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Flood Risk Assessment AEG4065_TN8_Edenbridge_01

Site Address: Land rear of 102 High Street
Edenbridge
TN8 5AR

UK Experts in Flood Modelling, Flood Risk
Assessments, and Surface Water Drainage Strategies

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Document Issue Record

Project: Flood Risk Assessment

Prepared for: Rahima Siddika

Reference: AEG4065_TN8_Edenbridge_01

Site Location: Land rear of 102 High Street, Edenbridge, TN8 5AR

Issue	Date	Author	Check	Auth.	Comments
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Summary

Development Description	Existing	Proposed
Development Type	Commercial premises	Conversion to a residential dwelling – two storey
EA Vulnerability Classification	Less Vulnerable	More Vulnerable
Ground Floor Level	Based on EA 1m LiDAR, the lowest topographic level recorded (along the pavement of the northern site boundary) is circa. 40.30m AOD	No change. Ground floor FFLs to remain as existing, with safe refuge provided at first floor.
Level of Sleeping Accommodation	N/A	First floor
Impermeable Surface Area	100% impermeable	No change
Surface Water Drainage	Existing building is positively drained through existing downpipes.	No external alterations are proposed as part of the development. Recommended to reuse existing drainage infrastructure associated with the existing building.
Site Size	Approximately 180m ²	No change
Risk to Development	Summary	Comment
EA Flood Zone	Flood Zone 3	
Flood Source	Fluvial	River Eden
SFRA Available	Sevenoaks District Council - Level 1 Strategic Flood Risk Assessment (Sevenoaks District Council, 2022)	
Management Measures	Summary	Comment
Ground floor level above extreme flood levels	No	Additional mitigation measures recommended to be incorporated. All sleeping raised on the first floor only. Safe refuge provided at first floor.
Safe Access/Egress Route	No	Recommended to sign up to EA Flood Warnings. This service allows site owners

		<p>to register an address along with contact details so that, in the event of a flood being forecast, they are sent an alert. As a further precaution and risk reduction, the owner of the site should sign up.</p> <p>Access should be provided to the first-floor level for all occupants for safe refuge in the event that prior evacuation is not possible prior to the onset of flooding.</p>
Flood Resilient Design	Yes	Conversion should be retrofit in flood resilient manner in accordance with the DCLG Report ' <i>Improving the Flood Performance of New Buildings - Flood Resilient Construction</i> ' ¹ (2007).
Site Drainage Plan	Yes	No external alterations are proposed as part of the development. Recommended to reuse existing drainage infrastructure associated with the existing building.
Flood Warning and Evacuation Plan	Yes	Recommended to sign up to the Rivers Eden and Eden Brook from Crowhurst to Peshurst Environment Agency (EA) flood warning service.
Offsite Impacts	Summary	Comment
Displacement of floodwater	No	No external alterations
Increase in surface run-off generation	No	No external alterations are proposed as part of the development. Recommended to reuse existing drainage infrastructure associated with the existing building.
Impact on hydraulic performance of channels	None	The closest watercourse to the site is the River Eden, located approximately 40m to

¹ https://assets.publishing.service.gov.uk/media/602d673ee90e0709e8d085d8/Improving_the_Flood_Resilience_of_Buildings_Through_Improved_Materials_Methods_and_Details_Technical_Report.pdf



the south of the site. There are no other watercourses in the vicinity of the site.

¹ not required for this assessment

² data not available.

1. Introduction

- 1.1. Aegaea were commissioned by Rahima Siddika to undertake a Flood Risk Assessment (FRA) to facilitate a planning application for the proposed development. This FRA has been prepared in accordance with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance.
- 1.2. This FRA is intended to support a full planning application and as such the level of detail included is commensurate and subject to the nature of the proposals.

Site Overview

- 1.3. The site of the proposed development is Land rear of 102 High Street, Edenbridge, TN8 5AR (Figure 1).

