

Land at Dutton Lane, Eastleigh

Flood Risk Assessment & Drainage Strategy

January 2026

Determinari-001 Ltd

AMA Project Number: 300402

Andrew Moseley Associates

15 St Paul's Street

Leeds

LS1 2JG

www.amatp.co.uk

info@amatp.co.uk

REPORT QUALITY MANAGEMENT

	First Issue	Revision 1	Revision 2	Revision 3
Remarks	Planning			
Date	January 2025			
Prepared	CS			
Checked	AY			
Authorised	GS			

REPORT PRODUCTION TEAM

Name	Initials	Job Title
Caitlin Shearer	CS	Graduate Flood Risk Engineer
Aaron Yesudian	AY	Principal Flood Risk and Drainage Engineer
Gavin Shepherd	GS	Associate Director

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1 INTRODUCTION

- 1.1.1 This Flood Risk Assessment (FRA) and Outline Drainage Strategy (DS) has been provided at the request of Determinari-001 Ltd, hereafter referred to as “the client”, to assess the flood risks associated with the proposed development of Land at Dutton Lane, Eastleigh, hereafter referred to as “the site”.
- 1.1.2 The purpose of this FRA and DS is to:
- ▶ Identify the possible hazards posed from all major sources of flooding (fluvial, surface water, groundwater, infrastructural and coastal sources);
 - ▶ Provide a qualitative assessment of the probability of each potential flood hazard representing a constraint on the proposed development, based on the proposed land use type for the development and likelihood of flood occurrence;
 - ▶ Investigate and define any potential drainage impacts associated with the site;
 - ▶ Conceptually determine and define necessary surface water management controls to ensure no exacerbation of flood risk on the site or to external receptors due to any increase in surface water runoff; and
 - ▶ Recommend appropriate and necessary mitigation measures and additional assessments that may be required to progress the sustainable development of the site.
- 1.1.3 The FRA and DS comprises the following:
- ▶ A desktop review of publicly available information, including information from the Environment Agency (EA) and Hampshire County Council who are the Lead Local Flood Authority (LLFA) for the proposed development area; and
 - ▶ An assessment and outline design of hydraulic controls and drainage requirements and drainage elements required to support the development of the site.
- 1.1.4 This report further details the methodologies employed within this study and provides recommendations as to any further work or investigations required to support the development of the site through the planning application process.

1.2 REGULATORY POLICY AND LEGISLATION

- 1.2.1 This assessment has been carried out in line with the current Government legislation, the National Planning Policy Framework (NPPF) 2024.
- 1.2.2 It has been assessed with reference to the following documents and legislative guidelines:
- ▶ CIRIA 753 The SUDS Manual V8 (2018);
 - ▶ DEFRA “Flood Risk Assessment Guidance for New Developments” (2006);
 - ▶ DEFRA “Surface Water Management Plan Technical Guidance” (2010);
 - ▶ BS 8533 2017 Assessing & Managing Flood Risk in Development Code of Practice (2017);
 - ▶ BS 8582:2013 Code of practice for surface water management for development Sites (2013);
 - ▶ National Planning Practice Guidance (2012 – updated 2022);
 - ▶ C624 Development and Flood Risk – Guidance for the Construction Industry’ (2004);
 - ▶ Sewage Sector Guidance (2022);
 - ▶ Planning Policy Guidance – Flood Risk and Climate Change (2014 – updated 2022).
- 1.2.3 In addition to the above, this report has also been informed by the following documents:
- ▶ Eastleigh Borough Local Plan (2016-2036)
 - ▶ South Hampshire Level 1 Strategic Flood Risk Assessment 2023

1.3 SCOPE OF FLOOD RISK ASSESSMENT

- 1.3.1 The objective of this analysis and report is to provide an FRA in accordance with local and national guidance.
- 1.3.2 The detail and complexity of the FRA will reflect the level of risk to the site and consider the appropriateness of the proposed development type. This will also include assessment of potential risk to property and livelihoods, consideration of climate change, and the definition of appropriate flood risk mitigations required to satisfy the planning process.
- 1.3.3 Based on the assessment of requirements for a site-specific FRA as defined within NPPF 2024 technical guidance, the site is indicated as being located within Flood Zone 1, however as the site is larger than 1 ha it is necessary to provide a site-specific FRA. Flood Zone 1 refers to an area assessed as having less than 1 in 1,000 annual probability (<0.1%) of river or sea flooding in any one year.
- 1.3.4 Similarly, as the site is indicatively located in an area that may be subject to other assessable sources of flooding, such as pluvial (surface water) flooding, it is necessary to undertake a further site-specific assessment to verify the proposals for development.
- 1.3.5 Policy DM5 of the Eastleigh Borough Local Plan states that all future development must ensure that:
 - ▶ Development will only be permitted within the areas at risk of flooding, now and in the future, as identified on the Environment Agency most recent flood maps and the Council's Strategy Flood Risk Assessment provided that:
 - It meets the sequential and exception test (where required) as outlined in Government guidance;
 - A site-specific flood risk assessment demonstrates that the development, including the access, will be safe without increasing flooding elsewhere, and where possible, will reduce flood risk overall;
 - The scheme incorporates flood protection, flood resilience and resistance measures appropriate to the character and biodiversity of the area and the specific requirements of the site where appropriate takes advantage of opportunities to utilise natural flood management techniques;
 - Appropriate flood warning and evacuation plans are in place; and
 - New site drainage systems are designed taking account of events which exceed the normal design standard.
 - ▶ Development should not increase flooding elsewhere.
 - ▶ Sustainable Drainage Systems (SuDS) must be designed in accordance with policy DM6.
- 1.3.6 Potential flood risk at the site has been assessed against the site layout plan, which has been provided as [Appendix A](#) to this report. Significant changes to the site's developable area may necessitate a further review of this document to ensure that risk of flooding is not exacerbated and has been satisfactorily addressed within the development proposal.

1.4 SCOPE OF OUTLINE DRAINAGE STRATEGY

- 1.4.1 Surface water runoff must be effectively managed to ensure that there is no exacerbation of potential surface water flooding issues on the site, or at any external receptors, due to any potential increases in surface water runoff rates and volumes.
- 1.4.2 The drainage hierarchy will be applied in determining the most suitable type and point of discharge of surface waters runoff from impermeable areas on the site. This will ensure that surface water is sustainably managed on the site, and that there is no exacerbation of flood risk elsewhere as a result of undertaking the development. This will be undertaken in accordance with industry best practice principles and guidance, such as the C753 SUDS Manual (2016), Design and Construction Guidance for Sewage Sector (DCGSS) (2020) and applicable sections of the Planning Policy Guidance (PPG).

