ARCH ASSOCIATES

APPENDIX 2

RIDGE & PARTNERS SPINE ROAD SUDS STRATEGY

RIDGE

FLOOD RISK ASSESSMENT
ONE HORTON HEATH

EASTLEIGH BOROUGH COUNCIL

December 2023

FLOOD RISK ASSESSMENT
ONE HORTON HEATH

December 2023

Prepared for

Eastleigh Borough Council

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VERSION CONTROL

PROJECT NAME:	One Horton Heath – Eastleigh Borough Council – FRA - INTERNAL DISTRIBUTOR ROADS
PROJECT NUMBER:	5018551
DOCUMENT REFERENCE:	5018551 - RDG-XX-XX-DOC-C-9950
DOCUMENT STATUS:	S2 – Suitable for Information

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SECTION 01
INTRODUCTION

1. INTRODUCTION

1.1. Appointment and Brief

Ridge & Partners prepared this Flood Risk Assessment on behalf of Eastleigh Borough Council. The proposed development has been designed in full accordance with the Development Plan and Outline Planning Application (OPA) O/20/89498, which has a resolution to grant consent subject to S106 negotiations relating to education. This application is for full planning consent due to the time for these negotiations to complete. Submitting details of the Secondary Infrastructure Road (SIR) as a full planning application will deliver the SIR in accordance with, and as part of the OPA, but enable commencement more quickly than waiting for the resolution of the OPA S106 and the determination of an application for Reserved Matters Approval of details of the SIR. The site is located at One Horton Heath at approximately SO50 7BZ, Grid reference SU 48905 16935 (hereby referred to as the 'Application Site- reserved matters planning application.

This assessment has been prepared for the benefit of the Hampshire County Council Lead Local Flood Authority and seeks to demonstrate that the proposed Internal Distributor Road is not at risk of flooding.

The purpose of this document is:

- To determine and outline potential sources of flooding along the Internal Distributor Road route, and;
- Establish how flood risk will be managed throughout the lifetime of the proposed Internal Distributor Road, taking into account the potential for climate change.
- Discuss the proposed outline surface water strategy for incorporation with the Internal Distributor Roads at the application site including SuDS for surface water quantity, surface water quality, amenity and biodiversity.

1.2. Aims and Objectives

It is intended to follow the procedures and guidance outlined within NPPF (2021), BS 8533 (2017), BS 8582 (2013), CIRIA C624 (2004) and SuDS Manual (C753) (2015) in the preparation of this document.

The governments flood mapping service shows that the site is largely within flood zone 1. It is therefore recommended that the proposal is split into steps. Step 1 and 2, outlined below, are required initially and will determine the risk of flooding. Subject to the findings, steps 3 and 4 may be required and even step 5 should the site be in the highest risk category.

Step 1 - Consultation with Lead Local Flood Authority (LLFA)

- Obtain and review the most up-to-date local flood risk information including the any previous Preliminary Flood Risk Assessments (PFRA), Strategic Flood Risk Assessments (SFRA) or Surface Water Management Plans (SWMP) undertaken for the area of interest;
- Review Environment Agency's online flood risk maps.
- Review Planning Policy applicable to the site.
- Liaise with Thames Water to obtain flooding history information etc.
- Consult with the Local Flood Authority.
- Advise you on our findings (email or tech note format).

Step 2 - Outline Flood Risk Assessment:

- Undertake a desktop assessment of pre- and post-development flood risk at the Site from all possible sources (fluvial, tidal, groundwater, sewers, overland and artificial sources);

- Outline the Sequential and Exception Test requirements.
- Advise on matters to be addressed with the Environment Agency.
- Produce an outline Flood Risk Assessment and circulate to the Client for comment.
- Incorporate comments from the Client and issue the final version.

If stages 1 and 2 determine that the site is either wholly or partly within are area of flood zone 2 or 3 then stages 3 and 4 are required.

Step 3 - Sequential Test:

- The process identifies the flood risks and development vulnerability in order to assess the suitability of each development location and where possible, steers more vulnerable developments to areas of lowest flood risk, matching vulnerability of land use to flood risk.

Step 4 - Exception Test:

- The Exception Test allows consideration of the wider sustainability benefits of a development to be considered to justify development in a higher risk flood zone.
- To ensure that the proposed development meets the requirements of the Exception test (NPPF):
  - It must be demonstrated that the development provides wider sustainability benefits for the community that outweigh flood risk, informed by a Strategic Flood Risk Assessment where one has been prepared.
  - The site-specific Flood Risk Assessment must demonstrate that the development will be safe for its lifetime taking into account the vulnerability of its users, without decreasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

Should completed steps 1-4 still show that the development is at a high risk of flooding, hydraulic modelling would be required, as follow:

Step 5 - Hydraulic Modelling

- Obtain Environment Agency flood model for the development area.
- Review flood model variables to ensure data and variables are current.
- Update model to take account of findings of review and to include proposal.
- Validate model to assess updated risk of flood to the development area.
- All the above is to be undertaken in conjunction with Environment Agency to ensure their acceptance.

1.3. Limitations

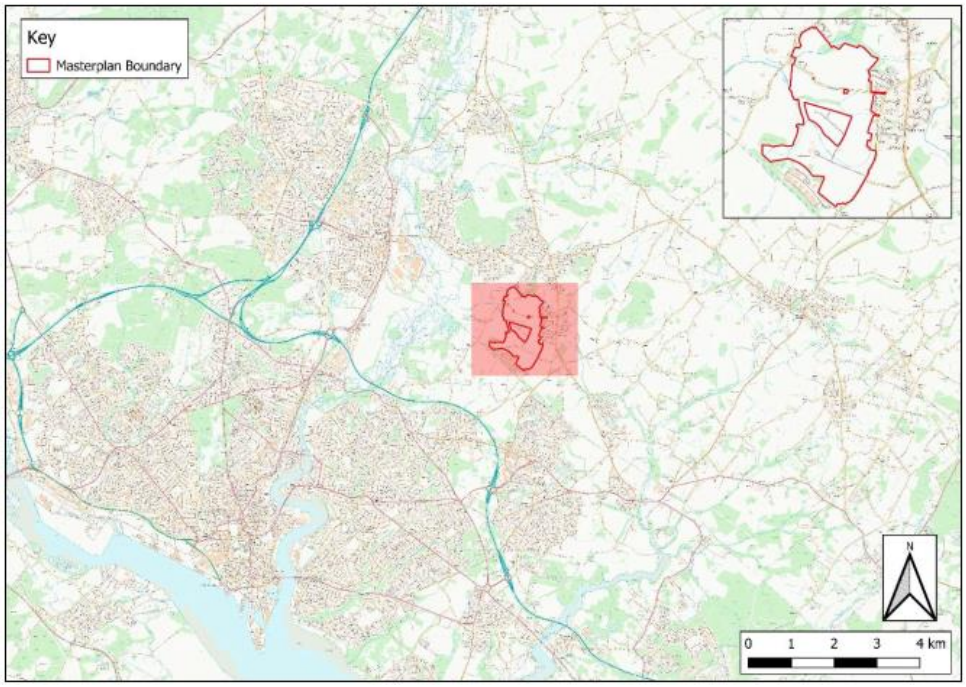
The purpose of this report as outlined in Section 1.2, together with those related matters specifically referred to therein and it is not intended to be used for any other purposes. The report is for the sole benefit and may only be relied upon by the addressee, to whom we will owe a duty of care. The report and any part of it is confidential to the addressee and should not be disclosed to any third party for any purpose, without the prior written consent of Ridge and Partners LLP as to the form and context of such disclosure. The granting of such consent shall not entitle the third party to place reliance on the report, nor shall it confer any third-party rights pursuant to the Contracts (Rights of Third Parties) Act. The report may not be assigned to any third party.