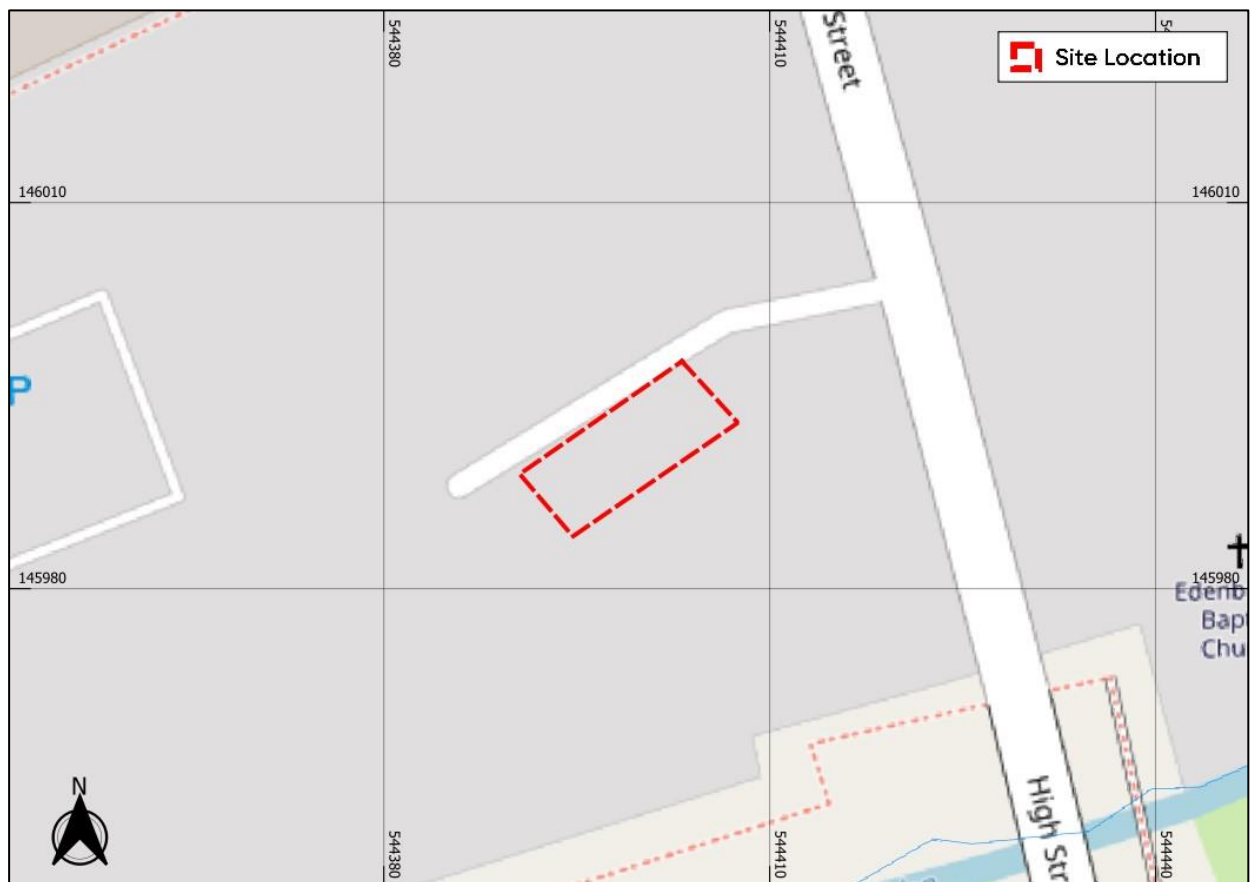


Figure 1: Site Location (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors)

- 1.4. The existing site is a commercial premises. It is understood that the proposed development is for the conversion of the ground and first floor from retail to residential use – a two storey dwelling.
- 1.5. In the absence of a topographical survey, Environment Agency Light Detection and Ranging (LiDAR) data Digital Terrain Model has been used to review the topography of the site (Figure 2). Upon review, it shows that the area surrounding the site is generally considered to be relatively flat with the existing buildings on site occupying large portions of the site boundary. Therefore, the lowest topographic level recorded (along the pavement of the northern site boundary) is circa. 40.30m AOD.