- 1.4.3 Any increase in surface water runoff rate associated with the development of the site must also be managed in accordance with the guidelines set by LPA, the LLFA for the area.
- 1.4.4 As indicated in Policy DM6 of the Eastleigh Borough Local Plan surface water runoff from the site must adhere to the following:
- ▶ New development (excluding extensions to dwellings and changes of use), will only be permitted if it incorporates Sustainable Drainage Systems (SuDS). Wherever feasible, naturalised filtration should be included within the treatment train as follows:
 - On sites of 1 hectare or more, or within 100m of the River Itchen SAC or Solent Maritime SAC, SuDS schemes should include at least three forms of naturalised filtration. On sites within 100m of headwaters and tributaries draining into a SAC, SuDS schemes should include at least three forms of naturalised filtration unless hydrological studies and project-level Habitat Regulations Assessment demonstrates this to be unnecessary to protect the integrity of the SAC and its qualifying features;
 - On other sites of between 0.5 hectares and 1 hectare, SuDS schemes should include at least two forms of naturalised filtration; and
 - On other sites of less than 0.5 hectares non-naturalised SuDS e.g. permeable paving will be considered where justified.
 - ▶ In order to reduce flooding and maintain water quality (in accordance with DM8) SuDS schemes should:
 - Be designed and monitored in accordance with the CIRIA C753 SuDS Manual or equivalent national or local guidance, noting that all receiving waters in the Borough should be classified as protected waters;
 - Manage surface water runoff as close to its source as possible;
 - Ensure that discharge rates are reduced as far as possible and that on greenfield sites these should be at least mirror greenfield rates before development;
 - Be provided as part of any application for full or outline planning permission;
 - Where discharge is to a wetland or wet woodland habitat, flows off site must mirror the natural hydrological pathways;
 - Include clear arrangements for their whole life management and maintenance.
 - ▶ Where a watercourse is present on a development site, it should be retained or restored into a natural state and enhanced where possible. The culverting of any watercourse will not generally be permitted, and development should wherever possible remove any existing culverts and increase on-site flood storage. Development should be laid out to enable maintenance of the watercourse.
 - ▶ Where development drains into a waterway connected to the Natura 2000 or Ramsar network a site specific Construction Environment Management Plan must be prepared before permission.
- 1.4.5 The outline DS will identify potential opportunities and locations for attenuation infrastructure, as well as potential connection points and provide calculations of permissible discharge rates for runoff generated on site.
- 1.4.6 The outline DS therefore aims to provide surety that any drainage provided as part of the project development can safely and appropriately convey all flows from the site to appropriate discharge locations. This is to ensure sustainable and safe operation within the site, as well as ensuring sustainable operation of any receiving infrastructure. These assessments have been undertaken in accordance with prescribed best practice and building codes, including prioritising the incorporation of SuDS, where appropriate and practicable for the management of surface water.
- 1.4.7 Following the completion of a final site masterplan the drainage scheme proposed within this report should be reassessed to ensure surface water runoff and foul water drainage can be appropriately managed in accordance with best practice and local and national standard requirements.

2 METHODOLOGY

2.1 INTRODUCTION

- 2.1.1 This report aims to demonstrate that the proposed development is sustainable and will not be impacted by or exacerbate flood risk elsewhere through the development of the site. This assessment will account for the effects of climate change, as well as identifying further opportunities to reduce the probability and consequences of flooding within the site locality.
- 2.1.2 This report aims to identify constraints and opportunities for the site based on the development proposals provided by the client ([Appendix A](#)) and provide recommendations for the sustainable provision of drainage and mitigation of any potential flood risk for the site.
- 2.1.3 The assessment methodology is as follows:
- ▶ Desktop review of the geology, hydrology, and other pertinent environmental characteristics of the site, and how these affect flood risk of the proposed development and site drainage.
 - ▶ Obtain and review existing baseline flood risk and drainage guidance information from relevant environmental authorities (EA, LLFA, etc.) as to site specific flood risk from all applicable sources.
 - ▶ Review the findings from the above and advise on the suitability of developing the site for the proposed development in consideration of the applicable flood risk and comment on limitations and opportunities for the site, with recommendations of further mitigation where applicable and appropriate.
 - ▶ Produce indicative design calculations for the Outline DS to determine the requirements for developing the site's surface water drainage and providing adequate storage in line with local planning policy and guidance. This will include the presentation of drawings with an indicative layout for any additional drainage and attenuation infrastructure located on the site.
 - ▶ Review the findings from the above and advise on the suitability of developing the site for the proposed development in consideration of the applicable flood risk and drainage and comment on limitations and opportunities for the site, with recommendations of further mitigation where applicable and appropriate.

3 PROJECT BACKGROUND

3.1 DEVELOPMENT DESCRIPTION AND LOCATION

- 3.1.1 Andrew Moseley Associates (AMA) was appointed by Determinari-001 Ltd to provide a Flood Risk Assessment and Drainage Strategy in support of change of use to open storage, located off Dutton Lane, Eastleigh, Southampton, SO50 6AA, and NGR: SU 45884 19286.
- 3.1.2 The proposed development is located in the area of Eastleigh, approximately 8.8 km from Southampton. Proposals for the site are for open storage use, consisting of a change of use to storage and distribution (B8) in the southern and central portions of the site and general industry/ storage and distribution (B2/B8) in the northern part of the site with associated infrastructure. A site layout can be found in [Appendix A](#).
- 3.1.3 The Local Planning Authority for this development is Eastleigh Borough Council, and Hampshire County Council are the Lead Local Flood Authority for the area.
- 3.1.4 This report has been prepared in accordance with the National Planning Policy Framework (NPPF) and the accompanying technical guidance to assess all forms of flooding including the management of surface water on-site.
- 3.1.5 The site is referenced in [Table 3-1](#) and [Figure 3-1](#) below.

Table 3-1 Site Context

Site Name	Land at Dutton Lane
Location	Eastleigh
NGR (approx..)	SU 45884 19286
Application Site Area (ha)	1.46
General Locality	The site is located on undeveloped previously developed brownfield land and borders residential development to its east, industrial development to its north, the B3037 to its south, and car parking to its west. Pedestrian and vehicular access to the site is provided via Dutton Lane which is located along the eastern boundary of the site.
Development Type	Storage
EA Flood Zone	Flood Zone 1

Figure 3-1 Site Location Plan



3.2 TOPOGRAPHY

- 3.2.1 A topographic survey provided by the client and undertaken by Vertex Surveys (Ref: 251109-01) shows ground levels at the site to be in the region of 14.55 to 15.50 m Above Ordnance Datum (m AOD). The topographic survey can be seen in [Appendix B](#).
- 3.2.2 Further review of topographical data shows site levels to be lowest in the east of the site, while greatest levels are located along the west of the site. A general fall in gradient from west to east is observed across the site.
- 3.2.3 As indicated by aerial imagery, the site consists of areas of hardstanding which make up approximately 100% of the site.

