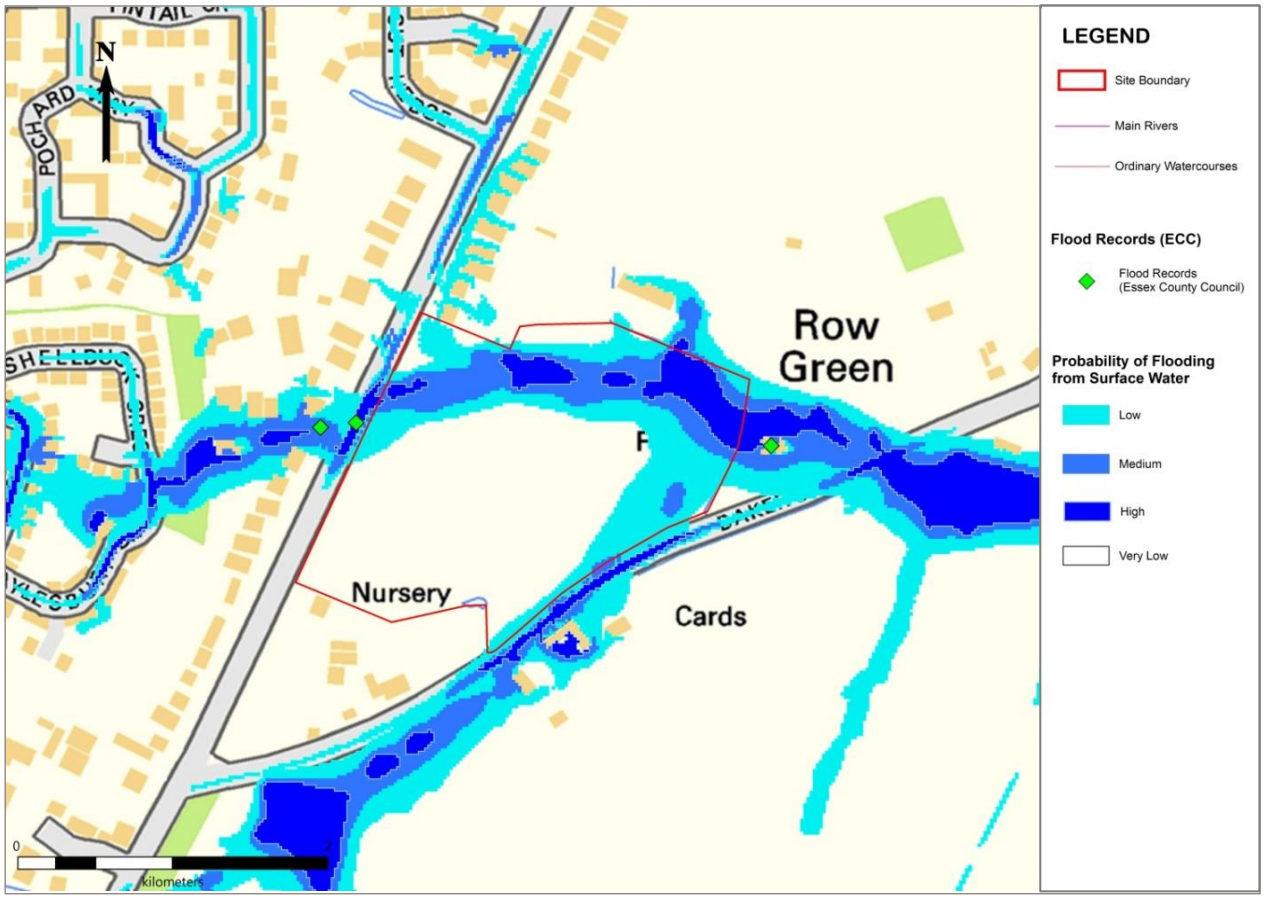

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Figure B Environment Agency's Risk of Flooding from Surface Water (RoFSW) : 1% AEP Scenario

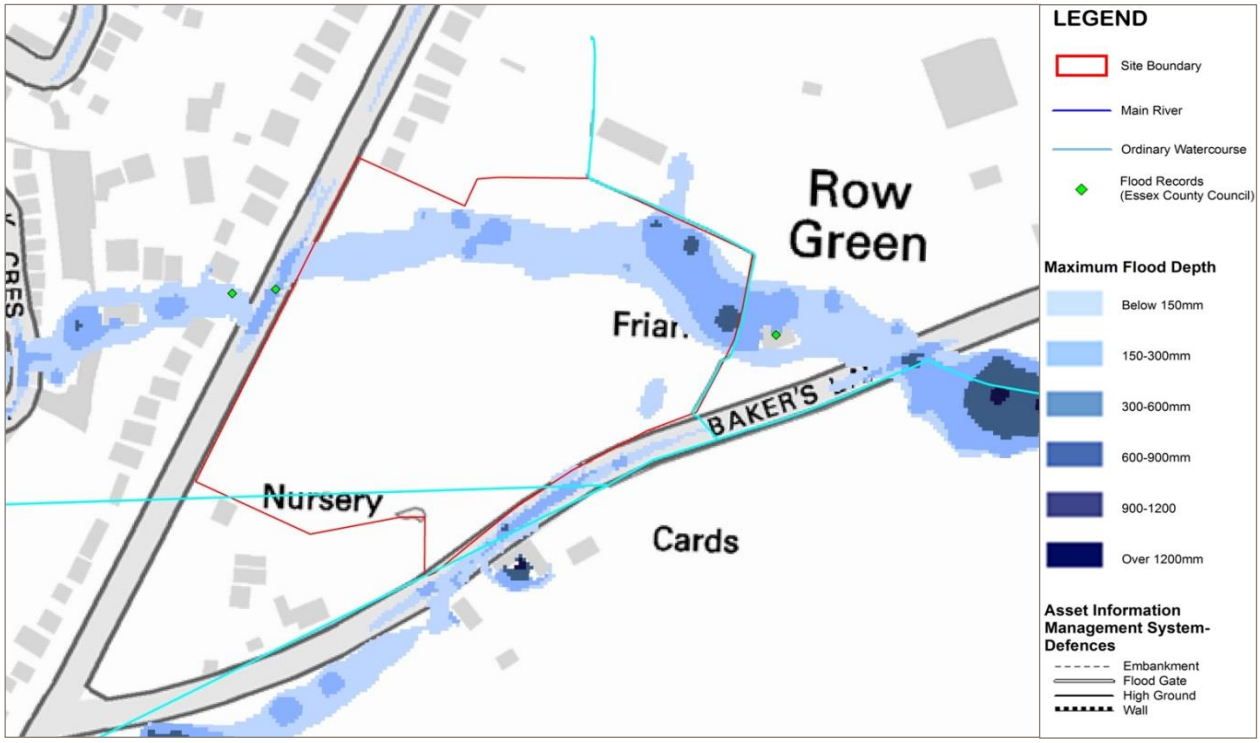

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Figure C Environment Agency's Risk of Flooding from Surface Water Depth: 1% AEP

Site Assessment Summary – Land at Bakers Lane and London Road

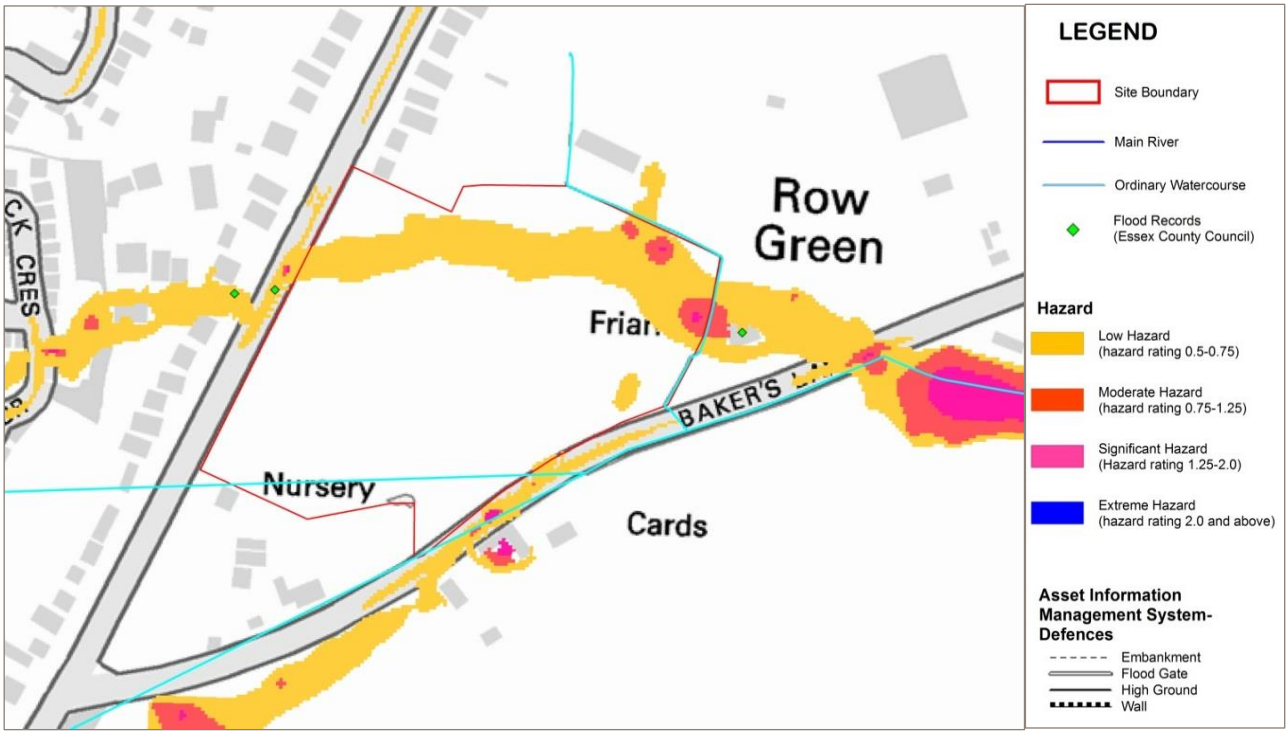

Figure D Environment Agency's Risk of Flooding from Surface Water Hazard: 1% AEP

Historic Flood Events

There are 3 historic flood records in the local area to the east and west of the site (Figure D); the source of flooding for the record to the east of the site is unknown and the source to the west of the site was a collapsed culvert. The Anglian Water DG5 database identifies a total of 2 external sewer flooding events have occurred in the site postcode area.

Geology and Groundwater

The bedrock geology in this area is Thames Group, comprising clay and silt. The overlying bedrock is comprised of till. Clayey soils are typically not very permeable and provide the potential for increased surface water ponding.

The AStGWF mapping shows that the site is located predominantly within a 1km square of which >25% is susceptible to groundwater emergence. The risk of groundwater flooding in this area is therefore generally considered to be of very low risk. This will need to be confirmed during site investigation survey.

Other Sources

No risk posed by other sources.

Greenfield Runoff and Drainage Hierarchy

Estimated Greenfield Runoff Rates (IH124 Results).	QBAR:	15.01 l/s	Flow rate in l/s/ha	QBAR:	3.78 l/s/ha
	1 in 1 year:	12.76 l/s		1 in 1 year:	3.21 l/s/ha
	1 in 30 year:	34.52 l/s		1 in 30 year:	8.69 l/s/ha
	1 in 100 year:	47.88 l/s		1 in 100 year:	12.06 l/s/ha

Drainage Hierarchy	Infiltration to ground		Uncertain due to geology; subject to on site infiltration testing.
	Discharge to watercourse		Discharge possible into the unnamed watercourse, subject to consultation with the LLFA.
	Discharge to surface water sewer		Possible, subject to consultation with Anglian Water.

Site Assessment Summary – Land at Bakers Lane and London Road

Site Specific Recommendations

Site Layout and Design

The site is currently defined as Flood Zone 1 (<0.1 AEP) and is therefore not at risk from fluvial flooding. Residential development should be avoided in areas defined as risk of surface water flooding; instead lower vulnerability uses including landscaped open space should be located here. The drainage strategy for the site must be considered early in the site planning process to ensure adequate inclusion of SuDS. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Set-back Distance

The LLFA will seek to ensure that development is set back by at least 3m on one side of an Ordinary Watercourse for ongoing maintenance purposes. The LLFA will need to be consulted and consent obtained for any proposed works that may impact flow within the channel of the watercourse.

Finished Floor Levels

If residential development cannot be avoided within the surface water flood extent, the Environment Agency Flood Risk Map for Surface Water should be consulted to identify the potential flood depth. Finished floor levels should be set at an appropriate freeboard above the surface water flood level.

Resilience Measures

A number of flood resistance and resilience measures can also be implemented into new developments to mitigate potential flooding. Guidance on resilience measures can be found in the 'Improving the Flood Performance of New Buildings, Flood Resilient Construction' published by The Department for Communities and Local Government (CLG).

LLFA Consultation

It is recommended that potential developers contact Braintree District Council and Essex CC as the LLFA for further information prior to taking forward site specific plans. A through utilities search prior to finalisation of development layout is recommended|

Summary

Based on the strategic assessment of flood risk and the recommendations for mitigation measures set out above, it is considered that proposed development on this site could be suitably designed to satisfy part 2) of the Exception Test subject to submission of a detailed site specific FRA.

Site Assessment Summary – Land at Bakers Lane (between London Rd and Row Green)

Location:	SHLAA Ref / Ref:	Area (ha):	Proposed Use:	Vulnerability Classification:
Black Notley	BLAN116	2.96	Residential	More Vulnerable

Fluvial Flood Risk

Flood Zone 1 (<0.1 AEP) :	Flood Zone 2 (0.1% AEP) :	Flood Zone 3 (1% AEP):	Flood Zone 3b (5% AEP):
100%	0%	0%	0%

Flood Zones and Flood Defences

The site is located entirely in Flood Zone 1 (<0.1 AEP) and is located 0.01km from the nearest culverted watercourse (Figure A). There are no modelled flood zones for this watercourse however the watercourse could still pose a flood risk to the site.

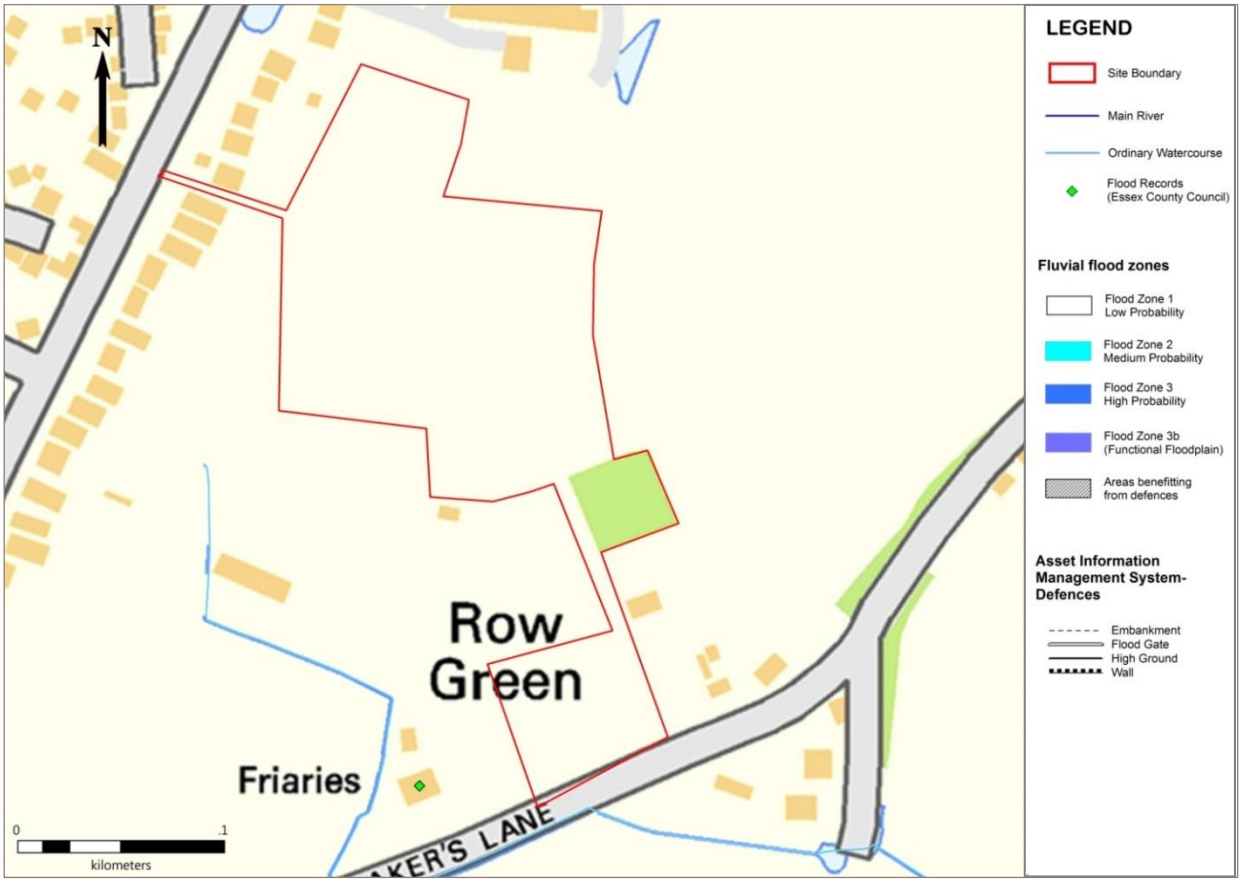

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Figure A Flood Zones

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The Environment Agency RoFSW mapping (Figure B) indicates that the south western corner of the site is at high risk of surface water flooding. The flow paths appear to correspond to the ordinary watercourse that has not been covered by hydraulic modelling in this area. Therefore developers are required to consider fluvial flood risk on this site, although it appears to be within Flood Zone 1.

The flow path should be considered carefully in the development of the site layout to ensure that residential dwellings are not placed at surface water flood risk. The Environment Agency's Surface Water depth modelling (Figure C) identifies the potential for depths of 0-300mm on the site during the 1% AEP event. The site has a low surface water flood hazard rating during a 1% AEP event (Figure D).

Site Assessment Summary – Land at Bakers Lane (between London Rd and Row Green)

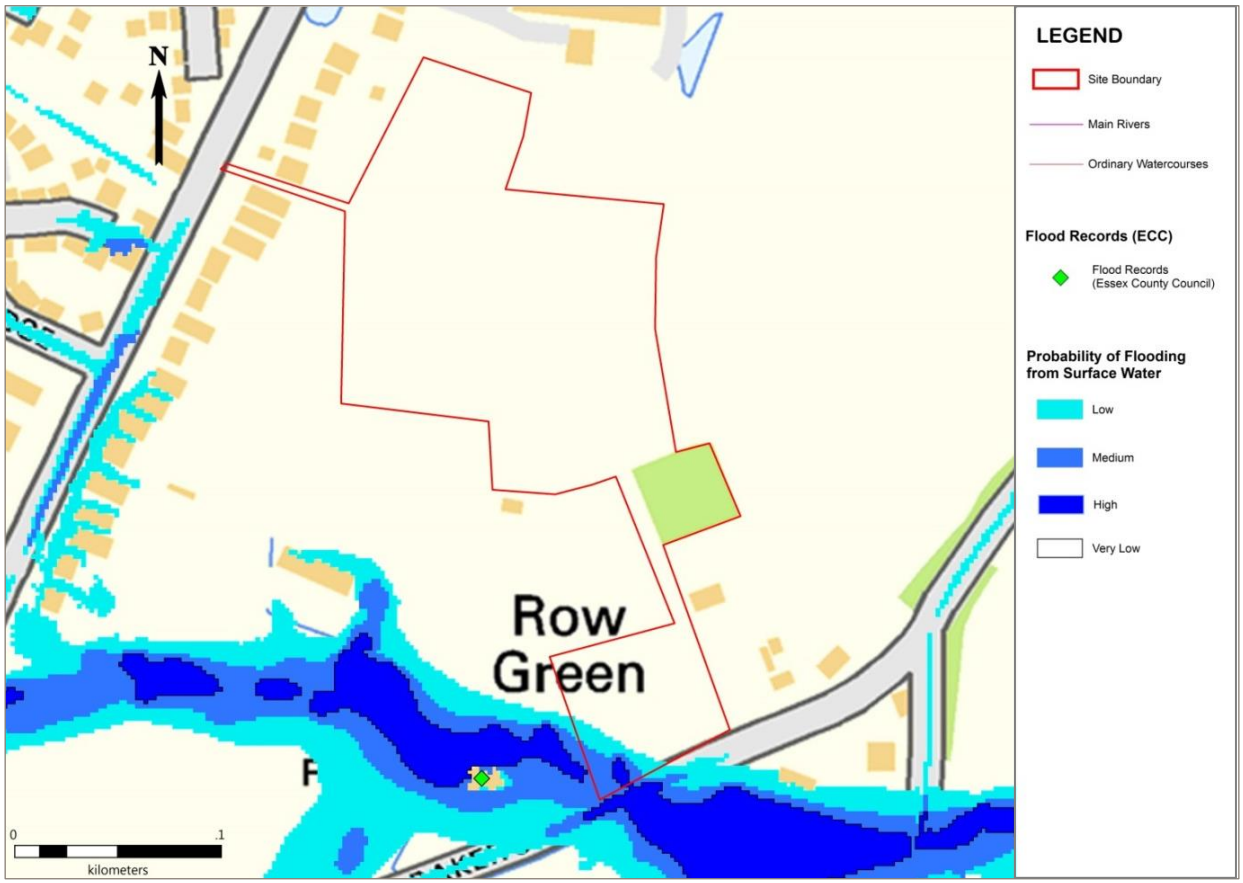

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Figure B Environment Agency's Risk of Flooding from Surface Water (RoFSW) : 1% AEP Scenario

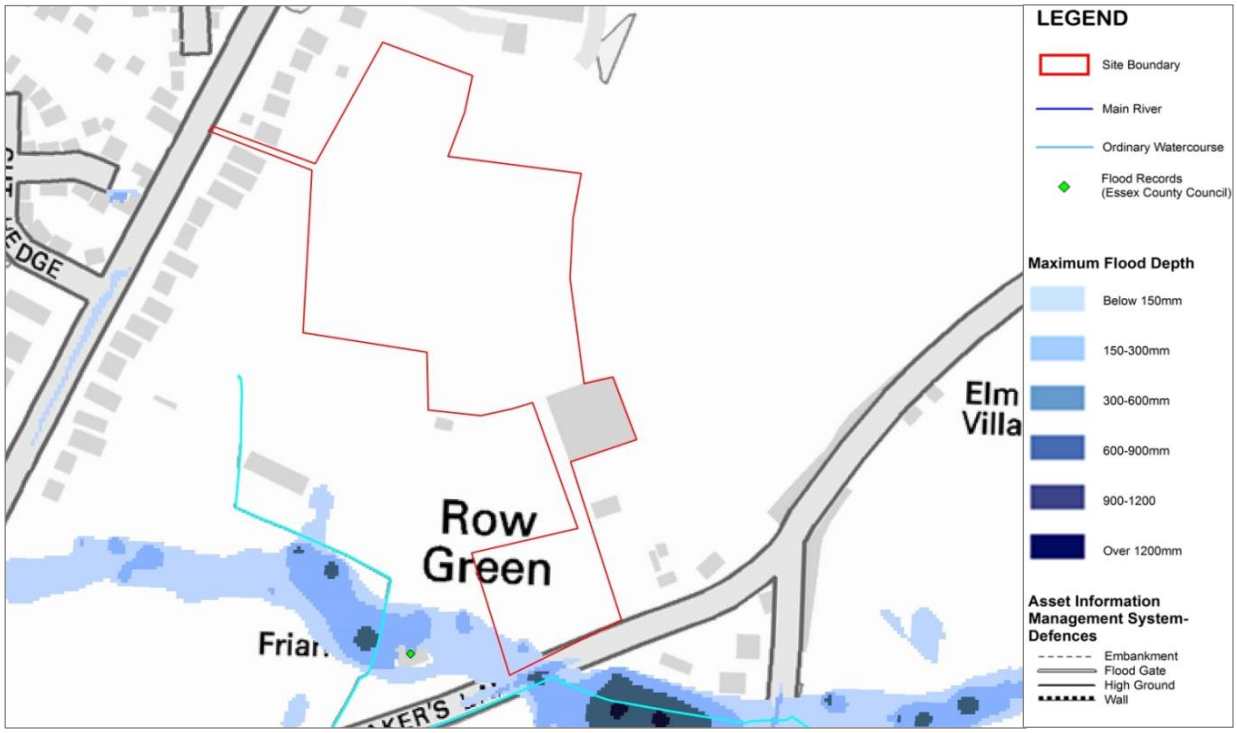

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Figure C Environment Agency's Risk of Flooding from Surface Water Depth: 1% AEP

Site Assessment Summary – Land at Bakers Lane (between London Rd and Row Green)

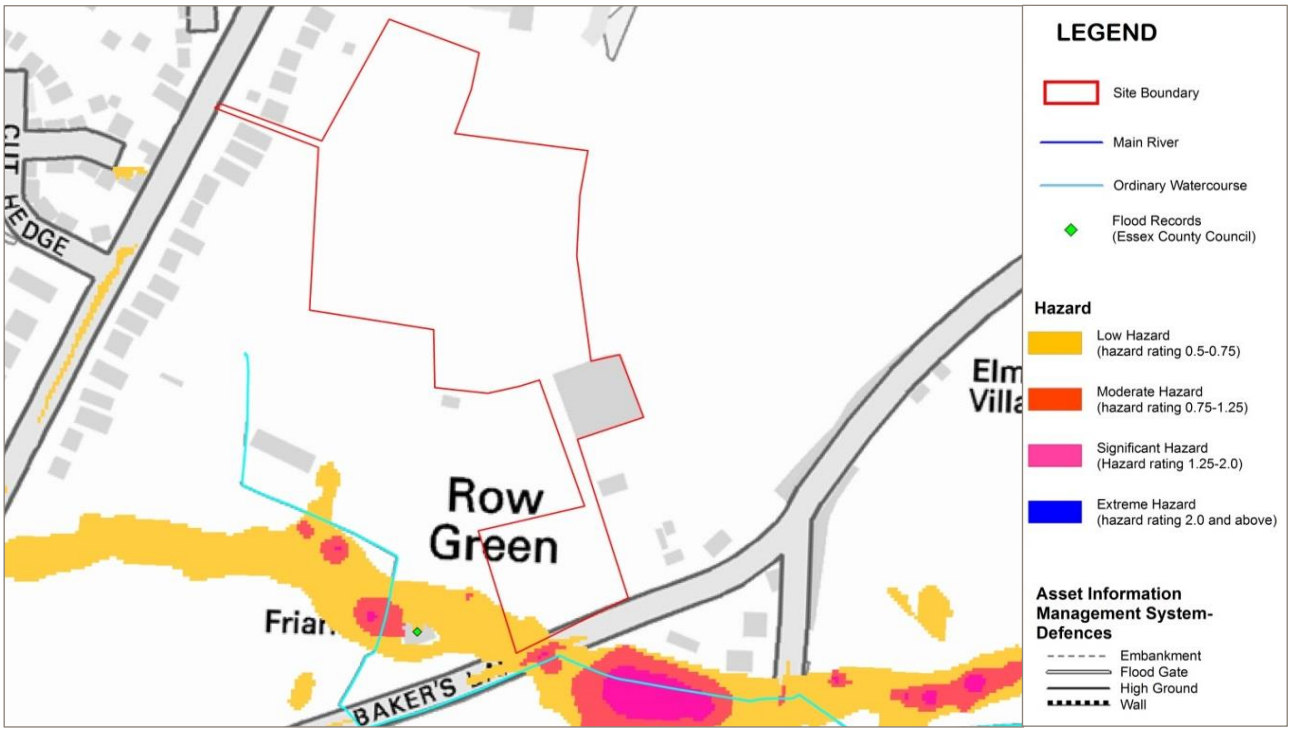

Figure D Environment Agency's Risk of Flooding from Surface Water Hazard: 1% AEP

Historic Flood Events

There is 1 historic flood record located 0.05km to the west of the site; the source of flooding is unknown. The Anglian Water DG5 database identifies a total of 2 external sewer flooding events have occurred in the site postcode area.

Geology and Groundwater

The bedrock geology in this area is Thames Group, comprising clay and silt. The overlying bedrock is comprised of till. Clayey soils are typically not very permeable and provide the potential for increased surface water ponding.

The AStGWF mapping shows that the site is located predominantly within a 1km square of which >25% is susceptible to groundwater emergence. The risk of groundwater flooding in this area is therefore generally considered to be of very low risk. This will need to be confirmed during site investigation survey.

Other Sources

No risk posed by other sources.

Greenfield Runoff and Drainage Hierarchy

Estimated Greenfield Runoff Rates (IH124 Results).	QBAR:	11.19 l/s	Flow rate in l/s/ha	QBAR:	3.78 l/s/ha
	1 in 1 year:	9.51 l/s		1 in 1 year:	3.21 l/s/ha
	1 in 30 year:	25.74 l/s		1 in 30 year:	8.69 l/s/ha
	1 in 100 year:	35.70 l/s		1 in 100 year:	12.06 l/s/ha

Drainage Hierarchy	Infiltration to ground		Uncertain due to geology; subject to on site infiltration testing.
	Discharge to watercourse		Discharge may be possible into the unnamed watercourse, subject to consultation with the LLFA and landowners.
	Discharge to surface water sewer		Possible, subject to consultation with Anglian Water.

Site Assessment Summary – Land at Bakers Lane (between London Rd and Row Green)

Site Specific Recommendations

Site Layout and Design

The site is currently defined as Flood Zone 1 (<0.1 AEP) and is therefore not at risk from fluvial flooding. A small section of the south western corner of the site is shown to be at risk of flooding from surface water. Residential development should be avoided in areas defined as risk of surface water flooding; instead lower vulnerability uses including landscaped open space should be located here. The drainage strategy for the site must be considered early in the site planning process to ensure adequate inclusion of SuDS. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Finished Floor Levels

Finished floor levels should be set at least 300mm freeboard above the flood level for 1% AEP event including an appropriate allowance for climate change. Internal access to higher floors is required.

Resilience Measures

A number of flood resistance and resilience measures can also be implemented into new developments to mitigate potential flooding. Guidance on resilience measures can be found in the 'Improving the Flood Performance of New Buildings, Flood Resilient Construction' published by The Department for Communities and Local Government (CLG).

LLFA Consultation

It is recommended that potential developers contact Braintree District Council and Essex CC as the LLFA for further information prior to taking forward site specific plans.

Summary

Based on the strategic assessment of flood risk and the recommendations for mitigation measures set out above, it is considered that proposed development on this site could be suitably designed to satisfy part 2) of the Exception Test subject to submission of a detailed site specific FRA.

Site Assessment Summary – Land at Colchester Road, Bures

Location:	SHLAA Ref / Ref:	Area (ha):	Proposed Use:	Vulnerability Classification:
Bures	BURE165	5.32	Residential	More Vulnerable

Fluvial Flood Risk

Flood Zone 1 (<0.1 AEP) :	Flood Zone 2 (0.1% AEP) :	Flood Zone 3 (1% AEP):	Flood Zone 3b (5% AEP):
91%	1%	7%	0%

Flood Zones and Flood Defences

The River Stour flows to the north of the site in open channel. Cambridge Brook, a main river, flows in a northerly direction into the River Stour. The majority of the site (91%) is identified as Flood Zone 1 (<0.1 AEP) with the remainder falling into Flood Zone 2 (1%) and Flood Zone 3a (7%). Along the northern edge of the site the AIMS dataset identifies that high ground and embankment acts as a flood defence for the River Stour and higher ground acts as a flood defence for Cambridge Brook to the east.

Functional Floodplain (Flood Zone 3b)

The site is located adjacent to, but not within, the functional floodplain associated with the River Stour.

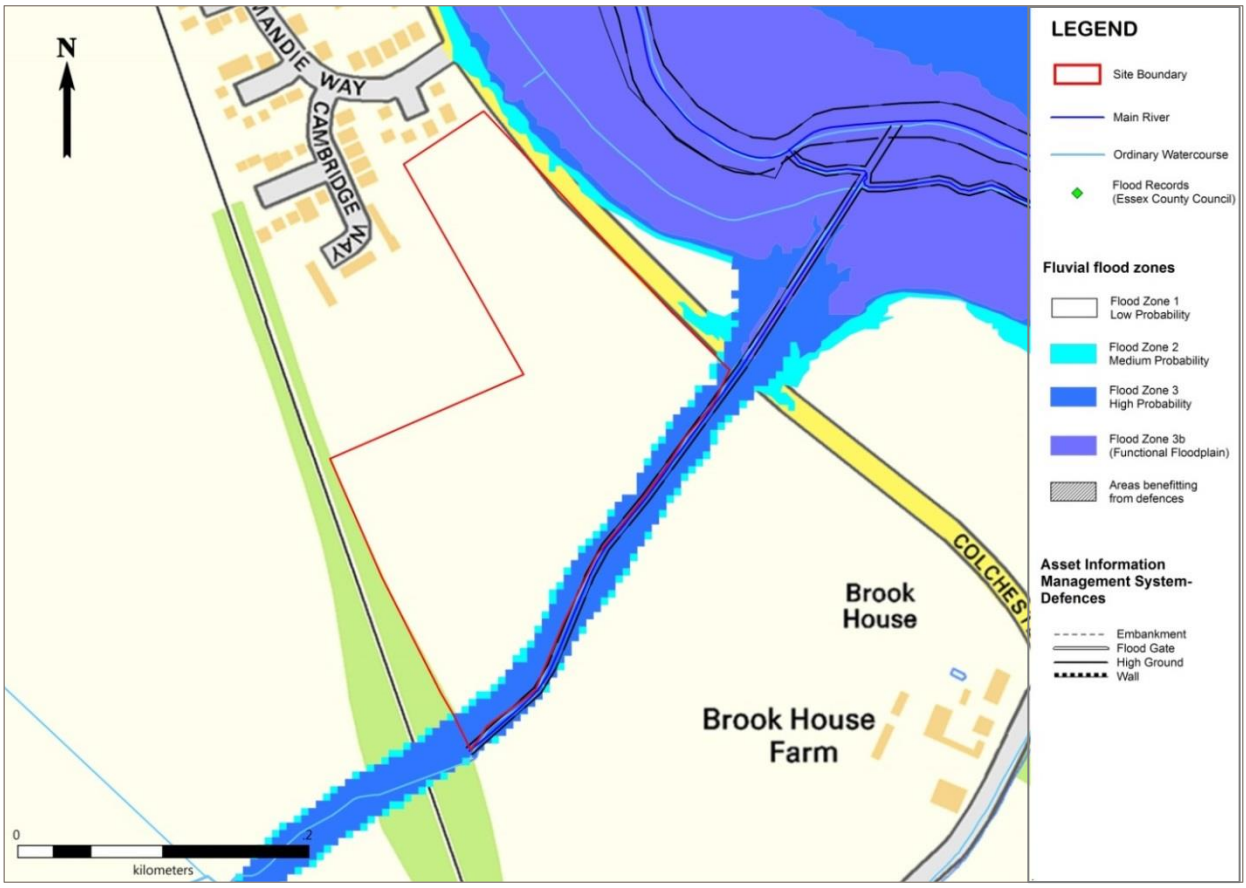

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Figure A Flood Zones

Detailed Flood Risk Information – Maximum Flood Depth and Hazard Mapping (refer to section 2.2.1.2)

It should be noted that the Environment Agency is currently updating their hydraulic model for the River Stour, which will include a flood hazard output. The flood hazard modelling will supersede the depth hazard mapping method used in this Level 2 SFRA. The Level 2 SFRA may need to be updated to incorporate the revised information. Developers and site promoters are required to consult with the Environment Agency for the most up-to-date hazard data to be included in site specific FRAs.

The site (BURE165) is located adjacent to the Cambridge Brook and at the extent of the River Stour floodplain in the 1% AEP event The River Stour model is a 1D hydraulic model and the Cambridge Brook is not directly represented in the model. A review of the flood extent on the site associated with the projected flood water levels for the 1% AEP plus 65% climate change event (Section 2.1.1.2 of this Level 2 SFRA) showed that there would be minimal flooding on the site associated solely with flooding from the River Stour. Instead, the depth and hazard for this site is better represented in the Environment Agency Risk of Flooding from Surface Water maps, as it includes the hazard associated with the Cambridge Brook (see Figure B and C).

Site Assessment Summary – Land at Colchester Road, Bures

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The Environment Agency RoFSW mapping (Figure B) indicates that the southern and eastern edge of the site is susceptible to surface water ponding. There is a contributing flow path that follows the course of Cambridge Brook from the south to the north across the development site. This flow path should be considered carefully in the development of the site layout to ensure that residential dwellings are not placed at surface water flood risk, and that the position of any new development does not divert the flow path to a neighbouring area.