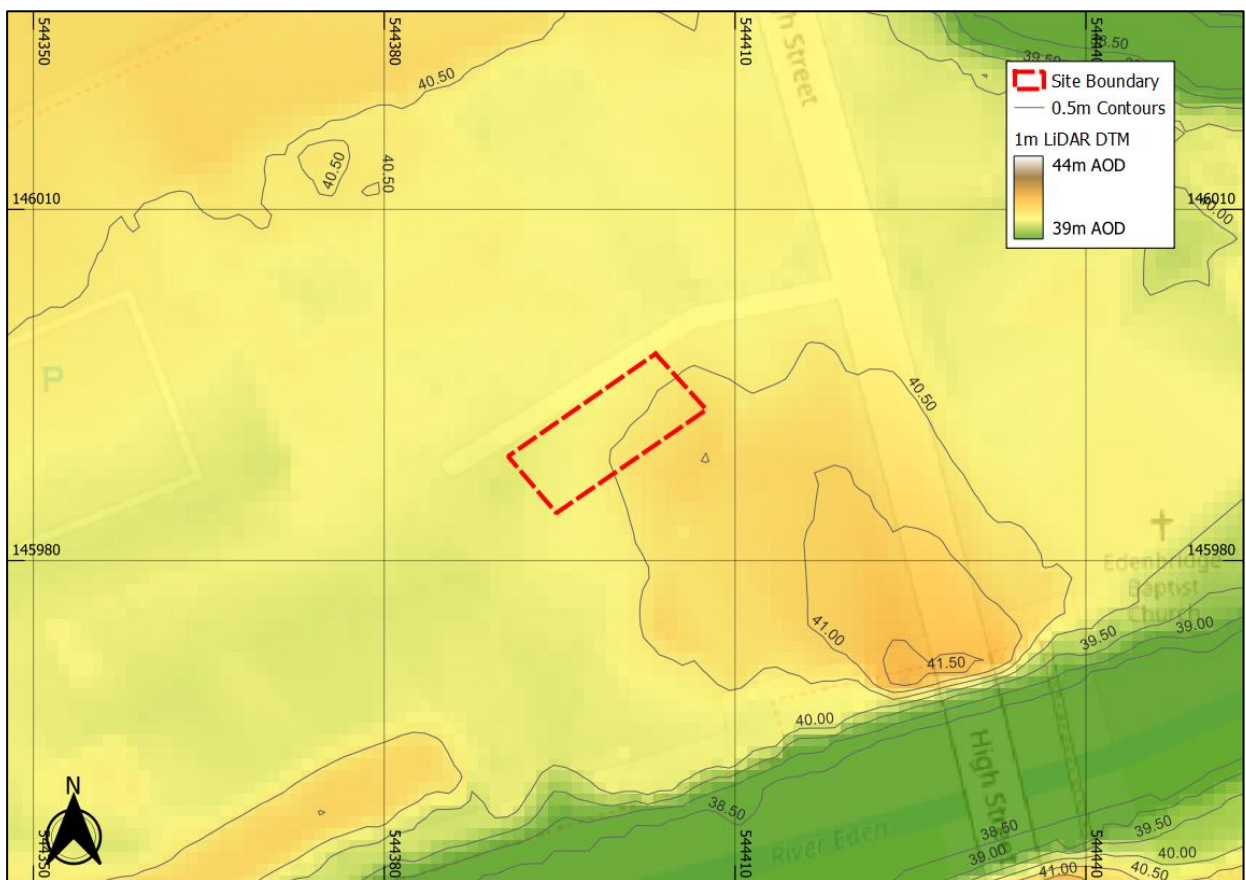


Figure 2: Site Topography (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors. Contains public sector information licensed under the Open Government Licence v3.0)

- 1.6. Sevenoaks District Council is the Local Planning Authority (LPA) for the site and Kent County Council is the designated Lead Local Flood Authority (LLFA). The site sits within the Environment Agency (EA)'s Kent South London and East Sussex region.