3.3 GEOLOGY AND GROUND CONDITIONS

- 3.3.1 British Geological Survey (BGS) Open Geoscience website indicates that the entire site is underlain by Wittering Formation – sand, silt and clay with overlying superficial deposits of River Terrace Deposits, 1 – sand and gravel.
- 3.3.2 The BGS website information indicates that there is a borehole located in close proximity to the site (borehole records Ref: SU41NE170); which is provided in [Appendix C](#).
- 3.3.3 The borehole is located approximately 112m north of the site. The borehole record show ground conditions to consist of soft light grey and brown sandy clay, which is underlain by soft light brown sandy gravelly clay, angular to sub-rounded gravel of flint, medium dense clayey sand and gravel and dense grey clay with thin bands of grey sands, i.e. ‘varied clay’. Resting ground water levels were found to be in the order of 3.7m below ground level (bgl).
- 3.3.4 Information obtained from the Cranfield University’s Soilscape website indicates that the site is located in an area classified as being Soilscape 6, which is defined as having freely draining slightly acid loamy soils.

3.4 HYDROGEOLOGY

- 3.4.1 According to the Department for Environment, Food and Rural Affairs (DEFRA) MAGIC map, the site is indicated as not being located in a Groundwater Source Protection Zone (SPZ), as defined by the Environment Agency (EA) for the protection of a potable groundwater supply.
- 3.4.2 The site is located as being in an area of medium groundwater vulnerability and located above a Secondary A bedrock aquifer and a Secondary A superficial drift aquifer.

3.5 HYDROLOGY

- 3.5.1 The River Itchen is located approximately 118m to the northeast of the site at its closest point.
- 3.5.2 The EA's Catchment Data Explorer website indicates that the site resides within the Itchen operational catchment and the Itchen sub catchment.

Figure 3-2 Watercourse Location



4 POTENTIAL FLOOD RISK

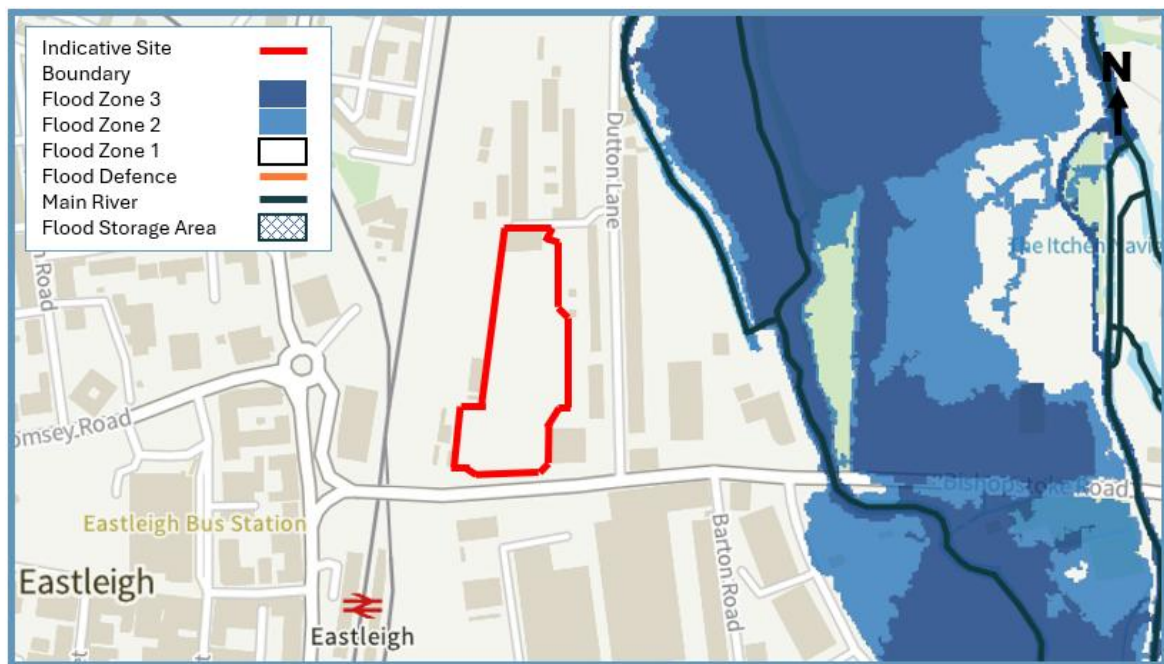
4.1 SOURCES OF FLOODING

- 4.1.1 This report is to consider flood risk from all potential sources. [Section 5](#) then discusses in further detail the probability of flooding, any potential impacts and necessary mitigation, where required.

4.2 ENVIRONMENT AGENCY FLOOD ZONES

- 4.2.1 The EA Flood Map for Planning shows the site is located within Flood Zone 1, which is designated as land having less than a 1 in 1000 probability of river or sea flooding.
- 4.2.2 This potential fluvial/coastal flood risk to the site has been illustrated in [Figure 4-1](#).

Figure 4-1 Environment Agency Long Term Flood Map for Planning



4.3 FLUVIAL AND COASTAL FLOODING

- 4.3.1 It is necessary to consider the risk of fluvial and coastal flooding at the site during both present times and with the impacts of climate change. Therefore, the EA Long Term Flood Risk Map for fluvial and coastal flooding between the years 2036 and 2069 has been presented below in [Figure 4-2](#). This figure indicates that the site is at very low risk of fluvial and/or coastal flooding.