SECTION 02
PROJECT BACKGROUND

2. PROJECT BACKGROUND

2.1. Site Location and Existing Land Use

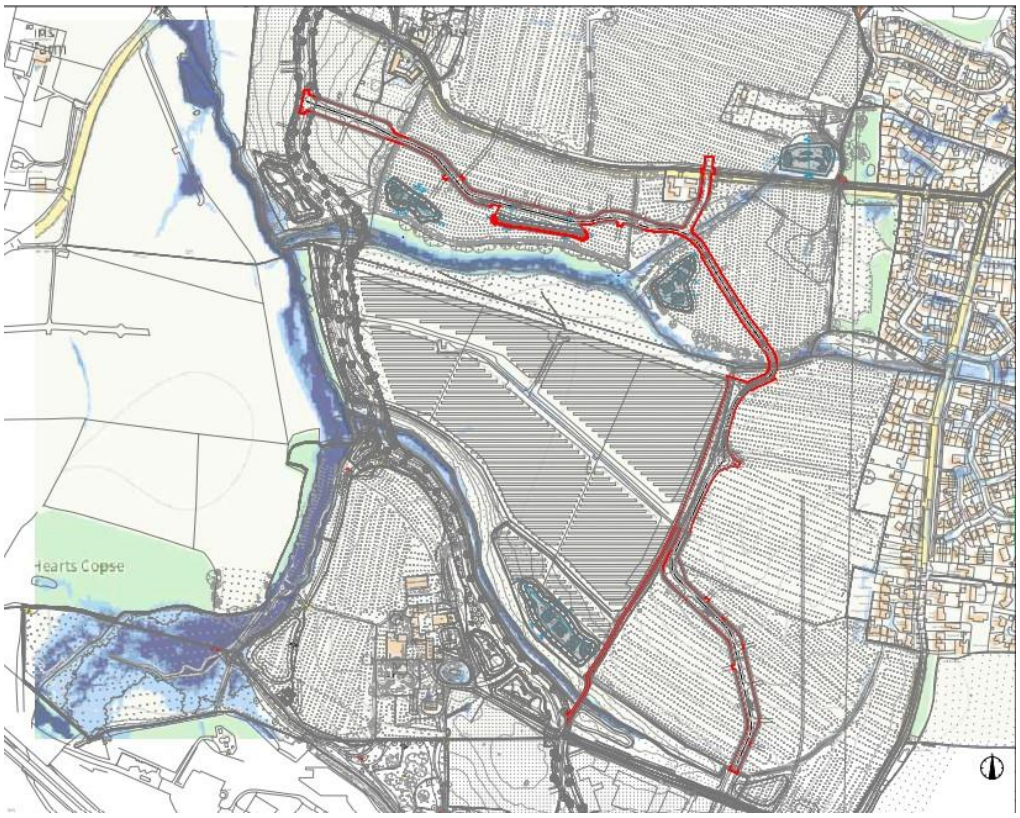
The site is located within the central two-thirds of One Horton Heath, Grid Reference SU 48931 17787, X (Easting) 448855 and Y (Northing) 117787. Latitude and Longitude (decimal), 50.949902 , -1.3059010, Latitude and Longitude (degs, mins, secs), 50°57′00″N , 001°18′21″W. Postcode (nearest) is SO50 7BZ. The site is currently in agricultural use, mainly arable with some grassland. The overall road lengths for this assessment are captured within the central two-thirds of the One Horton Heath, red outline, as shown below:



Site Location Area Plan (Google Earth Maps)

Area Of Flood Risk Assessment and Site Extents Area Plan (Google Earth Maps)

The Internal Distributor Road route focused upon by this Flood Risk Assessment is indicated below overlaid upon the Environment Agency (EA) surface water flood map:



EA Surface Water Flood Map With Internal Distributor Road Route Indicated In Red

2.2. Geology

The British Geological information is indicated below:

Bedrock geology: Wittering Formation - Bracklesham Group (BRB) are secondary or minor aquifers capable of supporting water supplies at a local rather than strategic level - Sand, silt and clay. Sedimentary bedrock formed between 56 and 41.2 million years ago during the Palaeogene period. Greyish brown laminated clay; wavy-to lenticular-bedded sand interbedded with clay in equal proportions; and fine-to medium-grained sparsely glauconitic sand. Bedrock Tertiary clays and sands which overlay Cretaceous Chalk at depth.

Definition of Lower Boundary: Rests on London Clay, a dark grey bioturbated clay below with marked lithological change to interbedded glauconitic fine-grained sand and very silty clay above.

Definition of Upper Boundary: Overlain by Earnley Sand Formation, well-marked by the transgressive basal surface of glauconitic silty sands with pebbles. Thickness: 40-53m.

Superficial deposits: Alluvium - Clay, silt, sand and gravel. Sedimentary superficial deposit formed between 11.8 thousand years ago and the present during the Quaternary period. Alluvium is a general term for clay, silt, sand and gravel. It is the unconsolidated detrital material deposited by a river, stream or other body of running water as a sorted or semi-sorted sediment in the bed of the stream or on its floodplain or delta, or as a cone or fan at the base of a mountain slope. Synonym: alluvial deposits. Normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel. A stronger, desiccated surface zone may be present. A number of drainage features and watercourses are present within the site. The watercourses within the site are tributaries of the River Itchen which is located approximately 1.5km to

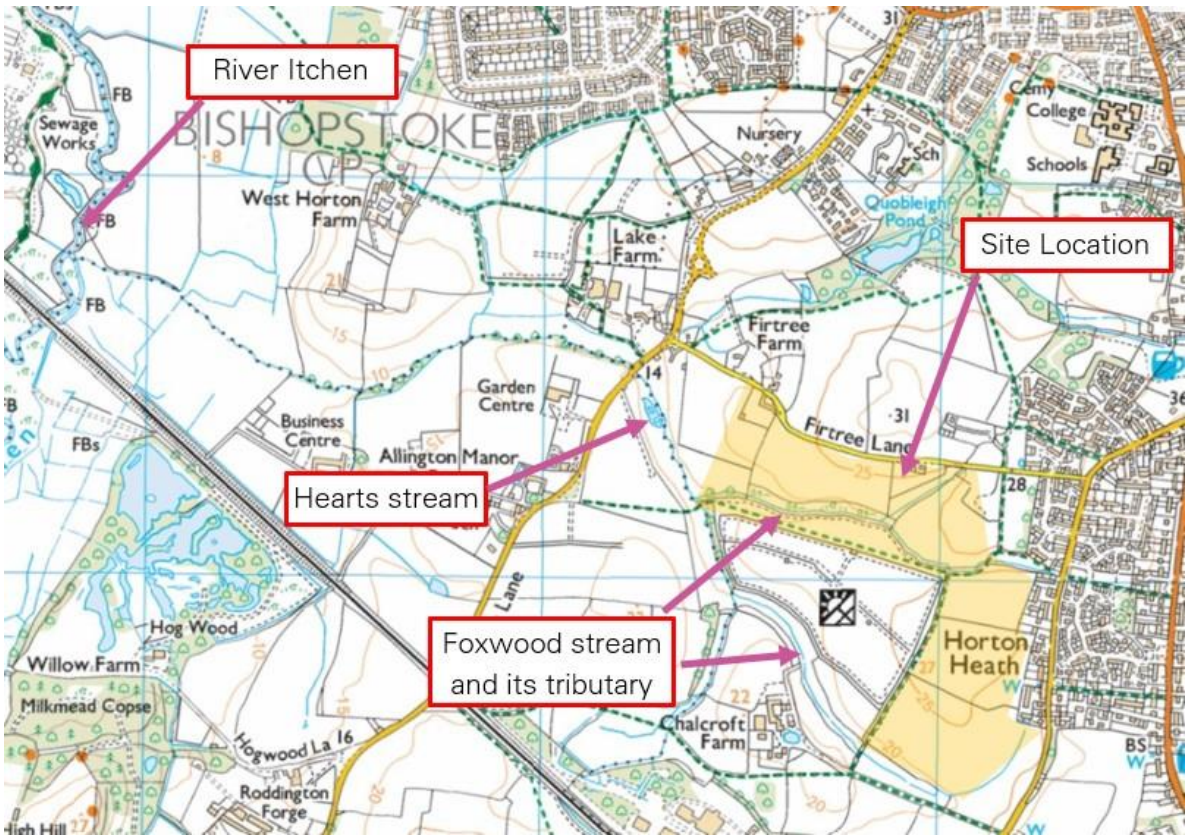
the west of the site's boundary. The watercourse on the western boundary is classified as a 'Main River' and flows from south to north under Allington Lane and into the River Itchen to the south of Chickenhall Lane Wastewater Treatment Works (WwTW). All other onsite watercourses discharge into this unnamed 'Main River'. A number of ponds are also present within the site and in its immediate vicinity.

British Geological information map

The above British Geological information map indicates the Aquifer Classification is Secondary A. From an inspection of the Environment Agency's Source Protection Zones dataset the site does not fall into a Groundwater Source Protection Zone. With reference to the 'Environment Agency's approach to groundwater protection', the discharge of clean roof water to ground is acceptable both inside and outside SPZ1('inner zone') provided that all roof water down-pipes are sealed against pollutants entering the system from surface run-off, effluent disposal or other forms of discharge. If infiltration SuDS are to be used on any part of the site for surface run-off from roads, car parking and public or amenity areas, they would be suitably designed to ensure that the system does not pose an unacceptable risk to the source of supply.

In addition to the above information, Ridge has provided a report based on a visual site inspection and study of readily accessible referenced historical records, information supplied by those parties noted in the report and preliminary discussions with local and Statutory Authorities; reference Ridge *Geotechnical Investigation Report* (Ref: 5019962-RDG-XX-ST-DOC-C-00GIR01) dated 3 February 2023.