Planning Policy and Guidance

1.7. UK government planning guidance states² that an FRA is required for developments which are:

- *in flood zone 2 or 3 including minor development and change of use*
- *more than 1 hectare (ha) in flood zone 1*
- *less than 1 ha in flood zone 1, including a change of use in development type to a more vulnerable class (for example from commercial to residential), where they could be affected by sources of flooding other than rivers and the sea (for example surface water drains, reservoirs)*
- *in an area within flood zone 1 which has critical drainage problems as notified by the Environment Agency*

1.8. The site is in Flood Zone 3 therefore the NPPF states that an FRA is required.

1.9. The objective of this FRA is to demonstrate that the proposals are acceptable in terms of flood risk. This report summarises the findings of the study and specifically addresses the following issues in the context of the current legislative regime:

- Fluvial flood risk
- Surface water flood risk
- Risk of flooding from other sources

²<https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications#when-you-need-an-assessment>

2. Planning Policy

2.1. Inappropriate development in a flood risk area could pose significant risk in terms of personal safety and damage to property for the occupiers of the development or for people elsewhere. The approach taken in the assessment of flood risk at the planning stage is set out in national, regional, and local planning policy and associated guidance. This section summarises the key policies and guidance relevant to the proposed development.

National Planning Policy Framework (NPPF)

2.2. The National Planning Policy Framework³ (NPPF) (DLUHC, 2023) which includes UK Government policy on development and flood risk states:

165. Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.

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

- a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;*
- b) the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;*
- c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;*

³<https://www.gov.uk/guidance/national-planning-policy-framework>, last updated Dec 2023

- d) *any residual risk can be safely managed; and*
- e) *safe access and escape routes are included where appropriate, as part of an agreed emergency plan.*

174. Applications for some minor development and changes of use should not be subject to the sequential or exception tests but should still meet the requirements for site-specific flood risk assessments set out in footnote 59.

2.3. Footnote 59 of the NPPF states:

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.

2.4. Flood Zones in England are defined as follows:

Table 1: Flood Zone Definitions

Flood Zone	Definition
Zone 1 Low Probability	Land having less than 1 in 1,000 annual probability of river or sea flooding (all land outside Zones 2 and 3).
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding.
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding.
Zone 3b The Functional Floodplain	<p>This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise:</p> <p>land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or</p> <p>land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding).</p> <p>Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)</p>

- 2.5. An FRA should be appropriate to the scale, nature, and location of the development. It should identify and assess the risk from all sources of flooding to and from the development and demonstrate how any flood risks will be managed over the lifetime of the development.
- 2.6. An assessment of hydrological impacts should be undertaken, including to surface water runoff and impacts to drainage networks in order to demonstrate how flood risk to others will be managed following development and taking climate change into account.

- 2.7. The Planning Practice Guidance, which was substantially revised in March 2015 in relation to drainage, requires that sustainable drainage systems (SuDS) should be considered and included where practicable, in line with Defra Technical Standards⁴.

Local Plan

- 2.8. Sevenoaks District Council are currently in the consultation process regarding their emerging local plan, which due for further consultation in 2024.

Sequential and Exception Tests

- 2.9. The Sequential and Exception Tests are applied in specific cases defined by UK Government policy. Their purpose is to drive development to areas of low flood risk and to support developments which improve flood risk for developments in areas at risk of flooding.
- 2.10. The proposed development is for conversion of the existing at the ground and first floor from retail to residential use. Therefore, the proposals constitute to a change of use.
- 2.11. As per Paragraph 168 of the NPPF, which states applications for some minor development and changes of use should not be subject to the sequential or exception tests but should still meet the requirements for site-specific flood risk assessments.

Summary

- 2.12. The proposals are for the conversion of an existing retail unit to a dwelling, therefore there is no requirement to undertake an Exception or Sequential Test. This flood risk assessment has been prepared with due consideration to the above local and national policy.

4 Technical Standards Accessed Online

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/415773/sustainable-drainage-technical-standards.pdf

3. Consultation and Review

Consultation

- 3.1. The site is within the remit of Kent County Council as Lead Local Flood Authority (LLFA). Aegaea have been provided with Product 6 (raw data) for this area by the Environment Agency which has been used to inform this FRA – see Section 4.