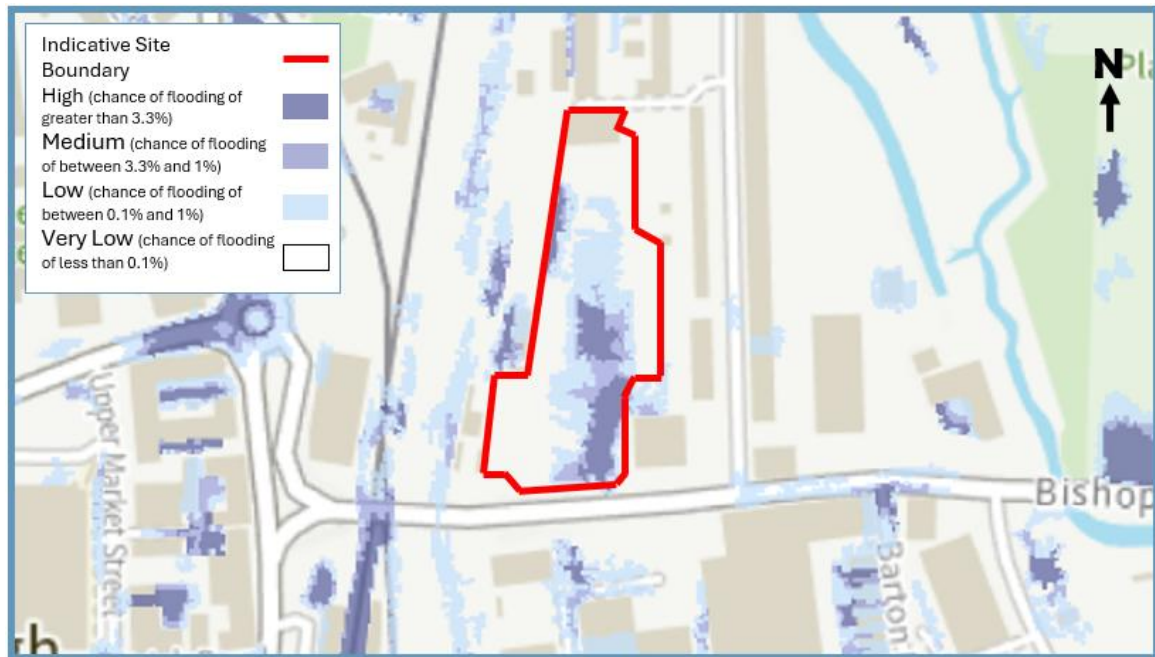
Figure 4-2 Environment Agency Long Term Flood Map – Rivers and Sea – Yearly Chance of Flooding between 2036 and 2069



4.4 PLUVIAL (SURFACE WATER) FLOODING

- 4.4.1 Similarly to that discussed in [Section 4.3](#), the impacts of climate change on the potential for surface water flooding should be considered within the assessment of the flood risk at the site. The EA Long Term Flood Risk Map for surface water flooding between the years 2040 and 2060 is shown below in [Figure 4-3](#). This figure shows that the majority of the site is located in an area at very risk of surface water flooding, with the remainder being located in an area at low to high risk of surface water flooding.
- 4.4.2 The areas at very low risk have less than 0.1% chance of flooding each year. The areas at low risk have between 0.1% and 1% chance of flooding each year. The areas at medium risk have between 1% and 3.3% chance of flooding each year. The areas at high risk have more than 3.3% chance of flooding each year.
- 4.4.3 The area in the west of the site at risk of surface water flooding is not expected to experience flood depths reaching 0.3m. The area in the southeast of the site at risk of surface water flooding has a low risk of flood depths reaching 0.3m. The entire site is not at risk of flood depths reaching 0.6m.
- 4.4.4 As the proposed development of the site may potentially reduce the overall site permeability and potentially increase surface water run-off rates and volumes, the surface water discharge controls must ensure that any proposal for drainage, or discharge, does not adversely impact upon downstream drainage infrastructure or offsite receptors.
- 4.4.5 The site is therefore considered to have low potential risk of flooding from pluvial sources.

Figure 4-3 Environment Agency Long Term Flood Risk Map – Pluvial (Surface Water) Flooding – Yearly Chance of Flooding between 2040 and 2060



4.5 GROUNDWATER FLOODING

- 4.5.1 Ground conditions at the site consist of freely draining slightly acid loamy soils, therefore the propensity for groundwater emergence at the site is considered to be low, and the potential risk of groundwater emergence affecting the site development is considered to be low.
- 4.5.2 However, given the impermeable nature of the proposed site's hardstanding areas subsequent to development, potential elevation of groundwater or groundwater emergence within the superficial geology causing flooding within the site post-development will be largely eliminated.
- 4.5.3 According to the South Hampshire Level 1 SFRA groundwater flooding map presented in [Appendix D](#), the site is at 25% to 50% susceptible to ground water flooding.
- 4.5.4 During long periods of heavy rainfall, the water table within an area can rise above the natural ground level, resulting in groundwater flooding.
- 4.5.5 Site specific investigations should be able to prove the presence of ground water and propose remedial mitigation where required. Flood risk to the proposed development due to groundwater emergence is therefore considered to be low.
- 4.5.6 Flood risk to the proposed development due to groundwater emergence is considered to be low provided that all reasonable and practicable mitigation measures for any subsurface construction associated with the development are adhered to.

4.6 FLOODING FROM ARTIFICIAL SOURCES

- 4.6.1 In accordance with information taken from the EA Long Term Flood Risk information, the site and its surroundings are unlikely to experience flooding from artificial sources such as dam or canal failure. In addition, reservoirs and canals are regularly maintained by relevant local authorities and failure is extremely unlikely. Therefore, the potential risk of flooding from reservoir and/or canal failure is considered to be negligible.

4.7 FLOODING FROM SEWERS

- 4.7.1 The site is brownfield there may be existing sewers within the site. The client has not reported any known instances of sewer flooding within the site. Additionally, the SFRA does not mention any occasions of sewer flooding within the site.

4.8 HISTORIC FLOODING

- 4.8.1 The EA historic flood map shows the site to not have experienced historic flooding.
- 4.8.2 A review of the SFRA confirms the EA historic flood mapping and indicates that the site has not experienced any historic flooding.

5 FLOOD RISK ASSESSMENT

5.1 FLOOD RISK PLANNING POLICY

National Planning Policy Framework

- 5.1.1 The National Planning Policy Framework (NPPF) sets out the Government's national policies on different aspects of land use planning in England in relation to flood risk. Planning Practice Guidance is also available online.
- 5.1.2 The Planning Practice Guidance sets out the vulnerability to flooding of different land uses. It encourages development to be located in areas of lower flood risk where possible and stresses the importance of preventing increases in flood risk off site to the wider catchment area.
- 5.1.3 The Planning Practice Guidance also states that alternative sources of flooding, other than fluvial (river flooding), should also be considered when preparing a Flood Risk Assessment.
- 5.1.4 This Flood Risk Assessment is written in accordance with the NPPF and the Planning Practice Guidance.
- 5.1.5 The EA Flood Map for Planning locates the site within Flood Zone 1, i.e. land assessed as having less than 1 in 1,000 annual probability (<0.1%) of river or sea flooding in any one year.
- 5.1.6 The flood map extents indicated on this map show the potential for flooding from fluvial and coastal sources, and although they are indicative, they are a key tool in defining the appropriateness of a development type or the requirement for further assessment.
- 5.1.7 Under the NPPF (2024), Flood Zone 1 is defined as having a low probability flood risk. The proposed development includes a change of use to open storage, which are defined within Table 2 of the NPPF technical guidance as being 'Less Vulnerable'. Therefore, according to the criteria in Table 3 of the NPPF Technical Guidance (Flood Risk Vulnerability and Flood Zone 'Compatibility'), the proposed development may be deemed as 'Appropriate'.