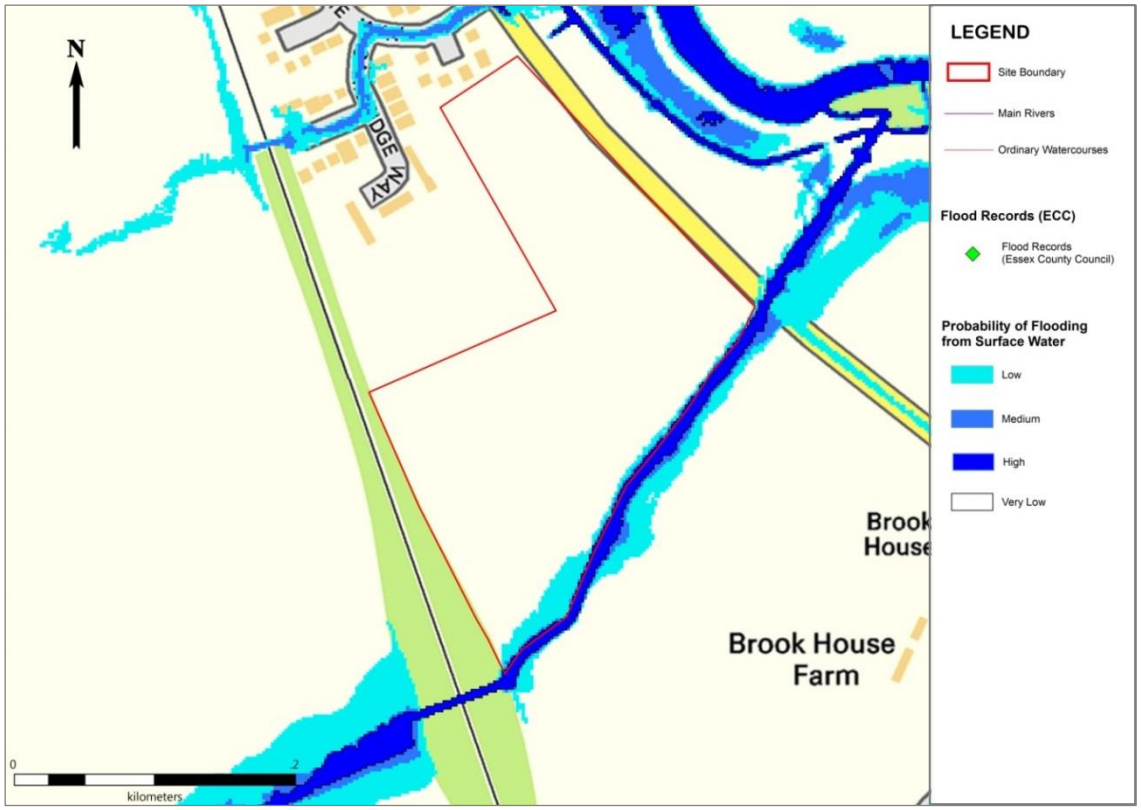

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Figure B Environment Agency's Risk of Flooding from Surface Water (RoFSW) : 1% AEP Scenario

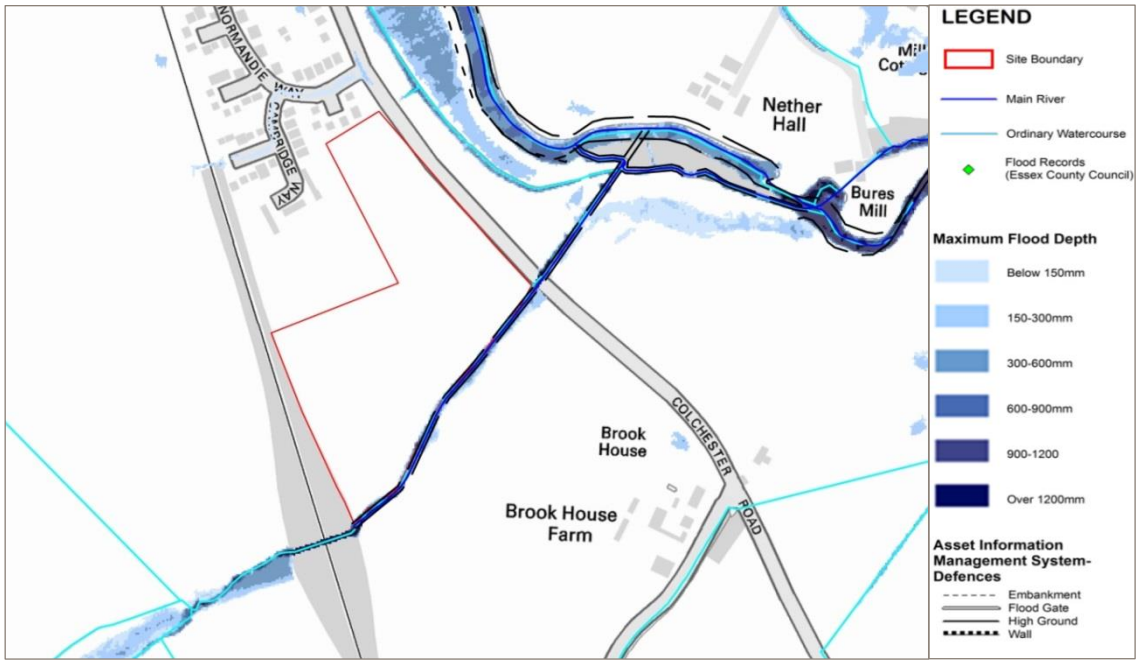

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Figure C Environment Agency's Risk of Flooding from Surface Water Depth: 1% AEP

Site Assessment Summary – Land at Colchester Road, Bures

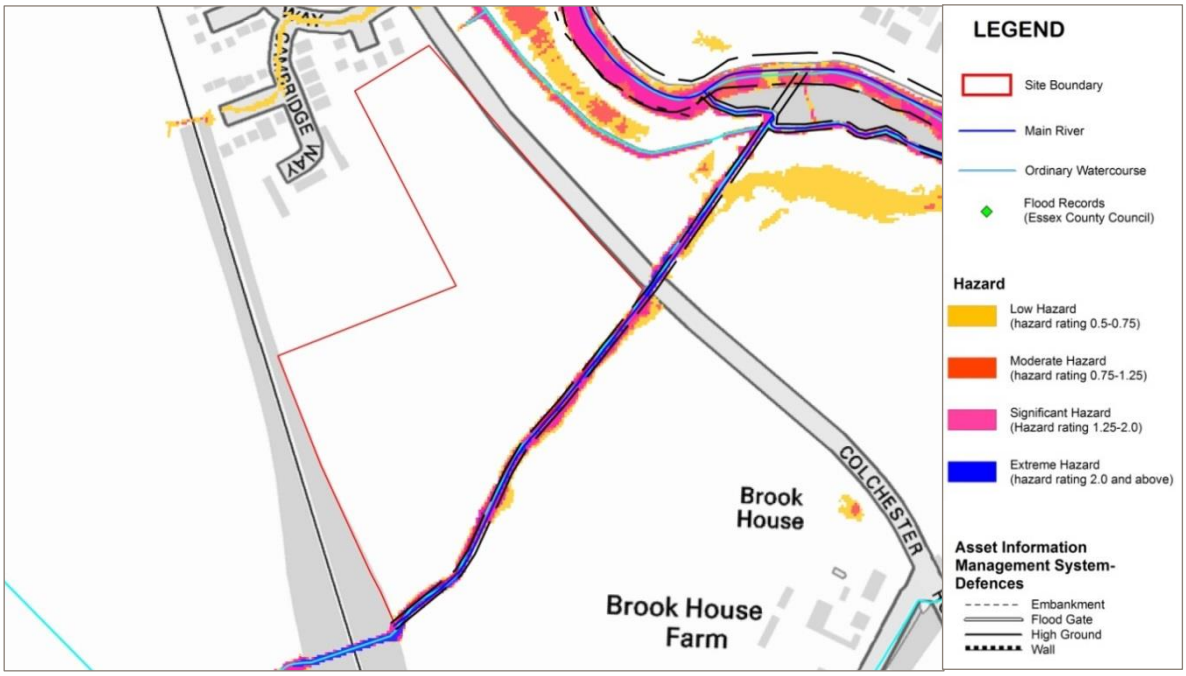

Figure D Environment Agency's Risk of Flooding from Surface Water Hazard: 1% AEP

Historic Flood Events

There are no historical records of flooding on the site or in the surrounding area.

Geology and Groundwater

The bedrock geology in this area is Thames Group, comprising clay and silt. The overlying bedrock is comprised of clay, silt and sand. Clayey soils are typically not very permeable and provide the potential for increased surface water ponding.

The AStGWF mapping shows that the site is located within a 1km square of which 50-75% is susceptible to groundwater emergence. The risk of groundwater flooding in this area is therefore generally considered to be medium. This will need to be confirmed during site investigation survey.

Other Sources

No risk posed by other sources

Greenfield Runoff and Drainage Hierarchy

Estimated Greenfield Runoff Rates (IH124 Results).	QBAR:	7.45 l/s	Flow rate in l/s/ha	QBAR:	1.40 l/s/ha
	1 in 1 year:	6.33 l/s		1 in 1 year:	3.21 l/s/ha
	1 in 30 year:	17.14 l/s		1 in 30 year:	1.20 l/s/ha
	1 in 100 year:	23.77 l/s		1 in 100 year:	4.46 l/s/ha

Drainage Hierarchy	Infiltration to ground		Uncertain due to geology; subject to on site infiltration testing.
	Discharge to watercourse		Discharge possible to Cambridge Brook that flows along the eastern boundary of the site, subject to consultation with the Environment Agency.
	Discharge to surface water sewer		Possible, subject to consultation with Anglian Water.

Site Assessment Summary – Land at Colchester Road, Bures

Site Specific Recommendations

Fluvial Modelling

As part of a site specific FRA for this site, a simple hydraulic model should be developed to more accurately determine the probability of flooding across the site from the River Stour. As part of this assessment, a range of probability events should be compared to determine the impact of climate change on the risk of flooding at this location.

Site Layout and Design

The majority of the site is defined as Flood Zone 1 (<0.1 AEP), low probability of flooding and therefore it should be possible to steer new development towards areas within Flood Zone 1 (<0.1 AEP). Residential development should be avoided in areas defined as Flood Zone 2 (0.1% AEP), and instead lower vulnerability uses including landscaped open space should be located here. The drainage strategy for the site must be considered early in the site planning process to ensure adequate inclusion of SuDS, taking care to consider SuDS features in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible). Storage features should not be located within the floodplain of the River Stour, as they may be rendered ineffective during times of fluvial flooding.

Set-back Distance

An 8m wide undeveloped buffer strip should be retained along main rivers to provide access for maintenance. The EA should be contacted to obtain an Environmental Permit for main rivers. The LLFA will seek to ensure that development is set back by at least 3m on one side for ongoing maintenance purposes. The LLFA will need to be consulted and consent obtained for any proposed works that may impact flow within the channel of the watercourse.

Finished Floor Levels

If residential development cannot be avoided within the flood extent for the 1% AEP event, finished floor levels should be set at least 300mm freeboard above the flood level for 1% AEP event including an appropriate allowance for climate change. Internal access to higher floors is required. It important to consider the implications of diverting the water on the flood risk of the rest of the site.

Access / Egress

Dry access to and from the site is provided via Cambridge Way, to the north west of the site.

Emergency Planning

The site is not shown to be within an Environment Agency Flood Warning Area.

LLFA Consultation

It is recommended that potential developers contact the Environment Agency, Braintree District Council and Essex CC as the LLFA for further information prior to taking forward site specific plans.

Summary

Based on the strategic assessment of flood risk and the recommendations for mitigation measures set out above, it is considered that proposed development on this site could be suitably designed to satisfy part 2) of the Exception Test subject to submission of a detailed site specific FRA.

Site Assessment Summary – Land bounded by A131, Broad Road and River Blackwater

Location:	SHLAA Ref / Ref:	Area (ha):	Proposed Use:	Vulnerability Classification:
Braintree	BOCN132	65.61	Mixed	More Vulnerable

Fluvial Flood Risk

Flood Zone 1 (<0.1 AEP) :	Flood Zone 2 (0.1% AEP) :	Flood Zone 3 (1% AEP):	Flood Zone 3b (5% AEP):
100%	0%	0%	0%

Flood Zones and Flood Defences

The River Blackwater (main river) is located to the south of the site. The site borders areas defined as Flood Zone 2 (0.1% AEP) and Flood Zone 3b from the River Blackwater. The AIMS dataset identifies the presence of high ground either side of the River Blackwater at this location. The site is located entirely within Flood Zone 1 (<0.1 AEP), and is therefore currently considered to be at low risk of flooding from the River Blackwater. An unnamed ordinary watercourse is located in the south of the site but there are no modelled flood zones for the watercourse.

Functional Floodplain (Flood Zone 3b)

The site is located adjacent to, but not within, the functional floodplain associated with the River Blackwater.

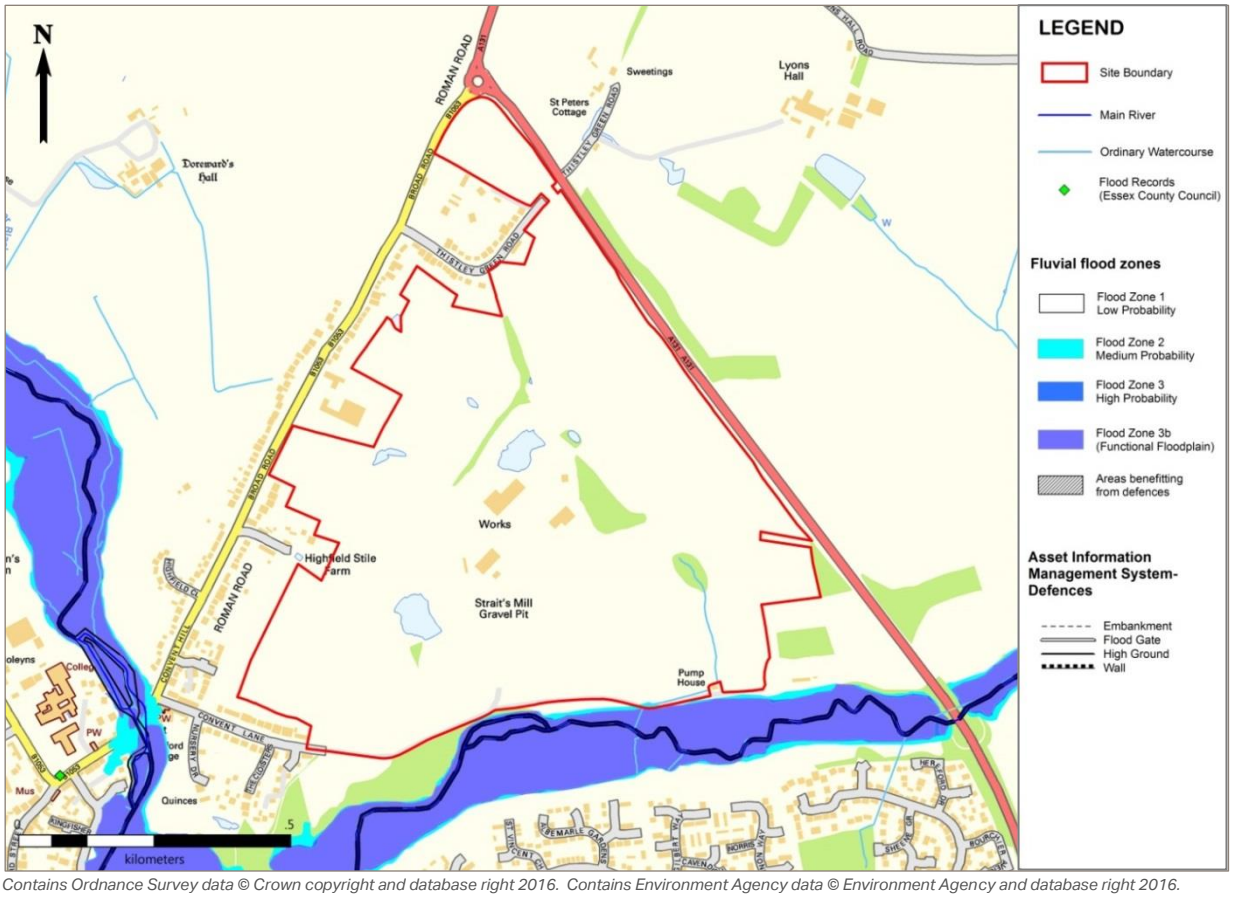

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Figure A Flood Zones

It should be noted that the Environment Agency is currently updating their hydraulic model for the River Blackwater, which will include a flood hazard output. Developers and site promoters are required to consult with the Environment Agency for the most up-to-date fluvial model data to be included in site specific FRAs.

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The Environment Agency RoFSW mapping (Figure B) indicates that parts of the site are susceptible to surface water ponding and flow. The site borders the River Blackwater floodplain that is at high risk of surface water flooding. There is a contributing flow path that flows from centre to the south of the site, following the course of the watercourse. Additional areas of ponding and small flow paths are located around the site. This should be considered carefully in the development of the site layout to ensure that residential dwellings are not placed at surface water flood risk, and that the position of any new development does not divert the flow path to a neighbouring area.

Site Assessment Summary – Land bounded by A131, Broad Road and River Blackwater

Environment Agency surface water modelling (Figure C) identifies the potential for depths of 0-600mm on the site during the 1% AEP event. The site has a low to significant surface water flood risk hazard rating in isolated 'pockets' across the site during a 1% AEP event (Figure D).

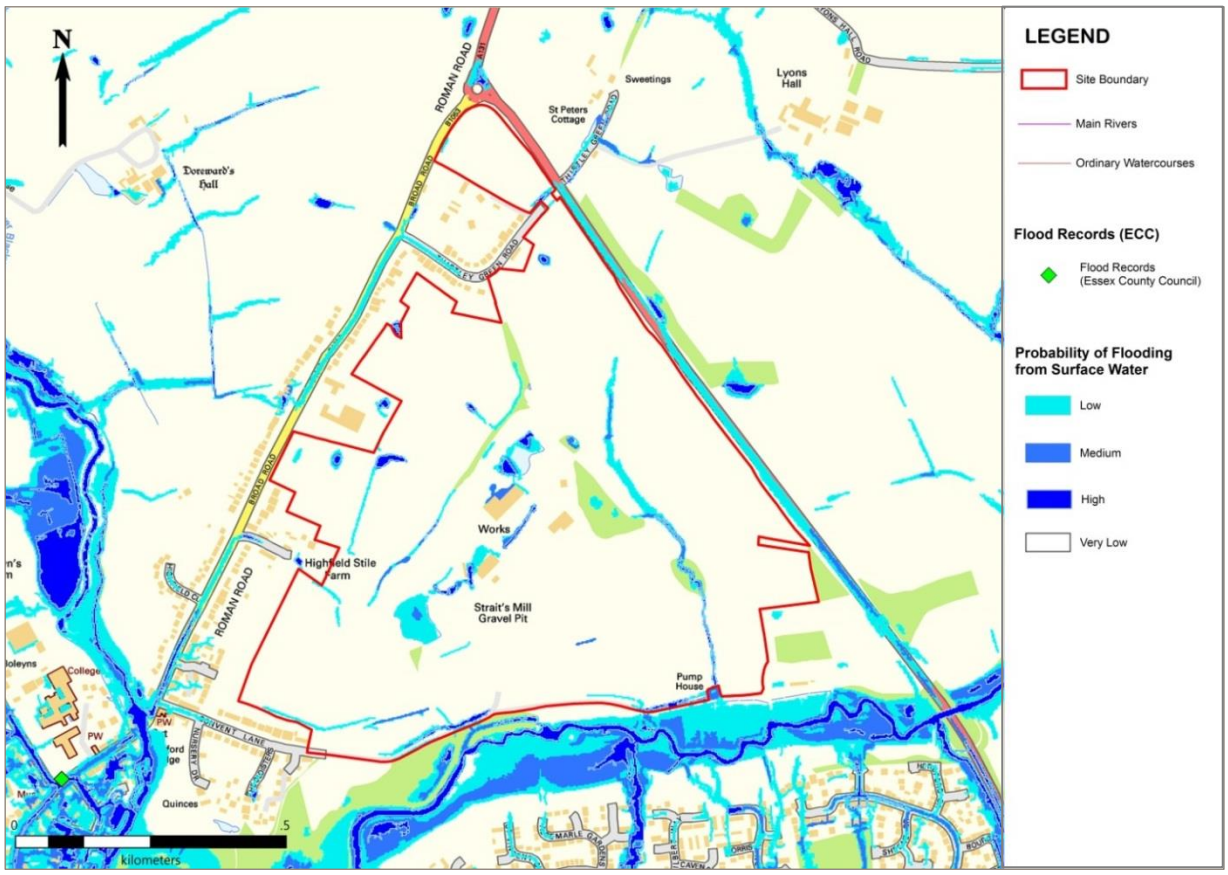

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Figure B Environment Agency's Risk of Flooding from Surface Water (RoFSW) : 1% AEP Scenario

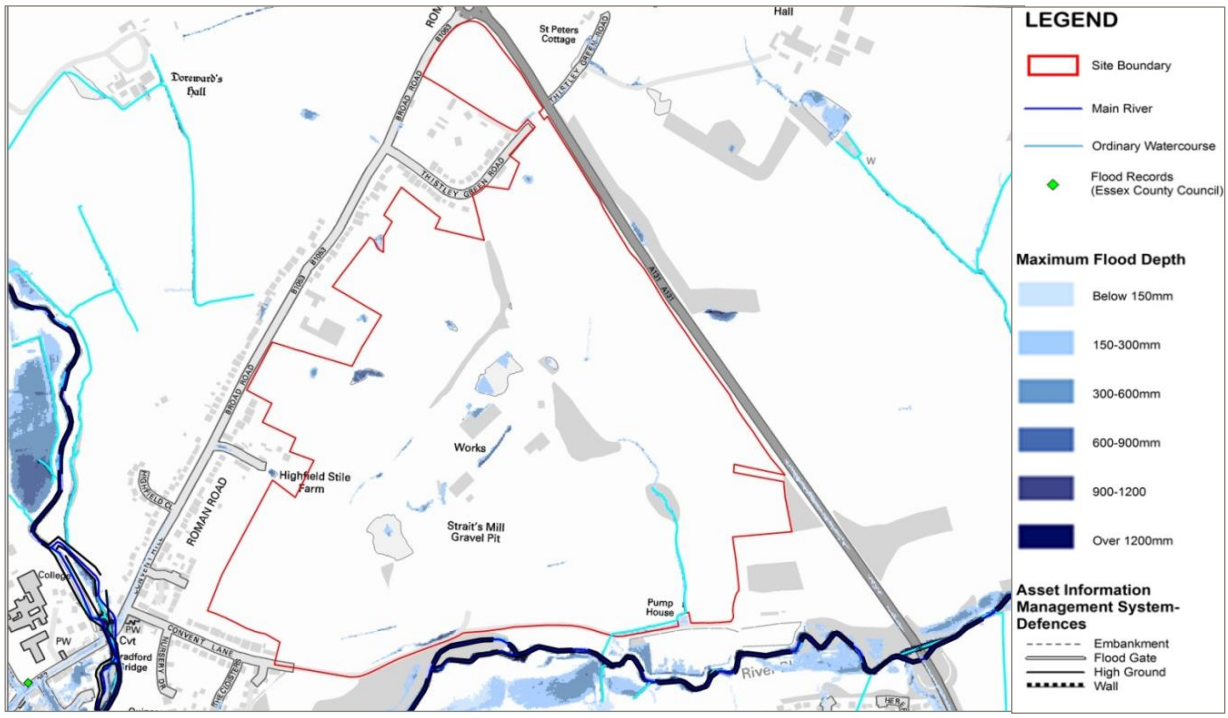

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Figure C Environment Agency's Risk of Flooding from Surface Water Depth: 1% AEP

Site Assessment Summary – Land bounded by A131, Broad Road and River Blackwater

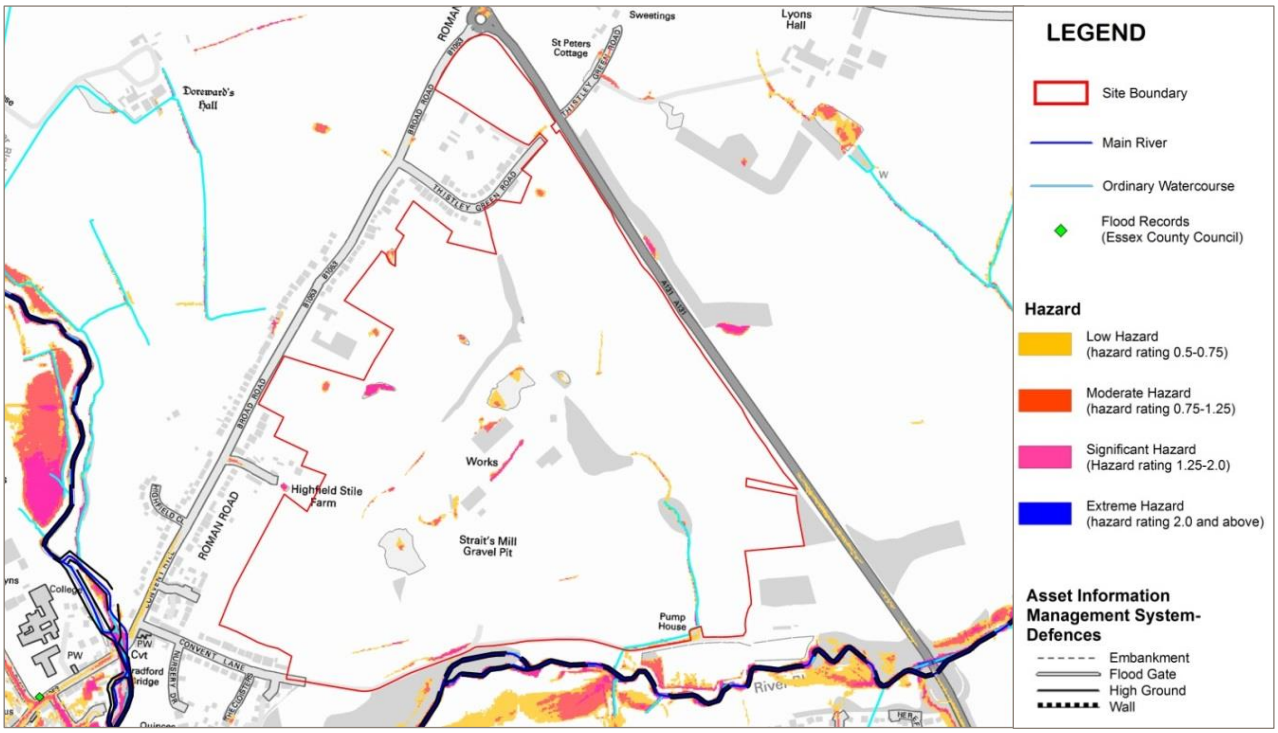

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Figure D Environment Agency's Risk of Flooding from Surface Water Hazard: 1% AEP

Historic Flood Events

There are no historical records of flooding on the site or in the surrounding area.

Geology and Groundwater

The bedrock geology in this area is Thames Group, comprising clay, gravel and silt. The overlying bedrock is comprised of till. Clayey soils are typically not very permeable and provide the potential for increased surface water ponding.

The AStGWF mapping shows that the site is located within 4 1km squares that have groundwater emergence percentages. The northern part of the site is located within 2 1km square of which >25% is susceptible to groundwater emergence. The western part of the site is located within a 1km square of which 50-75% is susceptible to groundwater emergence. The eastern part of the site located within a 1km square of which 25-50% is susceptible to groundwater emergence. The risk of groundwater flooding in this area is therefore generally considered to be low to high risk. This will need to be confirmed during site investigation survey.

Other Sources

No risk posed by other sources.

Greenfield Runoff and Drainage Hierarchy

Estimated Greenfield Runoff Rates (IH124 Results).	QBAR:	90.69 l/s	Flow rate in l/s/ha	QBAR:	1.38 l/s/ha
	1 in 1 year:	77.09 l/s		1 in 1 year:	1.17 l/s/ha
	1 in 30 year:	208.59 l/s		1 in 30 year:	3.17 l/s/ha
	1 in 100 year:	289.31 l/s		1 in 100 year:	4.41 l/s/ha

Drainage Hierarchy	Infiltration to ground		Uncertain due to geology; subject to on site infiltration testing.
	Discharge to watercourse		Discharge possible to the River Blackwater, subject to consultation with the Environment Agency.
	Discharge to surface water sewer		Possible, subject to consultation with Anglian Water.

Site Assessment Summary – Land bounded by A131, Broad Road and River Blackwater

Site Specific Recommendations

Site Layout and Design

The site is currently defined as Flood Zone 1 (<0.1 AEP) and is therefore not at risk from fluvial flooding. Residential development should be avoided in areas defined as risk of surface water flooding; instead lower vulnerability uses including landscaped open space should be located here. The drainage strategy for the site must be considered early in the site planning process to ensure adequate inclusion of SuDS. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Set-back Distance

The LLFA will seek to ensure that development is set back by at least 3m on one side of an Ordinary Watercourse for ongoing maintenance purposes. The LLFA will need to be consulted and consent obtained for any proposed works that may impact flow within the channel of the watercourse.

Finished Floor Levels

If residential development cannot be avoided within the surface water flood extent, the Environment Agency Flood Risk Map for Surface Water should be consulted to identify the potential flood depth. Finished floor levels should be set at an appropriate freeboard above the surface water flood level.

Resilience Measures

A number of flood resistance and resilience measures can also be implemented into new developments to mitigate potential flooding. Guidance on resilience measures can be found in the 'Improving the Flood Performance of New Buildings, Flood Resilient Construction' published by The Department for Communities and Local Government (CLG).

LLFA Consultation

It is recommended that potential developers contact Braintree District Council and Essex CC as the LLFA for further information prior to taking forward site specific plans.

Summary

Based on the strategic assessment of flood risk and the recommendations for mitigation measures set out above, it is considered that proposed development on this site could be suitably designed to satisfy part 2) of the Exception Test subject to submission of a detailed site specific FRA.

Site Assessment Summary – Land East of Friaries, Bakers Lane

Location:	SHLAA Ref / Ref:	Area (ha):	Proposed Use:	Vulnerability Classification:
Braintree	BLAN110	1.01	Residential	More Vulnerable

Fluvial Flood Risk

Flood Zone 1 (<0.1 AEP) :	Flood Zone 2 (0.1% AEP) :	Flood Zone 3 (1% AEP):	Flood Zone 3b (5% AEP):
100%	0%	0%	0%

Flood Zones and Flood Defences

The site is located entirely in Flood Zone 1 (<0.1 AEP) and is located 0.04 km from the nearest unnamed ordinary watercourse (Figure A). There are no modelled flood zones for this watercourse however the watercourse could still pose a flood risk to the site.

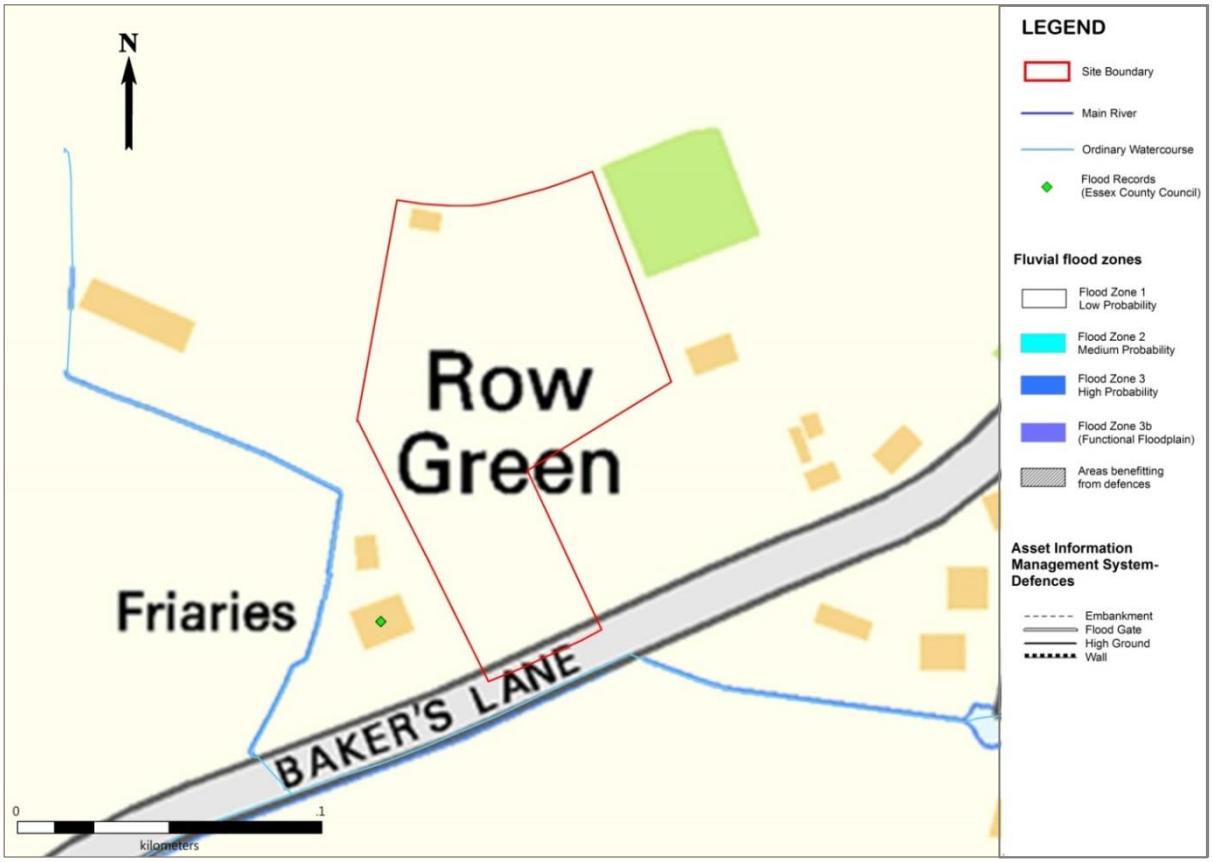

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Figure A Flood Zones

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The Environment Agency RoFSW mapping (Figure B) indicates that the southern half of the site is at risk of surface water flooding. A contributing flow path flows from the west to the east of the site. It appears that this is associated with the un-named ordinary watercourse. Therefore developers are required to consider fluvial flood risk on this site, although it appears to be within Flood Zone 1.

The risk from this source should be considered carefully in the development of the site layout to ensure that residential dwellings are not placed at surface water flood risk. Environment Agency surface water modelling (Figure C) identifies the potential for depths of 0-600mm on the site during the 1% AEP event. The site has a low to significant surface water hazard rating during a 1% AEP event (Figure D).