Documents and Online Mapping

- 3.2. Local Governments and Lead Local Flood Authorities provide documents which contain data and policies on flood risk and new development in their areas. These documents are introduced and briefly summarised below. For the purposes of this FRA, these documents have been reviewed for relevant information and any relevant data is discussed within the appropriate sub heading of this report.
- 3.3. The following sources of information have been reviewed for this assessment:
- Flood Map for Planning on the Environment Agency website <https://flood-map-for-planning.service.gov.uk/>
 - Long Term Flood Risk Information on the Environment Agency website <https://www.gov.uk/check-long-term-flood-risk>
 - National Planning Policy Framework (NPPF) (Department for Levelling Up, Housing and Communities, 2023)
 - Planning Practice Guidance - Flood Risk and Coastal Change (Department for Levelling Up, Housing and Communities, 2022)
 - Geoindex Onshore (British Geological Survey, 2023)
 - Core Strategy⁶ (Sevenoaks District Council, 2011)

6

https://www.sevenoaks.gov.uk/info/20069129/current_local_plan/249/core_strategy_development_plan

- Kent County Council Preliminary Flood Risk Assessment (Kent County Council, 2011)⁷
- Sevenoaks District Council Level 1 Strategic Flood Risk Assessment (Sevenoaks District Council, 2022)⁸
- Kent County Council Local Flood Risk Management Strategy (Kent County Council, 2017)⁹

Preliminary Flood Risk Assessment (PFRA)

- 3.4. The PFRA, published in 2011, is a high-level appraisal of flood risk across Lead Local Flood Authority Kent County Council. The flood risk from all sources, including fluvial, surface water, groundwater, and surcharged sewers is evaluated. It is the basis upon which the Local Flood Risk Management Strategy is produced.
- 3.5. The PFRA summarises historical flood incidents in Kent County Council. The site is recorded as having been affected by a flood event.

Strategic Flood Risk Assessment (SFRA)

- 3.6. The SFRA, published in 2022, provides the evidence base for the Local Planning Authority Sevenoaks District Council Local Plan and guidance for consideration when determining planning applications. The SFRA seeks to place new development into areas of lower flood risk taking into account current flood risk, future flood risk, and the effect a proposed development would have on the risk of flooding.
- 3.7. The SFRA mapping provided by Sevenoaks District Council has been used throughout production of this report as a source of information, particularly pertaining to historical flood incidents.

⁷ https://www.kent.gov.uk/__data/assets/pdf_file/0013/12091/Preliminary-flood-risk-assessment.pdf

⁸ https://www.sevenoaks.gov.uk/downloads/file/3621/level_1_strategic_flood_risk_assessment_august_2022

⁹ https://www.kent.gov.uk/__data/assets/pdf_file/0010/79453/Local-Flood-Risk-Management-Strategy-2017-2023.pdf

Local Flood Risk Management Strategy (LFRMS)

- 3.8. The Local Flood Risk Management Strategy sets out roles and responsibilities for flood risk management, assesses the risk of flooding in the area, where funding can be found to manage flood risk, and the policies, objectives, and actions of the Lead Local Flood Authority.
- 3.9. The Kent County Council LFRMS is used within this report to identify any flood management infrastructure and historical incidences of flooding.

4. Sources of Flood Risk

Fluvial

- 4.1. Flooding from watercourses arises when flows exceed the capacity of the channel, or where a restrictive structure is encountered, resulting in water overtopping the banks into the floodplain.

Main Rivers and Ordinary Watercourses

- 4.2. The closest watercourse to the site is the River Eden, located approximately 40m to the south of the site. There are no other watercourses in the vicinity of the site.
- 4.3. Based on the Environment Agency Flood Map for Planning, the site is located within Flood Zone 3 (Figure 3). Flood Zone 3 denotes a risk of flooding from fluvial sources greater than 1 in 100 (1%).