As part of the Geotechnical Investigation eleven boreholes were installed with 50mm diameter standpipes to circa 2.50mbgl to allow monitoring of groundwater levels across the site between 3 November 2022 and 30 March 2023. Following the completion of winter groundwater monitoring at land near Horton Heath, Hampshire, broadly centred on 448877 E 117310 N, the report provided commentary on groundwater gauging rounds conducted although it was unclear whether groundwater levels have peaked across the site, and therefore it recommends additional rounds to capture peak levels, and subsequent fall in groundwater level. Reference *One Horton Heath – Winter Groundwater Monitoring*, Letter Reference: 5019962-WGM/MS/T-815 dated 3 April 2023.



Location of River Itchen from the proposed site

The majority of the site geology is falling into HOST Class 25, which is defined as "Slowly permeable, seasonally waterlogged soils over impermeable clay substrates with no storage capacity".

On the basis of the available modelled flood levels provided by the Environment Agency, the areas of the site where built-development and the Internal Distributor Road are proposed are unaffected by the floodplain associated with the watercourses except for the watercourse crossing points where culverts have been designed to ensure the watercourse flows are maintained with no flooding of the roads.

2.3. Proposed Development

The proposed development is a part of One Horton Heath Site Wide Infrastructure Delivery which includes the construction of the Internal Distributor Road, residential homes, local centres and primary schools. However, this report primarily focuses on the Internal Distributor Road which runs between the Fir Tree Lane and the Foxwood stream connecting west to east and crosses the Foxwood Stream and runs adjacent to the solar farm before connecting to the north of the proposed lower acre site.

SECTION 03
FLOOD RISK STATEMENT

3. FLOOD RISK STATEMENT

3.1. Sources of Information

Information relating to the flood risk at the site at the time of writing has been obtained from, but not limited to:

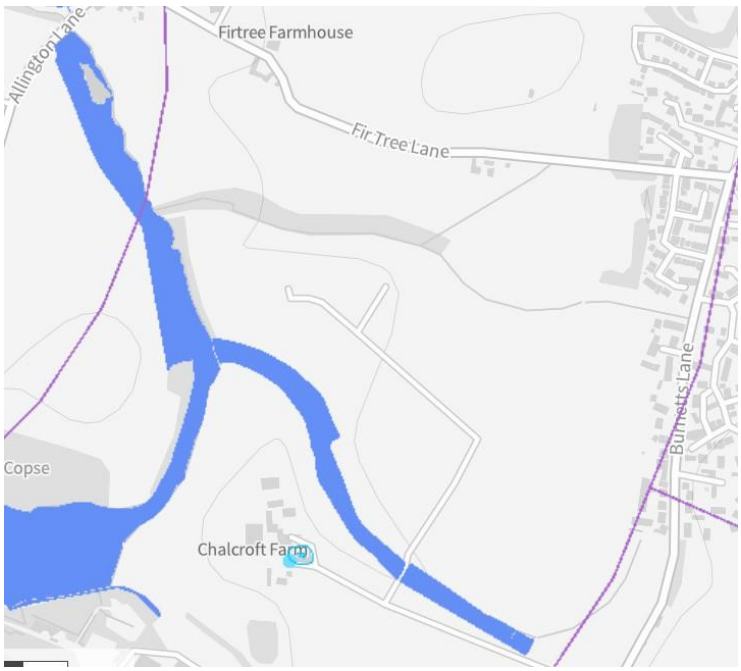
- The Environment Agency (EA) website;
- Water Environment (Water Framework Directive (WFD) England and Wales) Regulations 2017
- Flood and Water Management Act 2010
- Flood Risk Regulations 2009
- Flood Risk Assessments: Climate Change Allowances (2021)
- Eastleigh Borough Local Plan (2016-2036) April 2022
- Hampshire County Council Surface Water Management Plan – Eastleigh
- Eastleigh Flood Risk Assessment Guidance Document 2016
- CIRIA C753 SuDS Manual November 2015
- Internet research.

3.2. Hydrology / Hydrological Features

Hydrology is the study of the distribution and movement of water both on and below the Earth's surface, as well as the impact of human activity on water availability and conditions.

Hydrogeology is the study of groundwater – it is sometimes referred to as geohydrology or groundwater hydrology. Hydrogeology deals with how water gets into the ground (recharge), how it flows in the subsurface (through aquifers) and how groundwater interacts with the surrounding soil and rock (the geology).

The vadose zone is the variably saturated zone between the ground surface and the permanent water table of the groundwater. It is an important part of the water cycle and stores at least 8.5 times more water than is held by rivers. The vadose zone is the Earth's terrestrial subsurface that extends from the surface to the regional groundwater table. The vadose zone may be very shallow (less than 1 m) or very deep (extending hundreds of meters or more), depending on the depth to the water table. This zone is one of the underground soil stratums that are of considerable interest in terms of pollution and becomes the focus for SUDS via infiltrating surface water and rainwater below ground to alleviate surface flooding.



Defra Magic Portal and the BGS GeoIndex

The above base map by Defra Magic Portal and the BGS GeoIndex (https://www.bgs.ac.uk/datasets/aquifer-designation-data/), states the aquifer designation dataset has been created by the Environment Agency (EA), Natural Resources Wales (NRW) and the BGS, and identifies the different aquifers of England and Wales. Groundwater protection policy in England and Wales uses aquifer designations that are consistent with the Water Framework Directive. The above blue shading (watercourses) relates to *"Priority Habitat Inventory - Coastal and Floodplain Grazing Marsh (England)". Groundwater Vulnerability Map (England) – Medium.*

The map indicates the following:

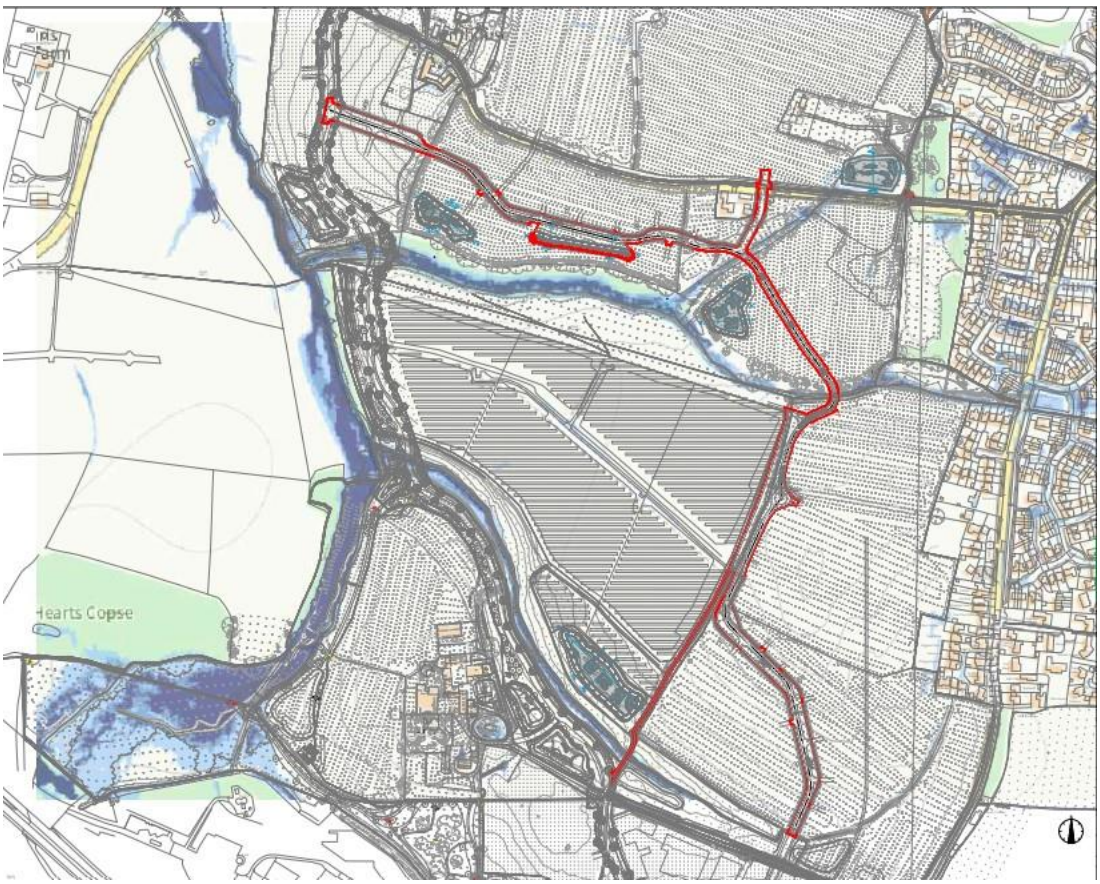
The borough of Eastleigh is dominated by two main river catchments; the River Itchen catchment covers the majority of the borough with the River Hamble catchment to the East.