Site Assessment Summary – Land East of Friaries, Bakers Lane

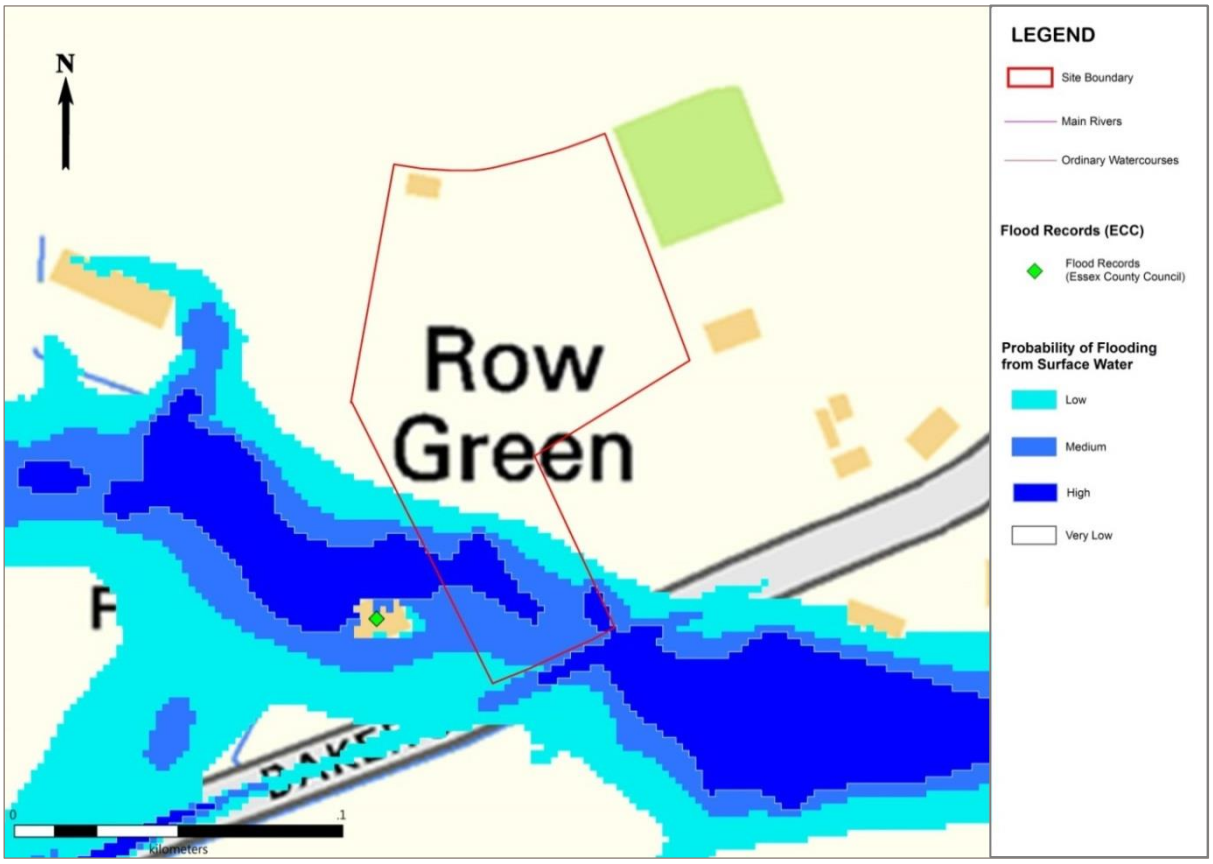

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Figure B Environment Agency's Risk of Flooding from Surface Water (RoFSW) : 1% AEP Scenario

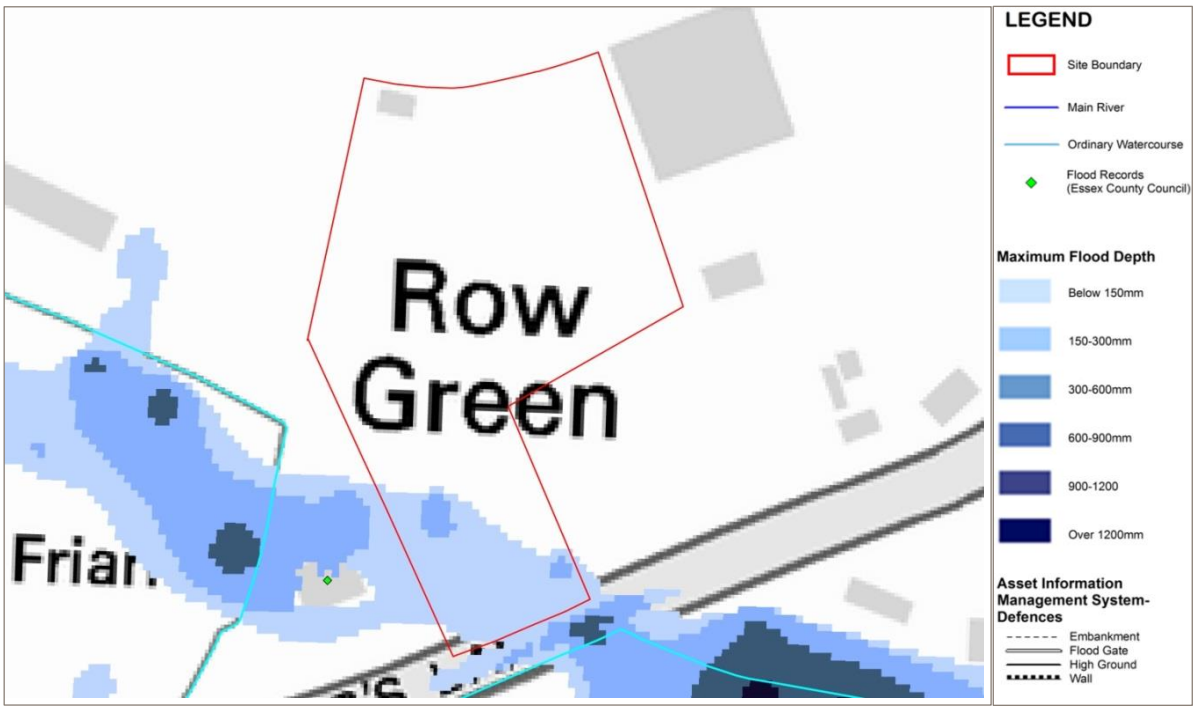

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Figure C Environment Agency's Risk of Flooding from Surface Water Depth: 1% AEP

Site Assessment Summary – Land East of Friaries, Bakers Lane

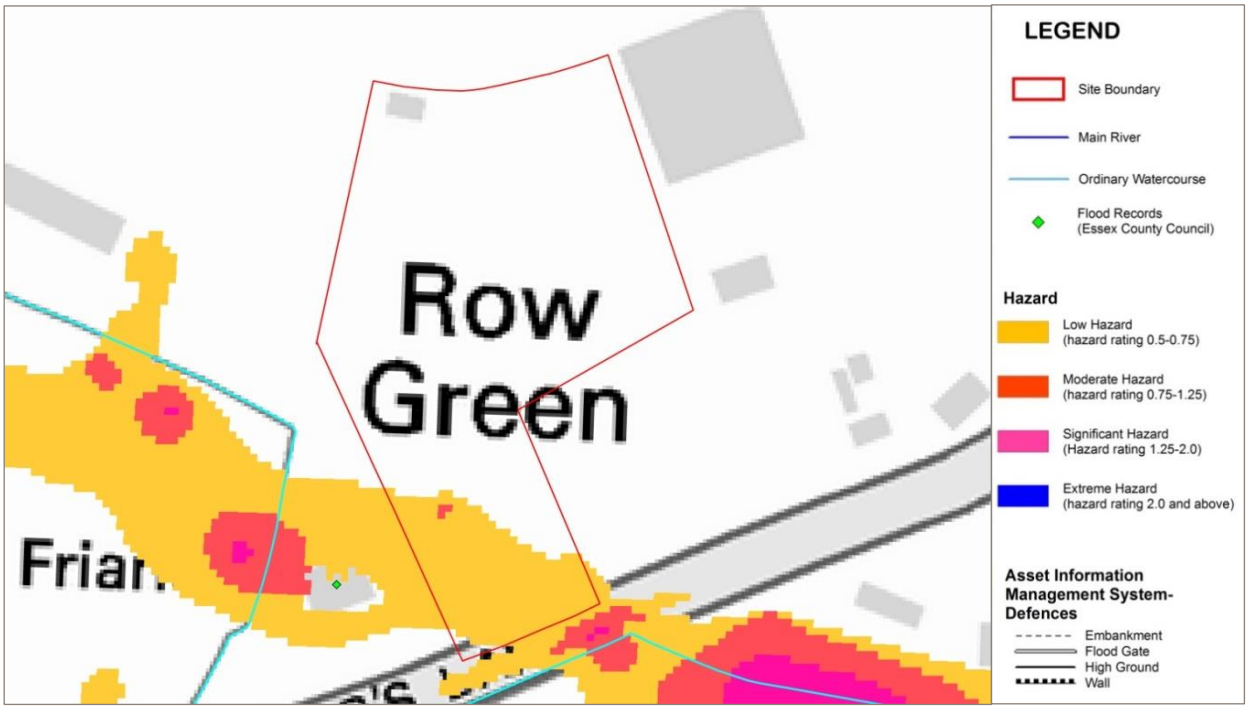

Figure D Environment Agency's Risk of Flooding from Surface Water Hazard: 1% AEP

Historic Flood Events

There are no historical records of flooding on the site. There is 1 historical records of flooding in the surrounding area however the source of flooding is unknown. The Anglian Water DG5 database identifies a total of 2 external sewer flooding events have occurred in the site postcode area.

Geology and Groundwater

The bedrock geology in this area is Thames Group, comprising clay, gravel and silt. The overlying bedrock is comprised of till. Clayey soils are typically not very permeable and provide the potential for increased surface water ponding.

The AStGWF mapping shows that the site is located within a 1km square of which <25% is susceptible to groundwater emergence. The risk of groundwater flooding in this area is therefore generally considered to be of high risk. This will need to be confirmed during site investigation survey.

Other Sources

No risk posed by other sources.

Greenfield Runoff and Drainage Hierarchy

Estimated Greenfield Runoff Rates (IH124 Results).	QBAR:	1.44 l/s	Flow rate in l/s/ha	QBAR:	1.42 l/s/ha
	1 in 1 year:	1.23 l/s		1 in 1 year:	1.22 l/s/ha
	1 in 30 year:	3.32 l/s		1 in 30 year:	3.30 l/s/ha
	1 in 100 year:	4.60 l/s		1 in 100 year:	4.55 l/s/ha

Drainage Hierarchy	Infiltration to ground		Uncertain due to geology; subject to on site infiltration testing.
	Discharge to watercourse		Discharge may be possible into the unnamed watercourse, subject to consultation with the LLFA.
	Discharge to surface water sewer		Possible, subject to consultation with Anglian Water.

Site Assessment Summary – Land East of Friaries, Bakers Lane

Site Specific Recommendations

Site Layout and Design

The site is currently defined as Flood Zone 1 (<0.1 AEP) and is therefore not at risk from fluvial flooding. However, it appears that the un-named ordinary watercourse located to the west of the site may pose a potential flood source. There are no modelled flood outlines available for this source and it should be investigated further as part of the site development.

Residential development should be avoided in areas defined as risk of surface water flooding; instead lower vulnerability uses including landscaped open space should be located here. The drainage strategy for the site must be considered early in the site planning process to ensure adequate inclusion of SuDS. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Finished Floor Levels

The Environment Agency Flood Risk Map for Surface Water should be consulted to identify the potential surface water flood depth. Finished floor levels should be set at an appropriate freeboard above the surface water flood level.

Resilience Measures

A number of flood resistance and resilience measures can also be implemented into new developments to mitigate potential flooding. Guidance on resilience measures can be found in the 'Improving the Flood Performance of New Buildings, Flood Resilient Construction' published by The Department for Communities and Local Government (CLG).

LLFA Consultation

It is recommended that potential developers contact Braintree District Council and Essex CC as the LLFA for further information prior to taking forward site specific plans.

Summary

Based on the strategic assessment of flood risk and the recommendations for mitigation measures set out above, it is considered that proposed development on this site could be suitably designed to satisfy part 2) of the Exception Test, subject to submission of a site specific FRA.

Site Assessment Summary – Land east of Great Notley/South of Braintree

Location:	SHLAA Ref / Ref:	Area (ha):	Proposed Use:	Vulnerability Classification:
Black Notley	BLAN114 and BLAN117	117.90 and 0.28	Residential & appropriate to scale other mixed uses	More Vulnerable

Fluvial Flood Risk

Flood Zone 1 (<0.1 AEP) :	Flood Zone 2 (0.1% AEP) :	Flood Zone 3 (1% AEP):	Flood Zone 3b (5% AEP):
100%	0%	0%	0%

Flood Zones and Flood Defences

Both BLAN114 and BLAN117 sites are located within Flood Zone 1 (<0.1 AEP). An unnamed ordinary watercourse is located in the north of the site and a culverted watercourse is located in the south of the site. There are no modelled flood zones for these watercourses, however the watercourse could still pose a flood risk to the site.

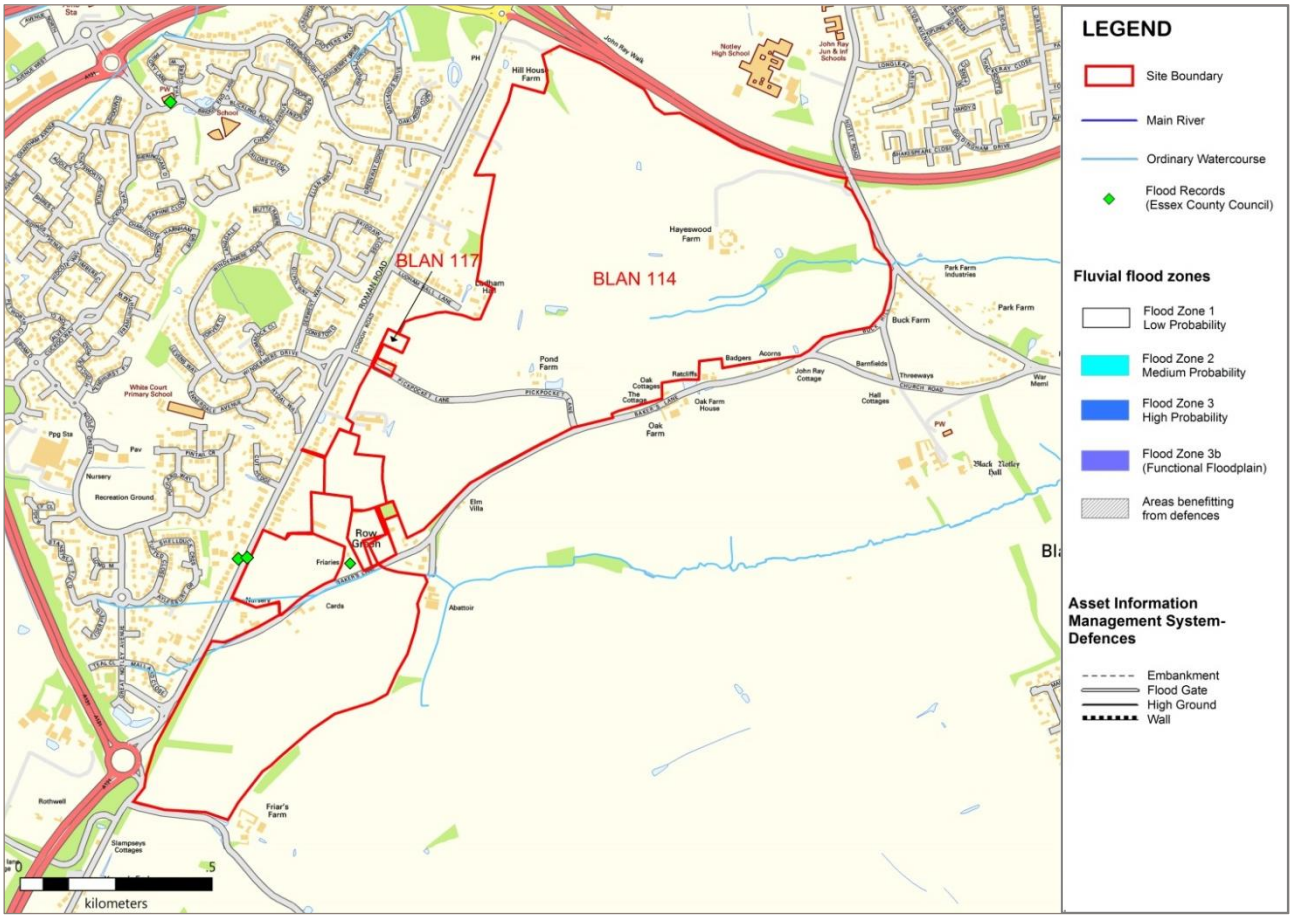

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Figure A Flood Zones

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The Environment Agency RoFSW mapping (Figure B) indicates that the BAN114 site is at risk of surface water flooding. There are two contributing flow paths that flow in an easterly direction across the centre of the site. Small areas of surface water ponding are located across the site. This should be considered carefully in the development of the site layout to ensure that residential dwellings are not placed at surface water flood risk, and that the position of any new development does not divert the flow path to a neighbouring area. Environment Agency surface water modelling (Figure C) identifies the potential for surface water flood depths of 0-1200mm on the site during the 1% AEP event. The site has a low to significant surface water flood hazard rating during a 1% AEP event (Figure D).

The Environment Agency RoFSW mapping (Figure B) indicates that the BAN117 site is not at risk of surface water flooding.

Site Assessment Summary – Land east of Great Notley/South of Braintree

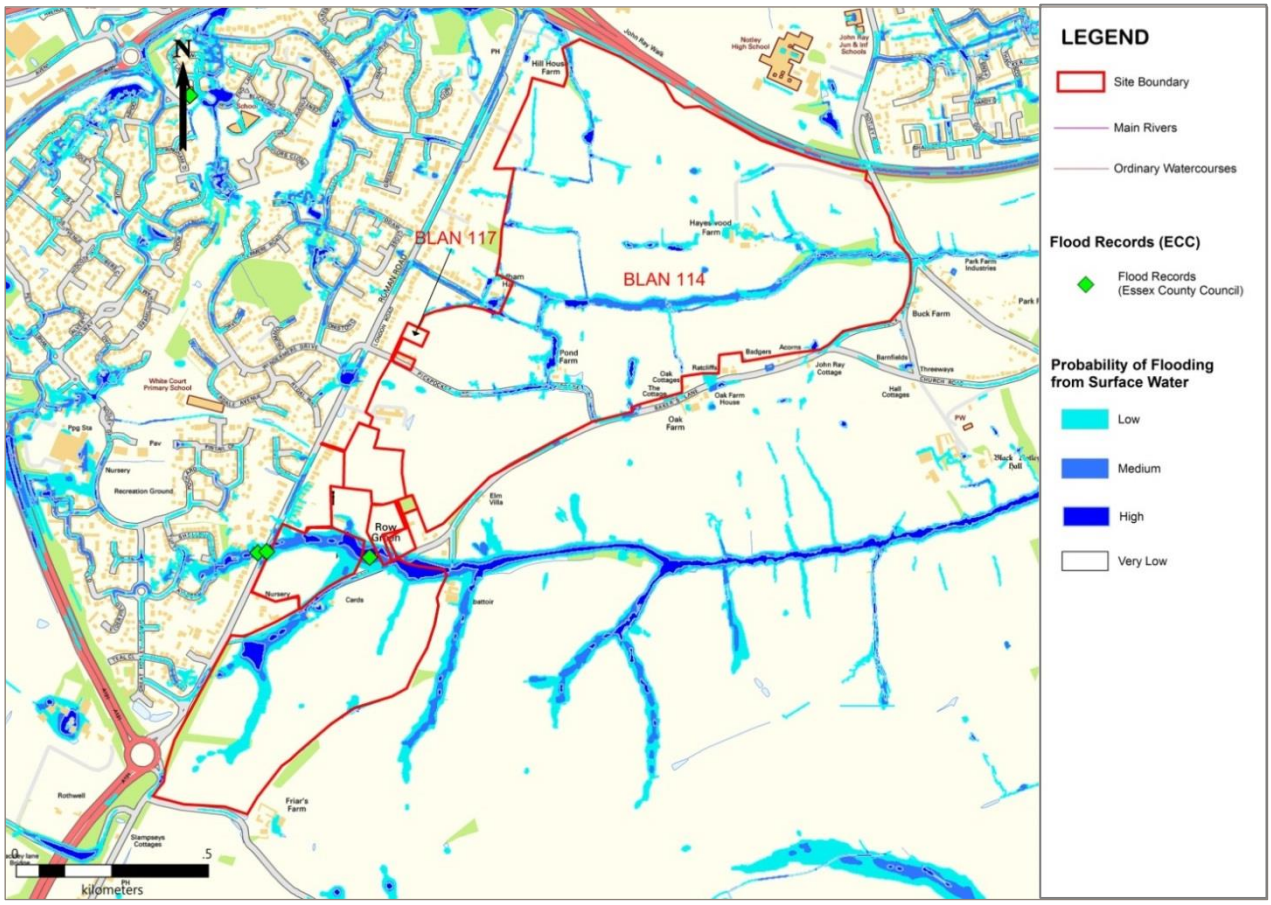

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Figure B Environment Agency's Risk of Flooding from Surface Water (RoFSW) : 1% AEP Scenario

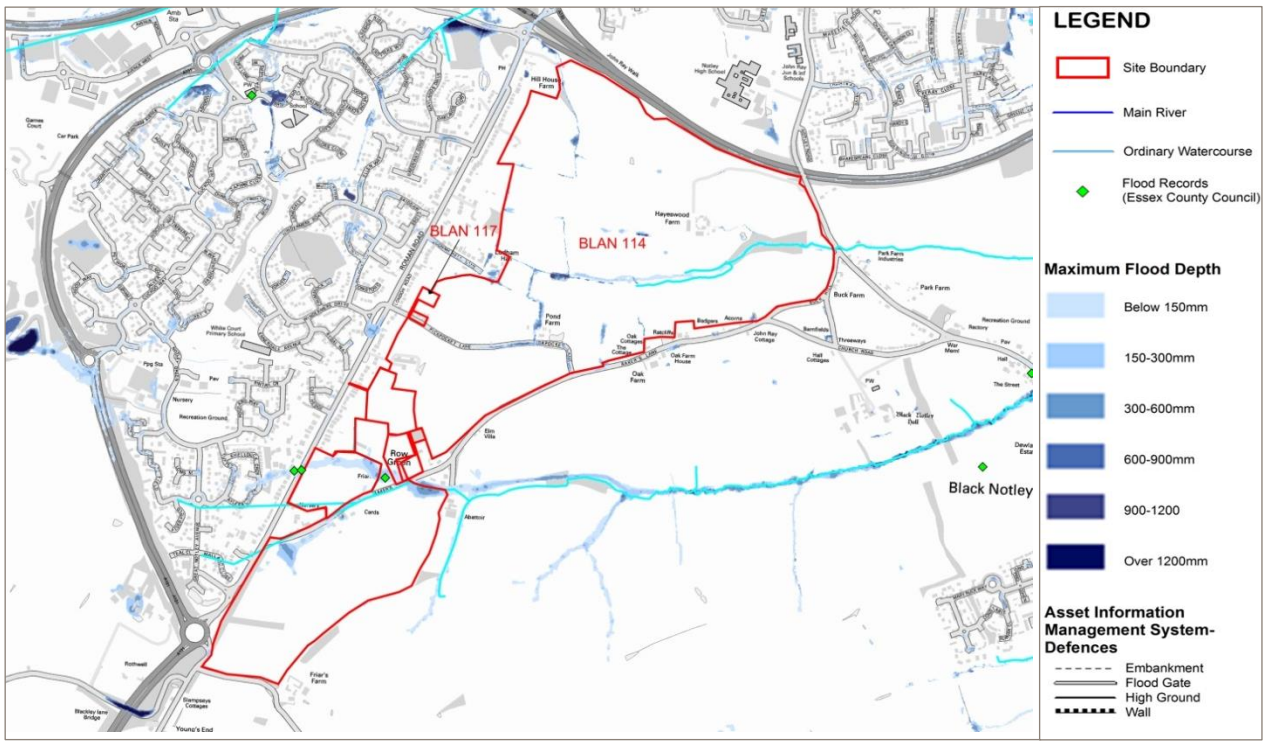

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Figure C Environment Agency's Risk of Flooding from Surface Water Depth: 1% AEP

Site Assessment Summary – Land east of Great Notley/South of Braintree

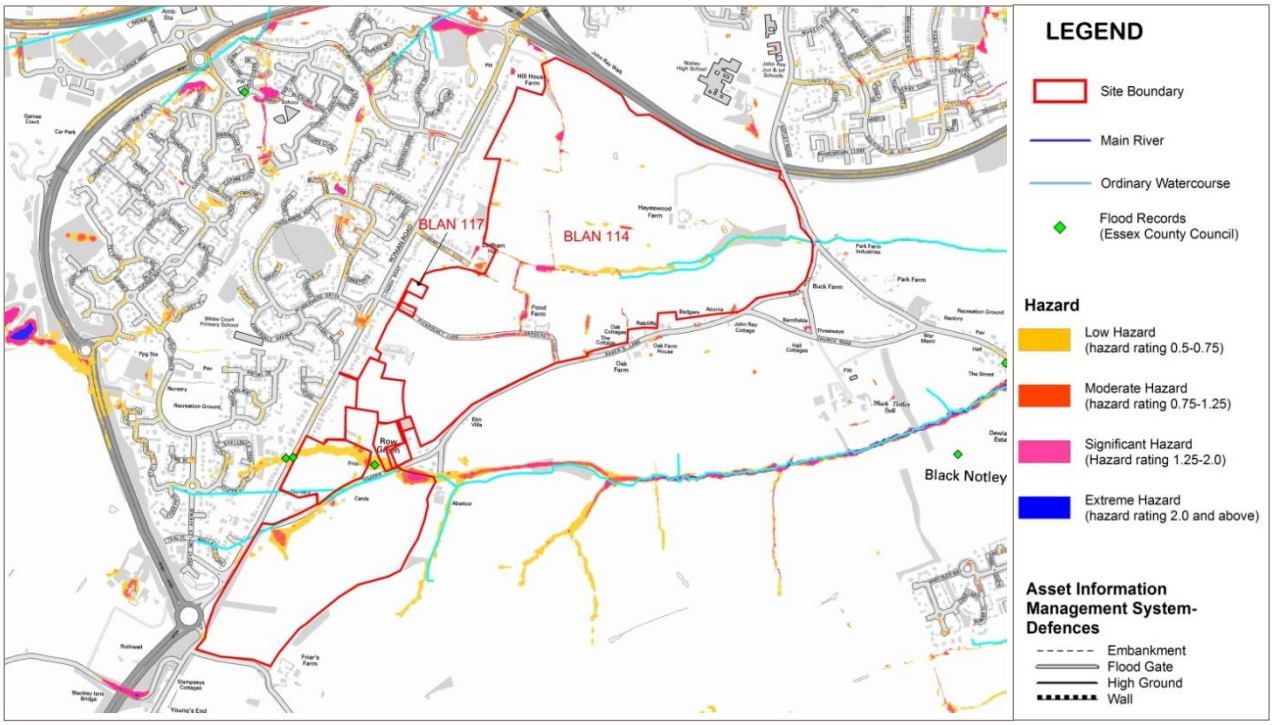

Figure D Environment Agency's Risk of Flooding from Surface Water Hazard: 1% AEP

Historic Flood Events

There is 1 historical record of flooding on the BAN114 site however the source of flooding is unknown. There are no historical records of flooding on the BAN117 site.

There are 2 historic flood records in the local area; the source of flooding was a collapsed culvert. The Anglian Water DG5 database identifies a total of 2 external sewer flooding events have occurred in the site postcode area.

Geology and Groundwater

The bedrock geology in this area is Thames Group, comprising clay, gravel and silt. The overlying bedrock is comprised of till. Clayey soils are typically not very permeable and provide the potential for increased surface water ponding.

The AStGWF mapping shows that the sites are located within 4 1km squares of which >25% is susceptible to groundwater emergence. The risk of groundwater flooding in this area is therefore generally considered to be of very low risk. This will need to be confirmed during site investigation survey.

Other Sources

No risk posed by other sources.

Greenfield Runoff and Drainage Hierarchy

Estimated Greenfield Runoff Rates (IH124 Results) for BLAN114	QBAR:	152.80 l/s	Flow rate in l/s/ha	QBAR:	1.29 l/s/ha
	1 in 1 year:	129.88 l/s		1 in 1 year:	1.10 l/s/ha
	1 in 30 year:	351.43 l/s		1 in 30 year:	2.98 l/s/ha
	1 in 100 year:	487.42 l/s		1 in 100 year:	487.42 l/s/ha

Drainage Hierarchy	Infiltration to ground		Uncertain due to geology; subject to on site infiltration testing.
	Discharge to watercourse		Discharge possible into the unnamed watercourse, subject to consultation with the LLFA.
	Discharge to surface water sewer		Possible, subject to consultation with Anglian Water.

Site Assessment Summary – Land east of Great Notley/South of Braintree

Site Specific Recommendations

BLAN117 site is not at risk from any source of flooding, therefore it has not been assessed further in this site assessment. The assessment below relates to site BLAN114.

Site Layout and Design

The site is currently defined as Flood Zone 1 (<0.1 AEP) and is therefore not at risk from fluvial flooding. However, there is an ordinary watercourse flowing through the centre of the site with no flood zones defined. The potential flood risk posed by this watercourse should be further investigated as part of any site development.

Residential development should be avoided in areas defined as risk of surface water flooding; instead lower vulnerability uses including landscaped open space should be located here. The drainage strategy for the site must be considered early in the site planning process to ensure adequate inclusion of SuDS. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Set-back Distance

The LLFA will seek to ensure that development is set back by at least 3m on one side of an Ordinary Watercourse for ongoing maintenance purposes. The LLFA will need to be consulted and consent obtained for any proposed works that may impact flow within the channel of the watercourse.

Finished Floor Levels

If residential development cannot be avoided within the surface water flood extent, the Environment Agency Flood Risk Map for Surface Water should be consulted to identify the potential surface water flood depth. Finished floor levels should be set at an appropriate freeboard above the surface water (and ordinary watercourse) flood level.

Resilience Measures

A number of flood resistance and resilience measures can also be implemented into new developments to mitigate potential flooding. Guidance on resilience measures can be found in the 'Improving the Flood Performance of New Buildings, Flood Resilient Construction' published by The Department for Communities and Local Government (CLG).

LLFA Consultation

It is recommended that potential developers contact Braintree District Council and Essex CC as the LLFA for further information prior to taking forward site specific plans.

Summary

Based on the strategic assessment of flood risk and the recommendations for mitigation measures set out above, it is considered that proposed development on site BLAN114 could be suitably designed to satisfy part 2) of the Exception Test, subject to submission of a detailed site specific FRA.

Site Assessment Summary – Towerlands Park, between Panfield Lane and Deanery Hill

Location:	SHLAA Ref / Ref:	Area (ha):	Proposed Use:	Vulnerability Classification:
Braintree	BOCN137	42.99	Residential	More Vulnerable

Fluvial Flood Risk

Flood Zone 1 (<0.1 AEP) :	Flood Zone 2 (0.1% AEP) :	Flood Zone 3 (1% AEP):	Flood Zone 3b (5% AEP):
100%	0%	0%	0%

Flood Zones and Flood Defences

The site is located entirely in Flood Zone 1 (<0.1 AEP) and is located 0.3km southwest from the River Pant. There is an ordinary watercourse crossing the south west corner of the site.

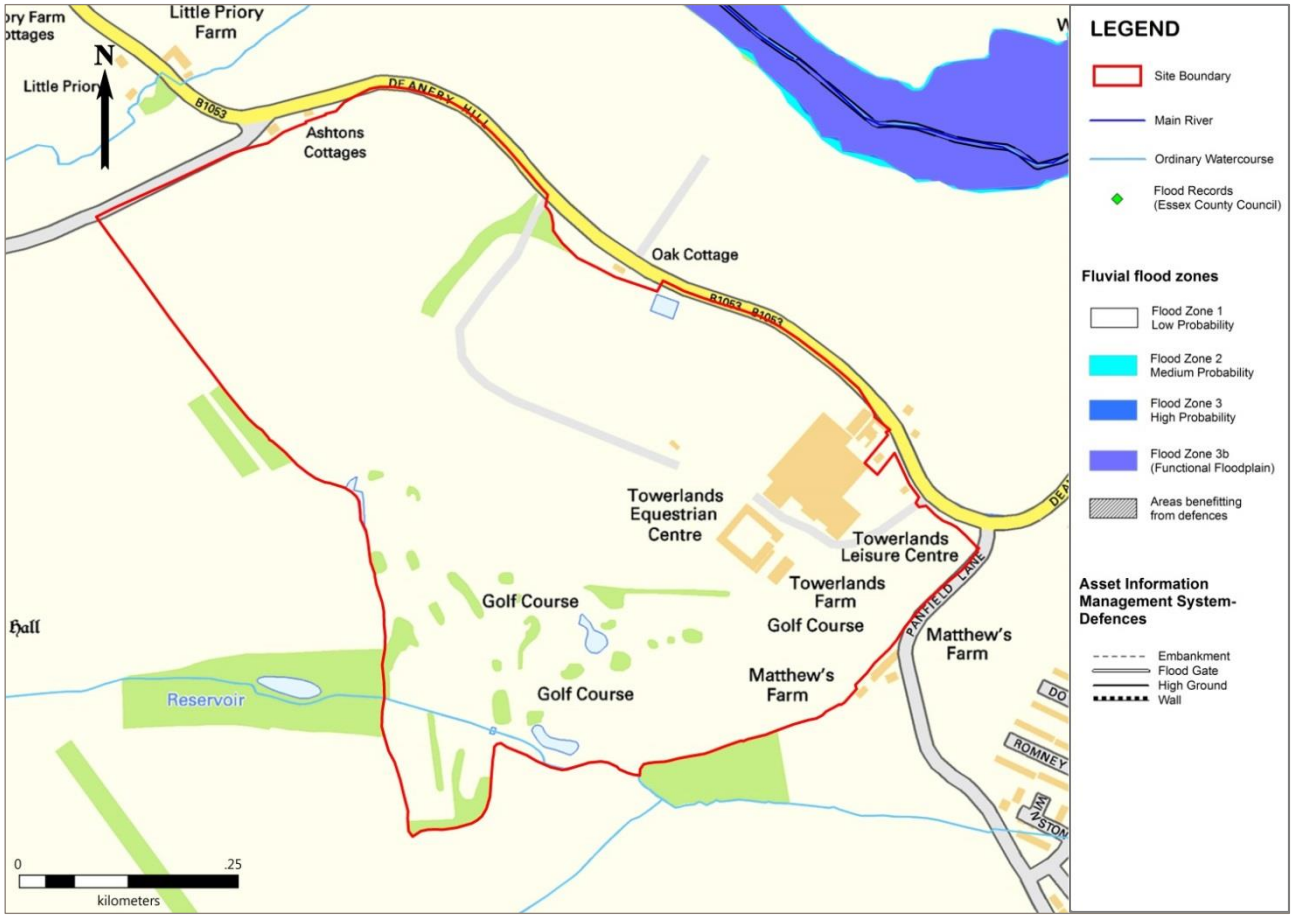

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Figure A Flood Zones

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The Environment Agency RoFSW mapping (Figure B) identifies two surface water flow paths, one flowing in a northerly direction across the centre of the site, and the second flowing in a south easterly direction across the southern section of the site. In addition, there are small areas of surface water ponding across the site. The flow paths appear to correspond to the ordinary watercourse that has not been covered by hydraulic modelling in this area. Therefore developers are required to consider fluvial flood risk on this site, although it appears to be within Flood Zone 1.

This surface water flood risk should be considered carefully in the development of the site layout to ensure that residential dwellings are not placed at surface water flood risk, and that the position of any new development does not divert the flow path to a neighbouring area.

Environment Agency surface water modelling (Figure C) identifies the potential for surface water flood depths of 0-600mm on the site during the 1% AEP event. The site has a low to significant surface water flood risk hazard rating during a 1% AEP event (Figure D).

Site Assessment Summary – Towerlands Park, between Panfield Lane and Deanery Hill

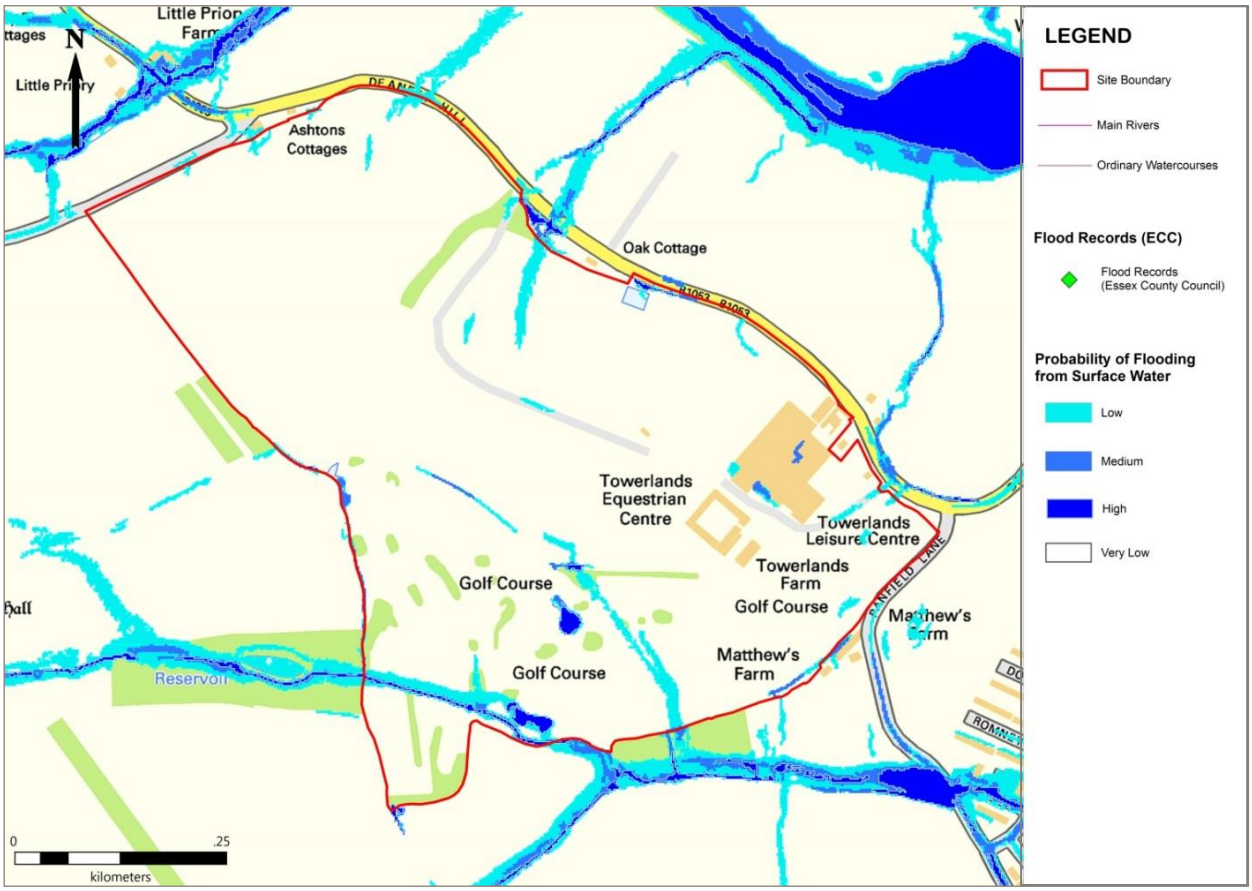

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Figure B Environment Agency's Risk of Flooding from Surface Water (RoFSW) : 1% AEP Scenario

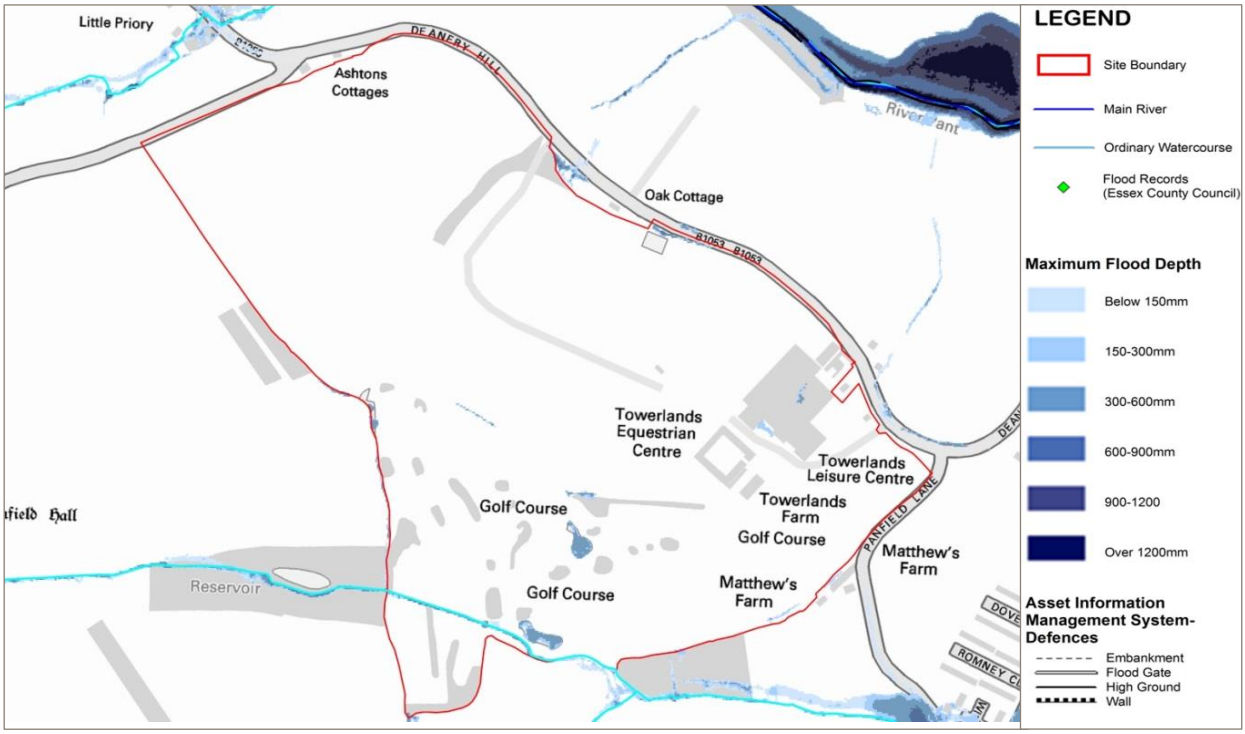

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Figure C Environment Agency's Risk of Flooding from Surface Water Depth: 1% AEP

Site Assessment Summary – Towerlands Park, between Panfield Lane and Deanery Hill

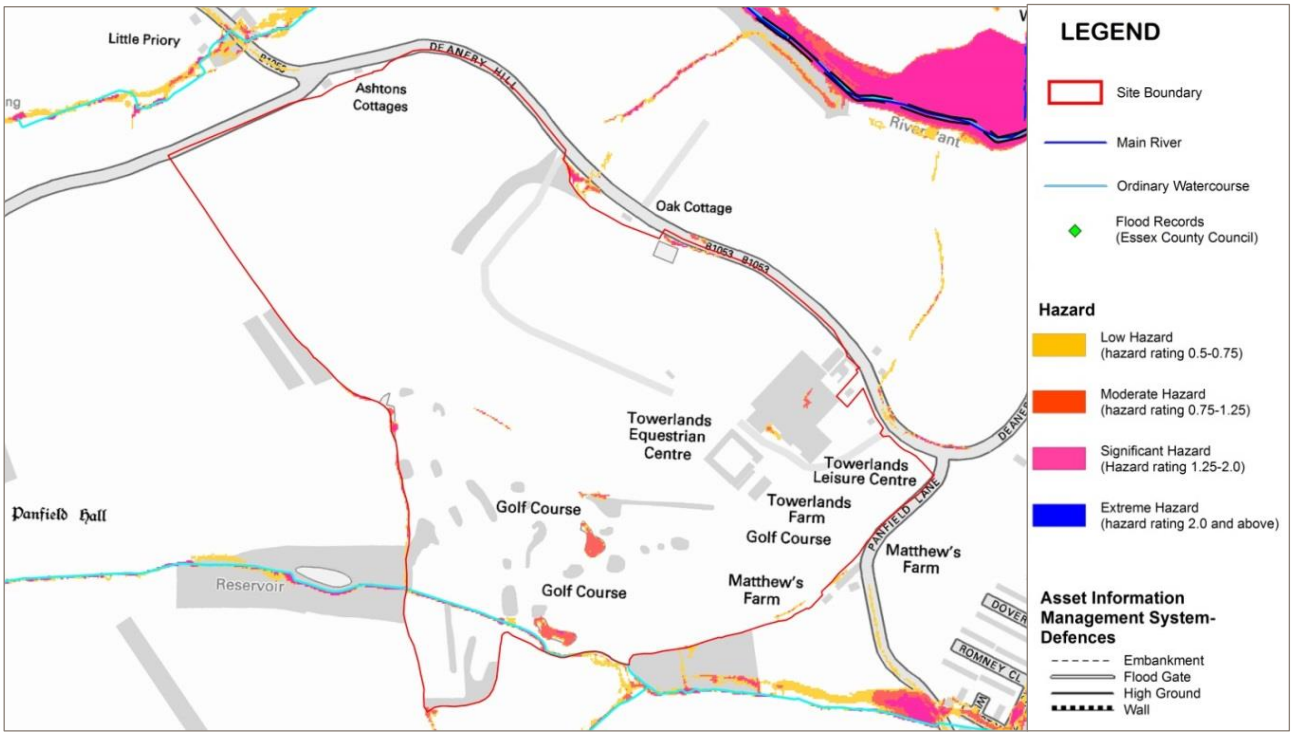

Figure D Environment Agency's Risk of Flooding from Surface Water Hazard: 1% AEP

Historic Flood Events

There are no historical records of flooding on the site or in the surrounding area.