5.2 SEQUENTIAL AND EXCEPTION TEST

- 5.2.1 Both the NPPG and the SFRA require the 'Sequential Test' to be applied to ensure that proposed developments are carried out in area that are at the least risk of flooding, before considering development in areas that are at risk of flooding. The proposed site falls within Flood Zone 1 and is considered to come under the 'Less Vulnerable' category as a storage development.
- 5.2.2 Based on Table 3 in the National Planning Practice Guidance for Flood Risk and Coastal Change, the proposed use of the site is acceptable due to it being located in Flood Zone 1 and an Exception Test is not required.

Table 5-1 Development Appropriateness Based on Vulnerability and Flood Zones

Flood Risk Vulnerability Classification	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone 1	✓	✓	✓	✓	✓
Flood Zone 2	✓	✓	Exception test required	✓	✓
Flood Zone 3a	Exception test required	✓	x	Exception test required	✓
Flood Zone 3b	Exception test required	✓	x	x	x

5.3 CONCLUSION

- 5.3.1 In light of this assessment against the sites applicable flood zone (Flood Zone 1), further assessment against the sequential or exception test is not required. This should be confirmed with the LPA prior to development of the site.
- 5.3.2 **Table 5-2** summarises the pre mitigation flood risk associated with the site as well as the impacts of the flood risk on the wider catchment prior to mitigation. The mitigation measures proposed to address flood risk issues and ensure the development is appropriate for its location are discussed within **Section 6**.

Table 5-2 Pre-Mitigation Flood Risk Summary

Sources	Probability of Flood Risk	Impacts	Description
Tidal	Very Low	Very Low	The site is located inland and therefore, is not tidally influenced.
Fluvial	Low	Very Low	The site is not shown to be located in an area susceptible to fluvial flooding.
Surface Water (Pluvial)	Medium	Low	Review of information from multiple sources (EA, LLFA) reveals evidence of surface water flooding along the west and southeastern part of the site. The expected flood depths within the site have a low chance of reaching 0.3m.
Groundwater	Low	Very Low	The site is shown to be at risk of ground water flooding; however, given the hard standing nature of the site following development, ground water emergence at the site will be limited.
Artificial Sources	Very Low	Very Low	Review of information from multiple sources (EA, LLFA) reveals no evidence of flooding from reservoirs or canals.
Sewers	Very Low	Low	The risk of flooding from the surcharging of sewers is considered to be low.
Effect of development on wider catchment	Very Low	Low	The impermeable area of the site is being altered.

- 5.3.3 Based on the assessable information presented, the site is considered to meet the requirements of the NPPF, given the assessed potential flood risk posed from all applicable sources, the means of adopting suitable mitigation measures to prevent increase in the potential for flood risk and based on the vulnerability of the development type. Further consideration of necessary surface water run-off

mitigation measures will be provided, so as to address the potential for increase of surface water arising from the proposed development of the site.

6 FLOOD RISK MITIGATION

6.1 INTRODUCTION

- 6.1.1 **Section 4** has identified the sources of flooding which could potentially pose a risk to the site and the proposed development. This section of the FRA sets out the mitigation measures which are to be considered within the proposed development detail design to address and reduce the risk of flooding to within acceptable levels.

6.2 EFFECT OF DEVELOPMENT ON WIDER CATCHMENT

Development Drainage

- 6.2.1 The current site is considered to be brownfield, as the topographic survey shows existing drainage infrastructure within the site. As the development is for a change of use, the amount of impermeable area will not be altered.

6.3 SITE ARRANGEMENTS

- 6.3.1 The Flood Zone mapping shows the site to be located within Flood Zone 1. Therefore, a Sequential Test has not been completed for this site.
- 6.3.2 As the site is open storage, there are no proposed buildings so there is no requirement for any finished floor levels or considerations for ingress of water.

7 FOUL WATER DRAINAGE

7.1 INTRODUCTION

- 7.1.1 Based on the proposed development of the site comprising of open storage, there is no requirement for foul water drainage within the site.

7.2 EXISTING SEWERS

- 7.2.1 AMA attained a Southern Water sewer map which can be seen in [Appendix E](#). They show that there is a public foul water sewer located in the Dutton Lane to the east of the site. They also show that there is a public surface water sewer located in Bishopstoke Road to the south of the site.
- 7.2.2 The topographic survey shows that there is existing drainage within the site, with multiple gullies, drainage channels and inspection chambers. As the site is in close proximity to the public sewer network, it is assumed that the site drains to a sewer.

8 SURFACE WATER DRAINAGE STRATEGY

8.1 INTRODUCTION

- 8.1.1 The National Planning Policy Framework (NPPF) and accompanying Technical Guidance indicate that surface water run-off should be controlled as near to its source as possible through a sustainable drainage approach to surface water management.
- 8.1.2 Consideration should therefore firstly be given to using sustainable drainage (SuDS) techniques including soakaways, infiltration trenches, permeable pavements, grassed swales, ponds and wetlands to reduce flood risk by attenuating the rate and quantity of surface water run-off from a site. This approach can also offer other benefits in terms of promoting groundwater recharge, water quality improvement and amenity enhancements. Approved document Part H of the Building Regulations (2015) sets out a hierarchy for the disposal of surface water which encourages a SuDS approach.

8.2 OVERVIEW AND CONCEPT

- 8.2.1 As detailed in [Section 3.1](#), development proposals for the site consist change of use to open storage, consisting of a change of use to storage and distribution (B8) in the southern and central portions of the site and general industry/ storage and distribution (B2/B8) in the northern part of the site with associated infrastructure. The site plan shows the developable area of the site to be restricted to the red line boundary, as shown in [Appendix A](#), with an approximate total developable area of 1.46 ha.
- 8.2.2 Review of the site plan shows proposals to consist of an approximate total impermeable area of 1.46 ha, which equates to approximately 100% of the total proposed developable area.
- 8.2.3 It is considered that green open space and landscaped areas will not produce or contribute run-off to the surface water management infrastructure proposed as part of this strategy. This has been taken into account when deriving the impermeable area for the site.