- Geology and Soils: Groundwater Vulnerability Classification is Medium
- [Blue areas] Grassland: Priority Habitat Inventory - Coastal and Floodplain Grazing Marsh (England)
- [Green areas] Woodland: Ancient and Semi-Natural Woodland
- [Green areas] Woodland: Priority Habitat Inventory - Deciduous Woodland (England)

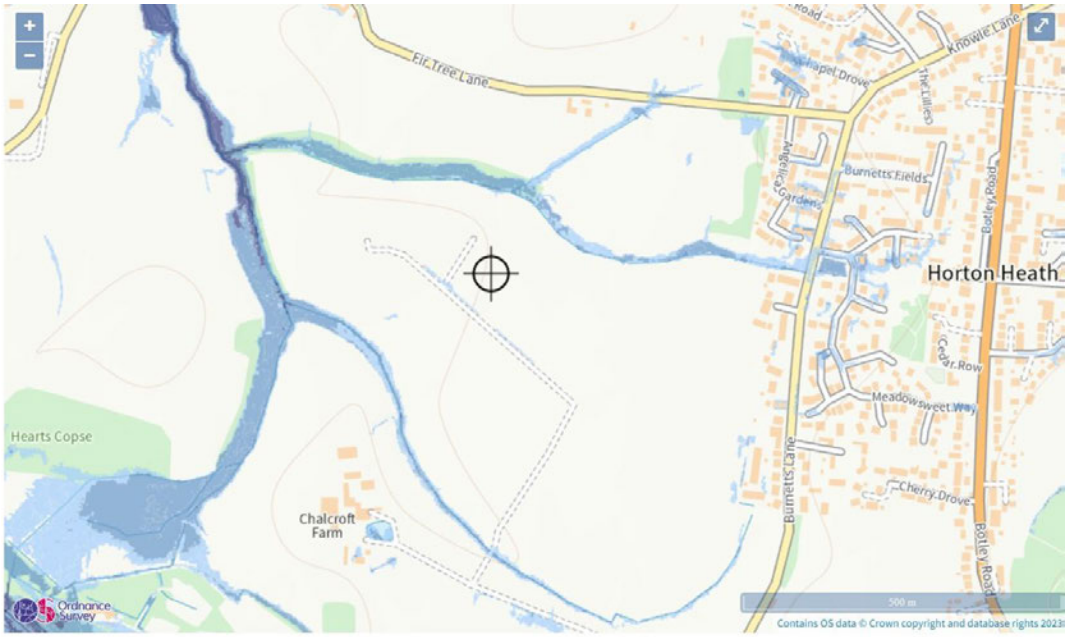
3.3. Historic Flooding

According to the Strategic Flood Risk Assessment produced by the Eastern Solent Coastal Partnership for the Partnership for Urban South Hampshire, and the Environment Agency Flood Maps for Planning, the site has a natural main river running through its western flank. The watercourse has tributaries running into it from the east and lower also from the east. Apart from the watercourse causing local bank-full and local overland flooding the remaining site area is in Flood Zone 1. However, apart from the watercourses there is no recorded flooding from any other sources, neither historical flooding nor specific event records, apart from the main river (outside the roads boundaries) and the watercourses.

The Environment Agency flood zoning map does shows surface water flooding from watercourse tributaries.



Environment Agency Extent of Flooding from surface water with proximity of the new roads in red



Surface water flood risk: water depth in a low risk scenario
Flood depth (millimetres)

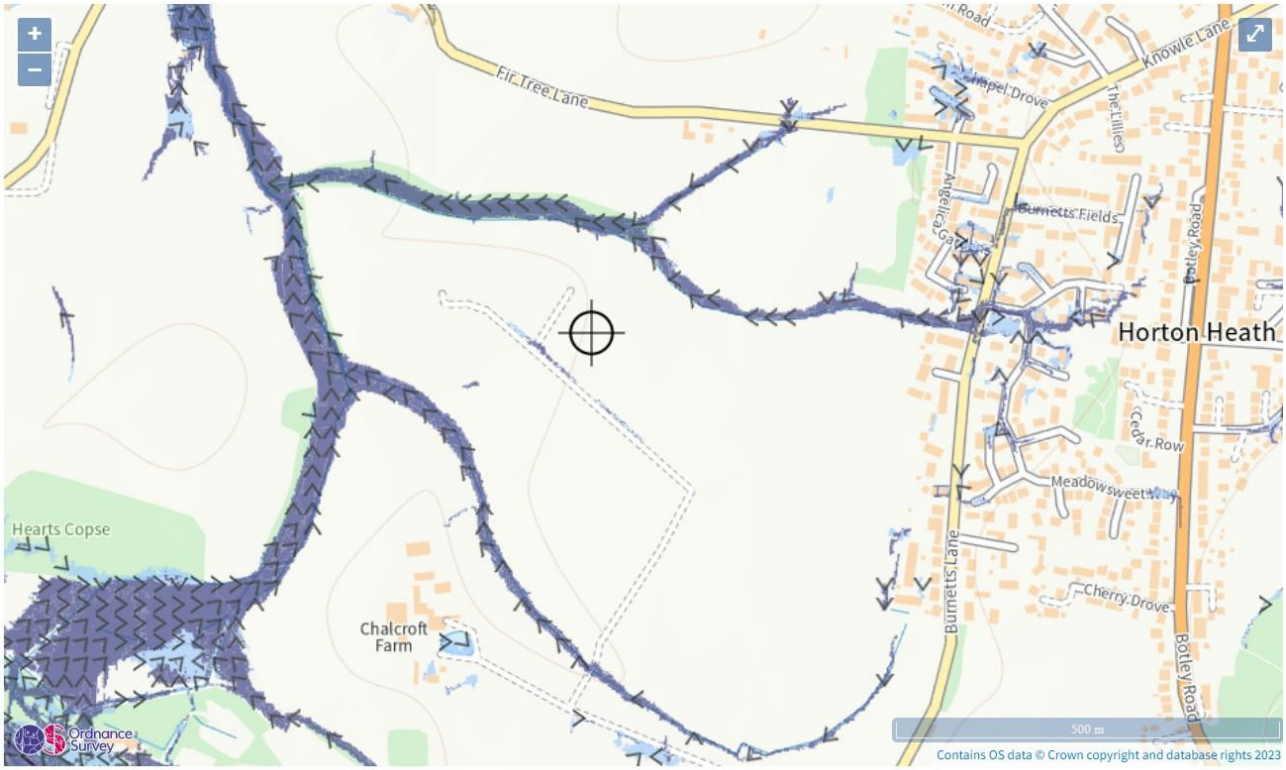
Over 900mm · 300 to 900mm · Below 300mm · Location you selected

Environment Agency Surface Water Depth Low Risk Scenario

Surface water flood risk: water depth in a high risk scenario
Flood depth (millimetres)

Over 900mm · 300 to 900mm · Below 300mm · Location you selected

Environment Agency Surface Water Depth High Risk Scenario



Surface water flood risk: water velocity in a low risk scenario
Flood velocity (metres/second)

Over 0.25 m/s · Less than 0.25 m/s · Direction of water flow · Location you selected

Environment Agency Surface Water Velocity Low Risk Scenario

Environment Agency Surface Water Velocity High Risk Scenario

The definition of EA flood zones is provided within the National Planning Policy Framework (NPPF) and its associated Planning Practice Guidance (PPG) Table 1 (Flood Zones) and summarised below:

- **Flood Zone 1 (Low Probability)**
  Land which could be at risk of flooding from fluvial or tidal flood events with less than 0.1 % (1:1000 year) annual probability of occurrence and therefore considered to be at 'low probability' of flooding.

- **Flood Zone 2 (Medium Probability)**
  Land which could be at risk of flooding with an annual probability of occurrence between 1% (1:100 year) and 0.1% (1:1000 year) from fluvial sources and between 0.5% (1:200 year) and 0.1% (1:1000 year) from tidal sources and therefore considered to be at 'medium probability' of flooding.