Geology and Groundwater

The bedrock geology in this area is Thames Group, comprising clay, gravel and silt. The overlying bedrock is comprised of till. Clayey soils are typically not very permeable and provide the potential for increased surface water ponding.

The AStGWF mapping shows that the site is located predominantly within a 1km square of which >25% is susceptible to groundwater emergence. The additional part of the site is within a 1km square of which 25%-50% is susceptible to groundwater emergence. The risk of groundwater flooding in this area is therefore generally considered to be of low to medium risk. This will need to be confirmed during site investigation survey.

Other Sources

No risk posed by other sources.

Greenfield Runoff and Drainage Hierarchy

Estimated Greenfield Runoff Rates (IH124 Results).	QBAR:	61.61 l/s	Flow rate in l/s/ha	QBAR:	1.43 l/s/ha
	1 in 1 year:	52.37 l/s		1 in 1 year:	1.21 l/s/ha
	1 in 30 year:	141.70 l/s		1 in 30 year:	3.30 l/s/ha
	1 in 100 year:	196.53 l/s		1 in 100 year:	4.57 l/s/ha

Drainage Hierarchy	Infiltration to ground		Uncertain due to geology; subject to on site infiltration testing.
	Discharge to watercourse		Discharge possible into the unnamed watercourse, subject to consultation with the LLFA.
	Discharge to surface water sewer		Possible, subject to consultation with Anglian Water.

Site Assessment Summary – Towerlands Park, between Panfield Lane and Deanery Hill

Site Specific Recommendations

Site Layout and Design

The site is currently defined as Flood Zone 1 (<0.1 AEP) and is therefore not at risk from fluvial flooding. There is an un-named ordinary watercourse crossing the south western corner of the site. Further investigation into the potential flood risk associated with this watercourse should be made as part of the site design process.

Residential development should be avoided in areas defined as risk of surface water flooding; instead lower vulnerability uses including landscaped open space should be located here. The drainage strategy for the site must be considered early in the site planning process to ensure adequate inclusion of SuDS. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Set-back Distance

The LLFA will seek to ensure that development is set back by at least 3m on one side of an Ordinary Watercourse for ongoing maintenance purposes. The LLFA will need to be consulted and consent obtained for any proposed works that may impact flow within the channel of the watercourse.

Finished Floor Levels

If residential development cannot be avoided within the flood extent, the Environment Agency Flood Risk Map for Surface Water should be consulted to identify the potential flood depth. Finished floor levels should be set at an appropriate freeboard above the surface water flood level.

LLFA Consultation

It is recommended that potential developers contact Braintree District Council and Essex CC as the LLFA for further information prior to taking forward site specific plans.

Summary

Based on the strategic assessment of flood risk and the recommendations for mitigation measures set out above, it is considered that proposed development on this site could be suitably designed to satisfy part 2) of the Exception Test, subject to submission of a detailed site specific FRA.

Site Assessment Summary – Dutch Nursery, West Street

Location:	SHLAA Ref / Ref:	Area (ha):	Proposed Use:	Vulnerability Classification:
Coggeshall	COGG506	2.50	Mixed use development up to 30 units, B1/B2 employment, retail associated with garden centre, community access to river.	More Vulnerable

Fluvial Flood Risk

Flood Zone 1 (<0.1 AEP) :	Flood Zone 2 (0.1% AEP):	Flood Zone 3 (1% AEP):	Flood Zone 3b (5% AEP):
59%	5%	0%	0%

Flood Zones and Flood Defences

The River Blackwater flows from west to east approximately 27m south of the site in open channel. The majority of the site is located in Flood Zone 1 with the remainder falling into Flood Zone 2. Along the edge of the site the AIMS dataset identifies that high ground acts as a flood defence. An unnamed ordinary watercourse is located to the south of the southern site boundary and drains into the River Blackwater.

Functional Floodplain (Flood Zone 3b)

The site is located within 8m of the functional floodplain associated with the River Blackwater.

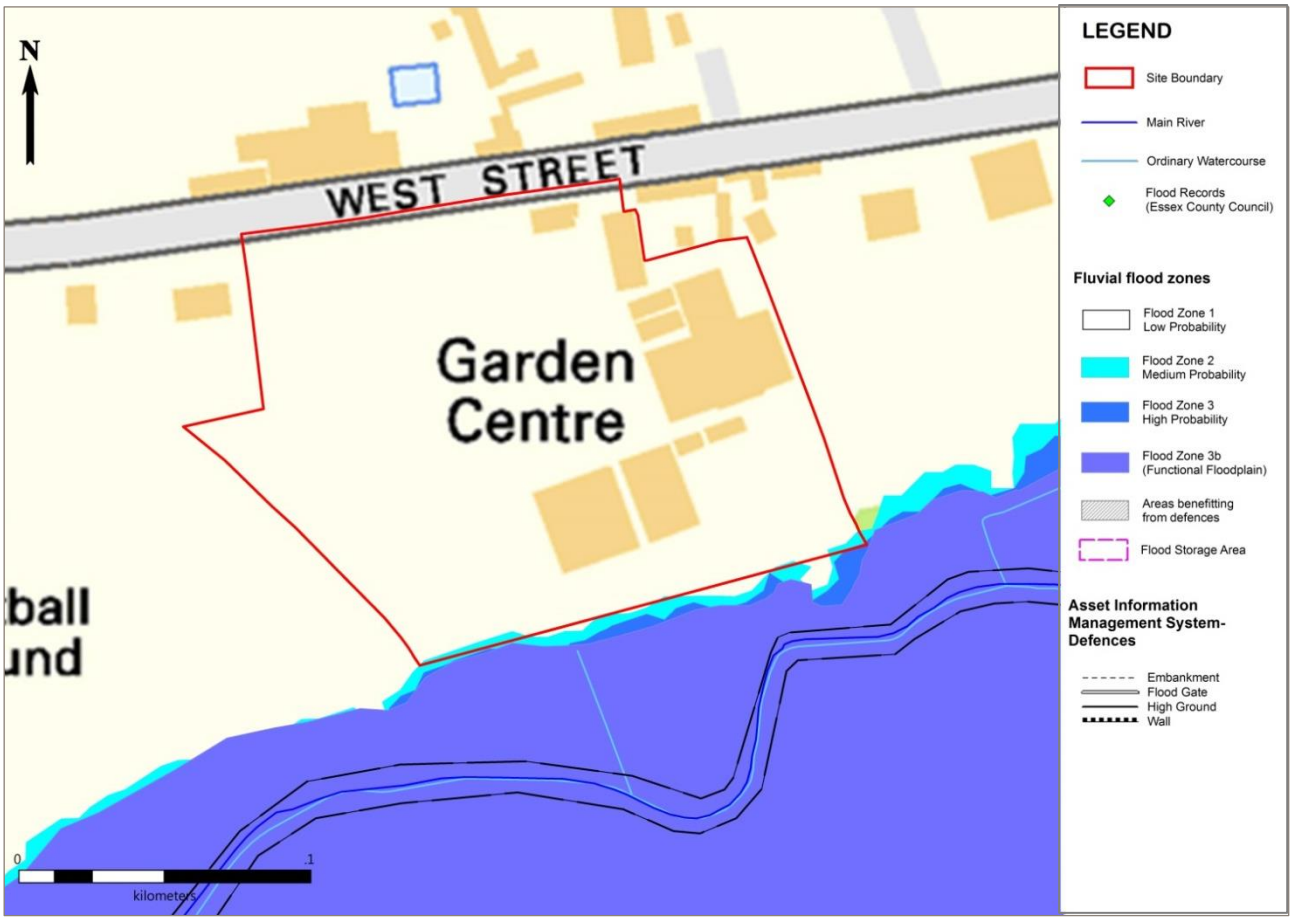

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Figure A-Flood Zones

It should be noted that the Environment Agency is currently updating their hydraulic model for the River Blackwater, which will include the updated climate change allowances. In the absence of hydraulic model outputs for these allowances, Flood Zone 2 (0.1% AEP event) has been used as a proxy for the 100year plus 35% climate change (as described in Section 2.1.1.1 of this Level 2 SFRA). Developers and site promoters are required to consult with the Environment Agency for the most up-to-date fluvial model data to be included in site specific FRAs.

Site Assessment Summary – Dutch Nursery, West Street

Detailed Flood Risk Information – Maximum Flood Depth and Hazard Mapping

It should be noted that the Environment Agency is currently updating their hydraulic model for the River Blackwater, which will include a flood hazard output. Developers and site promoters are required to consult with the Environment Agency for the most up-to-date fluvial model data to be included in site specific FRAs.

Environment Agency modelling for the River Blackwater (2010) identifies that the southern area of the site has a flood depth range of 0.1-0.5m during the 0.1% AEP event and 0.1% AEP plus 20% (Figures B and C). This corresponds to a hazard rating of Moderate (danger to some) (Figures D and E).

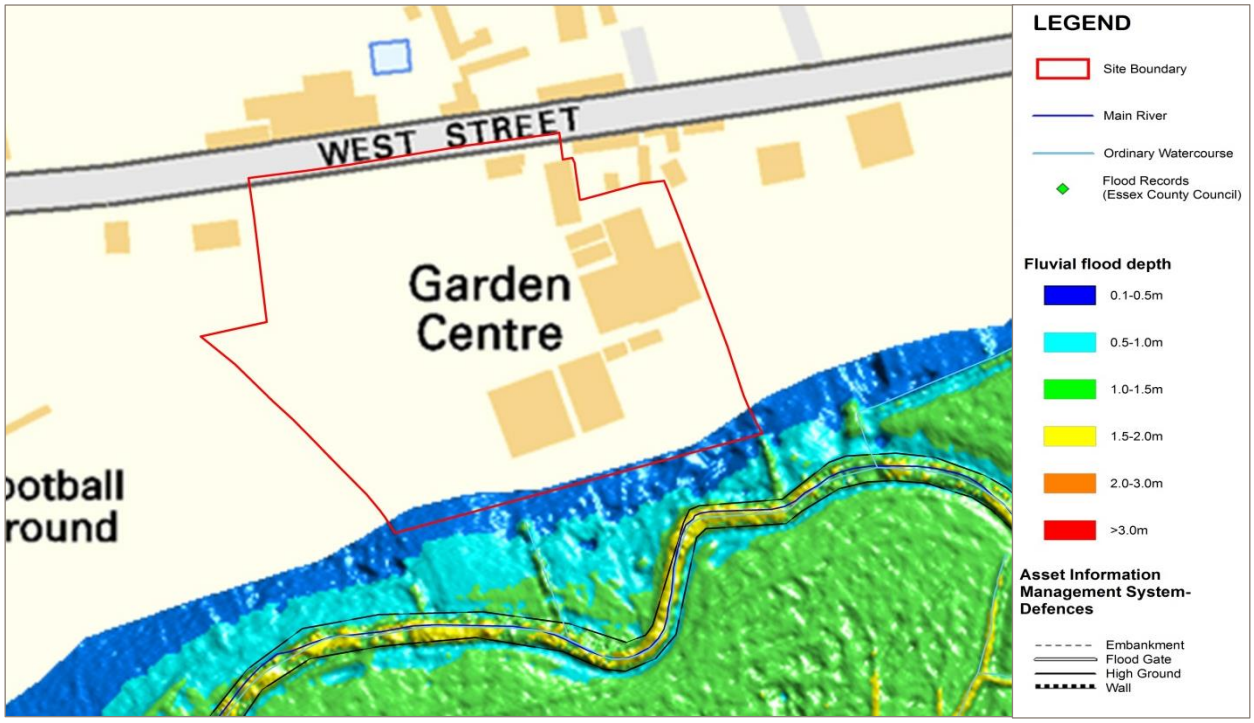

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Figure B River Blackwater flood depth mapping for the site - 0.1% AEP scenario (proxy for 1% plus 35% climate change)

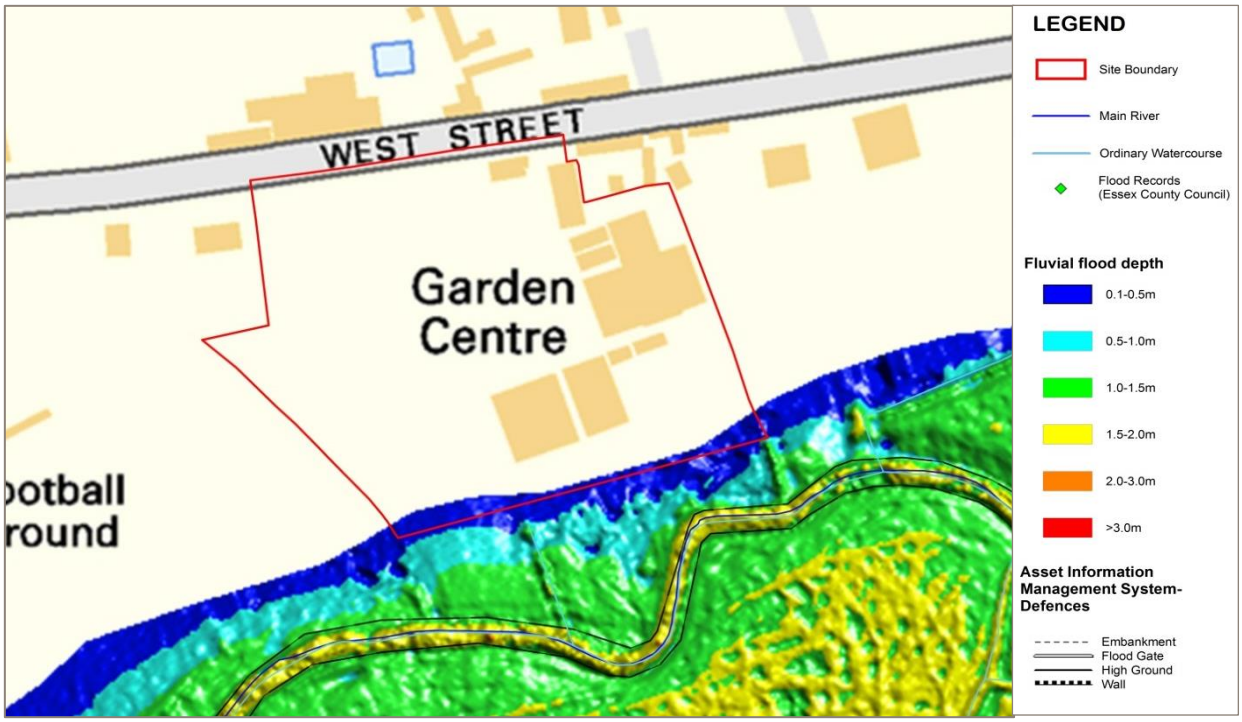

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Figure C River Blackwater flood depth mapping for the site - 0.1% AEP scenario plus 20% (proxy for 1% plus 65% climate change)

Site Assessment Summary – Dutch Nursery, West Street

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Figure D River Blackwater flood hazard mapping for the site - 0.1% AEP scenario (proxy for 1% plus 35% climate change)

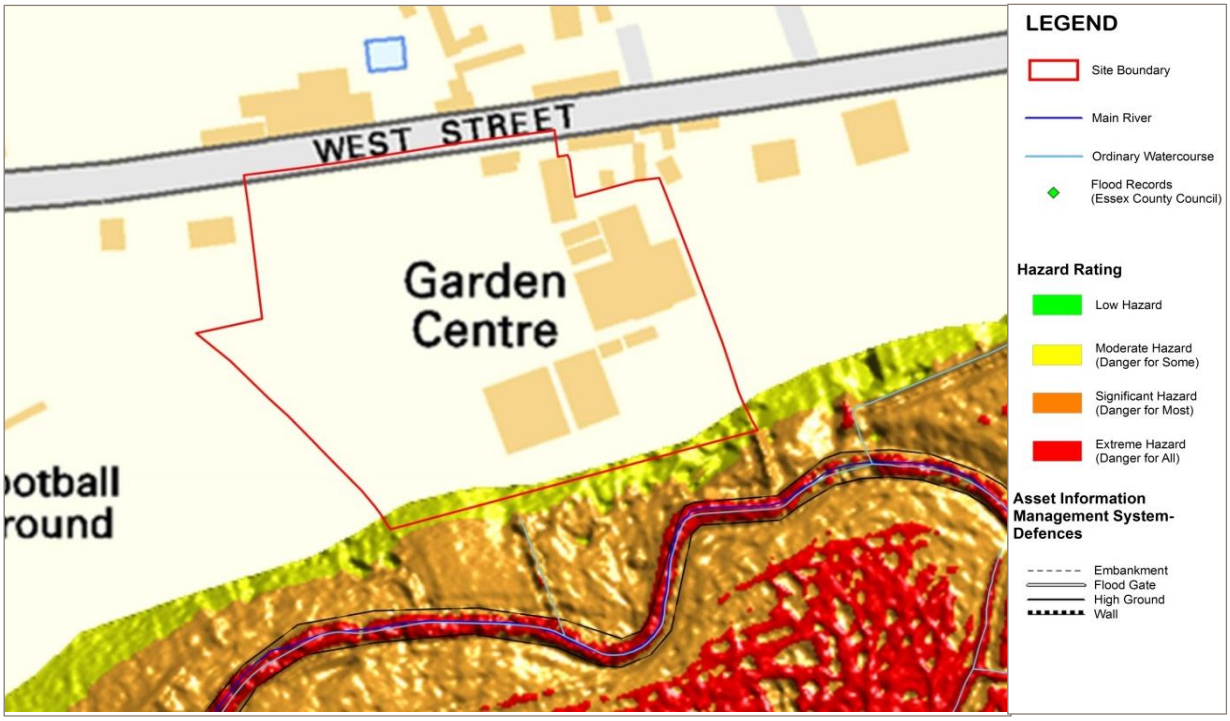

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Figure E River Blackwater flood hazard mapping for the site - 0.1% AEP scenario plus 20% (proxy for 1% plus 65% climate change)

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The Environment Agency RoFSW mapping indicates that there is a contributing flow path that flows from north to south across the development site following local topography (see Figure F). This flow path should be considered carefully in the development of the site layout to ensure that residential dwellings are not placed at surface water flood risk, and that the position of any new development does not divert the flow path to a neighbouring area. The Environment Agency RoFSW Depth map in Figure G identifies the potential for depths of 150-300mm on small sections of the northern boundary of the site during the 1% AEP event. The site has a low hazard rating for Surface Water flooding during a 1% AEP event (Figure H).

Site Assessment Summary – Dutch Nursery, West Street

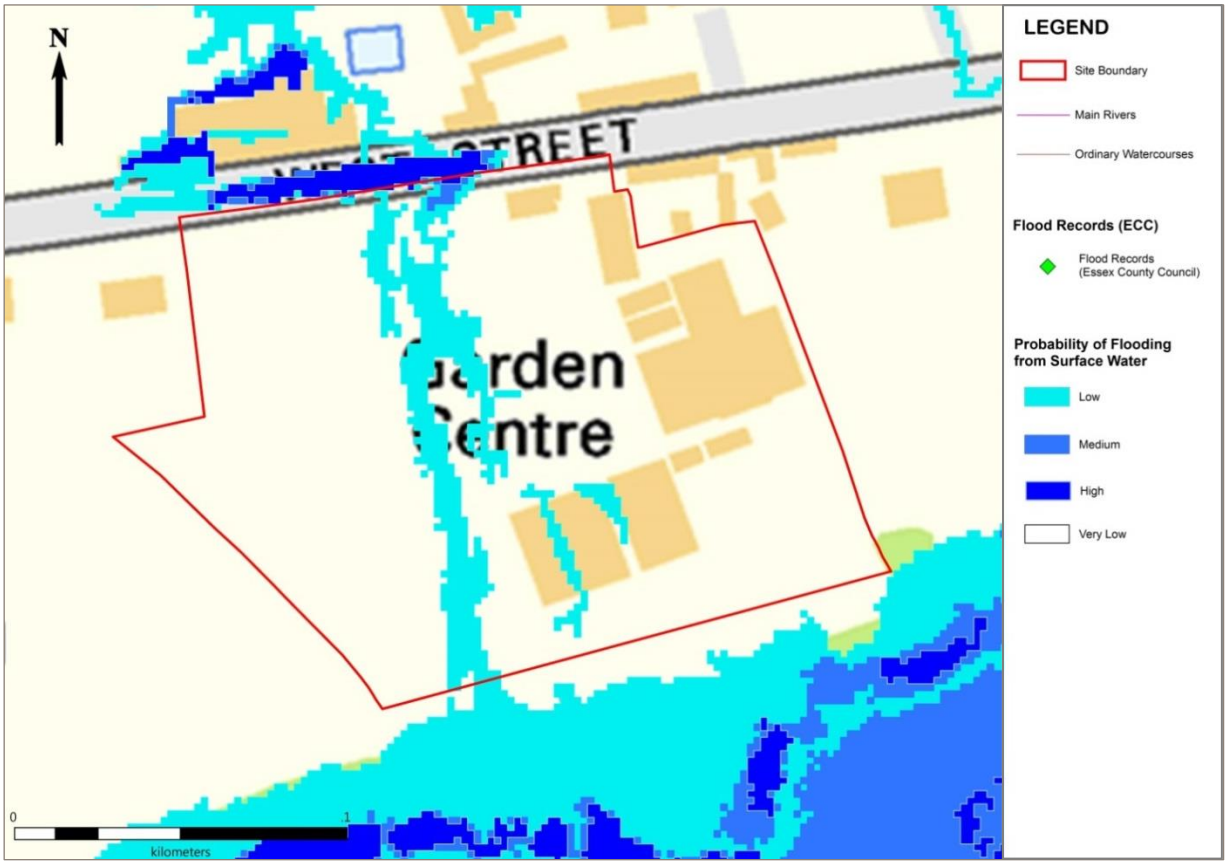

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Figure F Environment Agency's Risk of Flooding from Surface Water (RoFSW) : 1% AEP Scenario

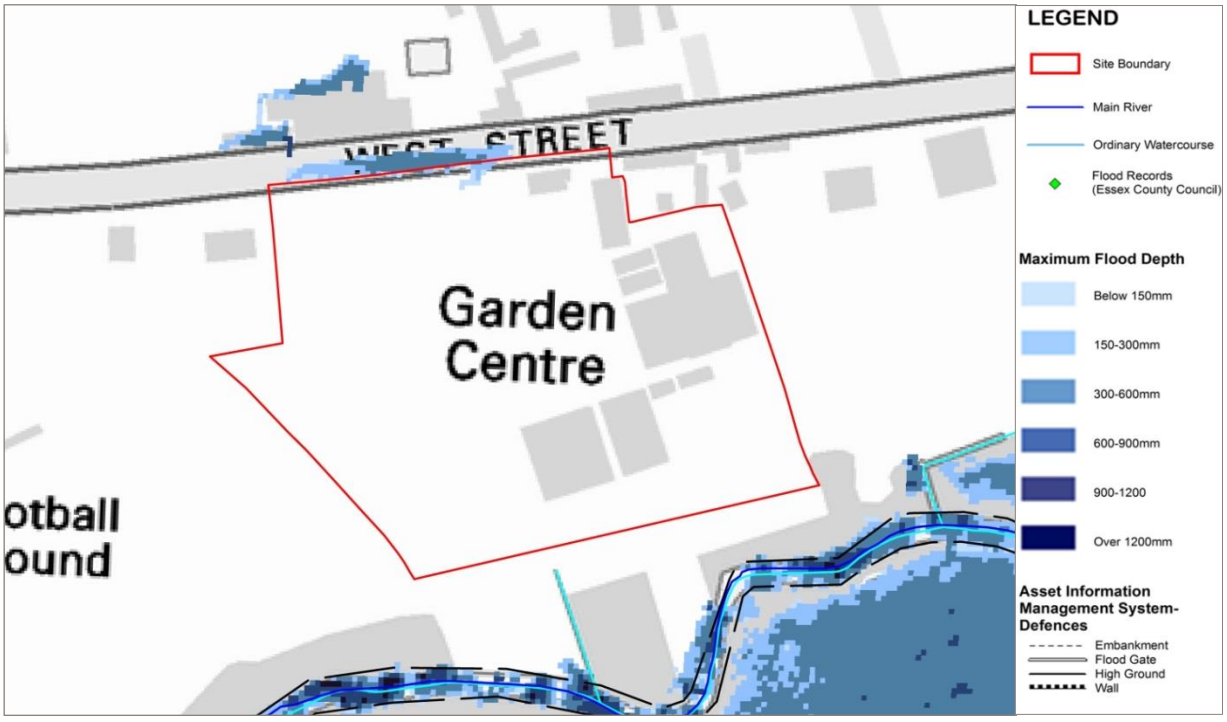

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Figure G Environment Agency's Risk of Flooding from Surface Water Depth: 1% AEP

Site Assessment Summary – Dutch Nursery, West Street

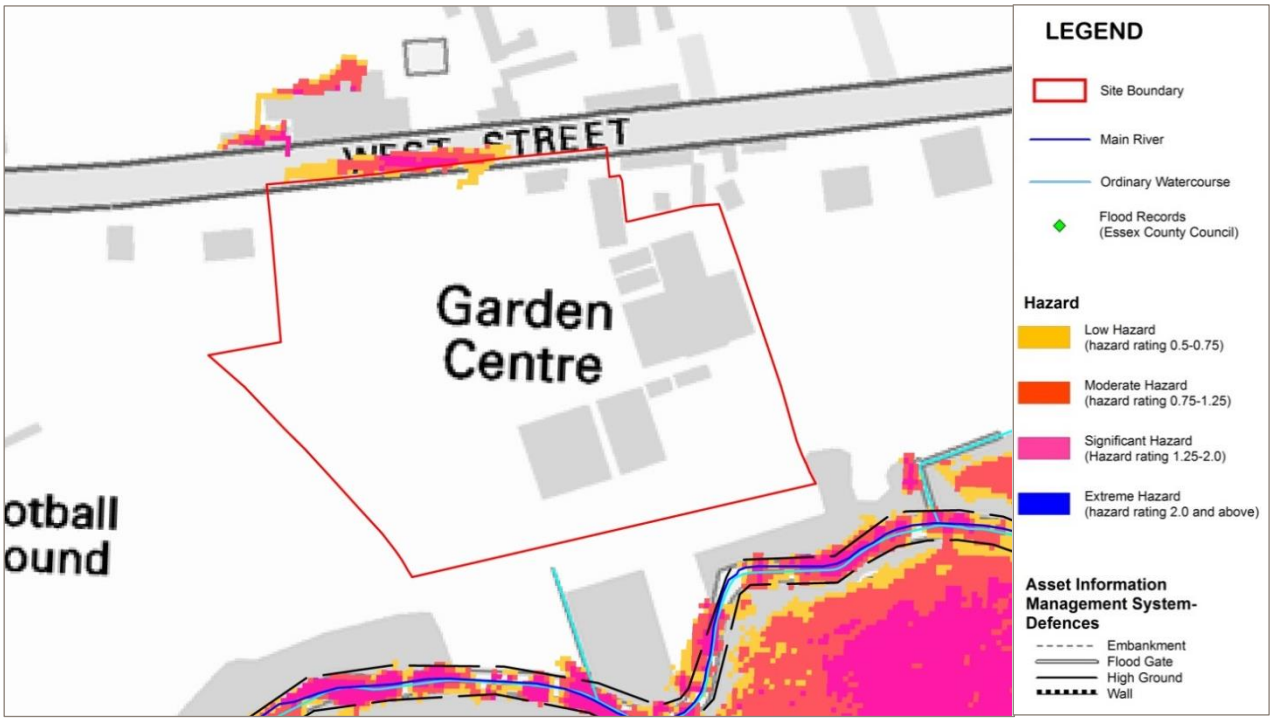

Figure H Environment Agency's Risk of Flooding from Surface Water Hazard: 1% AEP

Historic Flood Events

There are no historical records of flooding on the site.

Geology and Groundwater

The underlying geology is Thames Group (previously known as London Clay formation), with overlying superficial deposits of glacial sand and gravel in the southern part of the site and till in the northern part of the site. This type of geology is typically not very permeable, resulting in rapid runoff of surface water across the ground surface.

The AStGWF mapping shows that the site is located within a 1km square of which 25-50% is susceptible to groundwater emergence. The risk of groundwater flooding in this area is therefore generally considered to be of medium risk. This will need to be confirmed during site investigation survey

Other Sources

No risk posed by other sources.

Greenfield Runoff and Drainage Hierarchy

Estimated Greenfield Runoff Rates (IH124 Results).	QBAR:	5.53 l/s	Flow rate in l/s/ha	QBAR:	2.21 l/s/ha
	1 in 1 year:	4.70l/s		1 in 1 year:	1.88 l/s/ha
	1 in 30 year:	12.71 l/s		1 in 30 year:	5.09 l/s/ha
	1 in 100 year:	17.63 l/s		1 in 100 year:	7.05 l/s/ha

Drainage Hierarchy	Infiltration to ground		Uncertain due to geology; subject to on site infiltration testing.
	Discharge to watercourse		Discharge possible to the River Blackwater, subject to consultation with the Environment Agency.
	Discharge to surface water sewer		Possible, subject to consultation with Anglian Water.

Site Assessment Summary – Dutch Nursery, West Street

Site Specific Recommendations

Fluvial Modelling

It is likely that hydraulic modelling will be required as part of the site specific FRA for this site, to more accurately determine the probability of flooding across the site and to inform appropriate finished floor levels for any proposed More Vulnerable development. Developers should contact the Environment Agency at the project outset to discuss requirements.

Site Layout and Design

Residential development should be avoided in areas defined as Flood Zone 2 (0.1%AEP) on the southern edge of the site, and instead lower vulnerability uses including landscaped open space should be located here. The drainage strategy for the site must be considered early in the site planning process to ensure adequate inclusion of SuDS, taking care to consider SuDS features in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible). Flood storage features should not be located within the floodplain of the River Blackwater, as they may be rendered ineffective during times of fluvial flooding.

Set-back Distance

An 8m wide undeveloped buffer strip should be retained along main rivers to provide access for maintenance. The EA should be contacted to obtain an Environmental Permit for main rivers. The EA should be contacted to obtain an Environmental Permit for main rivers, further information can be found on their website: https://www.gov.uk/guidance/flood-risk-activities-environmental-permits

Finished Floor Levels

If residential development cannot be avoided within the flood extent for the 0.1% AEP event, finished floor levels should be set at least 300mm freeboard above the flood level for 1% AEP event including an appropriate allowance for climate change. Internal access to higher floors is required. It important to consider the implications of diverting the water on the flood risk of the rest of the site.

Access / Egress

Safe dry access to and from the site is provided via West Street, to the north of the site for the 1% AEP event including an allowance for climate change.

Resilience Measures

A number of flood resistance and resilience measures can also be implemented into new developments to mitigate potential flooding. Guidance on resilience measures can be found in the 'Improving the Flood Performance of New Buildings, Flood Resilient Construction' published by The Department for Communities and Local Government (CLG).

Emergency Planning

The site is shown to be within an Environment Agency Flood Warning Area; it is strongly recommended that occupants of the site should register to receive the warning service for the River Blackwater given that proximity to the River and the risk posed to the site. A Flood Warning and Evacuation Plan should be prepared to demonstrate what actions site users will take before, during and after a flood event to ensure their safety, and to demonstrate their development will not impact on the ability of the local authority and the emergency services to safeguard the current population.

LLFA Consultation

It is recommended that potential developers contact the Environment Agency, Braintree District Council and Essex CC as the LLFA for further information prior to taking forward site specific plans.

Summary

Based on the strategic assessment of flood risk and the recommendations for mitigation measures set out above, it is considered that proposed development on this site could be suitably designed to satisfy part 2) of the Exception Test subject to submission of a detailed site specific FRA.

Site Assessment Summary – Land at Inworth Road

Location:	SHLAA Ref / Ref:	Area (ha):	Proposed Use:	Vulnerability Classification:
Feering	FEER 230	1.97	Residential	More Vulnerable

Fluvial Flood Risk

Flood Zone 1 (<0.1 AEP) :	Flood Zone 2 (0.1% AEP):	Flood Zone 3 (1% AEP):	Flood Zone 3b (5% AEP):
100%	0%	0%	0%

Flood Zones and Flood Defences

The site is located entirely within Flood Zone 1 (<0.1 AEP) and is 0.5km from the nearest watercourse.