8.3 PRE-DEVELOPMENT SURFACE WATER RUN-OFF

Brownfield

- 8.3.1 As the site is a previously developed, brownfield site, with an existing industrial structure pre-development surface water drainage will be based upon the Modified Rational Method (MRM).
- 8.3.2 As discussed previously in this report the total site area marked out by the red line boundary found in [Appendix A](#) is 1.46 ha with a total impermeable area of 1.46 ha. The pre-development surface water run-off will be based upon the existing impermeable area 1.46 ha. Therefore:
 - ▶ The total impermeable area (Pre-Development) of the site is 1.46 ha.
 - ▶ The estimated peak flow rate for the site for a 50 mm / event is defined below using the Modified Rational Equation method.
- 8.3.3 $Q = C i A$
- 8.3.4 Where:
 - ▶ Q = Flow rate in m^3 / sec
 - ▶ C = site impermeability or run-off coefficient = estimated as 100% or 1
 - ▶ i = rainfall intensity = 50 mm/hr
 - ▶ A = impermeable site area producing run-off = 1.46 ha or 14,600 m^2
- 8.3.5 The peak run-off rate using the above defined equation would therefore be:
 - ▶ $Q = 1.00 \times 50 \times 1.46$ (impermeable area in ha) $\times 2.78 = 202.9 \text{ l/s}$

- 8.3.6 As shown above the peak run-off rate for the site using the modified rational method is estimated to be 202.9 l/s. As the proposed development is for a change of use and the impermeable area is not changing, there is no requirement for any restrictions to the surface water discharge rate.

8.4 GROUNDWATER PROTECTION

- 8.4.1 The proposed development site is not identified as being within a groundwater source protection zone (SPZ), as such no special measures are required to prevent risk to drinking water supplies.

8.5 METHODS OF SURFACE WATER MANAGEMENT

- 8.5.1 There are three methods that have been reviewed for the management and discharge of surface water which are detailed below; these may be applied individually or collectively to form a complete strategy. They should be applied in the order of priority as listed:

- ▶ Discharge via Infiltration
- ▶ Discharge to a Watercourse
- ▶ Discharge to Surface Water Sewer or Highway Drain
- ▶ Discharge to Public Sewer

8.6 INFILTRATION

- 8.6.1 Any impermeable areas that can drain to a soakaway or an alternative method of infiltration would significantly improve the sustainability of any surface water systems.
- 8.6.2 The British Geological Society (BGS) Geology of Britain Viewer indicates that the entire site is underlain by Wittering Formation – sand, silt and clay with overlying superficial deposits of River Terrace Deposits, 1 – sand and gravel.
- 8.6.3 Information obtained from the Cranfield University's Soilscape website indicates that the site is in an area classified as being Soilscape 6, which is defined as freely drainage slightly acid loamy soils.
- 8.6.4 From a desktop review of the geology and soil at the site, it is believed that infiltration would be an acceptable way of discharging surface water from the site.
- 8.6.5 Percolation testing has not yet been carried out on this site. It is recommended that infiltration testing to BRE 365 digest is undertaken as part of any future site investigations works at the site so that this can be used as satisfactory evidence for the LLFA or Southern Water as necessary. The results of a percolation test will also be required to produce infiltration/soakaway designs.

8.7 WATERCOURSE

- 8.7.1 As discussed in [Section 3.4.1](#) the River Itchen is located approximately 118m to the northeast of the site at its closest point.
- 8.7.2 The distance and location of the River Itchen with existing developments and third-party land situated between the site and watercourse means it would be unviable to discharge surface water into the watercourse.

8.8 PUBLIC SEWERS

- 8.8.1 As a last resort and following the hierarchy of surface water, disposal discharge to the public sewer system may need to be considered.
- 8.8.2 In the Southern Water sewer maps ([Appendix E](#)) they show that there is a public surface water sewer located to the south of the site in Bishopstoke Road.

8.8.3 As mentioned previously, the topographic survey shows that is existing drainage within the site which is assumed to drain to the public surface water sewer.

8.8.4 Therefore, it would be possible to discharge surface water from the site into a public sewer.

8.9 PROPOSED DISCHARGED RATES

8.9.1 Surface water from the site will be discharged via the existing drainage infrastructure within the site. It is assumed that the existing drainage discharges to the public surface water sewer located in Bishopstoke Road.

8.9.2 As the site will be drained by discharging surface water into the public sewer, surface water will be restricted to greenfield/1.4ha/l/s/agreed discharge rate/bettered surface water.

8.9.3 As there is no change in the impermeable area, there is no requirement for a restricted discharge rate and therefore attenuation.

8.10 DRAINAGE NETWORK

8.10.1 As the proposal for the site is for a change of use and there is no change in the impermeable area, there is no requirement for a new drainage network to be designed. It is proposed that the existing drainage network should be utilised.

9 SUSTAINABLE DRAINAGE SYSTEMS

- 9.1.1 Where possible, Sustainable drainage (SuDS) systems/techniques should be used to drain the site of surface water runoff. These could be in the form of permeable paving, rainwater harvesting, ponds, and other above ground green systems. Swales could also be incorporated into the layout to convey surface runoff rather than below ground pipes (which tend to have a higher velocity).

9.2 SUSTAINABLE DRAINAGE (OVERVIEW)

- 9.2.1 Drainage systems can contribute to sustainable development and improve urban design, by balancing the different issues that influence the development of communities. Approaches to manage surface water that take account of water quantity (flooding), water quality (pollution) and amenity issues are collectively referred to as Sustainable Drainage Systems (SuDS).
- 9.2.2 SuDS mimic nature and typically manage rainfall close to where it falls. SuDS can be designed to slow water down (attenuate) before it enters streams, rivers, and other watercourses, they provide areas to store water in natural contours and can be used to allow water to soak (infiltrate) into the ground or evaporated from surface water and lost or transpired from vegetation (known as evapotranspiration).
- 9.2.3 SUDS are technically regarded as a sequence of management practices, control structures and strategies designed to drain surface water efficiently and sustainably, while minimising pollution and managing the impact on water quality of local water bodies.
- 9.2.4 SuDS are more sustainable than traditional drainage methods because they:
- ▶ Manage runoff volumes and flow rates from hard surfaces, reducing the impact of urbanisation on flooding,
 - ▶ Protect or enhance water quality (reducing pollution from runoff),
 - ▶ Protect natural flow regimes in watercourses,
 - ▶ Are sympathetic to the environment and the needs of the local community,
 - ▶ Provide an attractive habitat for wildlife in urban watercourses,
 - ▶ Provide opportunities for evapotranspiration from vegetation and surface water,
 - ▶ Encourage natural groundwater/aquifer recharge (where appropriate),
 - ▶ Create better places to live, work and play.