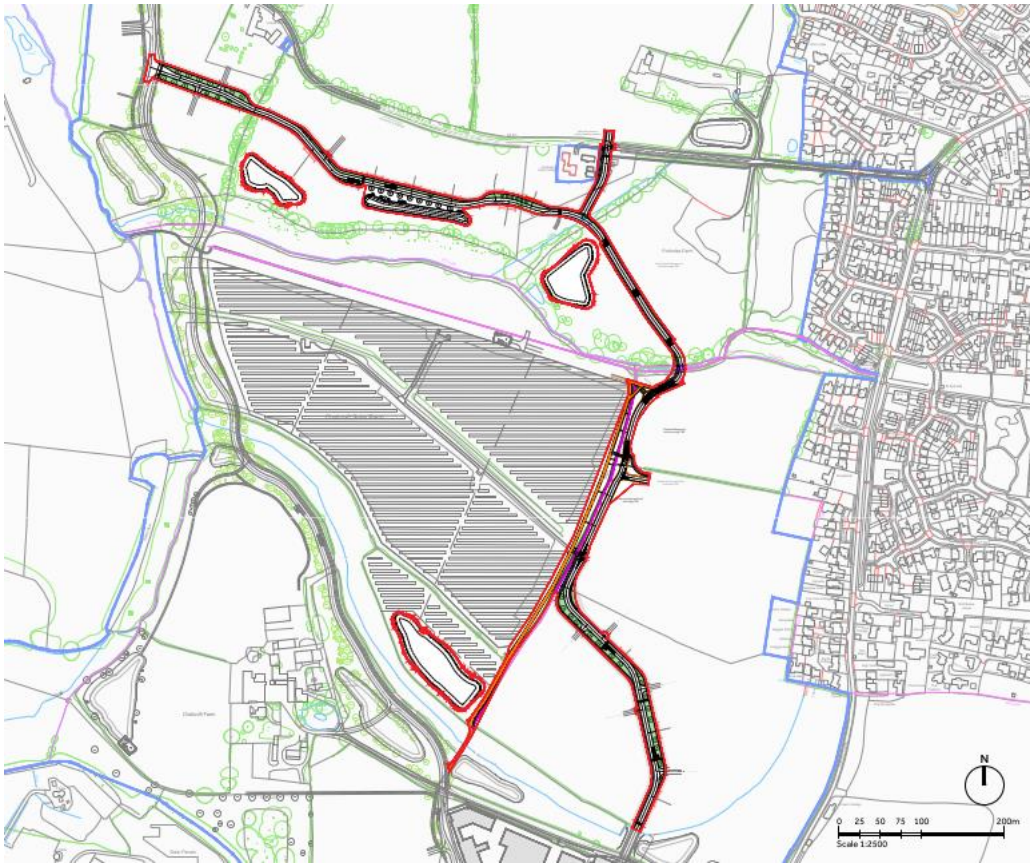
- **Flood Zone 3A (High Probability)**
  Land which could be at risk of flooding with an annual probability of occurrence greater than 1% (1:100 year) from fluvial sources and greater than 0.5% (1:200 year) from tidal sources and therefore considered to be at 'high probability' of flooding.

- **Flood Zone 3B (Functional Floodplain)**
  Land where water has to flow or be stored in times of flood. Local Planning Authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain in agreement with the Environment Agency. However, in general it is defined as land that would flood with an annual probability of 5 % (1:20 year) or greater.

Footnote 50 in the NPPF states that a site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having

critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use. Furthermore, in assessing the flood zoning, the protection afforded by any flood defence structures or strategic flood management measures is not taken into account by the EA.

Paragraph 30 in the Flood Risk and Coastal Change Planning Practice Guidance (Reference ID: 7-030-20140306) advises that a site-specific flood risk assessment is carried out to assess the flood risk to and from a development site. The assessment should demonstrate how flood risk will be managed now and over the development's lifetime, taking climate change into account, and with regard to the vulnerability of its users.



Internal Distributor Road routes and watercourses crossings

With the foregoing in consideration, the northern section of the Internal Distributor Road runs parallel with the surface water flooding from the watercourse, before crossing the watercourse twice at its eastern extent and then running south to a further crossing point. The remaining site areas and Internal Distributor Road route are not shown to be at risk of flooding, as indicated by EA flood maps.

The majority of the developable site, and all proposed built development including the Internal Distributor Road, is to be located in Flood Zone 1 with the exception of the watercourse crossings that are design not to flood and not to exacerbate flooding elsewhere.

Failure (Breaching) of Flood Defences and Management Measures

Based upon EA mapping, the site does not benefit from, nor rely upon, the presence of formal raised flood defences and therefore corresponding flood risk to the site due to defence failure (breach) is negligible. With the foregoing in consideration, the site is deemed to be at **low risk of flooding due to failure of flood defences and management measures.**

Reservoirs

Based upon EA mapping, the site does not lie within an area denoted as being at risk of flooding in the event of a significant breach (failure) of raised reservoir embankments. With the foregoing in consideration, the site is deemed to be at **low risk of flooding from Reservoirs.**

Canals and Artificial Water Bodies

There are no canals and other artificial water body in the site area apart from natural watercourses running across the site area and therefore this source poses no flood risk to the wider development area unaffected by flooding. With the foregoing in consideration, the site is deemed to be at **low risk of flooding from Canals and Artificial Water Bodies.**

Groundwater Flooding

Groundwater flooding is defined as flooding caused by the emergence of water originating from subsurface strata, with the most common forms being:

- A rise in groundwater from unconfined permeable soils (such as chalk), or shallow perched water tables after periods of heavy rainfall; or
-
- A rise in groundwater in unconsolidated permeable superficial deposits, which are in hydraulic continuity with local river levels and where the hydraulic gradient of the water table is low.

Based on the SFRA, the entire site is deemed to be at low risk of groundwater flooding except for the natural watercourses running along the western-south area, southern leg and north eastern area. It is considered that groundwater could be shallow on the site and shallowest in proximity to the onsite watercourses. With the foregoing in consideration, the site with the exception of the overland western-south area, southern leg and north eastern area watercourses flooding locally, the remaining site area is deemed to be at **low risk of groundwater flooding**, unless further intrusive site investigation identifies evidence to the contrary, such as perched water or similar.

Sewers and Artificial Drainage Systems

No public sewers are identified on the site and there are no known instances of flooding from overwhelmed sewers affecting the site. The risk of flooding from overwhelmed sewers is therefore assessed as Low. The SFRA does not find or mention any flooding in the area surrounding the application site. With the foregoing in consideration, the site is deemed to be at **low risk of sewers flooding.**

Failure of Utilities Infrastructure

It should be noted that burst water mains and failure of sewerage infrastructure could inherently pose a residual risk to any site. Assuming an adequate provision of buffer zones to allow overland flow paths along proposed infrastructure routes to be safeguarded, and accommodation of any sewer and utility easements within the future development layout, then utility and sewerage infrastructure are not deemed to pose a significant flood risk to the site. With the foregoing in consideration, the site is deemed to be at **low risk of flooding due to failure of utilities infrastructure.**

Tidal Flooding

Due to its inland location, the risk of tidal flooding to the site is considered negligible. With the foregoing in consideration, the site is deemed to be at **low risk of tidal flooding.**

Surface Water Flooding

The SFRA does not find or mention any surface water flooding at the application site with the exception of the watercourses flooding locally. With the foregoing in consideration, the remaining areas of the site are deemed to be at **low risk of surface water flooding**.

Overland Flow

Based upon the topography of the site and surrounding area, there is limited potential for surface water from **off-site** areas to progress overland toward the road or built development proposals, which is reinforced by interrogation of EA mapping. With the foregoing in consideration, the site, with the exception of the watercourses flooding locally, the remaining area of the site is deemed to be at **low risk of flooding** due to overland surface water flows.

Summary

FLOODING SOURCE	RISK
Fluvial Flooding (excluding existing natural watercourse)	Low
Failure (Breaching) of Flood Defences and Management Measures	Low
Reservoirs	Low
Canals and Artificial Water Bodies	Low
Groundwater Flooding	Low
Sewers and Artificial Drainage Systems	Low
Failure of Utility Infrastructure	Low
Tidal Flooding	Low
Surface Water Flooding (except for watercourse)	Low
Overland Flow from off-site areas (except for watercourse)	Low

Eastleigh Borough Council has a number of permissive powers under the Land Drainage Act 1991 for the prevention and mitigation of flood damage from ordinary watercourses and also responsibility for managing flood risk encompassed in planning legislation. Eastleigh falls within the Environment Agency's South East region. The Environment Agency has a supervisory role over all aspects relating to flood defence with a more specific role to the maintenance of main rivers. The borough is served by Southern Water supplying foul and surface water sewerage systems. Southern Water is also responsible for the maintenance of these networks.

SECTION 04
CLIMATE CHANGE

4. CLIMATE CHANGE

4.1. Anticipated Development Lifecycle

The NPPF requires development to take account of the impacts of climate change. The allowances to be made for climate change effects when assessing flood risk are related to the lifetime of the development. In accordance with the PPG, NPPF and best practice, a 100-year development lifecycle has been assumed for the proposed development of the site for predominantly residential end-use.

4.2. Climate Change Allowances

EA guidance "*Flood Risk Assessments: Climate Change Allowances*" (2022) outlines the required climate change allowances to be adopted when interrogating existing flood data and for use in the design of future surface water drainage systems.

Table 1 of 'Flood risk assessments: climate change allowances' gives the peak river flow allowances by river basin district for 3 categories: central, higher central and upper end, and 3-time frames. The appropriate allowance to use depends on the flood zone and the flood risk vulnerability classification of the development.

With reference to Table 1 of 'Flood risk assessments: climate change allowances' the appropriate allowances to use for the South East **river** basin district are the higher central and upper end allowances. The total potential change anticipated for 2070 to 2115 is given as 45% for the higher central category and 105% for the upper end category.