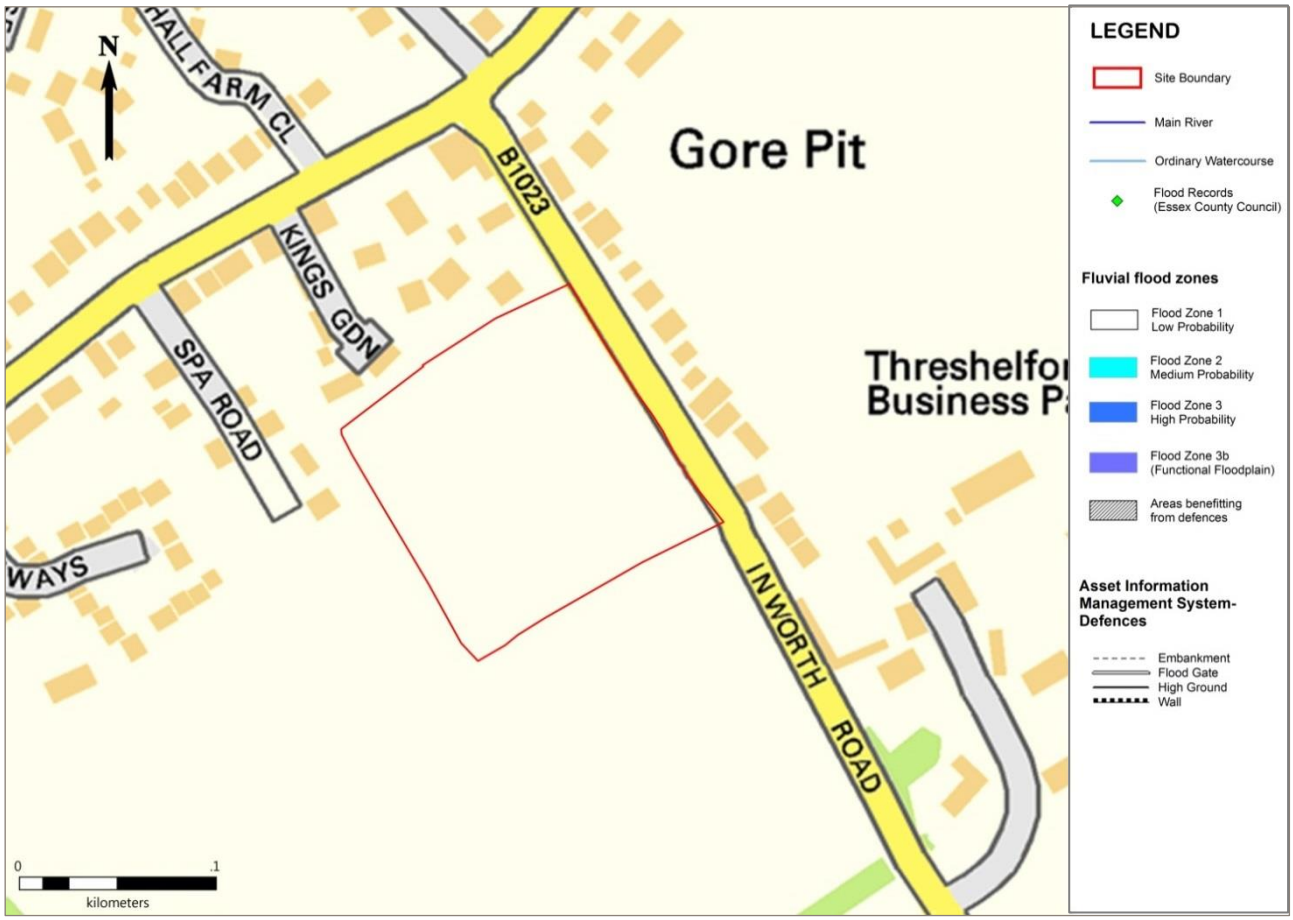

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Figure A Flood Zones

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The Environment Agency RoFSW mapping (Figure B) indicates that an area to the south eastern edge of the site is susceptible to surface water ponding. This should be considered carefully in the development of the site layout to ensure that residential dwellings are not placed at surface water flood risk. The Environment Agency's Surface Water depth modelling identifies the potential for depths of 150-300mm on the site during the 1% AEP event (Figure C). The site has a low surface water flood hazard rating during a 1% AEP event (Figure D).

Site Assessment Summary – Land at Inworth Road

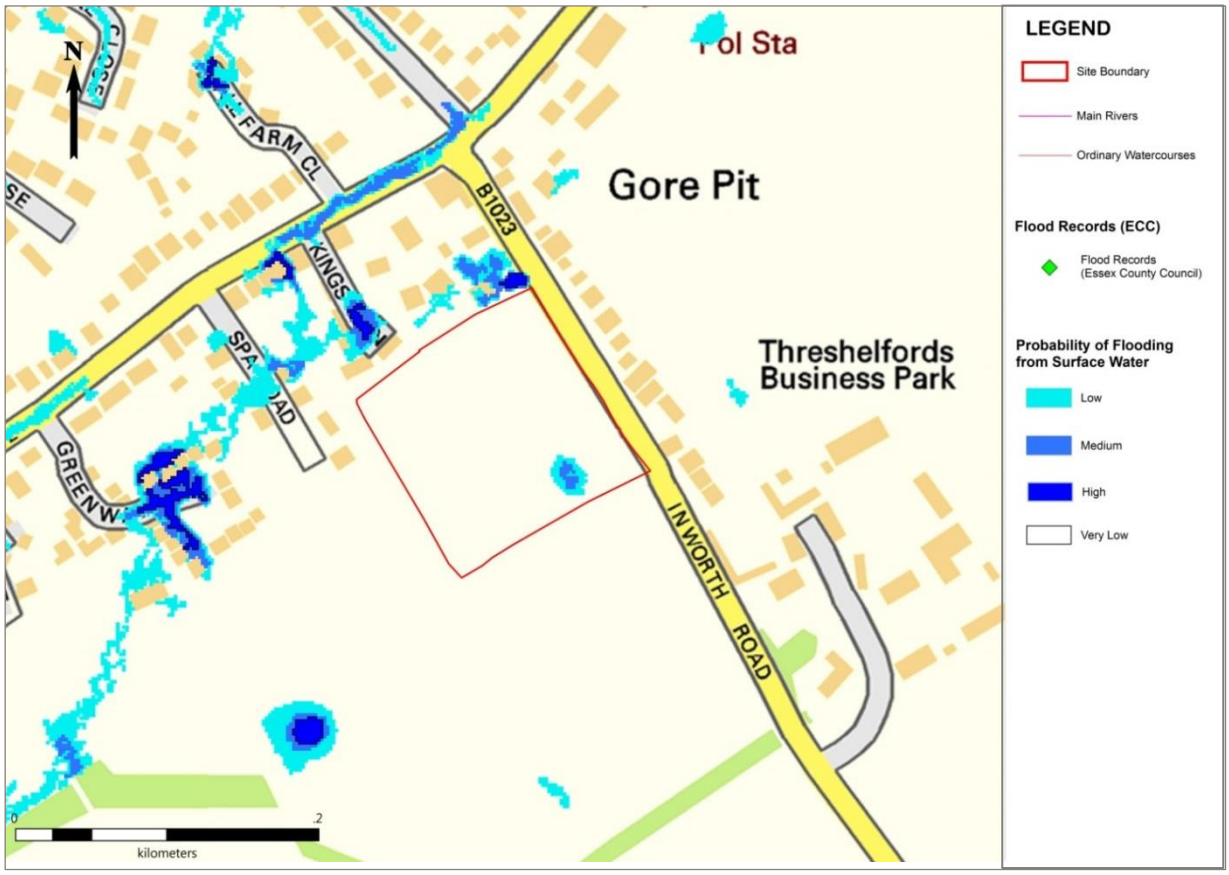

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Figure B Environment Agency's Risk of Flooding from Surface Water (RoFSW) : 1% AEP Scenario

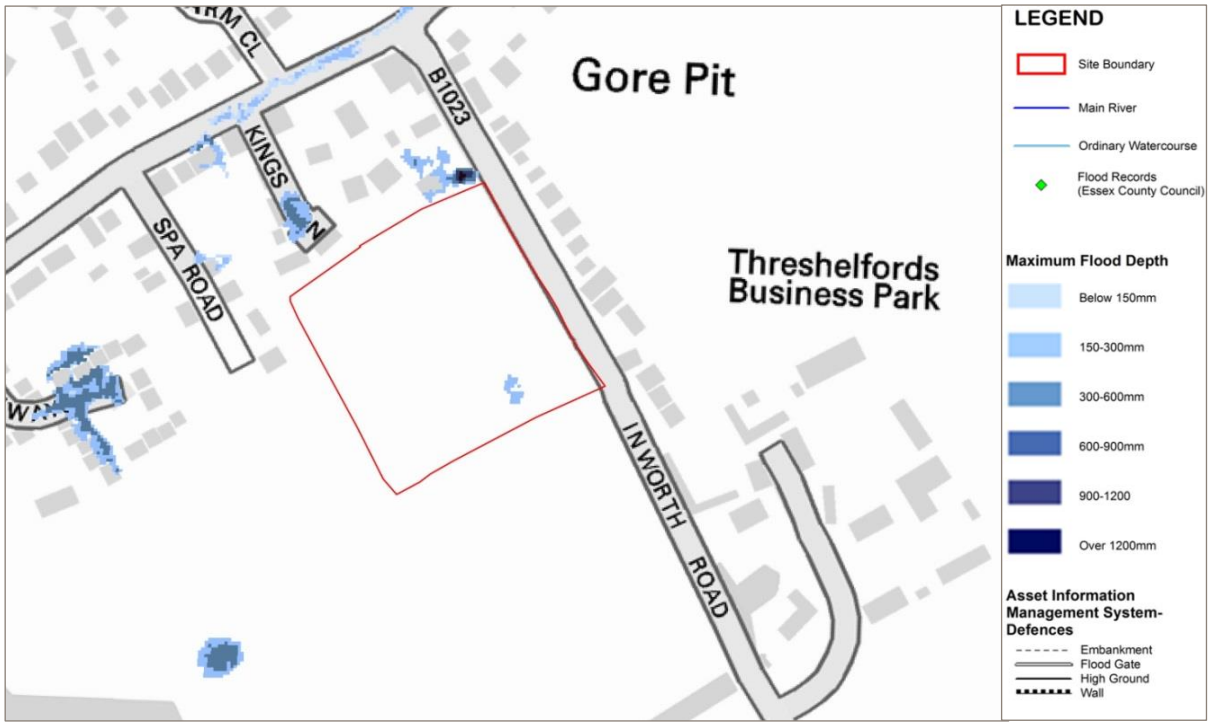

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Figure C Environment Agency's Risk of Flooding from Surface Water Depth: 1% AEP

Site Assessment Summary – Land at Inworth Road

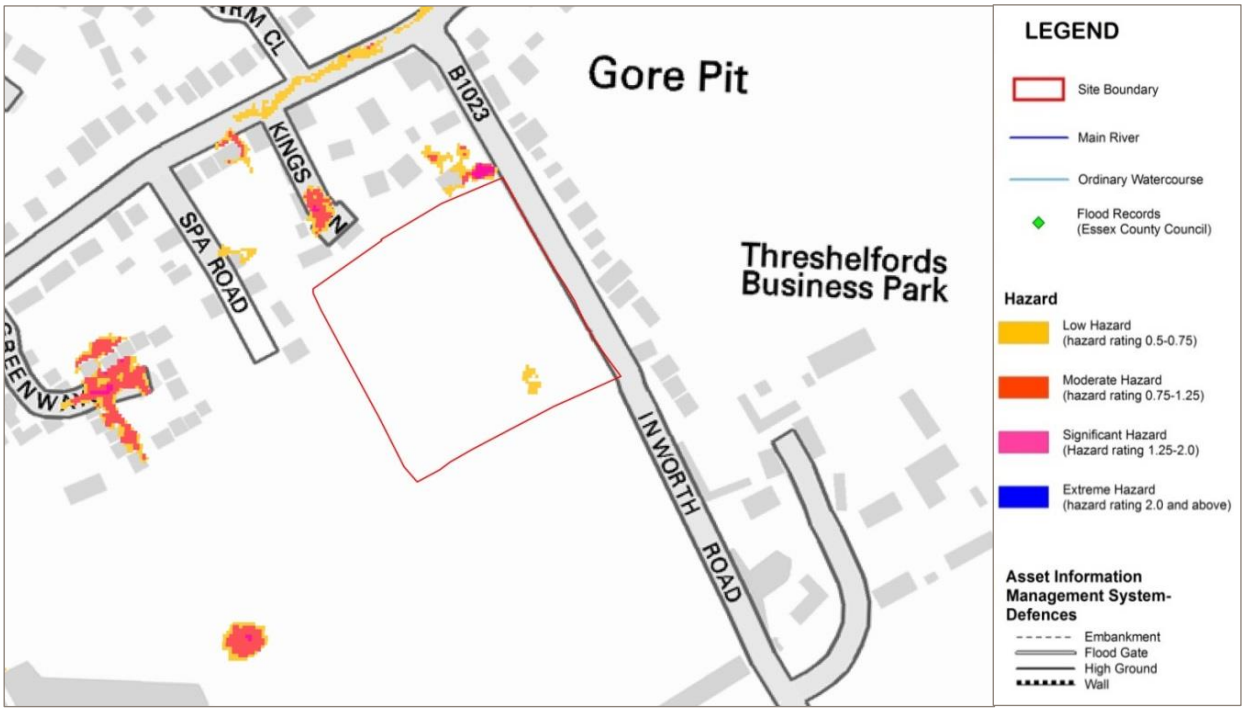

Figure D Environment Agency's Risk of Flooding from Surface Water Hazard: 1% AEP

Historic Flood Events

There are no historical records of flooding on the site or in the surrounding area.

Geology and Groundwater

The bedrock geology in this area is Thames Group, comprising clay and silt. The overlying bedrock is comprised of sand, gravel and till. Clayey soils are typically not very permeable and provide the potential for increased surface water ponding.

The AStGWF mapping shows that the site is located within a 1km square of which <25% is susceptible to groundwater emergence. The risk of groundwater flooding in this area is therefore generally considered to be low. This will need to be confirmed during site investigation survey.

Other Sources

No risk posed by other sources

Greenfield Runoff and Drainage Hierarchy

Estimated Greenfield Runoff Rates (IH124 Results).	QBAR:	2.77 l/s	Flow rate in l/s/ha	QBAR:	1.41 l/s/ha
	1 in 1 year:	2.36 l/s		1 in 1 year:	1.19 l/s/ha
	1 in 30 year:	6.37 l/s		1 in 30 year:	3.23 l/s/ha
	1 in 100 year:	8.84 l/s		1 in 100 year:	4.49 l/s/ha

Drainage Hierarchy	Infiltration to ground		Uncertain due to geology; subject to on site infiltration testing.
	Discharge to watercourse		No Watercourse located near the site.
	Discharge to surface water sewer		Possible, subject to consultation with Anglian Water.

Site Specific Recommendations

Site Layout and Design

The site is currently defined as Flood Zone 1 (<0.1 AEP) and is therefore not at risk from fluvial flooding. There is a small area of surface water risk on the site. Residential development should ideally be avoided in this area, and instead lower vulnerability uses including landscaped open space should be located here. The drainage strategy for the site must be considered early in the site planning process to ensure adequate inclusion of SuDS. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Site Assessment Summary – Land at Inworth Road

LLFA Consultation

It is recommended that potential developers contact Braintree District Council and Essex CC as the LLFA for further information prior to taking forward site specific plans.

Summary

Based on the strategic assessment of flood risk and the recommendations for mitigation measures set out above, it is considered that proposed development on this site could be suitably designed to satisfy part 2) of the Exception Test subject to submission of a site specific FRA.

Site Assessment Summary – Land south of Feering, west of A12 (between Coggeshall Road and New Lane)

Location:	SHLAA Ref / Ref:	Area (ha):	Proposed Use:	Vulnerability Classification:
Feering	FEER 232	57.24	Mixed (part of larger site)	More Vulnerable

Fluvial Flood Risk

Flood Zone 1:	Flood Zone 2 (0.1% AEP) :	Flood Zone 3 (1% AEP):	Flood Zone 3b (5% AEP):
100%	0%	0%	0%

Flood Zones and Flood Defences

The site is located entirely in Flood Zone 1 (<0.1 AEP) and is located 0.06km from the nearest ordinary watercourse and 0.2km from the nearest main river (see Figure A). There are no modelled flood zones for the unnamed watercourse however the watercourse could still pose a flood risk to the site.

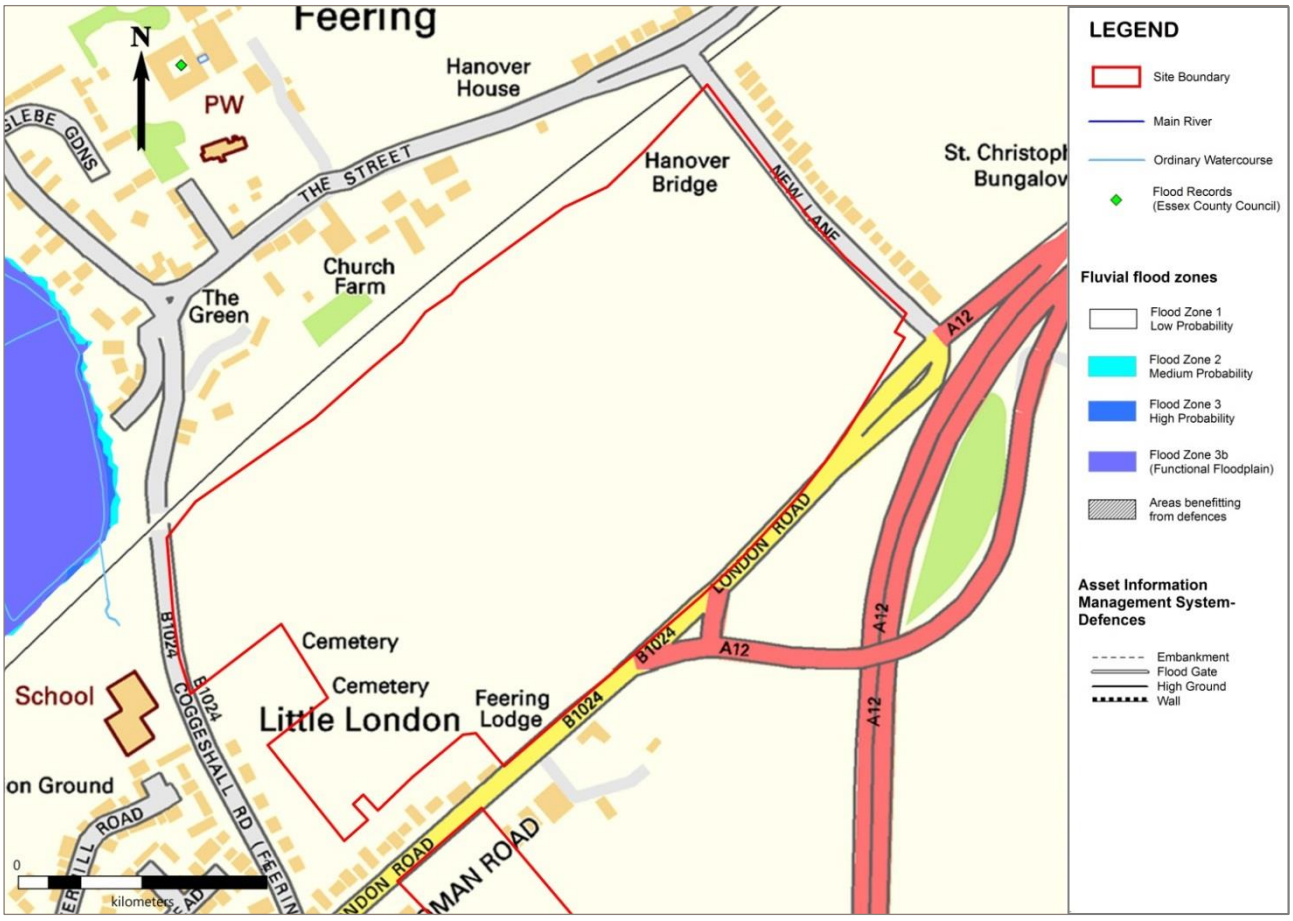

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Figure A Flood Zones

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The Environment Agency RoFSW mapping (Figure B) indicates that small isolated sections of the centre of the site may be susceptible to surface water ponding. This risk should be considered carefully in the development of the site layout to ensure that residential dwellings are not placed at surface water flood risk. Environment Agency surface water modelling (Figure C) identifies the potential for depths of 0-300mm in an isolated 'pocket' of the centre of the site during the 1% AEP event. A small isolated section of the site has a significant surface water flood risk hazard rating during a 1% AEP event. The remainder of the site is at low surface water flood hazard (Figure D).

Site Assessment Summary – Land south of Feering, west of A12 (between Coggeshall Road and New Lane)

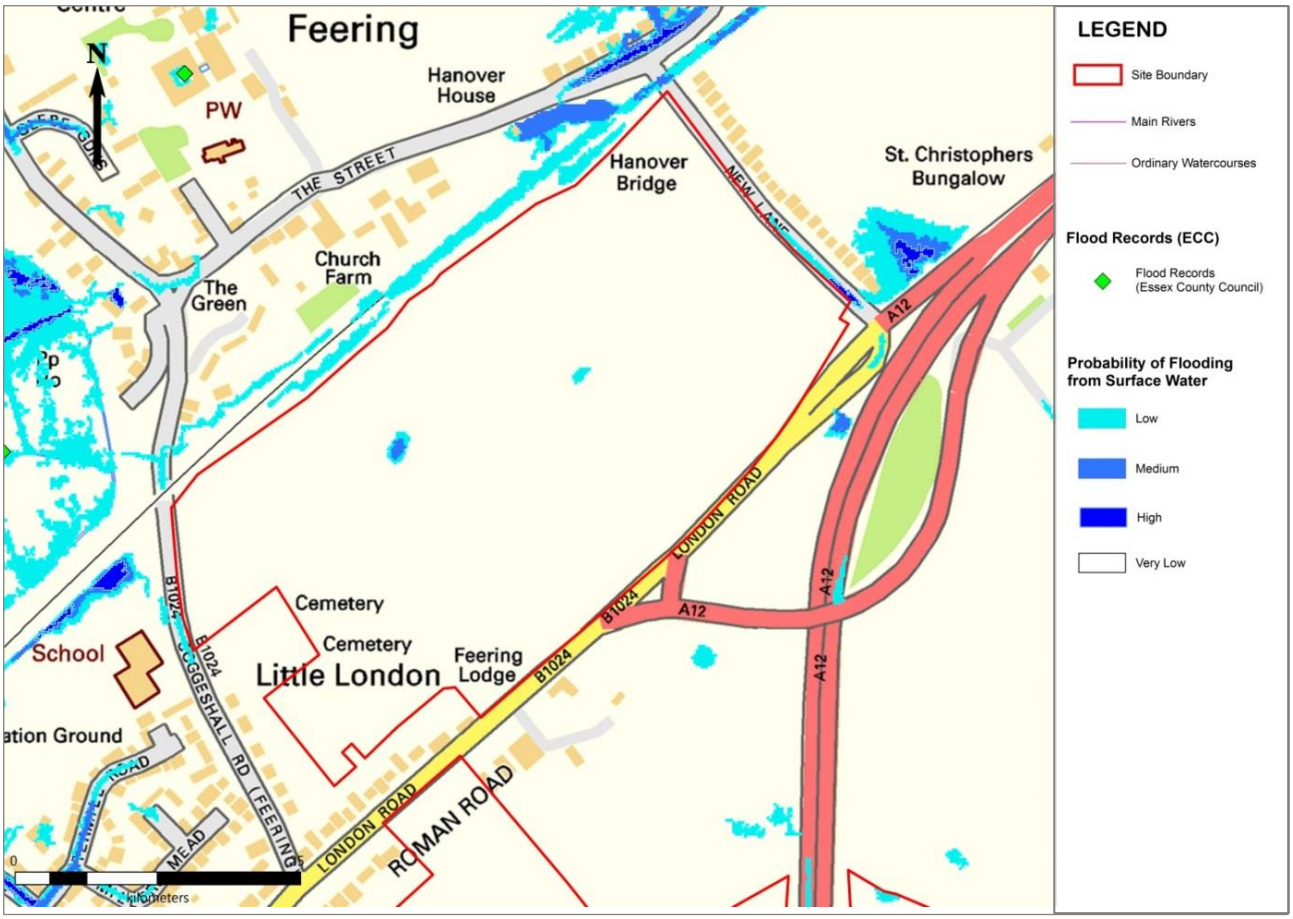

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Figure B Environment Agency's Risk of Flooding from Surface Water (RoFSW) : 1% AEP Scenario

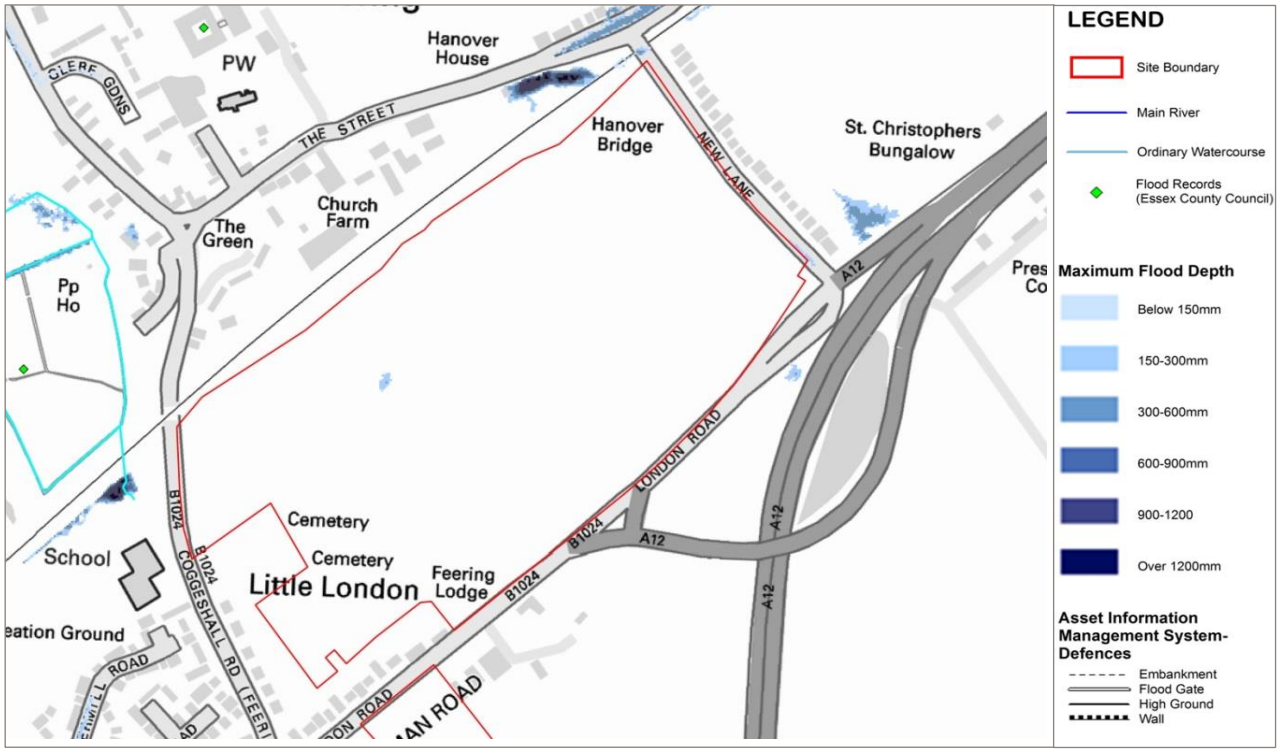

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Figure C Environment Agency's Risk of Flooding from Surface Water Depth: 1% AEP

Site Assessment Summary – Land south of Feering, west of A12 (between Coggeshall Road and New Lane)

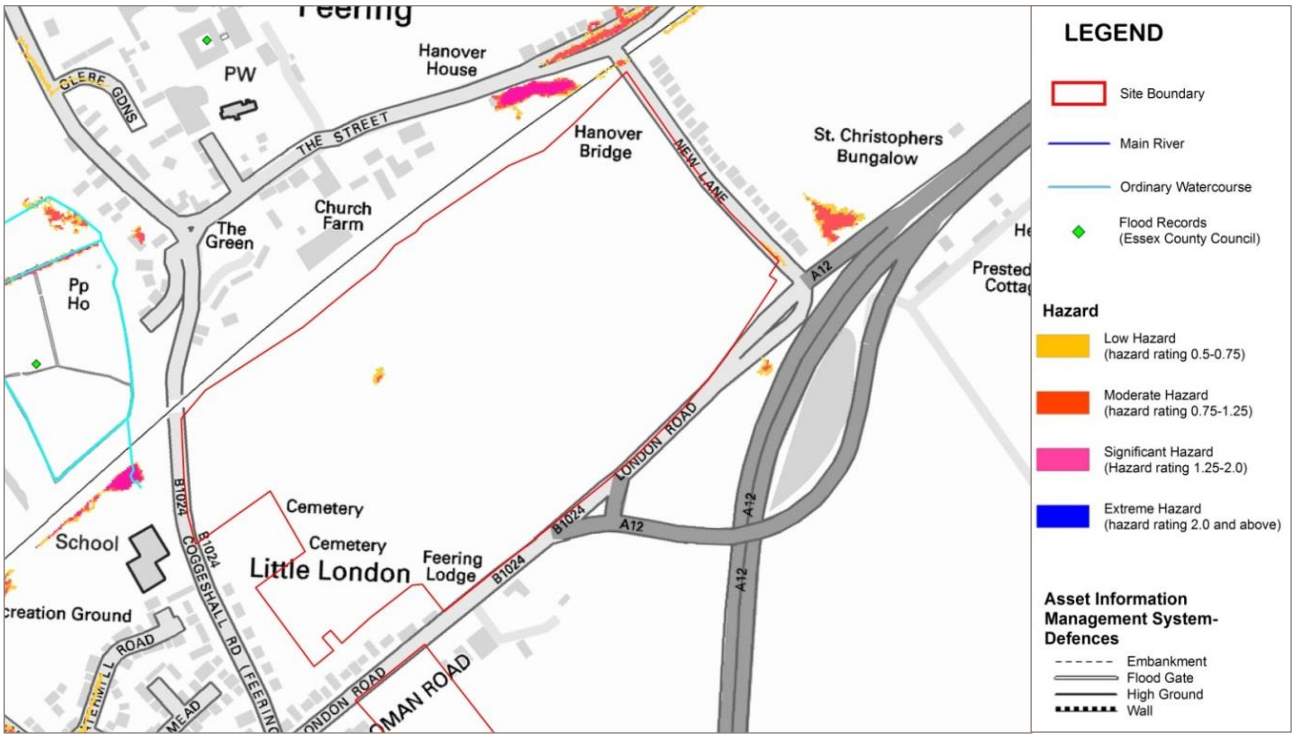

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Figure D Environment Agency's Risk of Flooding from Surface Water Hazard: 1% AEP

Historic Flood Events

There are no historical records of flooding on the site. There are 2 historical records of flooding in the surrounding area however the source of flooding is unknown.

Geology and Groundwater

The bedrock geology in this area is Thames Group, comprising clay, gravel and silt. The overlying bedrock is comprised of till. Clayey soils are typically not very permeable and provide the potential for increased surface water ponding.

The AStGWF mapping shows that the site is located within a 1km square of which 25%-50% is susceptible to groundwater emergence. The risk of groundwater flooding in this area is therefore generally considered to be of medium risk. This will need to be confirmed during site investigation survey.

Other Sources

No risk posed by other sources.

Greenfield Runoff and Drainage Hierarchy

Estimated Greenfield Runoff Rates (IH124 Results).	QBAR:	79.33 l/s	Flow rate in l/s/ha	QBAR:	1.39 l/s/ha
	1 in 1 year:	67.43 l/s		1 in 1 year:	1.17 l/s/ha
	1 in 30 year:	182.45 l/s		1 in 30 year:	3.19 l/s/ha
	1 in 100 year:	253.05 l/s		1 in 100 year:	4.42 l/s/ha

Drainage Hierarchy	Infiltration to ground		Uncertain due to geology; subject to on site infiltration testing.
	Discharge to watercourse		Discharge potentially possible into the unnamed watercourse, subject to consultation with the LLFA and local landowners.
	Discharge to surface water sewer		Possible, subject to consultation with Anglian Water.

Site Assessment Summary – Land south of Feering, west of A12 (between Coggeshall Road and New Lane)

Site Specific Recommendations

Site Layout and Design

The site is currently defined as Flood Zone 1 (<0.1 AEP) and is therefore not at risk from fluvial flooding. Residential development should be avoided in areas defined as risk of surface water flooding; instead lower vulnerability uses including landscaped open space should be located here. The drainage strategy for the site must be considered early in the site planning process to ensure adequate inclusion of SuDS. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

LLFA Consultation

It is recommended that potential developers contact Braintree District Council and Essex CC as the LLFA for further information prior to taking forward site specific plans.

Summary

Based on the strategic assessment of flood risk and the recommendations for mitigation measures set out above, it is considered that proposed development on this site could be suitably designed to satisfy part 2) of the Exception Test, subject to submission of a detailed site specific FRA.

Site Assessment Summary – Land south of Feering, west of A12 (south of Feering Hill/London Road)

Location:	SHLAA Ref / Ref:	Area (ha):	Proposed Use:	Vulnerability Classification:
Feering	FEER233	57.24	Mixed	More Vulnerable

Fluvial Flood Risk

Flood Zone 1 (<0.1 AEP) :	Flood Zone 2 (0.1% AEP):	Flood Zone 3 (1% AEP):	Flood Zone 3b (5% AEP):
94%	1%	5%	0%

Flood Zones and Flood Defences

Domsey Brook (a tributary of the River Blackwater) flows along the southern boundary of the site in open channel. The watercourse is defined as a designated main river. The majority of the site (94%) is identified as Flood Zone 1(<0.1 AEP). The additional 6% of the site is defined as Flood Zone 2 (0.1% AEP) and Flood Zone 3 (1% AEP). The AIMS dataset identifies that high ground acts as a flood defence (see Figure A).

Functional Floodplain (Flood Zone 3b)

The site is not located within the functional floodplain associated with Domsey Brook.

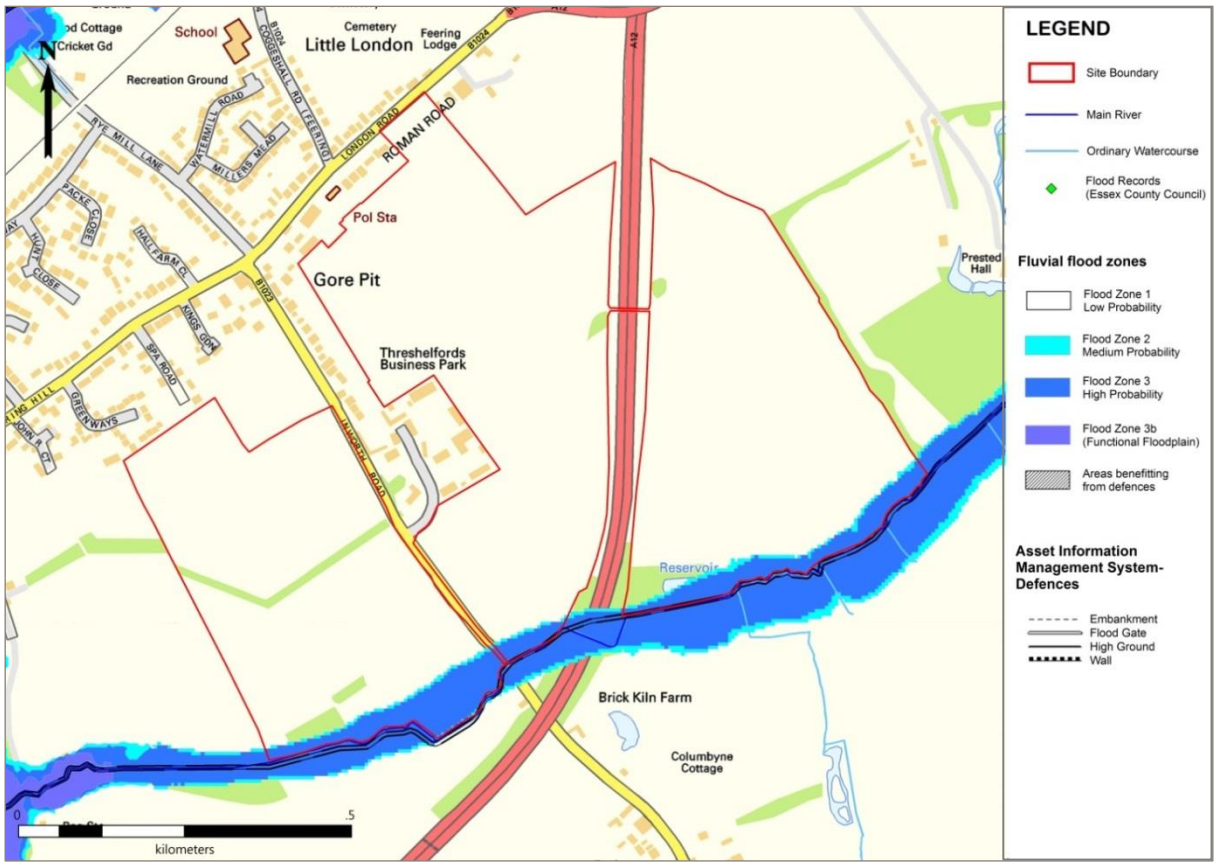

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Figure A Flood Zones

It should be noted that the Environment Agency currently does not have an accurate hydraulic model for the Domsey Brook. Developers and site promoters are required to develop a hydraulic model for this site as part of their in site specific FRA, in consultation with the Environment Agency.

Detailed Flood Risk Information – Maximum Flood Depth and Hazard Mapping

The River Blackwater model (2010) does not cover the Domsey Brook, therefore the fluvial flood depth and hazard could not be calculated for this site. The Environment Agency Surface Water depth and hazard maps have been used to estimate the potential hazard to the site.

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The Environment Agency RoFSW mapping (Figure B) identifies an area of high risk of surface water flooding associated with the Domsey Brook on the southern boundary of the site. Additional areas of surface water ponding are located to the north and west of the site. This should be considered carefully in the development of the site layout to ensure that residential dwellings are not placed

Site Assessment Summary – Land south of Feering, west of A12 (south of Feering Hill/London Road)

at surface water flood risk. The Environment Agency's Surface Water depth modelling (Figure C) identifies the potential for depths of 0-600mm on the site during the 1% AEP event. The site has a significant surface water flood hazard rating (Figure D) associated with the Domsey Brook during a 1% AEP event.