9.3 SUDS PRINCIPALS

- 9.3.1 Sustainable drainage is a departure from the traditional approach to draining sites. There are some key principles that influence the planning and design process enabling SuDS to mimic natural drainage by:
- ▶ Storing runoff and releasing it slowly (attenuation)
 - ▶ Allowing water to soak into the ground (infiltration)
 - ▶ Slowly transporting (conveying) water on the surface
 - ▶ Filtering out pollutants
 - ▶ Allowing sediments to settle out by controlling the flow of the water

- 9.3.2 The above was replicated from www.susdrain.org.

9.4 SUDS TECHNIQUES

- 9.4.1 The following table is a list of SuDS features that may/may not be feasible for the proposed site.

Table 9-1 SuDS Feasibility Table

SuDS Technique	Can they be feasibly incorporated into the site?	Comments
Green Roofs	N/A	There are no roofs proposed within the development.
Basins and Ponds	✗	The proposed development could not be designed to incorporate these elements due to site constraints such as the topography.
Filter Strips, Swales and Bio-Retention	✗	The proposed development could not be designed to incorporate these elements due to site constraints.
Infiltration Techniques	✓	Desktop review of the available data indicate that infiltration would be feasible at the site.
Permeable Surfaces and Tree Pits	✓	Surfacing of the external areas could be in a permeable material, such as permeable paved access roads and driveways.
Rainwater Harvesting	N/A	There are no roofs proposed within the development.

10 SUMMARY

- 10.1.1 The proposals for the site are for industrial use, consisting of open storage use, consisting of a change of use to storage and distribution (B8) in the southern and central portions of the site and general industry/ storage and distribution (B2/B8) in the northern part of the site with associated infrastructure.
- 10.1.2 The site is in an area identified as having a low probability of flooding on the EA Flood Map and is located in Flood Zone 1.
- 10.1.3 The site is at risk of surface water flooding along the west and southeastern part of the site. The expected flood depths within the site have a low chance of reaching 0.3m. The site is at risk of groundwater flooding, however as the site is hardstanding groundwater emergence at the site will be limited.
- 10.1.4 The site is not at risk of tidal flooding or fluvial flooding. The site is also not at risk of flooding from artificial sources or sewer flooding.
- 10.1.5 As the proposed use for the site is a change of use, mitigation for the site is to remain the same as the existing. There are no new buildings, and as such no requirements for changes to finished floor levels or considerations for ingress of water.
- 10.1.6 As with any drainage system, blockages within the surface water sewer systems constructed to serve the development has the potential to cause flooding or disruption. Any drainage systems which are not to be offered for adoption to either the Water Company or the Local Authority will have a suitable maintenance regime scheduled, and an appropriate management company appointed to carry out the works.
- 10.1.7 The primary option for surface water disposal is to use the existing drainage infrastructure within the site.
- 10.1.8 Infiltration testing has not yet been completed on site.
- 10.1.9 There is not a suitable watercourse in the vicinity of the site which could be utilised to dispose of surface water from the site.
- 10.1.10 There is a suitable public sewer in the vicinity of the site which could be utilised to dispose of the surface water. It is proposed that surface water will discharge through a connection into the surface water sewer located to the south of the site, in Bishopstoke Road via the existing drainage infrastructure.
- 10.1.11 Attenuation is not required as the proposed development is a change of use, and there is no change to the impermeable area. It is proposed that the existing drainage infrastructure is utilised and as such there is no requirement for a restricted discharge rate.
- 10.1.12 Due to the nature of the proposed development, there is no requirement for a foul water connection.

11 LIMITATIONS

- 11.1.1 This report has been prepared for exclusive use by Determinari-001 Ltd for the purpose of assisting them in evaluating the potential constraints imposed by flood risk and drainage in making a Planning Application.
- 11.1.2 AMA accepts no liability for any use of this document other than by its client and only for the purposes, stated in the document, for which it was prepared and provided. No person other than the client may copy (in whole or in part) use or rely on the contents of this document, without the prior written permission of AMA. Any advice, opinions or recommendations within this document should be read and relied upon only in the context of the document as a whole.
- 11.1.3 AMA has endeavoured to assess all information provided to them during this appraisal. The report summarises from several external sources and cannot offer any guarantees or warranties for the completeness or accuracy of information relied upon.
- 11.1.4 This report has been undertaken with the assumption that the site will be developed in accordance with the above proposals without significant change. The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the site.
- 11.1.5 A topographic survey has been completed for the site and was supplied to AMA by the client. AMA accepts no liability for the accuracy of this survey, and it is recommended that it is verified on-site prior to the commencement of any construction work.
- 11.1.6 Existing drainage information is based on third party survey data and record information which is considered to be incomplete. It is therefore recommended that a FULL drainage investigation survey is commissioned to establish the precise alignment, level, and condition of ALL existing drainage within the development site to inform the masterplan and future detailed design proposals.

APPENDICES

Appendix A Proposed Site Layout

Appendix B Topographic Survey

Appendix C BGS Borehole Records

Appendix D SFRA Groundwater Flooding Map

Appendix E Southern Water Sewer Maps



Appendix A
Proposed Site Layout



Access Road

Gate

Warehouse

Gate

Portakabin

Security Fence

Portakabin

Portakabin

Gate

Gate

Gate

Portakabin

Portakabin

Gate

Security Fence

Gate

Pole mounted security cameras (3 no. cameras on one pole.) Direction of each camera indicated

Portakabin

Offices

Portakabin

Portakabin

Security Fence

Security Fence

Brick boundary wall

13

Gate

Pole mounted security cameras (4 no. cameras on one pole.) Direction of each camera indicated