Table 2 of the same document also outlines that an extra 40% climate change allowance should be adopted for all peak **rainfall** intensities for the purposes of new surface water drainage design. This again assumes the 'upper end' value and a 100-year development lifecycle.

Department for Environment Food & Rural Affairs data services platform for the River Test and Itchen Management Catchment peak rainfall allowances, 3.3% annual exceedance rainfall event provides Central allowance 2050s epoch of 20% and 2070s epoch of 25%, Upper end allowances are given as 35% and 40% respectively. It also provides for a 1% annual exceedance rainfall event at the Central allowance for 2050s epoch of 20% and 2070s epoch of 25%, Upper end allowances are given as 40% and 45% respectively.

In addition, a building development creep allowance of 10% should be adopted in the calculations for new surface water drainage design within new housing conurbations.

4.3. Impacts on Flood Risk

Therefore, in terms of providing an acceptable standard of protection against flooding for new Internal Distributor Road and associated development, no flooding of the road or property should occur as a result of the 'design flood' corresponding to a 1 in 100-year fluvial flood event, or a 1 in 200-year tidal flood event, taking account of climate change and development creep. However, as this report primarily focuses on the construction of the road it is anticipated that this construction would not be considered appropriate to include 10% allowance for creep within separate modelling calculations.

SFRA and EA mapping confirms, apart from the existing natural watercourses, the site remains unaffected by fluvial or surface water flooding up to and including the 1% (1:100 year) AEP event, including an allowance for climate change and creep. Detailed EA mapping has also been interrogated with regard to the area of the site subject to Flood Zone 1 conditions, considering an appropriate climate change allowance.

The impact of climate change over the lifetime of the development must be taken into account within the assessment of post-development surface water runoff and subsequent design of surface water drainage systems for the proposed site.

4.4. Impacts on Proposed Surface Water Drainage Design

The impact of climate change over the lifetime of the development must be taken into account within the assessment of post-development surface water runoff and subsequent design of surface water drainage systems for the proposed site. SUDS systems will necessarily respect the Simple Index Approach for ensuring water quality is not impacted.

4.5. SuDS Management Train & Proposed SuDS Features

In accordance with the discharge hierarchy, the proposed development will discharge surface water to an existing ditch, Foxwood Stream and its tributary. The surface water discharged from the Internal Distributor Road and the nearby catchments will flow towards the SUDS feature which will be located within each catchment area.

SECTION 05

POLICY CONSTRAINTS AND IMPLICATIONS TO THE DEVELOPMENT

5. POLICY CONSTRAINTS AND IMPLICATIONS TO THE DEVELOPMENT

5.1. Sequential Test

The Sequential Test as outlined within the NPPF gives preference to locating new development in areas at lowest risk of flooding (i.e. Flood Zone 1) and requires developers to:

> "*… demonstrate that there are no reasonably available sites in areas with a lower probability of flooding that would be appropriate to the type of development or land use proposed*"

Paragraph 157 of the NPPF states:
'All plans should apply a sequential, risk-based approach to the location of development - taking into account the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property.'

Paragraph 158 of the NPPF goes onto state:
'The aim of the sequential test is to steer new development to areas with the lowest probability of flooding. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding. The strategic flood risk assessment will provide the basis for applying the test. The sequential approach should be used in areas known to be at risk now or in the future from any form of flooding.'

Paragraph 160 of the NPPF states:
'The application of the exception test should be informed by a strategic or site-specific flood risk assessment, depending on whether it is being applied during plan production or at the application stage. For the exception test to be passed it should be demonstrated that:

a) the development would provide wider sustainability benefits to the community that outweigh the flood risk; and
b) the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.'

Paragraph 161 of the NPPF goes onto state:
'Both elements of the exception test should be satisfied for development to be allocated or permitted.'

Whilst it is ultimately the responsibility of the Local Planning Authority to undertake this test, the principle of siting residential development on this site has already been firmly established.

Similarly, redevelopment of a site which is wholly situated within Flood Zone 1 and where all future proposed built development can be sited within Flood Zone 1, will easily satisfy the requirements of the Sequential Test as no reasonably available alternative sites, at a lower risk of flooding, are expected to be identified.

With the foregoing in consideration, it is **likely** that the requirements of the sequential test would be satisfied.

5.2. Flood Risk Vulnerability

PPG Table 2: Flood Risk Vulnerability Classification (summarised below), identifies that transport infrastructure (including mass evacuation routes) which has to cross the area at risk are considered as a **'Essential Infrastructure'** use.

CLASSIFICATION	EXAMPLES OF USE
Essential Infrastructure	▪ Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. ▪ Essential utility infrastructure which has to be located within a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operation in times of flood. ▪ Wind turbines.
Highly Vulnerable	▪ Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding. ▪ Emergency dispersal points. ▪ Basement dwellings. ▪ Caravans, mobile homes and park homes intended for permanent residential use. ▪ Installations requiring hazardous substances consent.
More Vulnerable	▪ Hospitals. ▪ Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. ▪ Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. ▪ Non-residential uses for health services, nurseries and educational establishments. ▪ Landfill and sites used for waste management facilities for hazardous waste. ▪ Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable	▪ Police, ambulance and fire stations which are not required to be operational during flooding. ▪ Buildings used for shops, financial, professional and other services, restaurants, cafes and hot food takeaways, offices, general industry, storage and distribution, non-residential institutions not included in the 'more vulnerable' class and assembly and leisure. ▪ Land and buildings used for agriculture and forestry. ▪ Waste treatment (excl. landfill and hazardous waste facilities). ▪ Minerals working and processing (except for sand and gravel working). ▪ Water treatment works which do not need to remain operation during times of flood. ▪ Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place.
Water-Compatible Development	▪ Flood control infrastructure. ▪ Water transmission infrastructure and pumping stations. ▪ Sewage transmission infrastructure and pumping stations. ▪ Sand and gravel working. ▪ Docks, marinas and wharves.

- Navigation facilities.
- Ministry of Defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.
- Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.
- Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

5.3. Flood Zone Compatibility

PPG Table 3: Flood Risk Vulnerability and Flood Zone Compatibility (summarised below), confirms that the site is appropriate for 'Essential Infrastructure' and 'More Vulnerable' uses in Flood Zone 1 and Flood Zone 2 without the need for application of the Exception Test. In Flood Zone 3a the more vulnerable, which includes dwelling houses, and essential infrastructure, uses should only be permitted in this zone if the Exception Test is passed. In Flood Zone 3b new residential development should not be permitted but essential infrastructure is appropriate in this zone if the Exception Test is passed.

FLOOD ZONE	ESSENTIAL INFRASTRUCTURE	HIGHLY VULNERABLE	MORE VULNERABLE	LESS VULNERABLE	WATER COMPATIBLE
Zone 1	Permitted	Permitted	Permitted	Permitted	Permitted
Zone 2	Permitted	Exception Test Required	Permitted	Permitted	Permitted
Zone 3A	Exception Test Required	Not Permitted	Exception Test Required	Permitted	Permitted
Zone 3B	Exception Test Required	Not Permitted	Not Permitted	Not Permitted	Permitted

5.4. Functional Floodplain

The existing natural watercourses impose flood zones 2 and 3 to the immediate areas to the sides of the watercourse runs. However, the majority of the site and locations of the proposed Internal Distributor Road is not located within an area designated as functional floodplain Zone 2, 3A, 3B and therefore no constraints apply to the proposed development other than at watercourse crossing points where the design will cater for the flood risk and the watercourse.

5.5. Off-site Impact

If the site is redeveloped, roads or residential, there is the potential to exacerbate flood risk elsewhere (off-site).

This said, adequate site area is available within the application boundary to mitigate any loss of flood conveyance capacity that may result from the proposed development. SUDS and pond features are being designed to ensure adequate provisions.

Furthermore, provided that surface water run-off generated from the proposed development and Internal Distributor Road will be managed on-site in a sustainable manner, then no detrimental off-site impact is anticipated.

5.6. Safe Access and Egress

Safe (dry) access and egress via the proposed Internal Distributor Road is maintained at the site for well beyond the 1% (1:100 year) fluvial event + climate change + creep allowances, and therefore the associated requirements of the NPPF and PPG are satisfied.