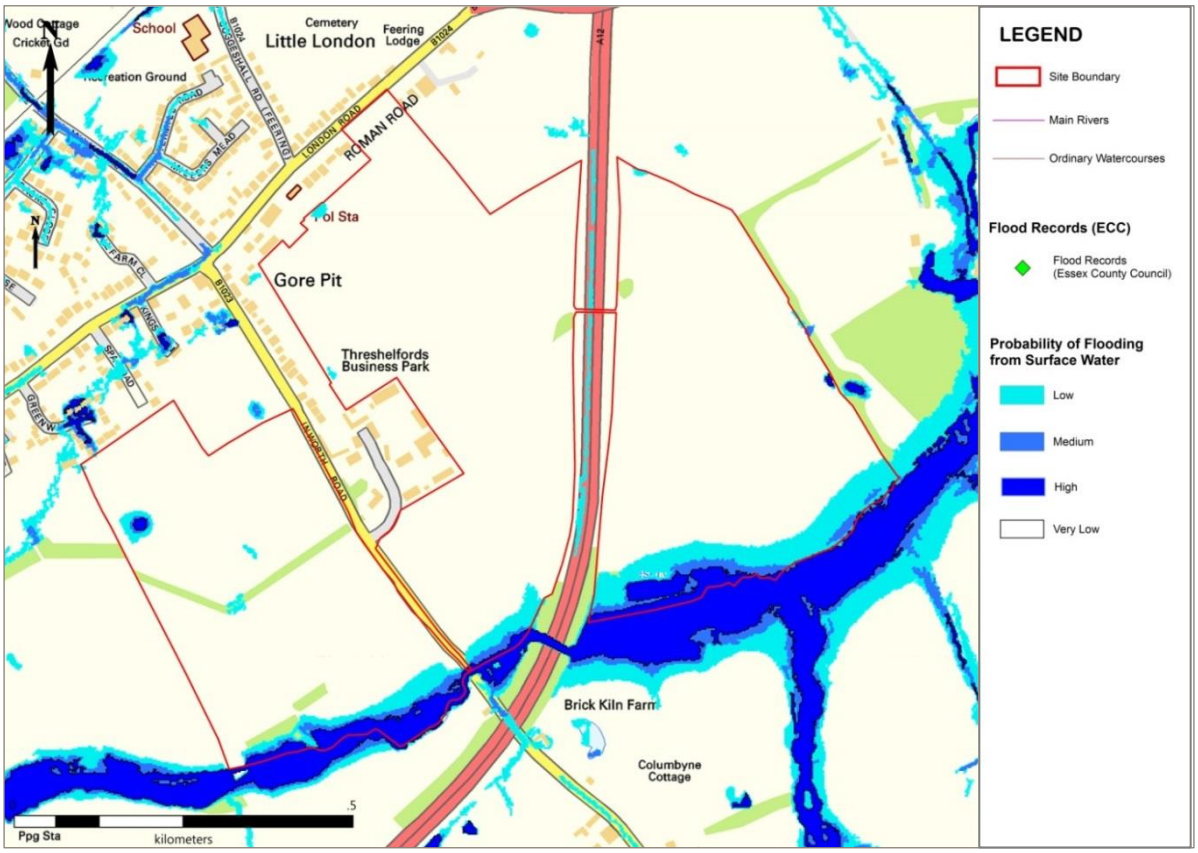

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Figure B Environment Agency's Risk of Flooding from Surface Water (RoFSW) : 1% AEP Scenario

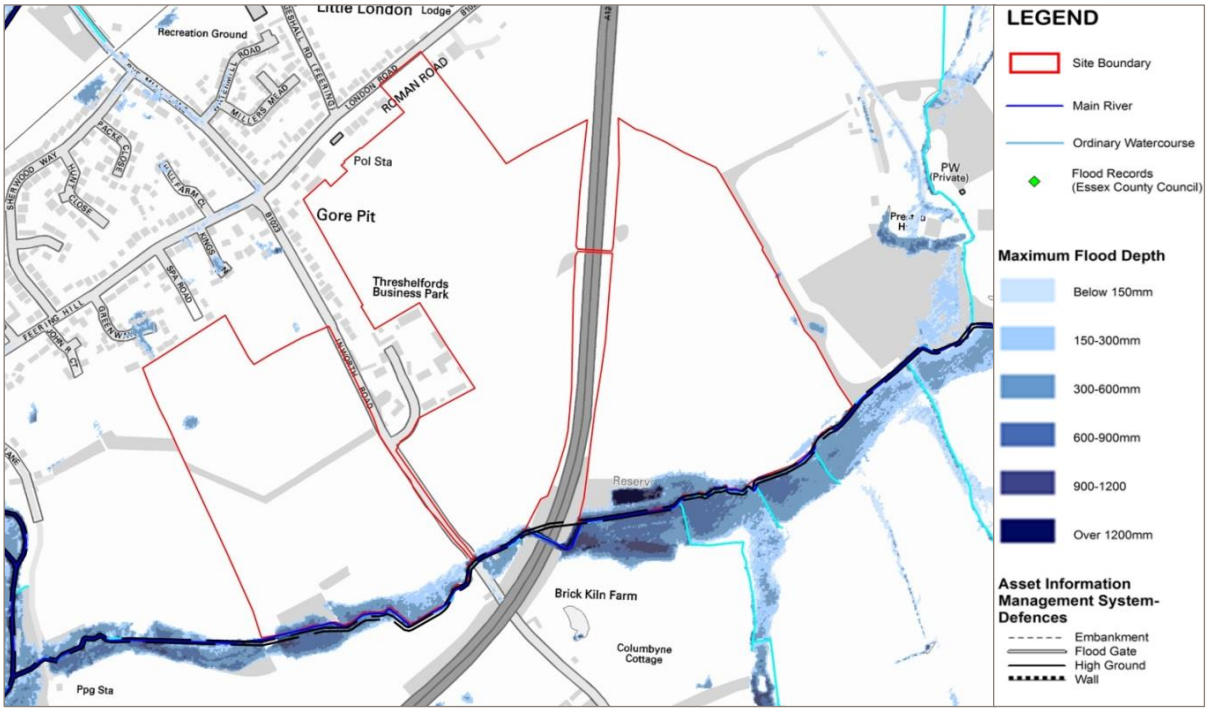

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Figure C Environment Agency's Risk of Flooding from Surface Water Depth: 1% AEP

Site Assessment Summary – Land south of Feering, west of A12 (south of Feering Hill/London Road)

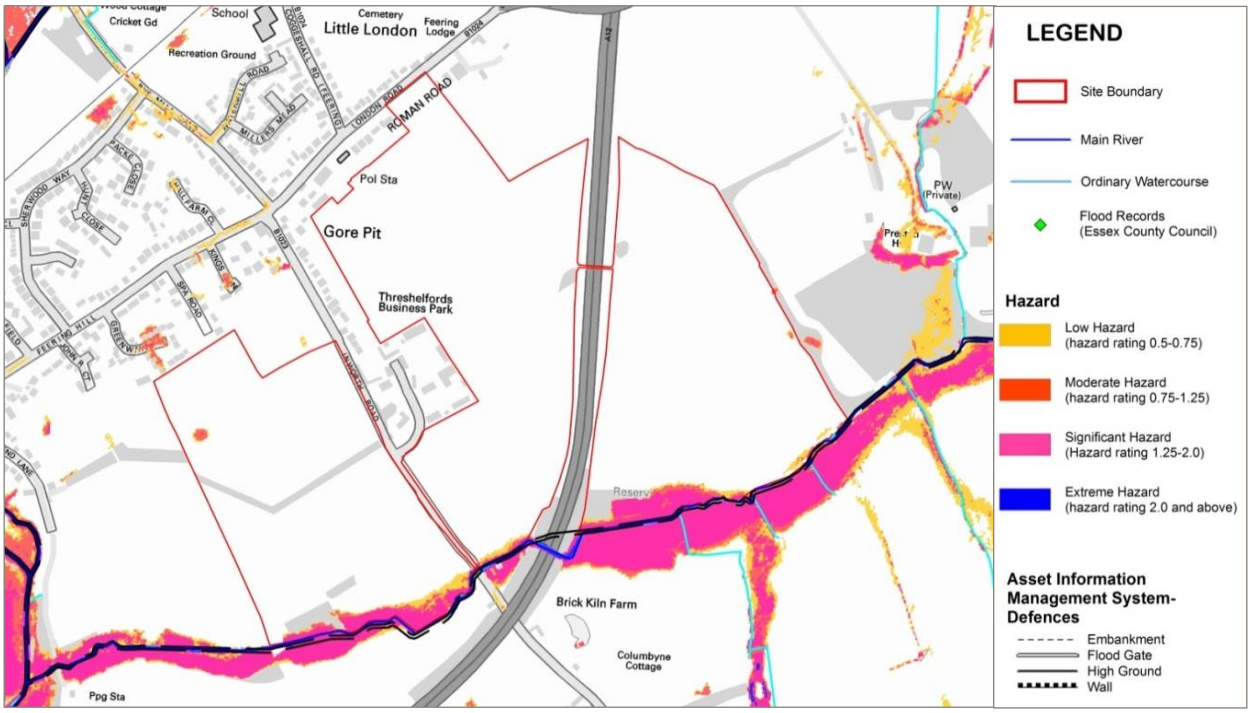

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Figure D Environment Agency's Risk of Flooding from Surface Water Hazard: 1% AEP

Historic Flood Events

There are no historical records of flooding on the site or in the surrounding area.

Geology and Groundwater

The bedrock geology in this area is Thames Group, comprising clay and silt. The overlying bedrock is comprised of sand, gravel and till. Clayey soils are typically not very permeable and provide the potential for increased surface water ponding.

The AStGWF mapping shows that the site is located predominantly within a 1km square of which 50-75% is susceptible to groundwater emergence. The risk of groundwater flooding in this area is therefore generally considered to be of high. This will need to be confirmed during site investigation survey.

Other Sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the floodplain of the Domsey Brook including the site is at risk of inundation in the event of a failure of Feeringbury Farm reservoir. Section 3.8 in the Braintree Level 1 SFRA provides further information on flood risk from reservoirs within the Braintree District. Given the regular inspection of these reservoirs in accordance with the Reservoirs Act 1975, flooding from reservoirs is considered to be a managed risk.

Greenfield Runoff and Drainage Hierarchy

Estimated Greenfield Runoff Rates (IH124 Results).	QBAR:	79.33 l/s	Flow rate in l/s/ha	QBAR:	1.38 l/s/ha
	1 in 1 year:	67.43 l/s		1 in 1 year:	1.17 l/s/ha
	1 in 30 year:	182.45 l/s		1 in 30 year:	3.19 l/s/ha
	1 in 100 year:	253.05 l/s		1 in 100 year:	4.42 l/s/ha

Drainage Hierarchy	Infiltration to ground		Uncertain due to geology; subject to on site infiltration testing.
	Discharge to watercourse		Discharge possible to the Domsey Brook, subject to consultation with the Environment Agency.
	Discharge to surface water sewer		Possible, subject to consultation with Anglian Water.

Site Assessment Summary – Land south of Feering, west of A12 (south of Feering Hill/London Road)

Site Specific Recommendations

Fluvial Modelling

As part of a site specific FRA for this site, further assessment is required of the impact of climate change allowances on flood risk. The Environment Agency East Anglia, Essex, Norfolk and Suffolk (ENS) guidance[10] states that for a more vulnerable large-major development in Flood Zone 3a, a detailed approach should be used, which includes hydraulic modelling. Developers should contact the Environment Agency at the project outset to discuss requirements.

Site Layout and Design

Residential development should be avoided at the south of the site in areas defined as Flood Zone 2 (0.1% AEP), and in areas identified to be at risk of surface water flooding; instead lower vulnerability uses including landscaped open space should be located here. The drainage strategy for the site must be considered early in the site planning process to ensure adequate inclusion of SuDS, taking care to consider SuDS features in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Set-back Distance

An 8m wide undeveloped buffer strip should be retained along main rivers to provide access for maintenance. The EA should be contacted to obtain an Environmental Permit for main rivers, further information can be found on their website: https://www.gov.uk/guidance/flood-risk-activities-environmental-permits

Finished Floor Levels

If residential development cannot be avoided within the flood extent for the 1% AEP event, finished floor levels should be set at least 600mm freeboard above the flood level for 1% AEP event including an appropriate allowance for climate change. Internal access to higher floors is required. It important to consider the implications of diverting the water on the flood risk of the rest of the site.

Resilience Measures

A number of flood resistance and resilience measures can also be implemented into new developments to mitigate potential flooding. Guidance on resilience measures can be found in the 'Improving the Flood Performance of New Buildings, Flood Resilient Construction' published by The Department for Communities and Local Government (CLG)

Access / Egress

Safe dry access to and from the site should be provided.

Emergency Planning

The site is not shown to be within an Environment Agency Flood Warning Area.

LLFA Consultation

It is recommended that potential developers contact the Environment Agency, Braintree District Council and Essex CC as the LLFA for further information prior to taking forward site specific plans.

Summary

Based on the strategic assessment of flood risk and the recommendations for mitigation measures set out above, it is considered that proposed development on this site could be suitably designed to satisfy part 2) of the Exception Test subject to submission of a detailed site specific FRA.

[10] Environment Agency (Sept 2016), East Anglia, Essex, Norfolk and Suffolk Area – Flood Risk Assessments: Climate change allowances

Site Assessment Summary – Harrison Works, Kings Road

Location:	SHLAA Ref / Ref:	Area (ha):	Proposed Use:	Vulnerability Classification:
Halstead	HATR299	0.81	Residential/Affordable/Care/Sheltered	More Vulnerable
	HATR298	0.45	Residential/Mixed	More Vulnerable

Fluvial Flood Risk

Site Ref:	Flood Zone 1 (<0.1 AEP) :	Flood Zone 2 (0.1% AEP):	Flood Zone 3 (1% AEP):	Flood Zone 3b (5% AEP):	Areas Benefiting from Defences:
HATR299	27%	72%	1%	0%	1%
HATR298	0%	1%	5%	95%	5%

Flood Zones and Flood Defences

The River Colne flows to the north of the sites in open channel. The majority of the HATR299 site (72%) is identified as Flood Zone 2 (0.1% AEP), medium probability of flooding from the River Colne. The south and west area of the site (27%) is defined as Flood Zone 1 (<0.1 AEP). The majority (94%) of HATR298 is identified as Flood Zone 3b (5% AEP) Functional Floodplain for the River Colne. The rest of the site is within Flood Zone 2 (0.1% AEP) and 3 (1% AEP).

The Halstead Flood Storage Area is a flood defence scheme located on the River Colne approximately 1.25 km upstream of the site. The scheme was developed to protect the town of Halstead to a standard of protection of 1 in 75 year event, however this may change in the future subject to alteration works by the Environment Agency. 5% of HATR298 and 1% of HATR299 are shown to benefit from the presence of defences. The AIMS dataset also identifies high ground adjacent to the River Colne, which acts as a flood defence, although the vast majority of the sites are undefended (see Figure A).

Functional Floodplain (Flood Zone 3b)

HATR 298 is located within the functional floodplain associated with the River Colne.

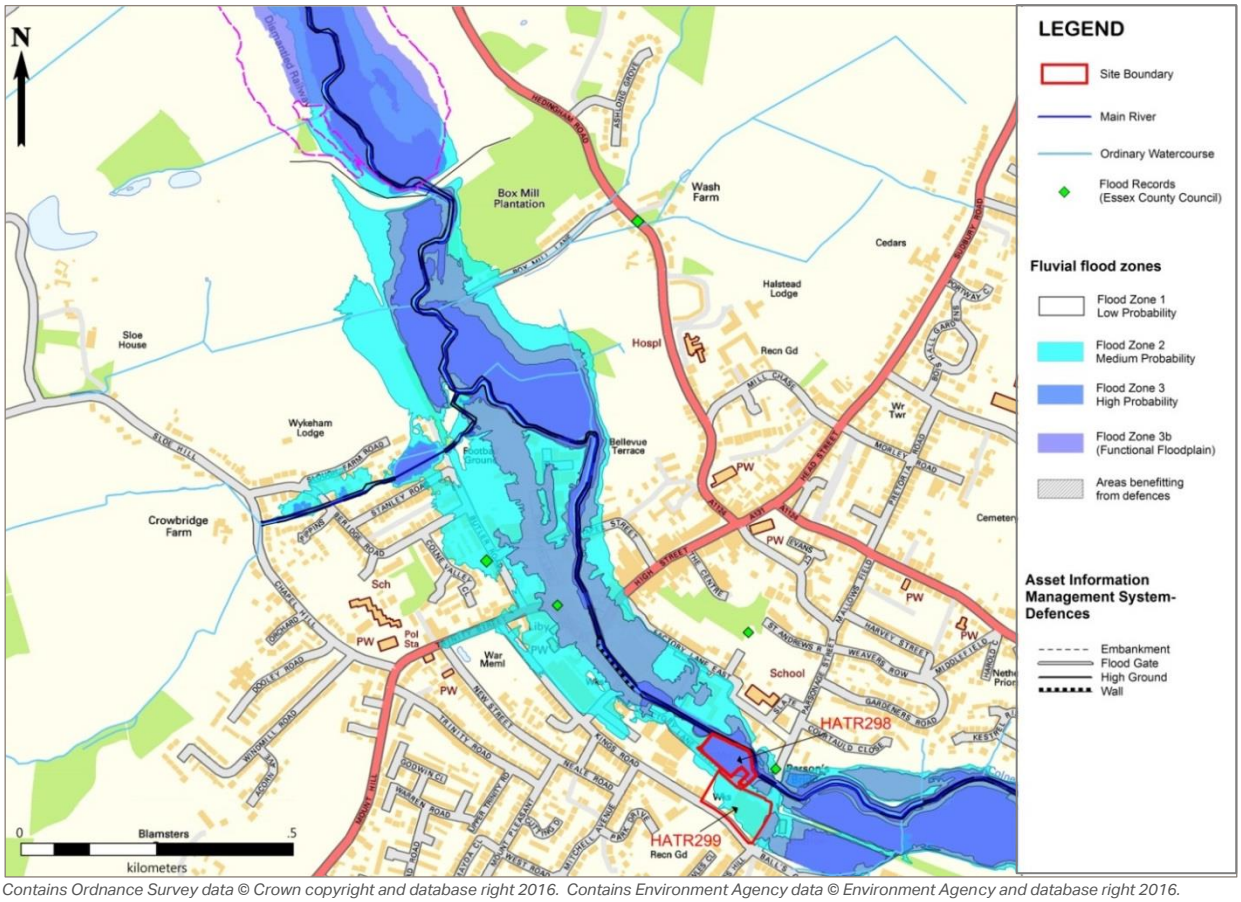

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Figure A Flood Zones

It should be noted that the current River Colne hydraulic model does not include the updated climate change allowances. In the absence of hydraulic model outputs for these allowances, Flood Zone 2 (0.1% AEP event) has been used as a proxy for the 100year plus 35% climate change (as described in Section 2.1.1.3 of this Level 2 SFRA). Developers and site promoters are required to consult with the Environment Agency for the most up-to-date fluvial model data to be included in site specific FRAs.

Site Assessment Summary – Harrison Works, Kings Road

Detailed Flood Risk Information – Maximum Flood Depth and Hazard Mapping

Figures B and C show the modelled River Colne (2010) maximum flood depth maps for the 1% AEP including an allowance for climate change[11] for both the defended and undefended scenarios. The defended scenario includes the operation of the Halstead Flood Storage Area. Modelling for the River Colne identifies that the HATR299 site itself has a flood depth range of 0.1-0.5m during the climate change scenario (Figure B and C). HATR298 has a flood depth range of 0.5-1.5m for both the defended and undefended climate change scenarios.

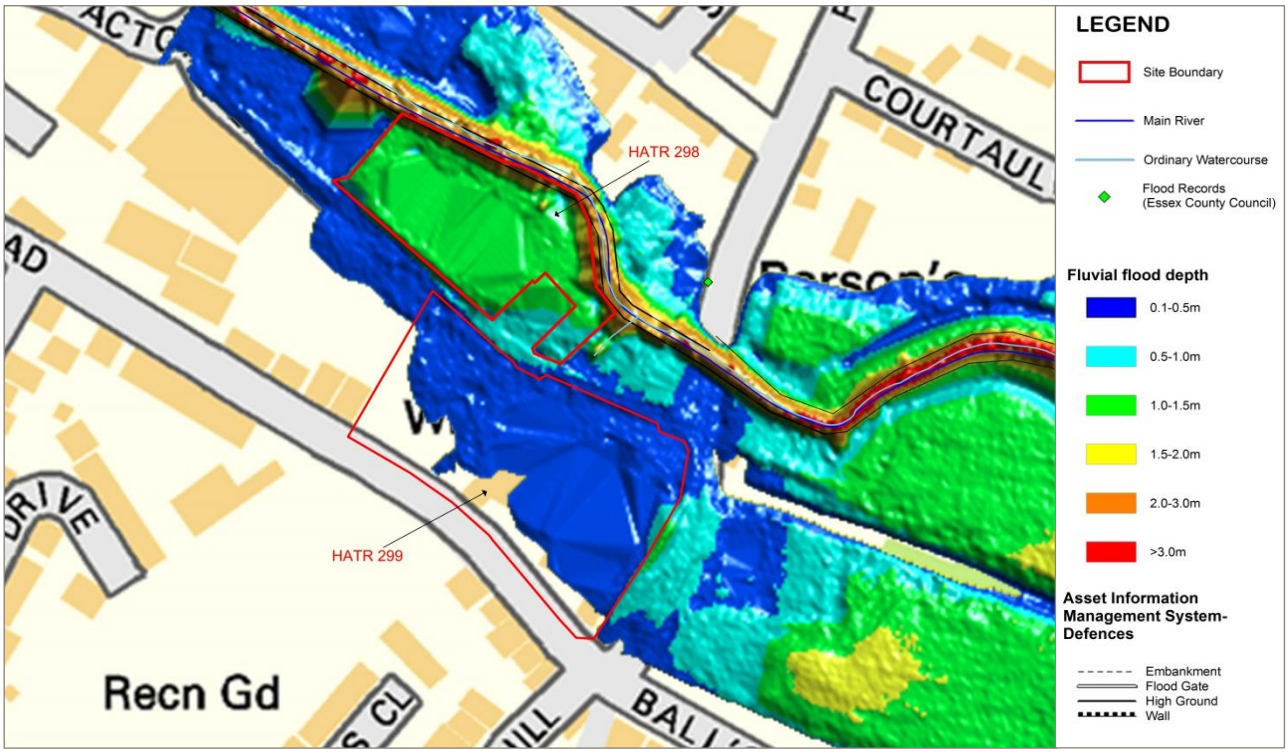

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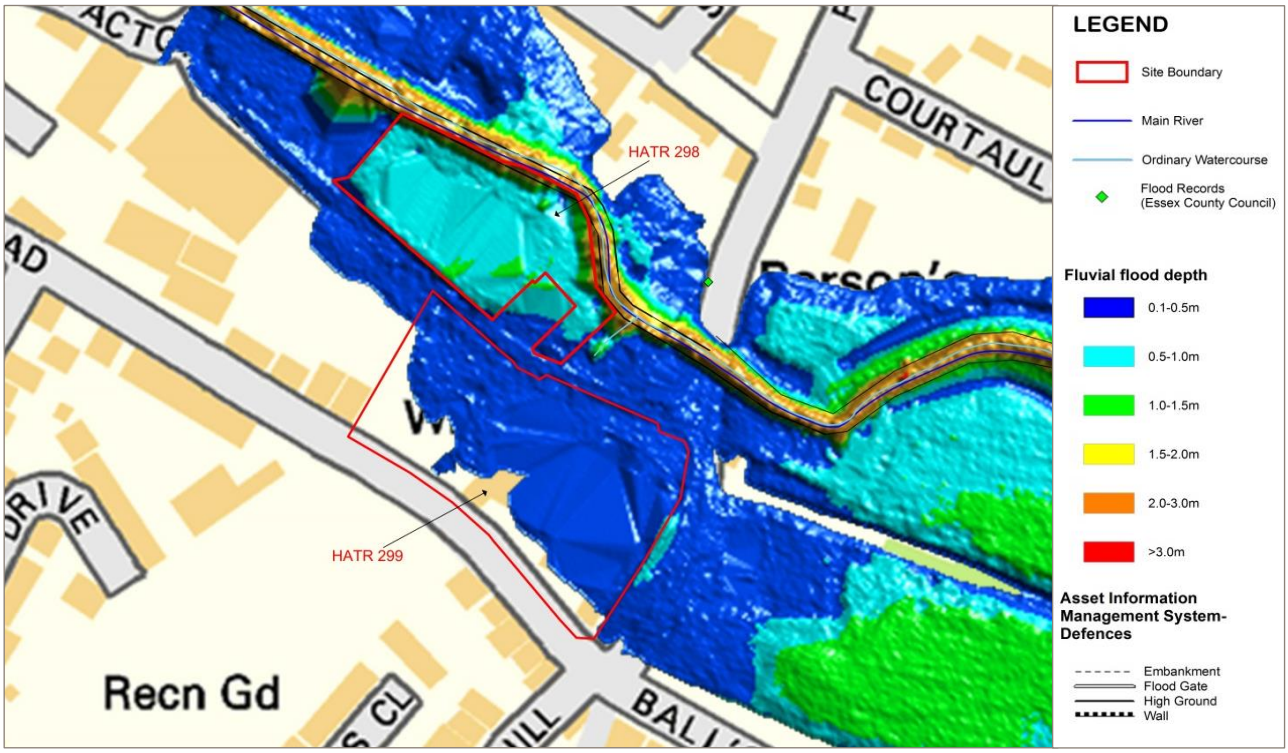
Figure B River Colne flood depth modelling for the site - undefended 1% AEP including an allowance for climate change



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[11] There is no hydraulic modelling data available to delineate new climate change allowances at this time. In the absence of this data, the 0.1% boundary has been used as a proxy to estimate the 1% AEP + climate change scenario (Level 2 SFRA section 2.1.1.3).

Site Assessment Summary – Harrison Works, Kings Road

Figure C River Colne flood depth modelling for the site – defended 1% AEP including an allowance for climate change

Results for the 0.1% AEP event including an allowance for failure of the flood defences (see Figures D and E) shows that flood depths on the HATR299 site could reach 0.1-0.5m, corresponding to a hazard rating of Moderate (danger for some people). HATR298 has a potential flood depth range of 0.5-1.5, corresponding to a hazard rating of Significant (danger for most).

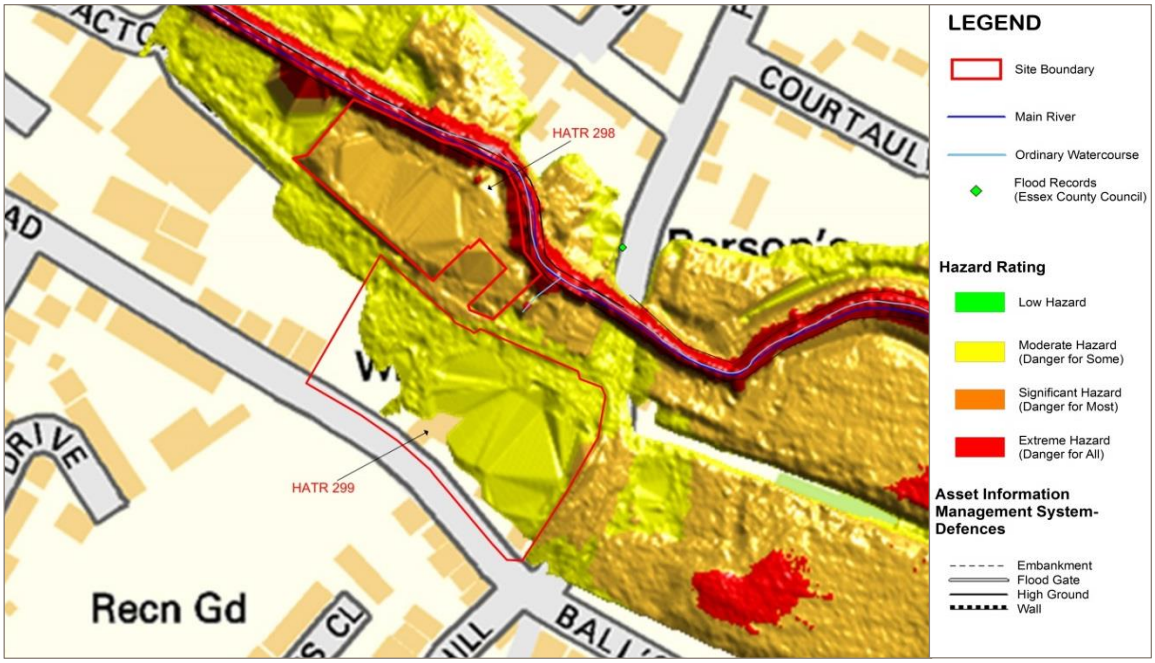

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Figure D River Colne flood Hazard modelling for the site - undefended 1% AEP including an allowance for climate change

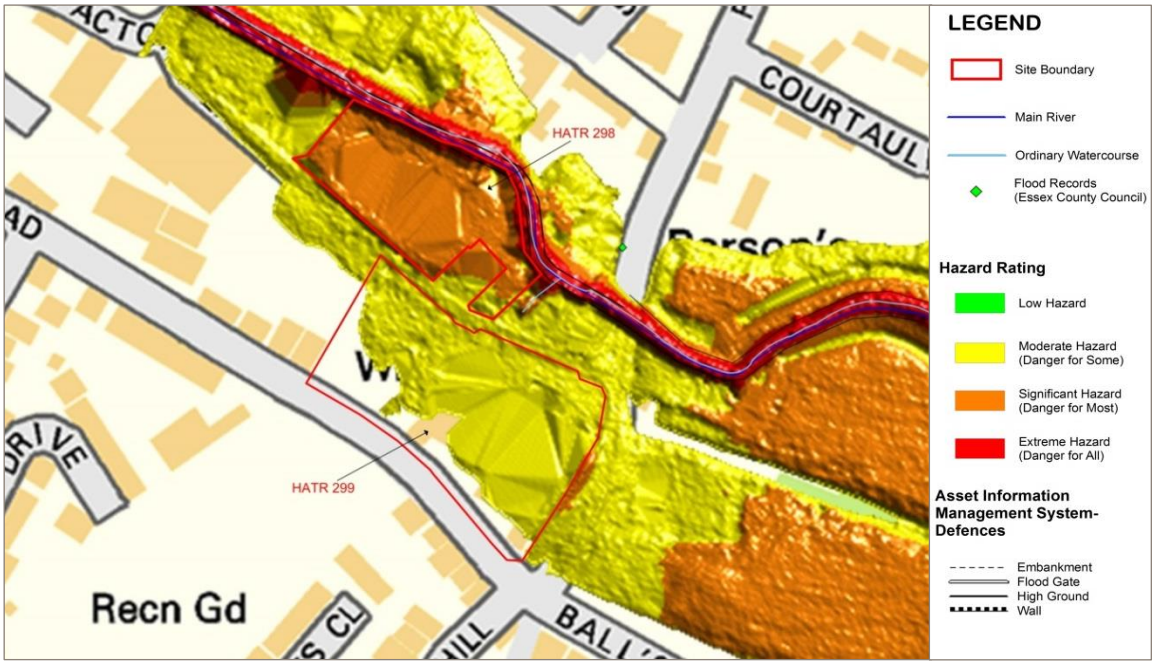

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Figure E River Colne flood Hazard modelling for the site - defended 1% AEP including an allowance for climate change

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

HATR299 - The Environment Agency RoFSW mapping (Figure F) indicates that a large proportion of the HATR299 site and local area is at high risk of surface water flooding. There is a contributing flow path that flows from south to north across the development site. This flow path should be considered carefully in the development of the site layout to ensure that residential dwellings are not placed at surface water flood risk, and that the position of any new development does not divert the flow path to a neighbouring area. The Environment Agency RoFSW Depth map (Figure G) identifies the potential for depths of 0-300mm on the site during the 1% AEP

Site Assessment Summary – Harrison Works, Kings Road

event. The site has a low to significant hazard rating in different areas of the site during a 1% AEP event (Figure H).

HATR298 -The Environment Agency RoFSW mapping (Figure F) indicates that the majority of the HATR 298 site is at risk from surface water flooding. The Environment Agency RoFSW Depth map (Figure G) identifies the potential for depths of 0-600mm along the northern boundary of the site during the 1% AEP event. Surface water hazard mapping (Figure H) indicates that the boundary of the site has a greater hazard rating (significant in parts) during a 1% AEP event.

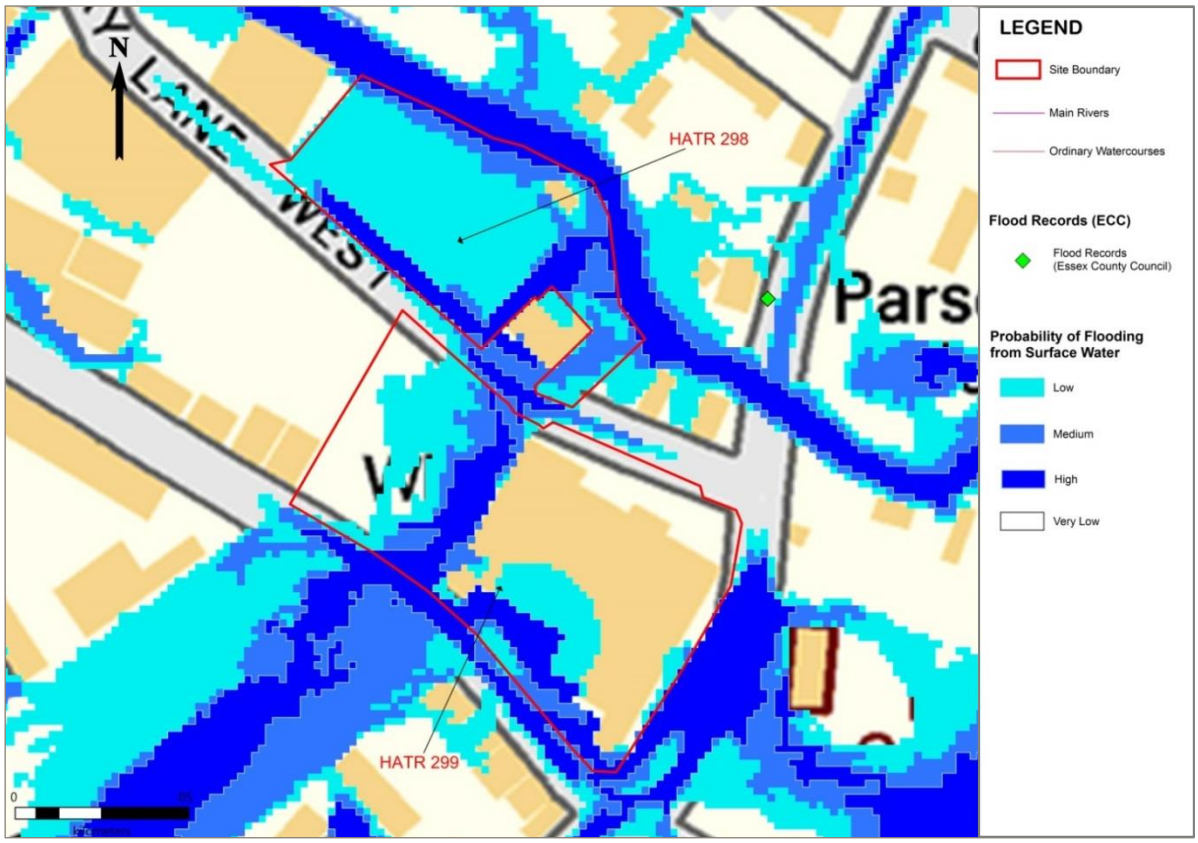

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Figure F Environment Agency's Risk of Flooding from Surface Water (RoFSW) : 1% AEP Scenario

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Figure G Environment Agency's Risk of Flooding from Surface Water Depth: 1% AEP

Site Assessment Summary – Harrison Works, Kings Road

Figure H Environment Agency's Risk of Flooding from Surface Water Hazard: 1% AEP

Historic Flood Events

There is 1 historic flood record 0.05km from the HATR299 site; the source of flooding is assumed to be from the highway. There are no historical records of flooding on the HATR298 site. The Anglian Water DG5 database identifies a total of 1 internal and 5 external sewer flooding events have occurred in the site postcode area.

Geology and Groundwater

The bedrock geology in this area is Thames Group, comprising clay and silt. Glacial deposits, comprising of sand and gravel, are present in the overlying bedrock. Clayey soils are typically not very permeable and provide the potential for increased surface water ponding.

The AStGWF mapping shows that the site is located within a 1km square of which 25-50% is susceptible to groundwater emergence. The risk of groundwater flooding in this area is therefore generally considered to be low risk. This will need to be confirmed during site investigation survey.

Other Sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the floodplain of the River Colne including sites HATR299 and HATR298 are at risk of inundation in the event of a failure of reservoirs. Section 3.8 in the Braintree Level 1 SFRA provides further information on flood risk from reservoirs within the Braintree District. Given the regular inspection of these reservoirs in accordance with the Reservoirs Act 1975, flooding from reservoirs is considered to be a managed risk.

Greenfield Runoff and Drainage Hierarchy

Estimated Greenfield Runoff Rates (IH124 Results) for HATR 299	QBAR:	1.14 l/s	Flow rate in l/s/ha	QBAR:	1.41 l/s/ha
	1 in 1 year:	0.97 l/s		1 in 1 year:	1.20 l/s/ha
	1 in 30 year:	2.62 l/s		1 in 30 year:	3.23 l/s/ha
	1 in 100 year:	3.63 l/s		1 in 100 year:	4.48 l/s/ha

Site Assessment Summary – Harrison Works, Kings Road

Estimated Greenfield Runoff Rates (IH124 Results) for HATR298	QBAR:	0.63 l/s	Flow rate in l/s/ha	QBAR:	1.40 l/s/ha
	1 in 1 year:	0.54 l/s		1 in 1 year:	1.20 l/s/ha
	1 in 30 year:	1.46 l/s		1 in 30 year:	3.24 l/s/ha
	1 in 100 year:	2.02 l/s		1 in 100 year:	4.49 l/s/ha

Drainage Hierarchy	Infiltration to ground	Uncertain due to geology; subject to on site infiltration testing.
	Discharge to watercourse	Discharge possible to the River Colne, subject to consultation with the Environment Agency.
	Discharge to surface water sewer	Possible, subject to consultation with Anglian Water.