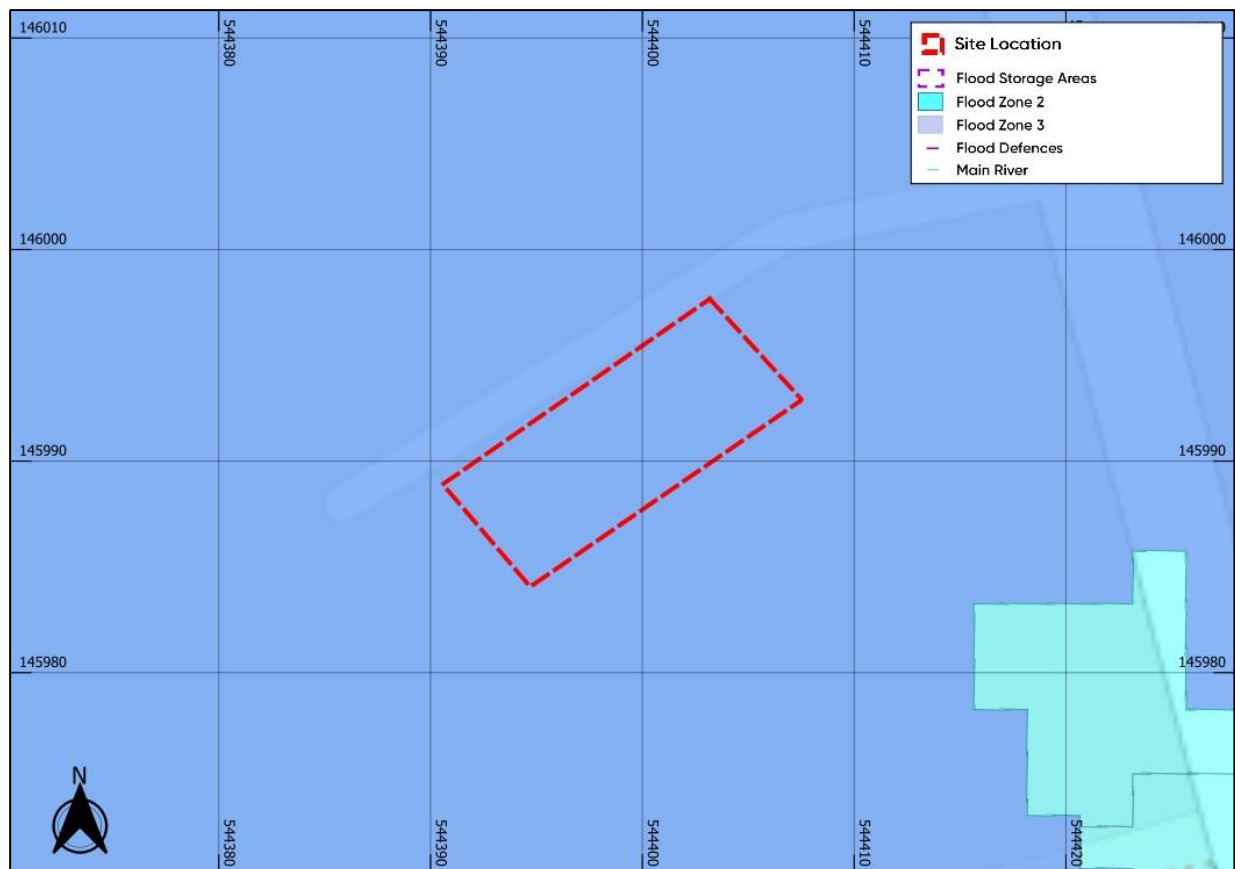


Figure 3: EA Flood Map for Planning (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors. Contains public sector information licensed under the Open Government Licence v3.0)

- 4.4. The EA Recorded and Historical Flood Outlines shows main river fluvial flooding on-site caused by channel capacity exceeded (no raised defences) in September 1950, November 1960, September 1968 and December 2013.