5.7. Local Plan Requirements

In addition to the requirements set out within the NPPF (2021) and the PPGs, the Eastleigh Borough Council Local Plan review (2001 – 2011) contains saved policies relevant to this assessment:

- Policy 41.ES – Development affecting water courses.
  Limits development as required by PPSs 25 and 9 and PPG20
- Policy 42.ES – Development in a catchment of a water course.
  Limits development in areas at risk of flooding as required by PPS25
- Policy 43.ES – Areas at risk of flooding.
  Limits development in areas at risk of flooding as required by PPS25
- Policy 44.ES – Development in areas at risk of flooding
  Limits development in areas at risk of flooding as required by PPS25
- Policy 45.ES – Sustainable Drainage.
  Controls development giving rise to risk of flooding as required by PPS25

The Eastleigh Borough Local Plan 2016 – 2036 was Adopted in April 2022. The following policies in the Adopted Local Plan are relevant to this assessment:

Eastleigh Borough Local Plan 2016-2036, Chapter 5: Development Management Policies, provides:

- Policy DM3 – Adaptation to climate change.
- Policy DM5 – Managing flood risk.
- Policy DM6 – Sustainable surface water management and watercourse management.
- Policy DM10 – Water and Waste Water.
- Policy DM11 – Nature conservation.

5.8. Compliance Summary

In order to comply with Eastleigh Borough Local Plan, the following steps will be taken:

- As the proposed new Internal Distributor Road routes are located within Flood Zone 1 except for crossing points within the overall red line area, roads and properties within flood zone 2 or 3 will not be proposed or built except for the crossing points and therefore a Sequential Test is not required.
- Incorporating thorough SuDS features as a method of alleviating and storing surface water run off
- Installing swales and ponds for surface water storage, if required

- Complying with Building Regulations and all relevant legislation
- Incorporating water butts for new residential developments, as required
- Maintaining the water quality through the use of swales, ponds, catchpits, sumps and gullies to intercept any contaminants before they reach infiltration systems or discharge into the watercourse.
- Ensuring the future proofing of the design by allowing for climate change and creep when calculating required storage volumes

SECTION 06

PROPOSED FLOOD MITIGATION AND MANAGEMENT MEASURES

6. PROPOSED FLOOD MITIGATION AND MANAGEMENT MEASURES

6.1. Siting of the Built Development

As the proposed roads are to be located within Flood Zone 1 only, except for the watercourse crossing points, hence there is no need to consider alternative locations or designate areas for flood compensation.

6.2. Elevation of the Development Platform

In accordance with Highway and Building Regulations, it is recommended that the Internal Distributor Road will be 300mm above any predicted flood levels and finished ground floor levels be set a minimum of 150 mm above immediately adjacent ground levels for all proposed buildings, with the exception of level thresholds at access points.

6.3. External Ground Levels

It is considered that no significant criteria need be adopted for the setting of external ground levels, assuming these will not be significantly reduced or increased from existing, as above.

It is recommended that external levels are maintained below the proposed Internal Distributor Road levels and that residential property thresholds are not lower than the road levels without adequate flood resilience.

6.4. Fluvial Flood Storage Compensation

As the proposed site is categorised as being at low risk of Fluvial Flooding, there is no need to provide any compensation or mitigation for Fluvial Flooding

6.5. Overland Flow Routes

Pluvial Flooding (or surface runoff flooding) is caused by rainfall and is that flooding which occurs due to water ponding on or flowing over the surface before it reaches a drain or watercourse or SuDS system.

Any surface water run-off, including exceedance flows, can be appropriately conveyed to a new surface water SUDS drainage system whilst avoiding the road and proposed built development and key infrastructure (i.e., substations).

All proposed highways and associated drainage will be designed in accordance with current Highways Act and Building Regulations criteria, and SuDS adopting overland flow routes for the conveyance of excess floodwater toward areas of low vulnerability and water compatible end use (such as open space and soft landscaping), where water may be temporarily detained, if required.

SECTION 07

SURFACE WATER DRAINAGE

7. SURFACE WATER DRAINAGE

7.1. Context

Without mitigation and consideration, the proposed redevelopment of the site and the new Internal Distributor Road could lead to an unacceptable increase in the rate and volume of surface water generated from the site.

To comply with current guidance and best practice, sustainable drainage systems (SuDS) will be required, to be implemented in order to manage the volume, rate and quality of surface water discharged off-site.

In terms of volume control, where reasonably practicable, for greenfield development, the runoff volume in the 1 in 100-year, 6-hour rainfall event should never exceed the greenfield runoff volume for the same event. Where reasonably practicable, for developments which have been previously developed this runoff volume must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume but should never exceed the runoff volume prior to redevelopment for that event. Where it is not reasonably practicable to constrain the volume of runoff as described it must be discharged at a rate that does not adversely affect flood risk. A separate modelling study demonstrates through evidenced based facts that the design will not be affected by flooding and flooding will not be exacerbated elsewhere.

Guidance on the design and construction of SuDS is provided in the 'Interim Code of Practice for Sustainable Drainage Systems', published by the National SUDS Working Group in July 2004 and in other CIRIA documents including The SuDS Manual 2015 (CIRIA C753), in the Environment Agency's document entitled 'Sustainable Drainage Systems (SUDS) An introduction', as well as in the Design and Construction Guidance (DCG) published by Water UK.

A sustainable drainage strategy, involving the implementation of SuDS, is proposed for managing surface water on the site wherever feasible. A full range of SuDS techniques has been considered for use on the site. Through early discussions with the Lead Local Flood Authority and other stakeholders it was agreed that the Strategic SuDS features on the site should include above ground storage features, ponds and swales, within the green corridors that follow the onsite watercourses.

Additional source control measures should be utilised within the upstream development parcels. This approach provides flexibility for the detailed design of individual development parcels whilst maximising the water quality, water quantity, amenity and biodiversity benefits of the overall SuDS strategy.

The SuDS Manual 2015, and CIRIA C687 'Planning for SuDs - making it happen', promote the use of a SuDS 'management train', which seeks to address the quality and quantity of runoff at all stages of a drainage system. It uses a hierarchy of techniques, namely: i) prevention, ii) source control, iii) site control and iv) regional control. The drainage strategy for the proposed Internal Distributor Road and associated development seeks to follow the concept of a SuDS management train.

A SuDS 'management train' approach is proposed to be implemented on the site. In terms of the SuDS 'management train', the surface water management strategy for the proposed Internal Distributor Road and development seeks to address the quality and quantity of runoff as follows:-

i) Prevention

Prevention is the use of good site design and housekeeping measures to prevent pollution. Good site design and housekeeping measures that should be considered include:

▪ Minimising the impermeable areas created on the site by providing permeable road surfaces and soft landscaping and planting wherever possible.
▪ Good site wide housekeeping and maintenance to minimise blockages and prevent pollution arising.
▪ Provision of water butts for rear gardens.
▪ The use of green roofs for public / commercial buildings where appropriate.
▪ The use of rainwater harvesting / reuse systems for public / commercial buildings and irrigation where appropriate.
▪ Installation of separators and other proprietary pollution control systems where land use requires or specific risks necessitate their use.
▪ Silt traps and trapped gullies to retain sediment.
▪ Planting within landscaped areas to encourage nutrient / pollutant uptake and evapotranspiration.
▪ The implementation of a SuDS Maintenance Strategy. Advice on what should be included within a maintenance strategy for the Strategic SuDS Features is included with this report. The SuDS Maintenance Strategy should become a living document that is continuously reviewed.

ii) Source Control

Source control is defined in The SuDS Manual 2015 (CIRIA C753) as the control of runoff at or near its source, so that it does not enter the drainage system or is delayed and attenuated before it enters the drainage system. Source Control techniques that should be used within road and development parcels include the following:

▪ Pervious Paving: Pervious paving intercepts rainfall that lands on its surface before it can run overland into the downstream drainage system. This provides a degree of interception, particularly in the most polluted first-flush events, as well as filtration through the various layers of construction and through the stone sub-base. Pervious paving will be used for the road design and would typically be used for parking areas such as driveways, parking courts and car parks. Through the inclusion of a suitable flow control device, the stone sub-base in the pervious paving structure can be utilised to provide additional attenuation storage.

▪ Bioretention Areas / Rain Gardens / Swales / Ponds: Bioretention areas utilise planting and constructed soils to intercept rainfall from their contributing catchment areas and contribute to interception storage, evapotranspiration and pollution removal. They can also be incorporated into traffic calming infrastructure such as build outs and into roadside planting and tree pits. Bioretention Swales can be installed adjacent to larger areas of highway to provide water quality treatment and attenuation storage along their length. Ponds serve as attenuation and storage and provide a wide range of biodiversity benefits.

▪ Other filtration techniques: Filter Trenches and French Drains can be used to intercept runoff from larger parking areas and highway areas, if required. These will provide interception storage and filtration through the stone fill within the trenches.

iii) Site Control

Site control is the management of water from roads and sub-catchments within a development parcels. Through close consultation with the layout designers flow conveyance measures such as swales, ponds and filter trenches can be incorporated into the development parcels to provide additional attenuation, treatment, amenity and opportunities for habitat creation.

iv) Regional Control

Regional control is the strategic management of runoff across the wider site. The Strategic SuDS Features will provide the attenuation volume and flow control required to reduce post-development flow rates to below greenfield runoff rates.