Site Specific Recommendations

HATR299:

Fluvial Modelling

As part of a site specific FRA for site HATR299, further assessment is required of the impact of climate change allowances on flood risk. The Environment Agency East Anglia, Essex, Norfolk and Suffolk (ENS) guidance[12] states that for a more vulnerable large-major development in Flood Zone 2, an intermediate approach should be used. Developers should contact the Environment Agency at the project outset to discuss requirements.

Site Layout and Design

A sequential approach to site planning should be applied within new development sites to locate the most vulnerable elements of a development in the lowest risk areas. The drainage strategy for the site must be considered early in the site planning process to consider SuDS features in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Set-back Distance

An 8m wide undeveloped buffer strip should be retained along main rivers to provide access for maintenance. The Environment Agency should be contacted to obtain an Environmental Permit for main rivers, further information can be found on their website: https://www.gov.uk/guidance/flood-risk-activities-environmental-permits.

Finished Floor Levels

Although the site is not within Flood Zone 3, it is within the 1% AEP including an allowance for climate change. Finished floor levels for residential development should be set with at least 300mm freeboard above the flood level for 1% AEP event including an appropriate allowance for climate change. Internal access to higher floors is required.

Access / Egress

Safe dry access to and from the HATR299 site should be provided for the 1% AEP including an allowance for climate change. Suggested safe access would be to proceed to the south of the site and exit onto Kings Road.

Resilience Measures

A number of flood resistance and resilience measures can also be implemented into new developments to mitigate potential flooding. Guidance on resilience measures can be found in the 'Improving the Flood Performance of New Buildings, Flood Resilient Construction' published by The Department for Communities and Local Government (CLG).

Floodplain Compensation

Land raising and any built development should be avoided within the floodplain of the River Colne. Where alterations to the floodplain (1% AEP including an allowance for climate change) are proposed, compensatory floodplain storage will need to be provided on a level-for-level and volume-for-volume basis. The land used to provide compensation storage will need to be in hydraulic connectivity with the existing floodplain, but not already part of the floodplain.

The majority of the HATR299 site is located with the 1% AEP including an allowance for climate change, therefore floodplain compensation is unlikely to be achievable on this site and it is unlikely that other areas outside the current site boundary could be considered. A site specific FRA should consider this potential impact further.

Emergency Planning

The site is shown to be within an Environment Agency Flood Warning Area; it is strongly recommended that occupants of the site should register to receive the warning service for the River Blackwater given that proximity to the River and the risk posed to the site. A Flood Warning and Evacuation Plan should be prepared to demonstrate what actions site users will take before, during and after a flood event to ensure their safety, and to demonstrate their development will not impact on the ability of the local authority and the

[12] Environment Agency (Sept 2016), East Anglia, Essex, Norfolk and Suffolk Area – Flood Risk Assessments: Climate change allowances

Site Assessment Summary – Harrison Works, Kings Road

emergency services to safeguard the current population.

LLFA Consultation

It is recommended that potential developers contact the Environment Agency, Braintree District Council and Essex CC as the LLFA for further information prior to taking forward site specific plans, particularly in relation to the need for floodplain compensation and the delineation of the site specific 1% + cc flood extent.

HATR298:

Site Layout and Design

The majority of this site is located within functional flood plain (Flood Zone 3b). **In accordance with NPPF only water – compatible and essential infrastructure that has to be there should be permitted for development at this location.** Section 8.3.1 in the Braintree Level 1 SFRA states that the functional flood plain should be safeguarded from development, with exemptions where development could reduce flood risk overall or improve floodplain storage. Only water compatible development and essential infrastructure are permitted and developments require an exceptions test to demonstrate it will:

- Remain operational and safe for users in times of flood;
- Result in no net loss of flood storage;
- Not impede water flows; and
- Not increase flood risk elsewhere.

Summary

Site HATR299

Based on the strategic assessment of flood risk and the recommendations for mitigation measures set out above, it is considered that proposed development on this site could be suitably designed to satisfy part 2) of the Exception Test subject to submission of a detailed site specific FRA that adequately accounts for any loss of floodplain storage and incorporates appropriate finished floor levels. However, the use of the site as a care home or sheltered accommodation should be carefully considered with regard to emergency planning.

Site HATR298

The majority of HATR298 site is within Flood Zone 3b of the River Colne, and more vulnerable development is not appropriate within Flood Zone 3b in accordance with the NPPF. Further detailed assessment in consultation with the Environment Agency will be required to confirm the suitability of potential development at this site.

Site Assessment Summary – Land East of the High Street

Location:	SHLAA Ref / Ref:	Area (ha):	Proposed Use:	Vulnerability Classification:
Halstead	HASA287	1.64	N/A	N/A

Fluvial Flood Risk

Flood Zone 1:	Flood Zone 2 (0.1% AEP) :	Flood Zone 3 (1% AEP):	Flood Zone 3b (5% AEP):
100%	0%	0%	0%

Flood Zones and Flood Defences

The River Colne (main river) flows in an open channel, approximately 0.1km to the south of the site. The site is located entirely within Flood Zone 1 (<0.1 AEP), and is therefore currently considered to be at low risk of flooding from the River Colne. The site borders areas defined as Flood Zone 2 (0.1% AEP) medium probability of flooding from the River Colne (Figure A). The Halstead Flood Storage Area is a flood defence scheme located on the River Colne approximately 1 km upstream of the site. The AIMS dataset identifies the presence of high ground either side of the River Colne at this location.

Functional Floodplain (Flood Zone 3b)

The site is not within the functional floodplain associated with the River Colne.

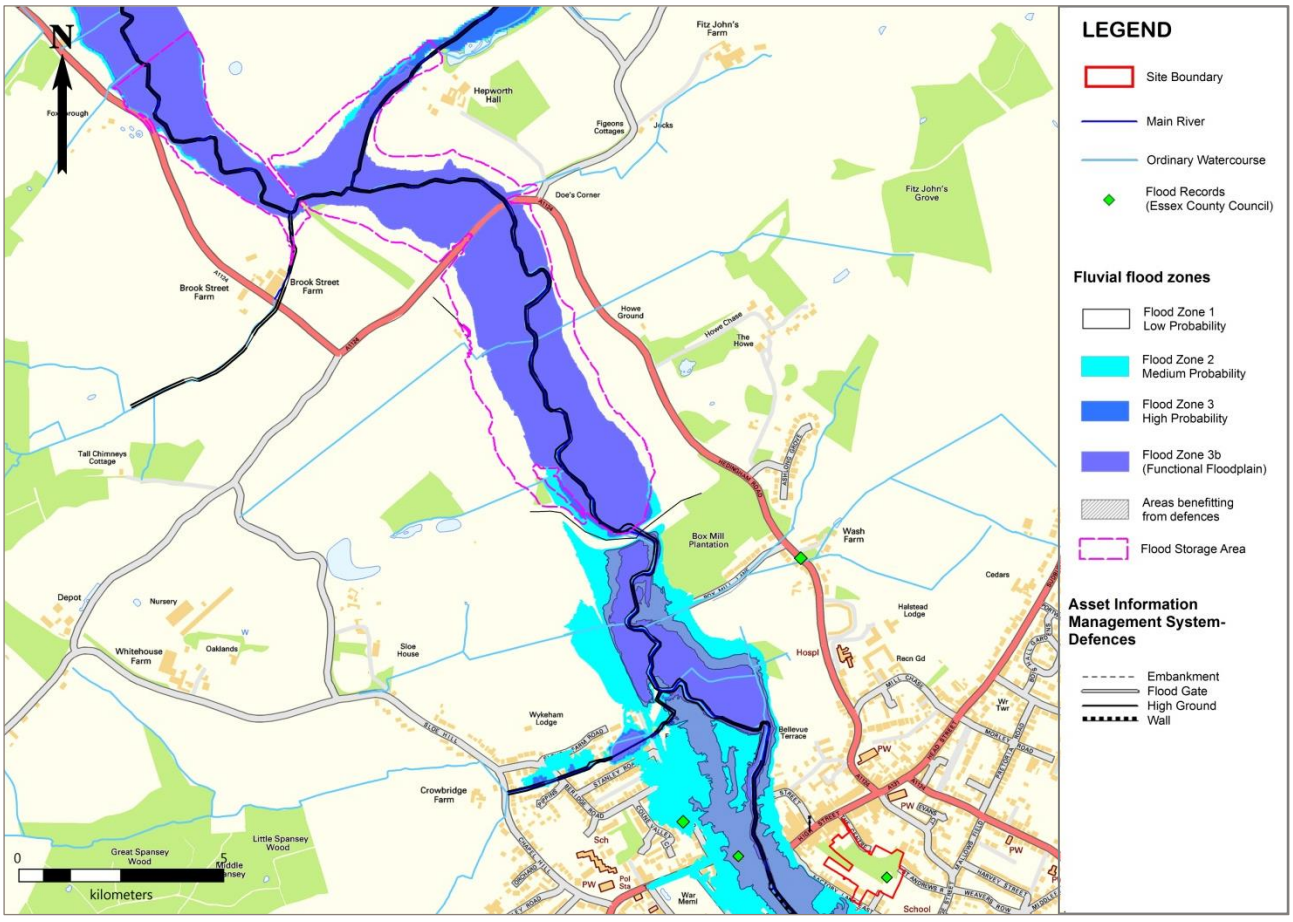

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Figure A Flood Zones

It should be noted that the Environment Agency is currently updating their hydraulic model for the River Colne, which will include a flood hazard output. Developers and site promoters are required to consult with the Environment Agency for the most up-to-date fluvial model data to be included in site specific FRAs.

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The Environment Agency RoFSW mapping (Figure B) indicates that a very small isolated section of the eastern portion of the site may be susceptible to surface water ponding. The site is not at risk from a 1.0% AEP flood event (see Figure C and D). This should be considered carefully in the development of the site layout to ensure that residential dwellings are not placed at surface water flood risk.

Site Assessment Summary – Land East of the High Street

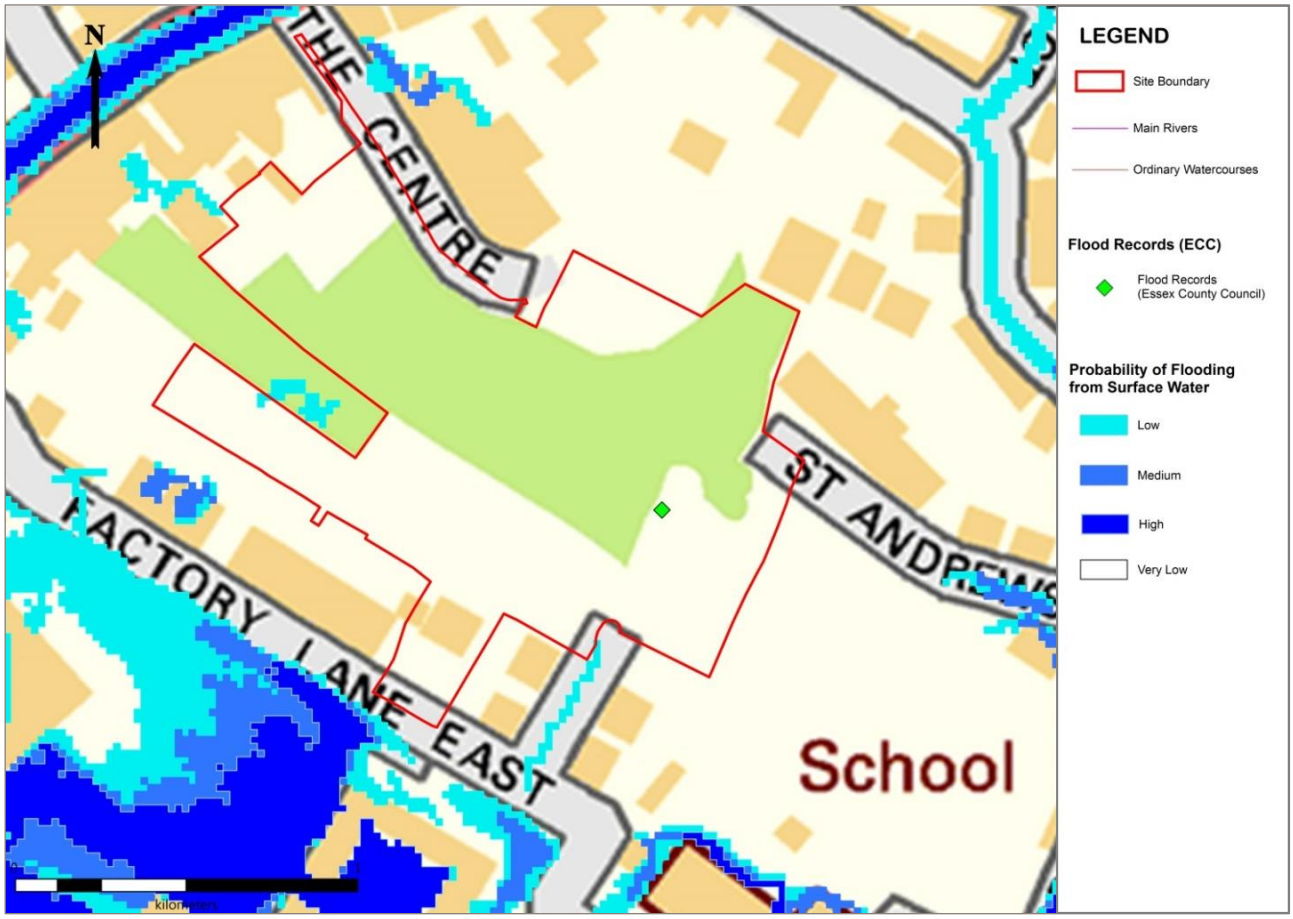

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Figure B Environment Agency's Risk of Flooding from Surface Water (RoFSW) : 1% AEP Scenario

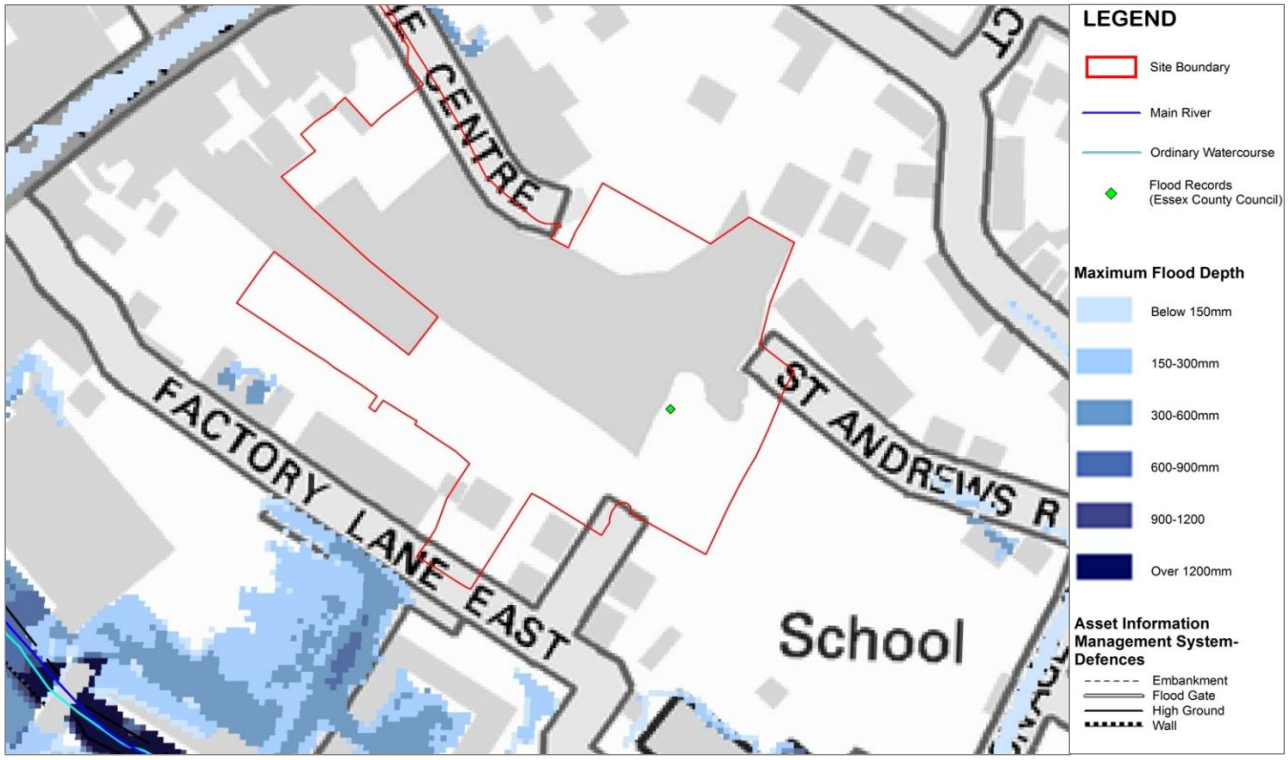

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Figure C Environment Agency's Risk of Flooding from Surface Water Depth: 1% AEP

Site Assessment Summary – Land East of the High Street

Figure D Environment Agency's Risk of Flooding from Surface Water Hazard: 1% AEP

Historic Flood Events

There is 1 historical records of flooding on the site however the source of flooding is unknown. The Anglian Water DG5 database identifies a total of 1 internal and 3 external sewer flooding events have occurred in the site postcode area.

Geology and Groundwater

The bedrock geology in this area is Thames Group, comprising clay, gravel and silt. The overlying bedrock is comprised of glacial sand and gravel. Clayey soils are typically not very permeable and provide the potential for increased surface water ponding.

The AStGWF mapping shows that the site is located within a 1km square of which 25%-50% is susceptible to groundwater emergence. The risk of groundwater flooding in this area is therefore generally considered to be of medium risk. This will need to be confirmed during site investigation survey.

Other Sources

No risk posed by other sources.

Greenfield Runoff and Drainage Hierarchy

Estimated Greenfield Runoff Rates (IH124 Results).	QBAR:	2.31 l/s	Flow rate in l/s/ha	QBAR:	1.41 l/s/ha
	1 in 1 year:	1.96 l/s		1 in 1 year:	1.20 l/s/ha
	1 in 30 year:	5.31 l/s		1 in 30 year:	3.67 l/s/ha
	1 in 100 year:	7.36 l/s		1 in 100 year:	5.72 l/s/ha

Drainage Hierarchy	Infiltration to ground		Uncertain due to geology; subject to on site infiltration testing.
	Discharge to watercourse		Discharge maybe possible to the River Colne, subject to consultation with the Environment Agency and local landowners.
	Discharge to surface water sewer		Possible, subject to consultation with Anglian Water.

Site Assessment Summary – Land East of the High Street

Site Specific Recommendations

Site Layout and Design

The site is currently defined as Flood Zone 1 (<0.1 AEP) and is therefore not at risk from fluvial flooding. Residential development should be avoided in areas defined as risk of surface water flooding; instead lower vulnerability uses including landscaped open space should be located here. The drainage strategy for the site must be considered early in the site planning process to ensure adequate inclusion of SuDS. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

LLFA Consultation

It is recommended that potential developers contact Braintree District Council and Essex CC as the LLFA for further information prior to taking forward site specific plans.

Summary

Based on the strategic assessment of flood risk and the recommendations for mitigation measures set out above, it is considered that proposed development on this site could be suitably designed to satisfy part 2) of the Exception Test, subject to submission of a detailed site specific FRA.

Site Assessment Summary – Land south of Newlands Street/off Kings Chase (Previously known as Gimsons)

Location:	SHLAA Ref / Ref:	Area (ha):	Proposed Use:	Vulnerability Classification:
Witham	WITC421	3.05	Residential	More Vulnerable

Fluvial Flood Risk

Flood Zone 1 (<0.1 AEP) :	Flood Zone 2 (0.1% AEP) :	Flood Zone 3 (1% AEP):	Flood Zone 3b (5% AEP):
99%	1%	0%	0%

Flood Zones and Flood Defences

The River Brain and an unnamed ordinary watercourse flow in an open channel to the south of the site. There are no modelled flood zones for the unnamed watercourse however the watercourse will still pose a flood risk to the site. The site borders areas defined as Flood Zone 2 (0.1% AEP) and Flood Zone 3 (1% AEP) associated with the River Brain. The AIMS dataset identifies the presence of high ground either side of the River Brain at this location that acts as a flood defence. The majority of the site (99%) is identified as Flood Zone 1 (<0.1 AEP). The other proportion of the site is defined as Flood Zone 2 (0.1% AEP) (1%) (Figure A).

Functional Floodplain (Flood Zone 3b)

The site is not located within the functional floodplain associated with the River Brain.

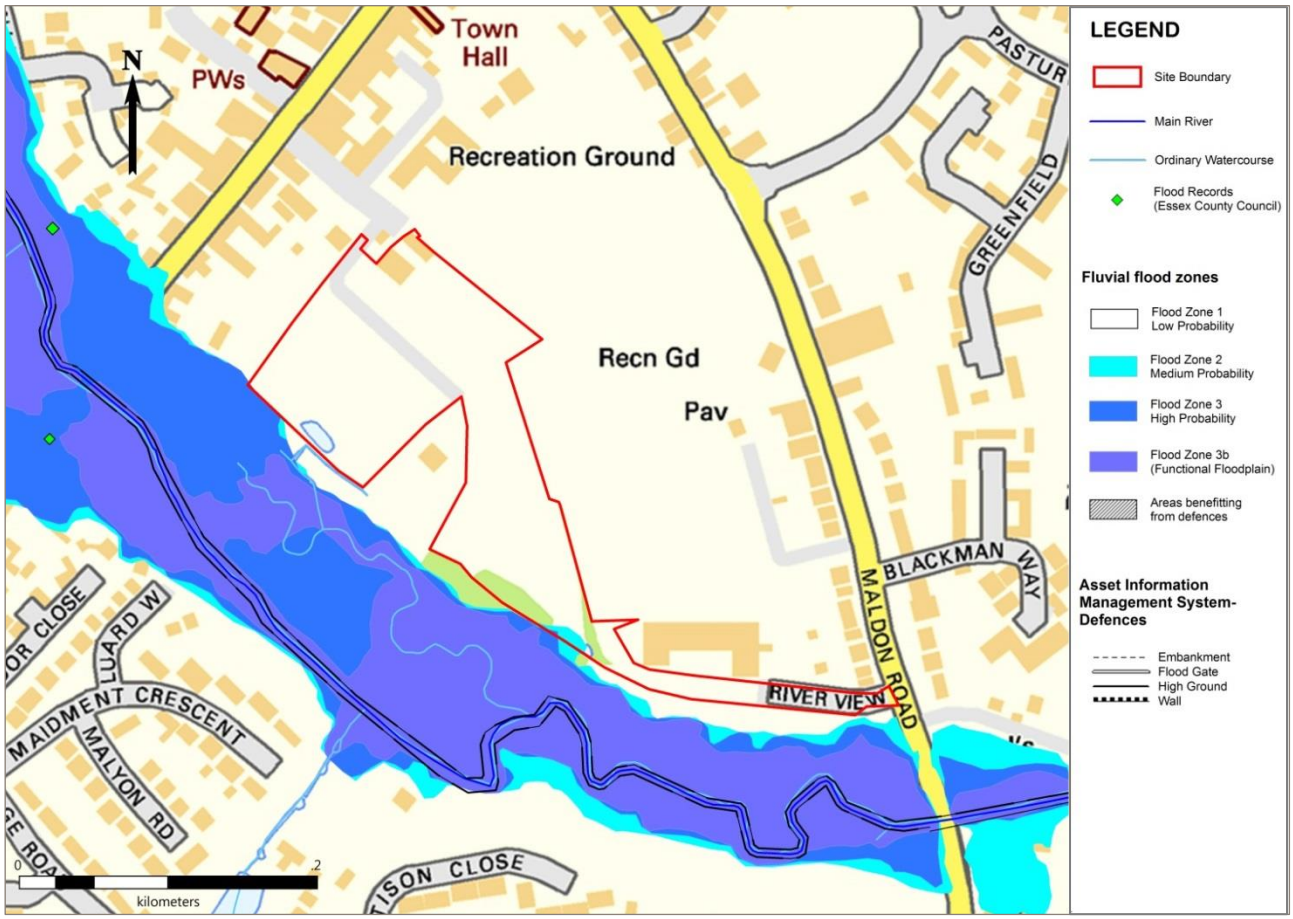

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Figure A Flood Zones

It should be noted that the Environment Agency is currently updating their hydraulic model for the River Brain, which will include a flood hazard output. Developers and site promoters are required to consult with the Environment Agency for the most up-to-date fluvial model data to be included in site specific FRAs.

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The Environment Agency RoFSW mapping indicates areas of surface water ponding are located to the south east and south of the site (see Figure B). There is a pond located to the south of the site but this is not shown to be at risk from surface water flooding. The Environment Agency's Surface Water depth modelling identifies a small area to the south east edge of the site the potential for depths of 150-300mm (Figure C). This should be considered carefully in the development of the site layout to ensure that residential dwellings are not placed at surface water flood risk.

Site Assessment Summary – Land south of Newlands Street/off Kings Chase (Previously known as Gimsons)

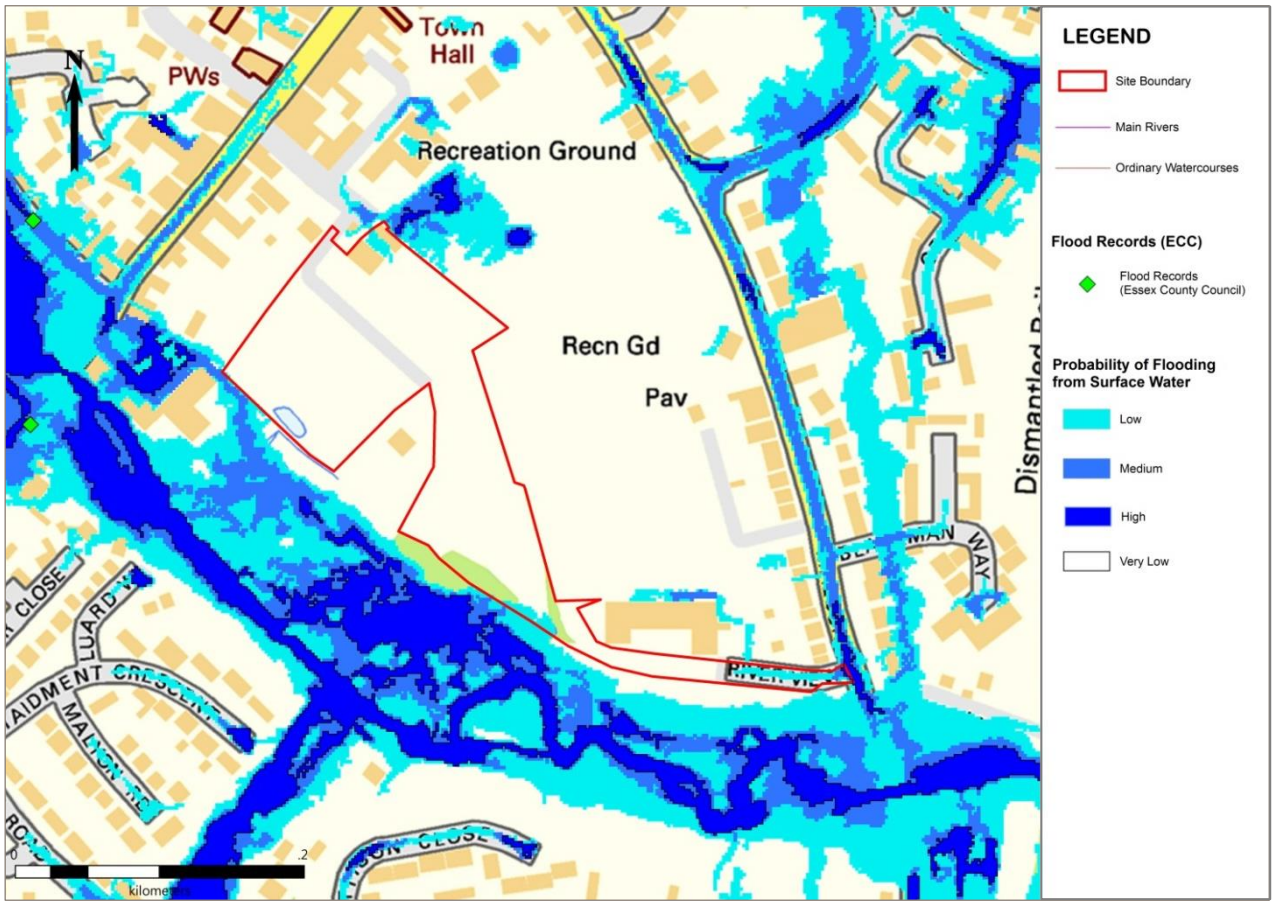

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Figure B Environment Agency's Risk of Flooding from Surface Water (RoFSW) : 1% AEP Scenario

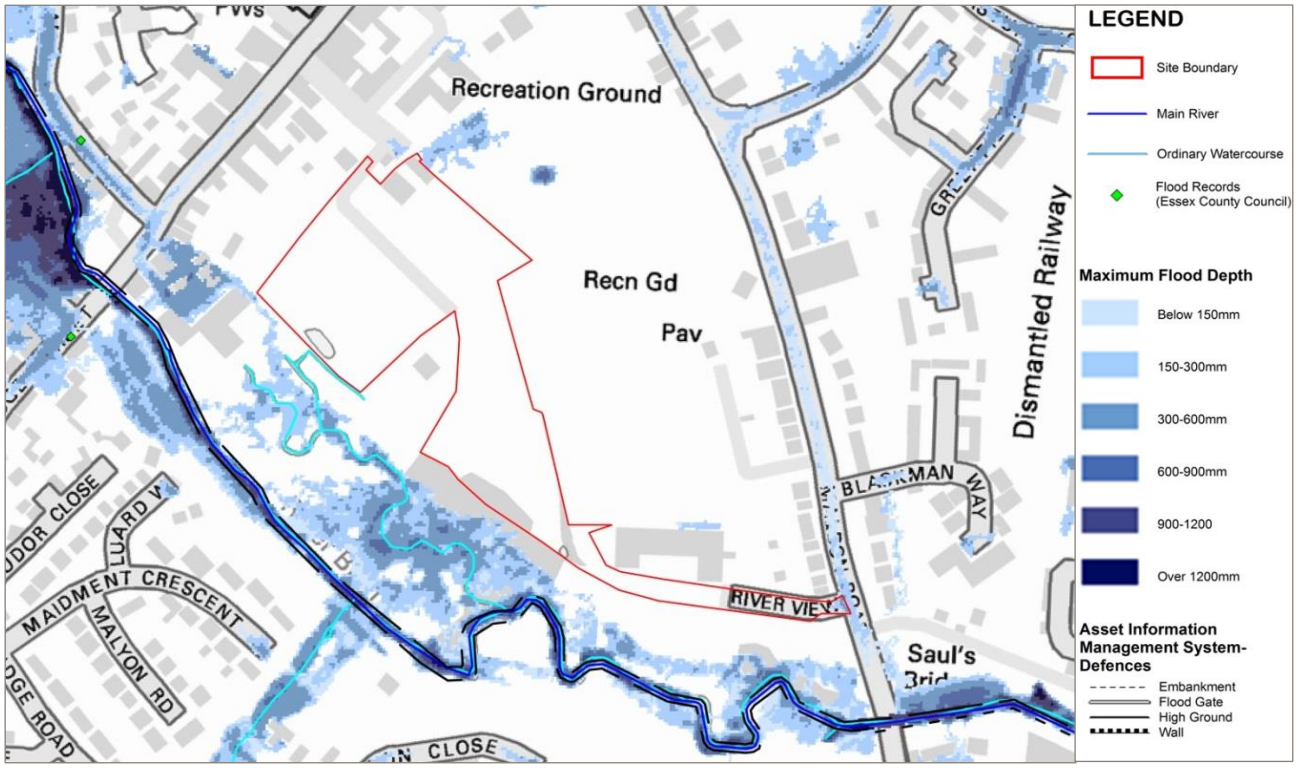

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Figure C Environment Agency's Risk of Flooding from Surface Water Depth: 1% AEP

Site Assessment Summary – Land south of Newlands Street/off Kings Chase (Previously known as Gimsons)

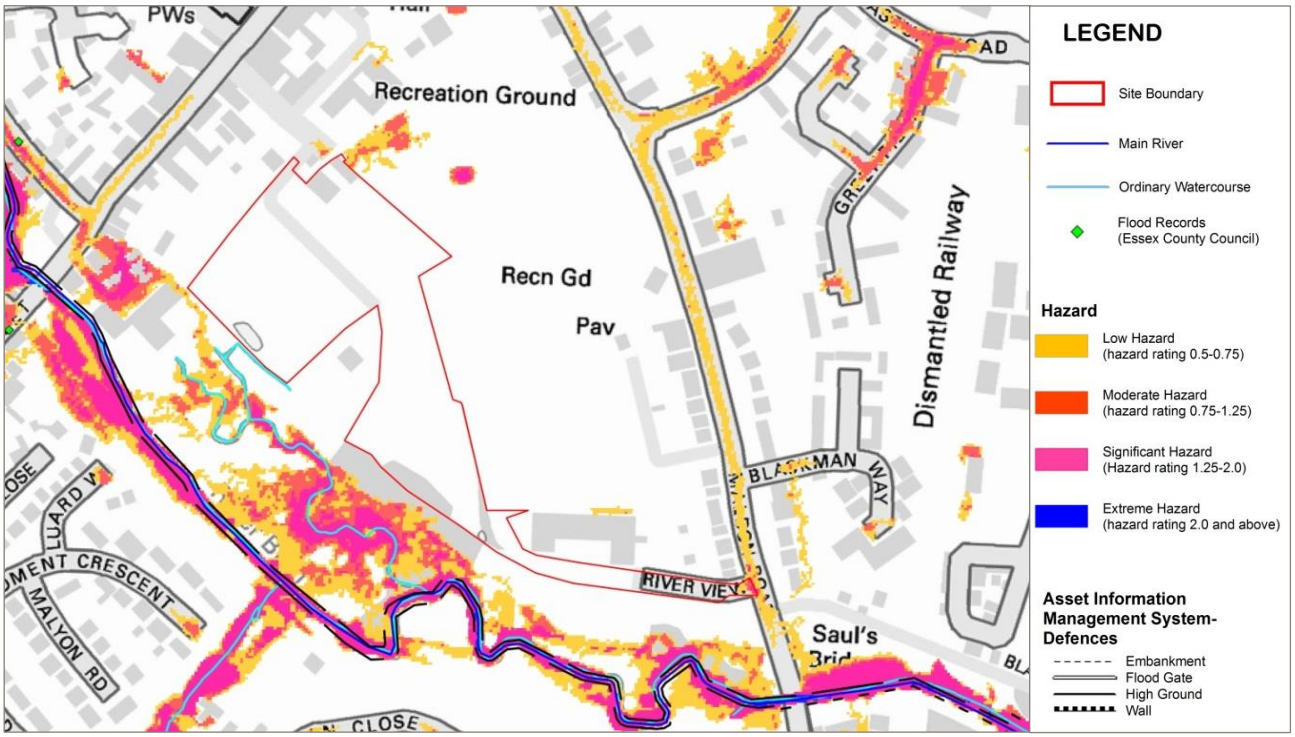

Figure D Environment Agency's Risk of Flooding from Surface Water Hazard: 1% AEP

Historic Flood Events

There are 2 historic flood records 0.13km and 0.17km west of the site; the source of flooding for the first record is unknown and the second is assumed to be from the highway.

Geology and Groundwater

The bedrock geology in this area is Thames Group, comprising clay and silt. The overlying bedrock is comprised of sand, gravel and clay. Clayey soils are typically not very permeable and provide the potential for increased surface water ponding.

The AStGWF mapping shows that the site is located predominantly within a 1km square of which <75% is susceptible to groundwater emergence. The risk of groundwater flooding in this area is therefore generally considered to be of very high risk. This will need to be confirmed during site investigation survey.

Other Sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the floodplain of the River Brain including part of the site is at risk of inundation in the event of a failure of Powers Hall reservoir. Section 3.8 in the Braintree Level 1 SFRA provides further information on flood risk from reservoirs within the Braintree District. Given the regular inspection of these reservoirs in accordance with the Reservoirs Act 1975, flooding from reservoirs is considered to be a managed risk.

Greenfield Runoff and Drainage Hierarchy

Estimated Greenfield Runoff Rates (IH124 Results).	QBAR:	4.27 l/s	Flow rate in l/s/ha	QBAR:	1.22 l/s/ha
	1 in 1 year:	3.63 l/s		1 in 1 year:	0.58 l/s/ha
	1 in 30 year:	9.83 l/s		1 in 30 year:	6.78 l/s/ha
	1 in 100 year:	13.63 l/s		1 in 100 year:	10.58 l/s/ha

Drainage Hierarchy	Infiltration to ground		Uncertain due to geology; subject to on site infiltration testing.
	Discharge to watercourse		Discharge possible into the unnamed watercourse, subject to consultation with the LLFA.
	Discharge to surface water sewer		Possible, subject to consultation with Anglian Water.

Site Assessment Summary – Land south of Newlands Street/off Kings Chase (Previously known as Gimsons)

Site Specific Recommendations

Fluvial Modelling

As part of a site specific FRA for this site, further assessment is required of the impact of climate change allowances on flood risk. The Environment Agency East Anglia, Essex, Norfolk and Suffolk (ENS) guidance[13] states that for a more vulnerable large-major development in Flood Zone 2, an intermediate approach should be used. Developers should contact the Environment Agency at the project outset to discuss requirements.

Site Layout and Design

The majority of the site is defined as Flood Zone 1 (<0.1 AEP), low probability of flooding from the ordinary watercourse, and therefore it should be possible to steer new development towards areas within Flood Zone 1 (<0.1 AEP). Residential development should be avoided in areas defined as Flood Zone 2 (0.1% AEP), and risk of surface water flooding; instead lower vulnerability uses including landscaped open space should be located here. The drainage strategy for the site must be considered early in the site planning process to ensure adequate inclusion of SuDS, taking care to consider SuDS features in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Set-back Distance

The LLFA will seek to ensure that development is set back by at least 3m on one side of an Ordinary Watercourse for ongoing maintenance purposes. The LLFA will need to be consulted and consent obtained for any proposed works that may impact flow within the channel of the watercourse.