Existing Access

Existing Access

Access Road

Warehouse

Trees/boundary vegetation

Security Fence

Existing Site Plan
Scale 1:200

MCA

MICHAEL
CONOLEY
ARCHITECTS
ASSOCIATES

Project:
Land at Dutton Lane, Eastleigh

Client:
1956

Drawn by:
Existing Site Plan

Date:
11.26

Scale:
1:200

Drawn by:
AD

1956/S-01



Appendix B
Topographic Survey



Appendix C
BGS Borehole Records

Hand log

SU41NE/170
NQR 4587 1950

FOUNDEX

200 Gooch Street
Birmingham 5
Telephone MID 3214

RECORD OF BOREHOLE No. 8

SITE: EASTLEIGH SEWER

CONTRACT No: 4471

TYPE OF BORING: CABLE PERCUSSION

LEGEND

Level
Water



Undisturbed
4 in diameter
Sample



Disturbed Bulk Sample

 Standard Penetration Test

Solid Nose Penetration Test

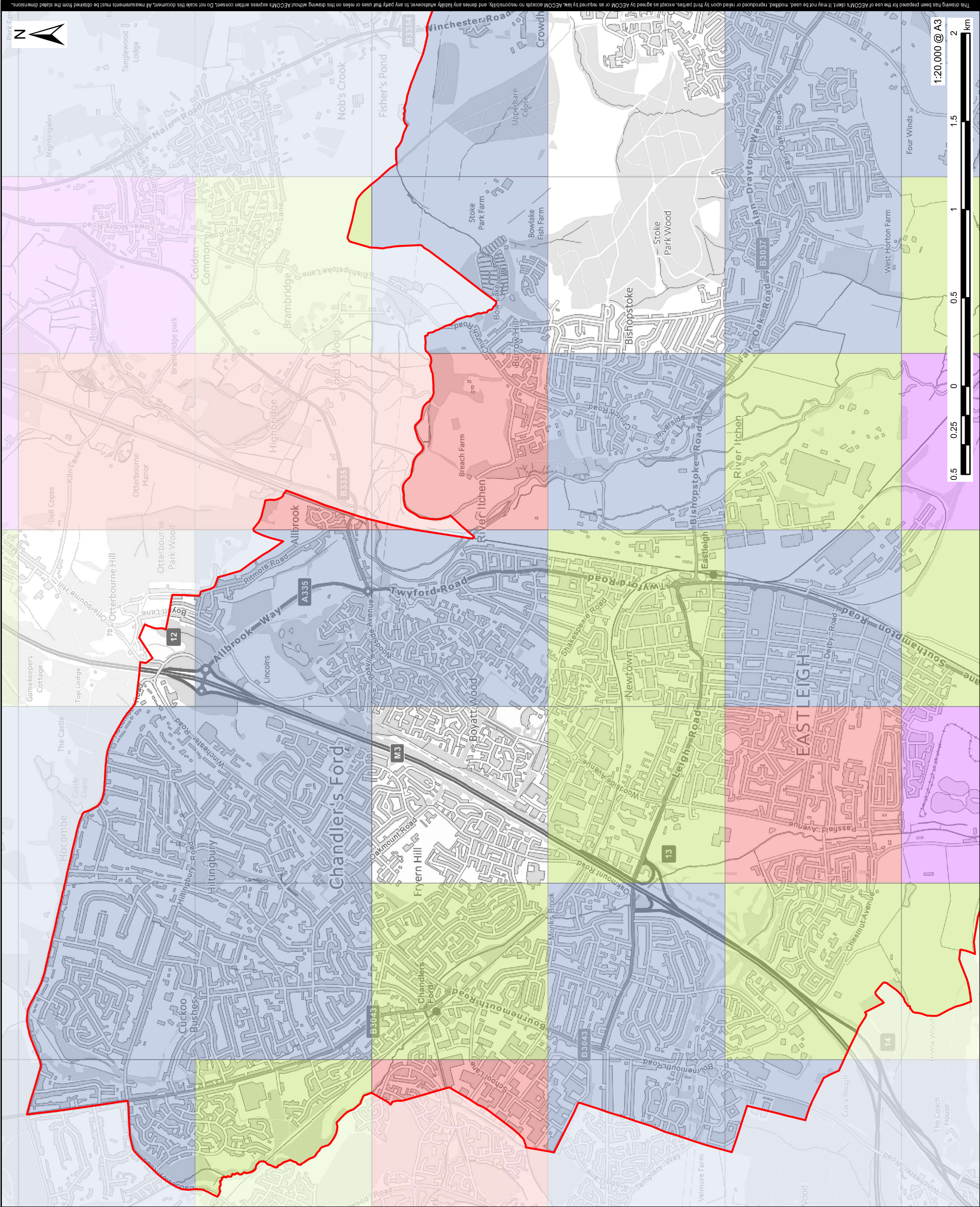
 Rotary Drilled Rock Core

J Disturbed Jar Sample
W Water Sample

DEPTH TO WATER MORNING AND EVENING		DEPTH OF CASING (FEET)	DEPTH (FEET)	SAMPLE	O.D. LEVEL	DESCRIPTION OF STRATA	STANDARD PENETRATION TEST	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	WET DENSITY lb/cu ft.	TRIAxIAL TEST				
DATE	DEPTH											LATERAL PRESSURE	COMP. STRESS	COHESION	ϕ	
						ROCK										
			2	J ₁		Soft light grey and brown sandy clay.										
			4													
			6	J ₂		Soft light brown sandy gravelly clay.										
			8													
			10	J ₃		Angular to sub-rounded gravel of flint.										
			12			Medium dense clayey sand and gravel.	25	14								
13 971	12.6		14													
rose to 10			16													
			18													
water at all stages below 12.0"			20				42	23								
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Appendix D
SFRA Groundwater Flooding Map



AECOM

PROJECT
Partnership for South Hampshire
Strategic Flood Risk Assessment

CLIENT
Portsmouth City Council on behalf of
Eastleigh Borough Council

CONSULTANT
AECOM Limited
Sunley House
4 Bedford Park
Croydon, CR0 2AP
www.aecom.com

LEGEND

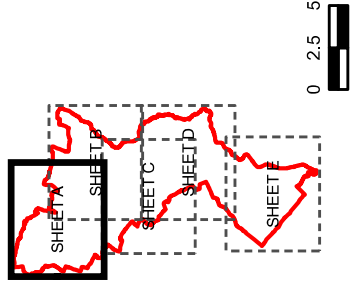
Eastleigh Borough Boundary

Areas Susceptible to Groundwater Flooding

- <25%
- >= 25% <50%
- >= 50% <75%
- >= 75%

Elsewhere: Not considered to be prone to groundwater flooding: based on rock type.

OVERVIEW



NOTES

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Additional layers provided by Hampshire County Council, March, 2022.
This map is intended to provide a strategic overview and should not be used to assess individual properties. Refer to the accompanying SFRA Report for details of the datasets and purpose of their use.

ISSUE PURPOSE
For Information

PROJECT NUMBER
60653132

FIGURE TITLE
Risk of Flooding from Surface Water
Sheet 1 of 5

FIGURE NUMBER
Figure 4A



Appendix E
Southern Water Sewer Maps



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Andrew Moseley Associates, 15 St Paul's Street, Leeds, LS1 2JG

www.amatp.co.uk

info@amatp.co.uk