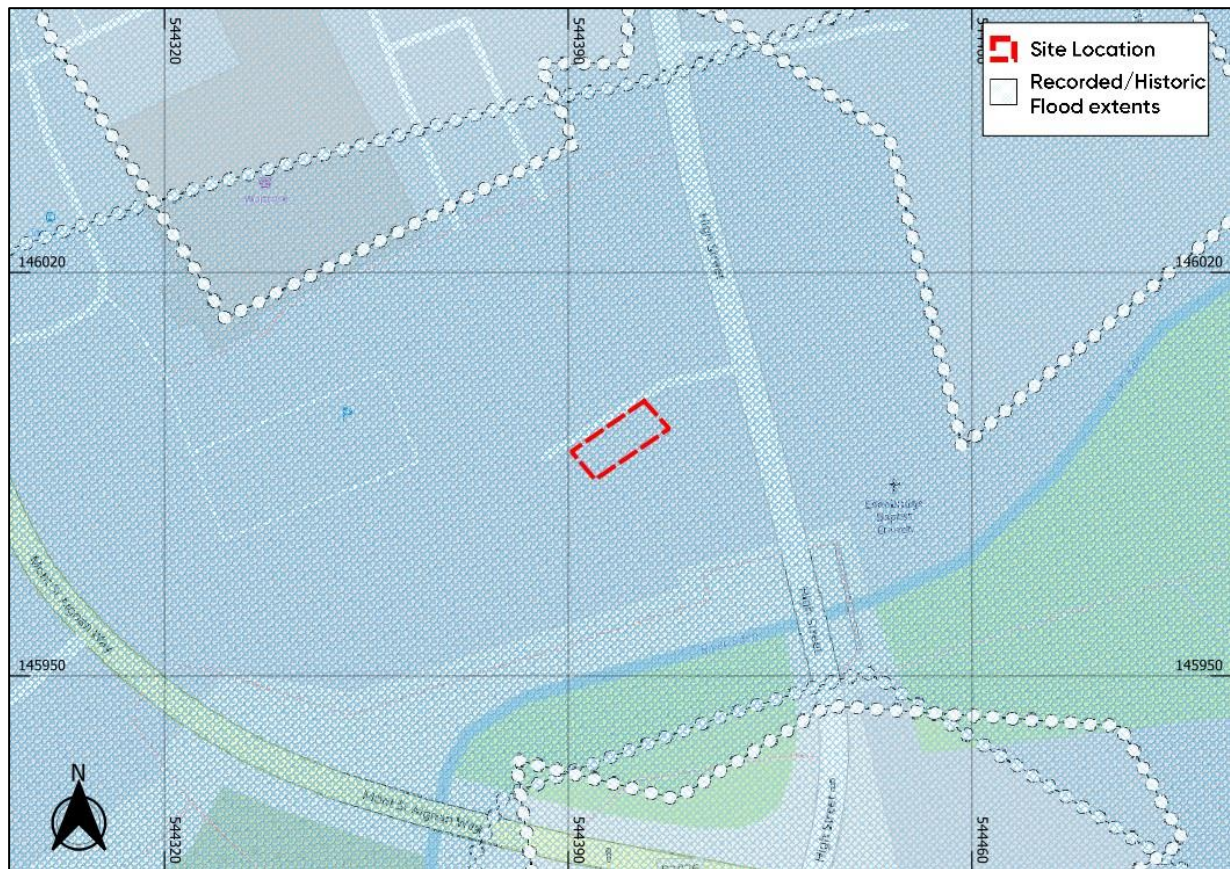


Figure 4: EA Historic Flood Mapping (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors. Contains public sector information licensed under the Open Government Licence v3.0)

River Medway Mapping Study (2015)

- 4.5. Aegaea have been provided with Product 6 (raw data) for this area by the Environment Agency which has been used to inform this FRA. Mapping outputs for the defended scenario for the following AEP's: 20%, 5%, 3.33%, 2%, 1.33%, 1%, 0.4% and 0.1% have been provided from the River Medway Mapping Study, dated 2015. Climate change outputs have been provided for the +25%, +35% and +70% from the River Medway climate change updates, dated 2016. These outputs have been used to assess the risk of flooding to the site.
- 4.6. For development located within Flood Zone 3, it is first necessary to delineate between Flood Zones 3a and 3b. It should be noted that the definition of Flood Zone 3b has changed since the

modelling was undertaken in 2015. Flood Zone 3b is now classified as the 1:30 year (3.3% AEP) event. Modelled data has been provided for the 1:30 year fluvial flood event. Analysis of these extents show that the 1:30 year scenario would generally remain in-channel and spill out downstream of the site (Figure 5).

- 4.7. The site is shown to be within the extent of the modelled 1:100 year defended fluvial flood event (Figure 5). The modelled flood level associated with this event is 40.90m AOD. Comparison with the lowest topographic level recorded (along the pavement of the northern site boundary) is circa. 40.30m AOD shows that the site may be affected by flood depths of approximately 0.6m.