Finished Floor Levels

If residential development cannot be avoided within the flood extent for the 1% AEP event, finished floor levels should be set at least 300mm freeboard above the flood level for 1% AEP event including an appropriate allowance for climate change. Internal access to higher floors is required.

Access / Egress

Safe dry access to and from the site should be provided.

Emergency Planning

The site is not shown to be within an Environment Agency Flood Warning Area.

LLFA Consultation

It is recommended that potential developers contact the Environment Agency, Braintree District Council and Essex CC as the LLFA for further information prior to taking forward site specific plans.

Summary

Based on the strategic assessment of flood risk and the recommendations for mitigation measures set out above, it is considered that proposed development on this site could be suitably designed to satisfy part 2) of the Exception Test subject to submission of a detailed site specific FRA.

[13] Environment Agency (Sept 2016), East Anglia, Essex, Norfolk and Suffolk Area – Flood Risk Assessments: Climate change allowances

Site Assessment Summary – Land at Woodend Farm, including Mayfield Nursery, London Road

Location:	SHLAA Ref / Ref:	Area (ha):	Proposed Use:	Vulnerability Classification:
Witham	HATF316	2.76	Residential	More Vulnerable

Fluvial Flood Risk

Flood Zone 1 (<0.1 AEP) :	Flood Zone 2 (0.1% AEP) :	Flood Zone 3 (1% AEP):	Flood Zone 3b (5% AEP):
100%	0%	0%	0%

Flood Zones and Flood Defences

The site is located entirely Flood Zone 1 (<0.1 AEP) and is located 0.5km from the nearest ordinary watercourse (Figure A). There are no modelled flood zones for this watercourse however the watercourse could still pose a flood risk to the site.

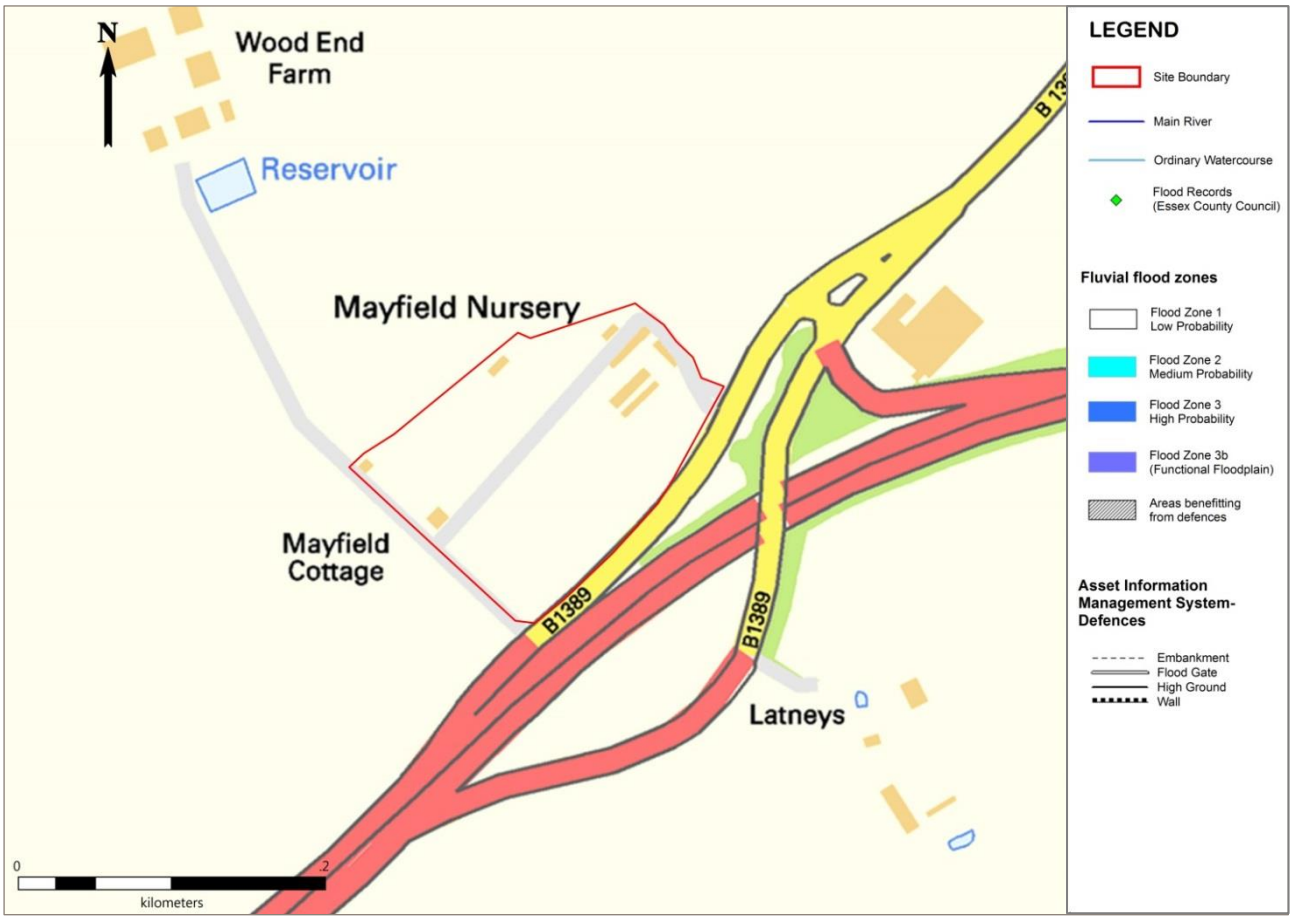

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Figure A Flood Zones

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The Environment Agency RoFSW mapping (Figure B) indicates that the site is susceptible to surface water ponding in small isolated sections of the east and west of the site. This should be considered carefully in the development of the site layout to ensure that residential dwellings are not placed at surface water flood risk. Environment Agency Surface Water modelling (Figure C) identifies the majority of the site has very low surface water flood risk the potential. Small areas of surface water ponding have the potential for depths of 0-1200mm in an isolated section on the western boundary of the site during the 1% AEP event. The site has a significant hazard rating from surface water flood risk during a 1% AEP event (Figure D). It should be noted that this is only for a small, isolated section of the site.

Site Assessment Summary – Land at Woodend Farm, including Mayfield Nursery, London Road

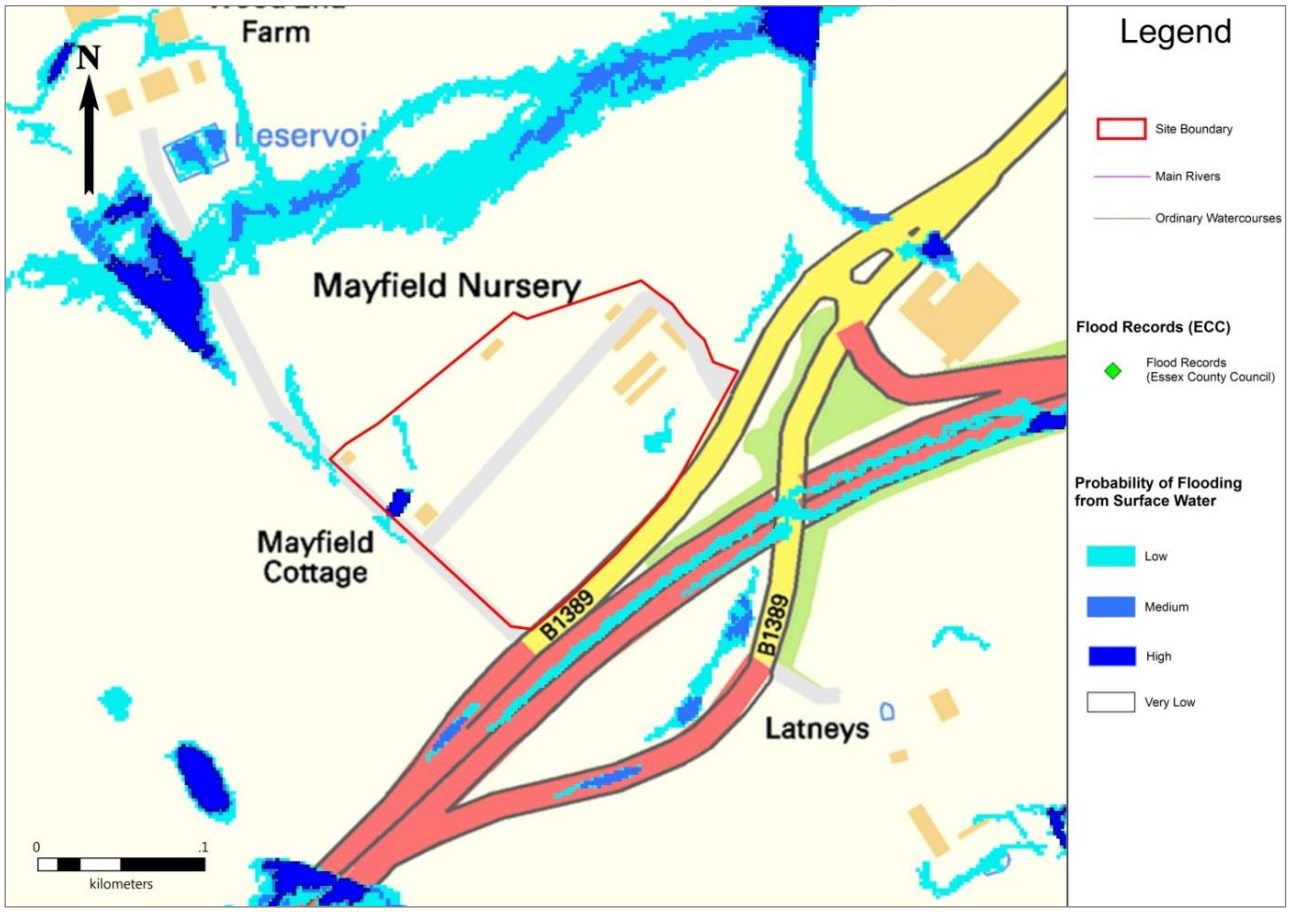

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Figure B Environment Agency's Risk of Flooding from Surface Water (RoFSW) : 1% AEP Scenario

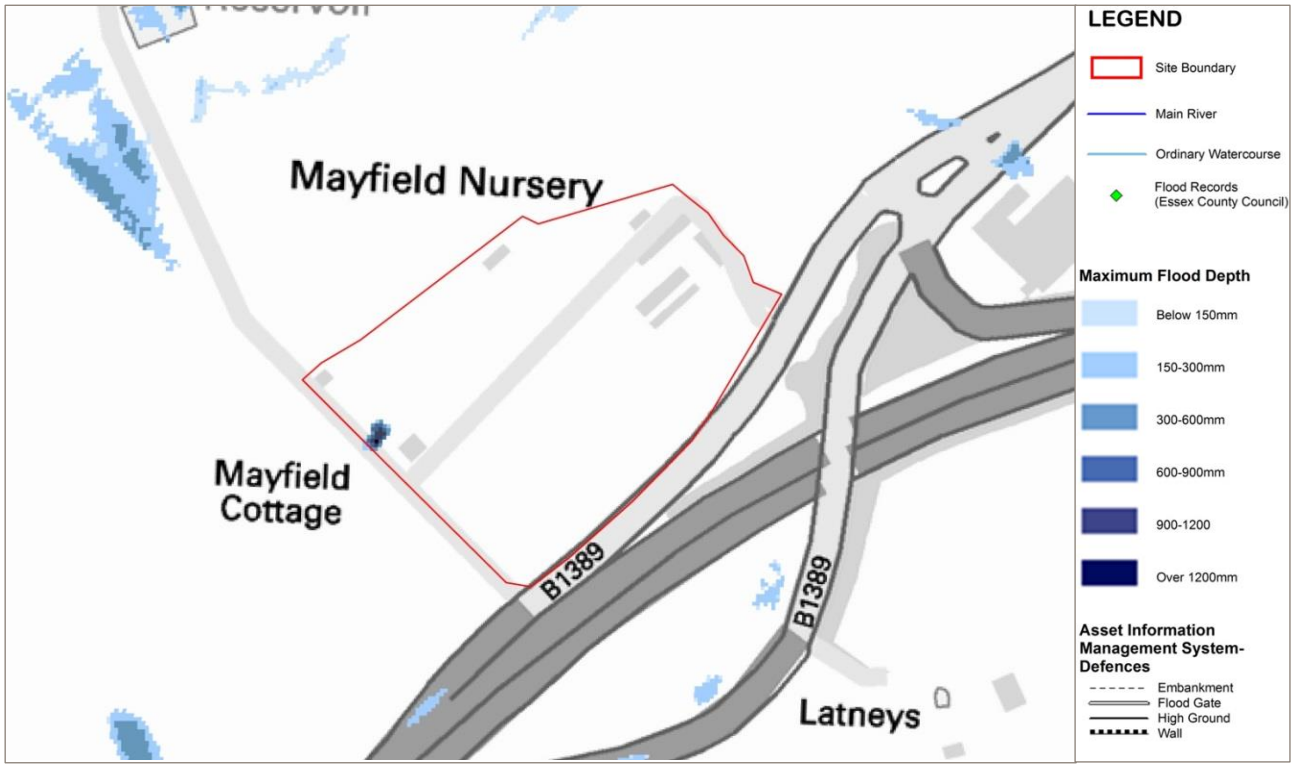

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Figure C Environment Agency's Risk of Flooding from Surface Water Depth: 1% AEP

Site Assessment Summary – Land at Woodend Farm, including Mayfield Nursery, London Road

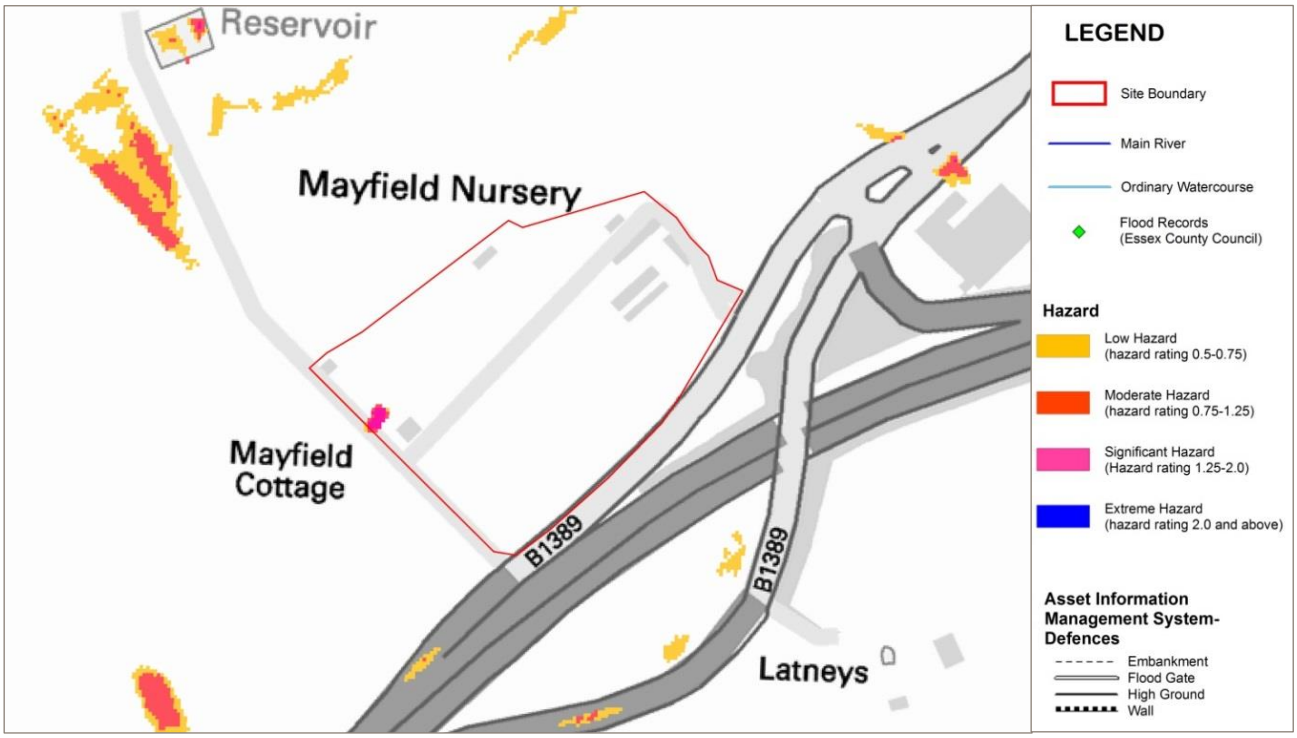

Figure D Environment Agency's Risk of Flooding from Surface Water Hazard: 1% AEP

Historic Flood Events

There are no historical records of flooding on the site or in the surrounding area.

Geology and Groundwater

The bedrock geology in this area is Thames Group, comprising clay and silt. The overlying bedrock is comprised of till. Clayey soils are typically not very permeable and provide the potential for increased surface water ponding.

The AStGWF mapping shows that the site is located within a 1km square of which >25% is susceptible to groundwater emergence. The risk of groundwater flooding in this area is therefore generally considered to be of very low risk. This will need to be confirmed during site investigation survey.

Other Sources

A reservoir is located to the north west of the site at Wood End Farm, but is not considered to pose a risk.

Greenfield Runoff and Drainage Hierarchy

Estimated Greenfield Runoff Rates (IH124 Results).	QBAR:	6.08 l/s	Flow rate in l/s/ha	QBAR:	3.32 l/s/ha
	1 in 1 year:	5.17 l/s		1 in 1 year:	2.41 l/s/ha
	1 in 30 year:	13.99 l/s		1 in 30 year:	11.23 l/s/ha
	1 in 100 year:	19.40 l/s		1 in 100 year:	16.64 l/s/ha

Drainage Hierarchy	Infiltration to ground		Uncertain due to geology; subject to on site infiltration testing.
	Discharge to watercourse		No Watercourse located near the site.
	Discharge to surface water sewer		Possible, subject to consultation with Anglian Water.

Site Assessment Summary – Land at Woodend Farm, including Mayfield Nursery, London Road

Site Specific Recommendations

Site Layout and Design

The site is currently defined as Flood Zone 1 (<0.1 AEP) and is therefore not at risk from fluvial flooding. Residential development should be avoided in areas defined as risk of surface water flooding; instead lower vulnerability uses including landscaped open space should be located here. The drainage strategy for the site must be considered early in the site planning process to ensure adequate inclusion of SuDS. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

LLFA Consultation

It is recommended that potential developers contact Braintree District Council and Essex CC as the LLFA for further information prior to taking forward site specific plans.

Summary

Based on the strategic assessment of flood risk and the recommendations for mitigation measures set out above, it is considered that proposed development on this site could be suitably designed to satisfy part 2) of the Exception Test subject to submission of a detailed site specific FRA.

Site Assessment Summary – Land at Woodend Farm, London Road

Location:	SHLAA Ref / Ref:	Area (ha):	Proposed Use:	Vulnerability Classification:
Witham	HATF315	15.90	Residential and community facilities	More Vulnerable

Fluvial Flood Risk

Flood Zone 1 (<0.1 AEP) :	Flood Zone 2 (0.1% AEP) :	Flood Zone 3 (1% AEP):	Flood Zone 3b (5% AEP):
100%	0%	0%	0%

Flood Zones and Flood Defences

The site is located entirely in Flood Zone 1 (<0.1 AEP) and is located 0.65km south from the nearest ordinary watercourse (Figure A). There are no modelled flood zones for this watercourse however the watercourse could still pose a flood risk to the site.

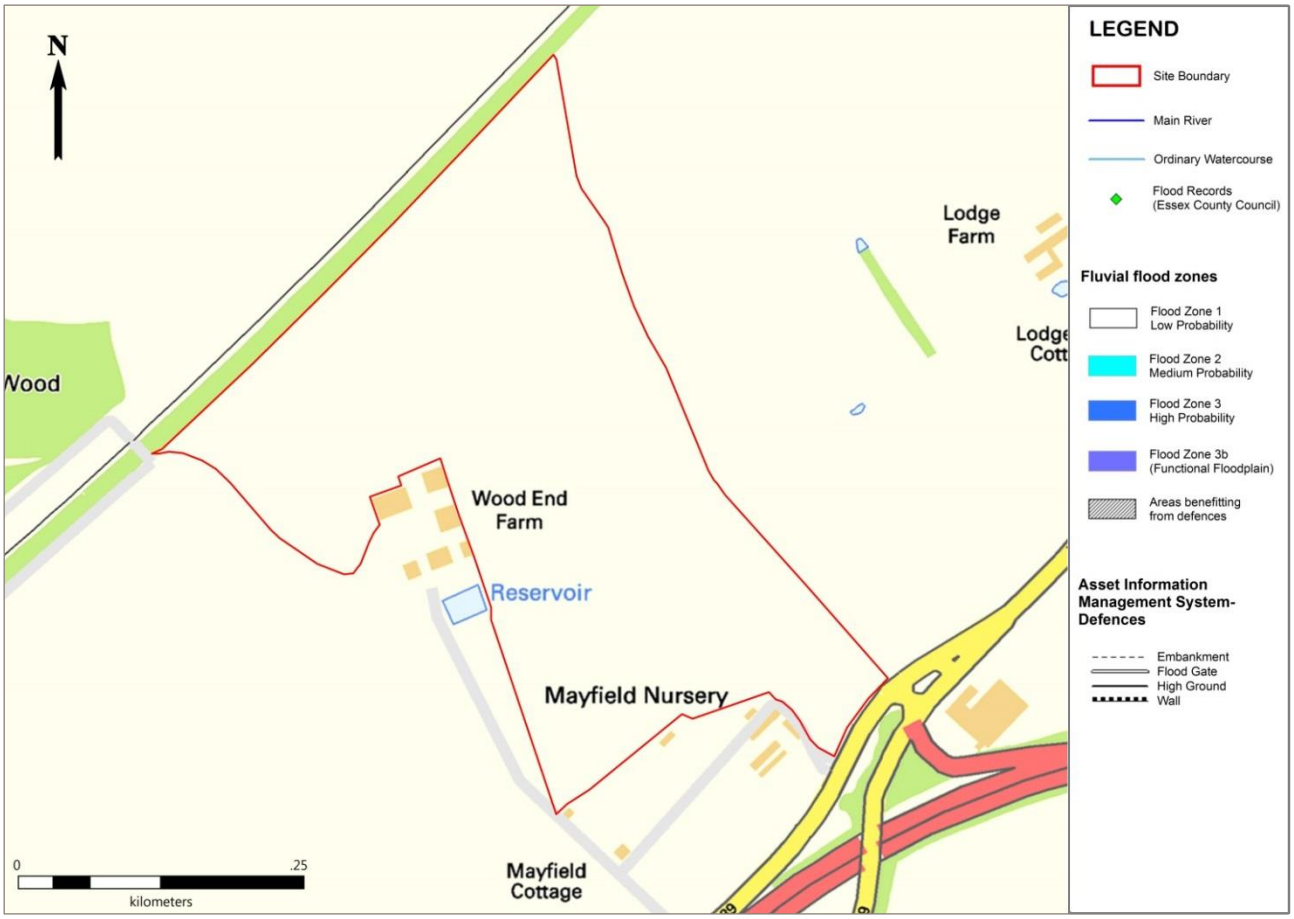

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Figure A Flood Zones

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The Environment Agency RoFSW mapping (Figure B) indicates that there is a surface water flow path crossing the central section of the site flowing in a north easterly direction. In addition, there is a small area of surface water ponding on the eastern site boundary. This should be considered carefully in the development of the site layout to ensure that residential dwellings are not placed at surface water flood risk, and that the position of any new development does not divert the flow path to a neighbouring area. The Environment Agency's Surface Water depth modelling (Figure C) identifies the potential for surface water flood depth of below 150mm across the central section of the site during the 1% AEP event. The site has a low surface water flood risk hazard rating during a 1% AEP event (Figure D).

Site Assessment Summary – Land at Woodend Farm, London Road

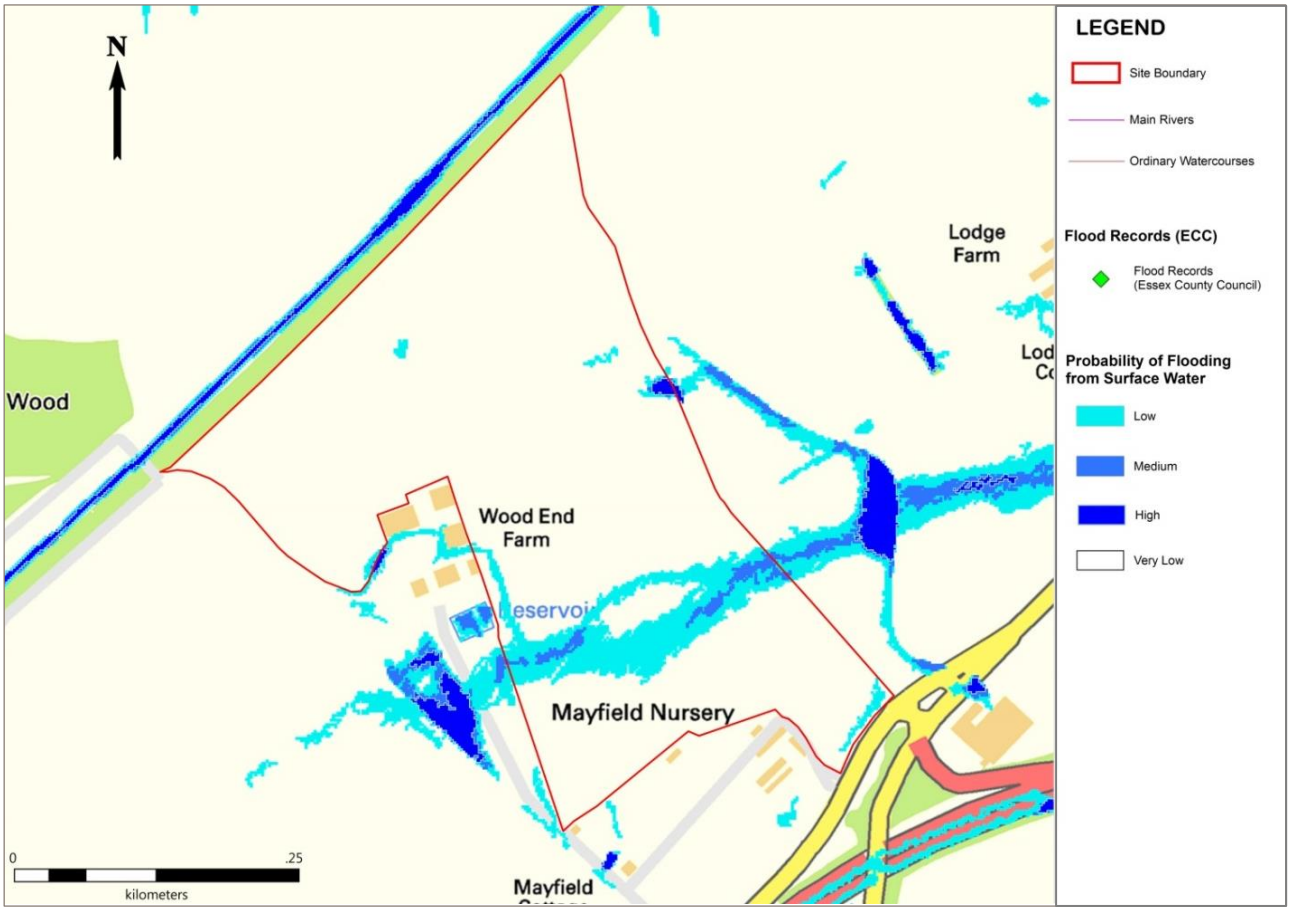

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Figure B Environment Agency's Risk of Flooding from Surface Water (RoFSW) : 1% AEP Scenario

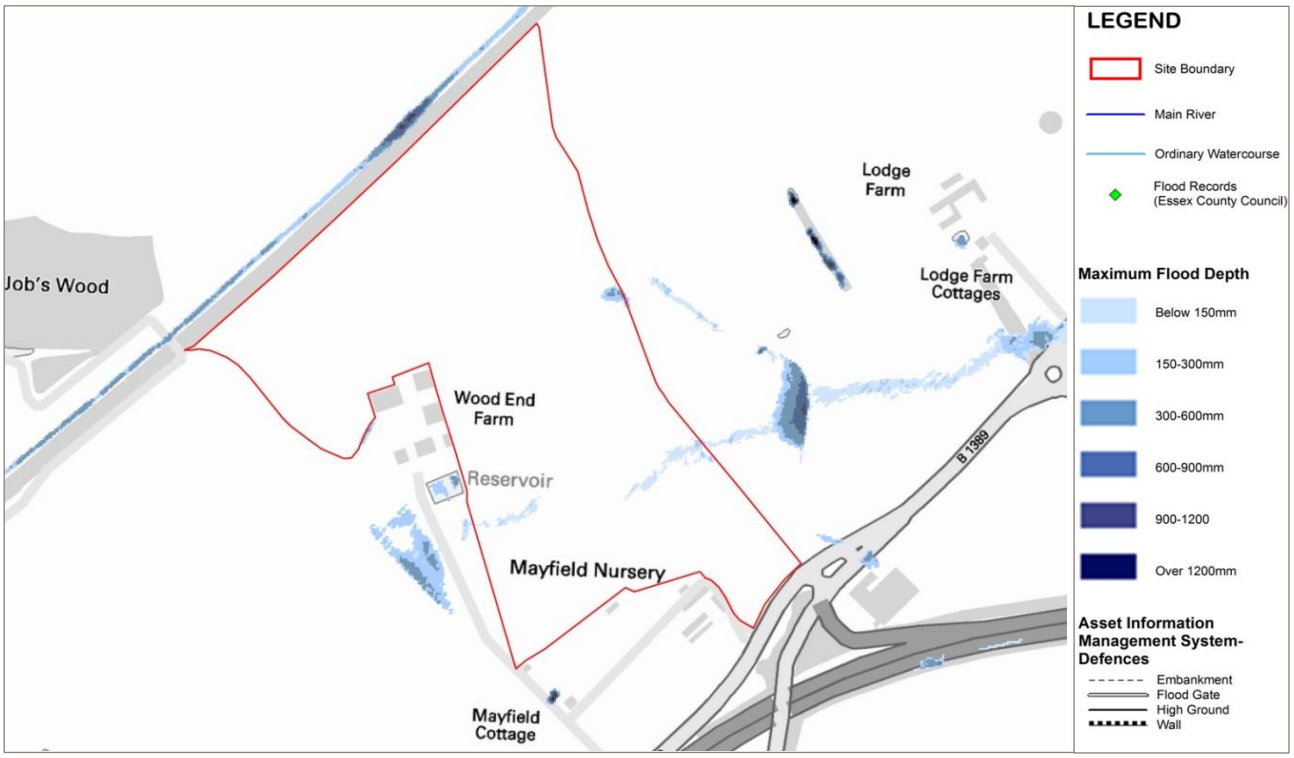

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Figure C Environment Agency's Risk of Flooding from Surface Water Depth: 1% AEP

Site Assessment Summary – Land at Woodend Farm, London Road

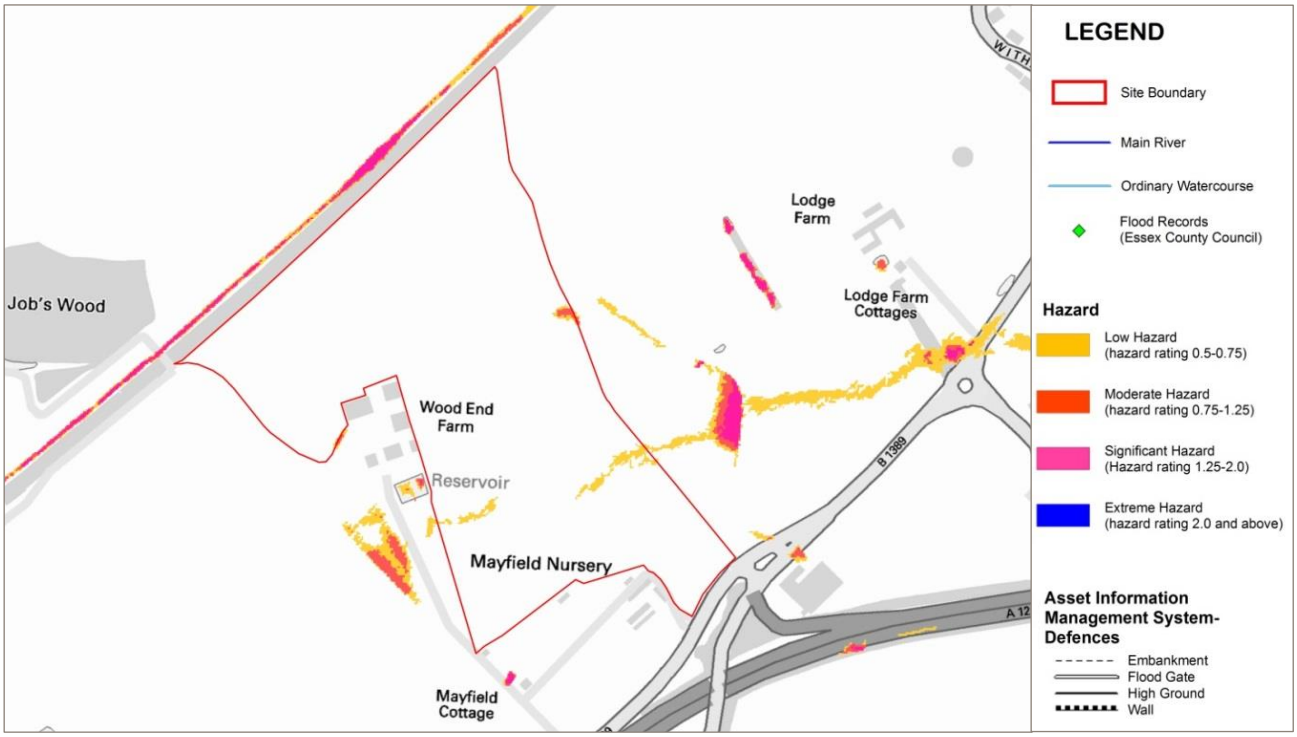

Figure D Environment Agency's Risk of Flooding from Surface Water Hazard: 1% AEP

Historic Flood Events

There are no historical records of flooding on the site or in the surrounding area.

Geology and Groundwater

The bedrock geology in this area is Thames Group, comprising clay, gravel and silt. The overlying bedrock is comprised of till. Clayey soils are typically not very permeable and provide the potential for increased surface water ponding.

The AStGWF mapping shows that the site is located predominantly within a 1km square of which the majority is not considered to be susceptible to groundwater emergence. The additional part of the site is within a 1km square of which >25% is susceptible to groundwater emergence. The risk of groundwater flooding in this area is therefore generally considered to be of very low risk. This will need to be confirmed during site investigation survey.

Other Sources

A reservoir is located adjacent to the west of the site at Wood End Farm, but is not considered to pose a risk.

Greenfield Runoff and Drainage Hierarchy

Estimated Greenfield Runoff Rates (IH124 Results).	QBAR:	35.03 l/s	Flow rate in l/s/ha	QBAR:	2.20 l/s/ha
	1 in 1 year:	29.78 l/s		1 in 1 year:	1.87 l/s/ha
	1 in 30 year:	80.58 l/s		1 in 30 year:	5.06 l/s/ha
	1 in 100 year:	111.76 l/s		1 in 100 year:	7.02 l/s/ha

Drainage Hierarchy	Infiltration to ground		Uncertain due to geology; subject to on site infiltration testing.
	Discharge to watercourse		No Watercourse located near the site.
	Discharge to surface water sewer		Possible, subject to consultation with Anglian Water.

Site Assessment Summary – Land at Woodend Farm, London Road

Site Specific Recommendations

Site Layout and Design

The site is currently defined as Flood Zone 1 (<0.1 AEP) and is therefore not at risk from fluvial flooding. Residential development should be avoided in areas defined as risk of surface water flooding; instead lower vulnerability uses including landscaped open space should be located here. The drainage strategy for the site must be considered early in the site planning process to ensure adequate inclusion of SuDS. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Finished Floor Levels

If residential development cannot be avoided within the surface water flood extent, the Environment Agency Flood Risk Map for Surface Water should be consulted to identify the potential flood depths. Finished floor levels should be set at an appropriate freeboard above the surface water flood level.

Resilience Measures

A number of flood resistance and resilience measures can also be implemented into new developments to mitigate potential flooding. Guidance on resilience measures can be found in the 'Improving the Flood Performance of New Buildings, Flood Resilient Construction' published by The Department for Communities and Local Government (CLG).

LLFA Consultation

It is recommended that potential developers contact Braintree District Council and Essex CC as the LLFA for further information prior to taking forward site specific plans.

Summary

Based on the strategic assessment of flood risk and the recommendations for mitigation measures set out above, it is considered that proposed development on this site could be suitably designed to satisfy part 2) of the Exception Test, subject to submission of a detailed site specific FRA.

4. Summary

A Level 2 SFRA has been carried out for the 18 potential development sites identified by BDC.

The Level 2 SFRA has identified that for six sites (Table 4-1), additional modelling information for fluvial watercourses will be required as part of site specific FRAs in order to more accurately determine the flood risk to the site and inform specific development design details such as finished floor levels.

Table 4-1 Level 2 sites requiring additional fluvial modelling as part of site specific FRAs

Site ID	Site Name
COGG506	Dutch Nursery, West Street
HATR299 and HATR298	Harrison Works, Kings Road
BURE165	Land at Colchester Road, Bures
FEER233	Land south of Feering, west of A12 (south of Feering Hill/London Road)
WITC421	Land south of Newlands Street/off Kings Chase (Previously known as Gimsons)

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