The proper implementation of a SuDS management / treatment train using a combination of upstream source control and strategic SuDS features will create greater resilience and allow the system to collect silt at various points which can then be removed as part of periodic maintenance.

Detailed design of the road and individual development parcels should, where possible, create a diverse SuDS scheme that encourages sedimentation, filtration and biological uptake throughout the site; ensuring that effective maintenance and management procedures are followed and will be the key to ensuring the overall effectiveness of the SuDS scheme.

Detailed design of the road and individual development parcels should, where possible, create a diverse SuDS scheme that incorporates the principles of the SuDS 'management train'.

7.2. SuDS Constraints

Geology

A site investigation is reported to have been undertaken by Hydrock in April 2019. With regards to the use of soakaways / infiltration drainage on the site, the Ground Investigation Report concluded the following: -

> *"Soakaway drainage is considered unsuitable for this site, subject to further BRE365 compliant testing."*

With regards to groundwater the Ground Investigation Report states the following: -

> *"Groundwater was not encountered during the investigation."*
>
> *"Water levels recorded post-fieldwork range from 0.93m bgl to 2.77m bgl (15.86m OD to 29.66m OD)."*

Based on the foregoing it is considered that the use of soakaways would not provide a suitable means of draining surface water runoff from the roads or the development on the majority of the site. However, in line with the recommendations of the Ground Investigation Report, it is recommended that localised infiltration testing is undertaken within the individual development parcels to identify any localised areas of the site where infiltration drainage may be feasible.

Groundwater monitoring is on-going in the locations of the proposed Strategic SuDS features to establish the highest annual groundwater levels to inform the detailed design of these features; it is noted that the winter Groundwater monitoring report is available.

Topography

The site predominantly slopes from East to West from an elevation of 28.14m to 20.59m with an approximately gradient of 1 in 12. However, the site falls from North to South from an elevation of 26.00m to 20.784m with an approximate gradient of 1 in 92m. The application site falls towards Foxwood Stream and its tributaries.

Trees

The siting and location of proposed SuDS features may be constrained by any proposal to retain established trees and to plant new trees, although requiring new drainage and SuDS features to be positioned outside of any root protection zones.

Public Safety and Maintenance

It is intended to fully utilise SUDS train management systems and the existing watercourses, it is unlikely that below ground geocellular drainage units for surface water will be required. It is intended to work with nature and enhance biodiversity opportunities.

Consideration must also be given to the access and future maintenance of these features, which lend themselves to significant landscaped areas remaining under private ownership.

Additional biodiversity and SuDS benefits could be achieved via the incorporation of 'above ground' systems such as swales, ponds, rainwater harvesting and water butts, within the development proposals.

7.3. Required Maintenance Schedule

To ensure the long-term performance of the proposed DS, the onsite drainage system will be owned and maintained by the site operator or a maintenance company (MC) in accordance with the indicative schedule below, in the alternative the local authority may wish to adopt such features. However, at the detailed drainage design stage a full management and maintenance plan detailing best practice system maintenance regimes and proprietary manufacturer requirements and lifecycle management, in accordance with the CIRIA SuDS Manual will need to be produced. In the absence of local authority adoptions, maintenance of the overall drainage network will be the responsibility of an appointed management company.

ELEMENT / DRAINAGE COMPONENT	OWNERSHIP / ADOPTION	MAINTENANCE REQUIREMENTS
Geocellular Attenuation Tank (if required)	Site Operator / MC	To be monitored for silt build-up and cleaned as required using suction methods, ensuring no solid material passes through outlet. Monitored for general condition of the tank and system generally, to suit manufacturer's guidance, check for leaks and displacement of 'cells'. **Inspection annually and before / after extreme storm events**.
Permeable Paving	Site Operator / MC	Non-aggressive brushing of the whole surface (avoiding disruption of the jointing material, with suction rates adjusted, based on a trial), either manually or mechanically carried out annually. Top up of the gritstone may be required after cleaning. Weed control – excessive weed growth can be managed by localised spot-treatment with weed killers, in accordance with suppliers' recommendations. **Inspection annually.**
Flow Restriction Device & Chamber	Site Operator / MC	To be monitored for silt build-up and cleaned as required using suction methods. Check function of flow restriction componentry to suit manufacturer's guidance. **Inspection annually and before / after extreme storm events**.
Catchpit Manholes	Site Operator / MC	To be monitored for silt build-up and cleaned as required using suction methods. **Inspection annually and before / after extreme storm events**.
Rain Water Pipes	Site Operator / MC	Clearance of leaves / debris from guttering and hopper inlets. Rodding points provided to clear blockages via conventional rodding methods. **Inspection annually and before / after extreme storm events.**

Soil Vent Piles / "Stub Stacks"	Site Operator / MC	Rodding points to be provided to clear blockages via conventional rodding methods. **Inspection annually**.
Gullies (Internal & External)	Site Operator / MC	To be monitored for silt build-up and cleaned as required. Where provided, ensure air traps are primed and sealed to prevent smells. **Inspection quarterly.**
Swales	Site Operator / MC	To be monitored for litter and debris. Strimming to remove overgrown vegetation twice yearly. Removal of self-seeded saplings to prevent new tree growth. Monitor for silt build up and remove and spread locally outside design profile as required. **Inspection quarterly and before / after extreme storm events.**
Ponds	Site Operator / MC	To be monitored for litter and debris. Careful strimming to remove overgrown vegetation twice yearly. Removal of self-seeded saplings to prevent new tree growth. Monitor for silt build up and remove and spread locally outside design profile as required. **Inspection quarterly and before / after extreme storm events.**

SECTION 08

FOUL WATER DRAINAGE

8. FOUL WATER DRAINAGE

The existing development site area is not crossed by any public foul sewers. Where appropriate it should be proposed to connect to an existing Public Foul Sewer network operated by Southern Water supplying foul and surface water sewerage systems.

The Foul sewers built as part of any new development must be constructed in accordance with Building Regulations Part H and where offered for adoption, to the local water company, in accordance with the latest technical guidance for the Design And Construction Guidance (DCG) April 2020.

SECTION 09
CONCLUSION

9. CONCLUSION

- Ridge & Partners prepared this Flood Risk Assessment on behalf of Eastleigh Borough Council. The proposed development has been designed in full accordance with the Development Plan and Outline Planning Application (OPA) O/20/89498, which has a resolution to grant consent subject to S106 negotiations relating to education. This application is for full planning consent due to the time for these negotiations to complete. Submitting details of the Secondary Infrastructure Road (SIR) as a full planning application will deliver the SIR in accordance with, and as part of the OPA, but enable commencement more quickly than waiting for the resolution of the OPA S106 and the determination of an application for Reserved Matters Approval of details of the SIR.

- Flood risk has been assessed in line with NPPF (2021), BS 8533 (2017), BS BS 8582 (2013), CIRIA C624 (2004) and SuDS Manual (C753) (2015), taking into account national and local planning policy and guidance to consider all potential sources of flooding to the site.

- Apart from the watercourse causing local bank-full and local overland flooding the remaining site area is in Flood Zone 1, although there are two additional tributary watercourses that will need to be crossed. However, apart from the watercourses there is no recorded flooding from any other sources, neither historical flooding nor specific event records, apart from the watercourses.

- Flood risk to the site from other potential sources such as surface water, ground water, sewers and infrastructure are also all considered low, with no significant flood risks identified. Soil Investigations and winter period borehole monitoring have been completed as referenced in Section 2.2.

- Based upon current information provided by the EA, the carefully selected site areas for the Internal Distributor Road and residential development within the site area are demonstrated to be at low probability of flooding (Flood Zone 1) from fluvial sources.

- Based upon our initial appraisal of flood risk, mitigation measures should be utilised to manage residual flood risks to the site. However, it is felt that the recommended measures are readily deliverable and would not unduly hinder or prevent the Internal Distributor Road construction or the redevelopment of the site.

- Development of the Internal Distributor Road and site within Floor Zone 1 areas only, with appropriate mitigation measures as outlined within this document, should readily satisfy the requirements of the Sequential Test as no reasonably available alternative sites, at a lower risk of flooding are expected to be identified. There is no requirement for the proposed development to be subject to the Exception Test. Adequately modelled and designed Internal Distributor Road crossing points over watercourses have been demonstrated.

- Surface water generated from the proposed Internal Distributor Road and development could be managed in a sustainable manner and at source by employing a wide variety of SuDS as far as possible with the support of enhanced biodiversity.

- Foul sewage from all new development should be connected to an existing public foul sewer system, subject to permission to connect or alternatively to new sewerage provisions with appropriate management and maintenance.

- The technical assessment of flood risk presented within this document demonstrates that the immediate and residual flood risks over the lifetime of the Internal Distributor Road and development are readily manageable and the redevelopment proposals are deemed acceptable in terms of flood risk throughout their lifetime, without increasing flood risk elsewhere.

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