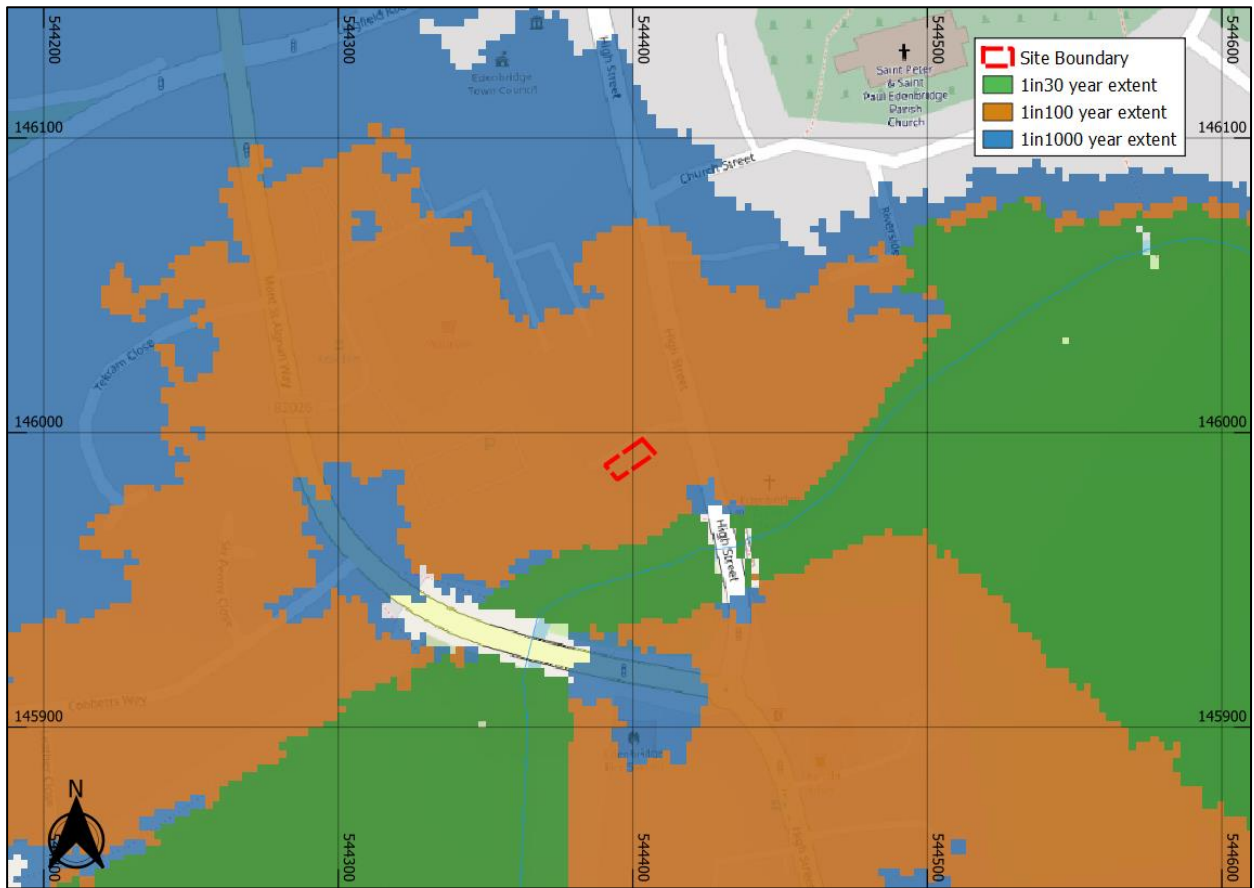


Figure 5: Modelled Present-Day Extents (River Medway Model, 2015) (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors)

Climate Change

- 4.8. Predicted future change in peak river flows as a result of climate change are provided by the Environment Agency with a range of projections applied to regionalised 'River Management Catchments'.

4.9. The site is located within the Thames River Basin District and the 'Medway' Management Catchment. The relevant peak river flow allowances for this river basin district are identified below (Table 2).

Table 2: Medway Management Catchment Climate Change Allowances

Epoch	Central	Higher	Upper
2020s	14%	19%	29%
2050s	15%	21%	37%
2080s	27%	37%	62%

4.10. The proposed development is for the conversion of an existing building to a residential dwelling. Residential development should be considered to have an anticipated lifetime of a minimum of 100 years. Therefore, the development should consider an additional 27% allowance to account for climate change.

4.11. No data has been provided as part of the Medway Model for the 1in100+27%CC scenario. However, data has been provided for the 1in100+35%CC scenario, which is deemed to be an appropriate, conservative proxy for the +27% event.

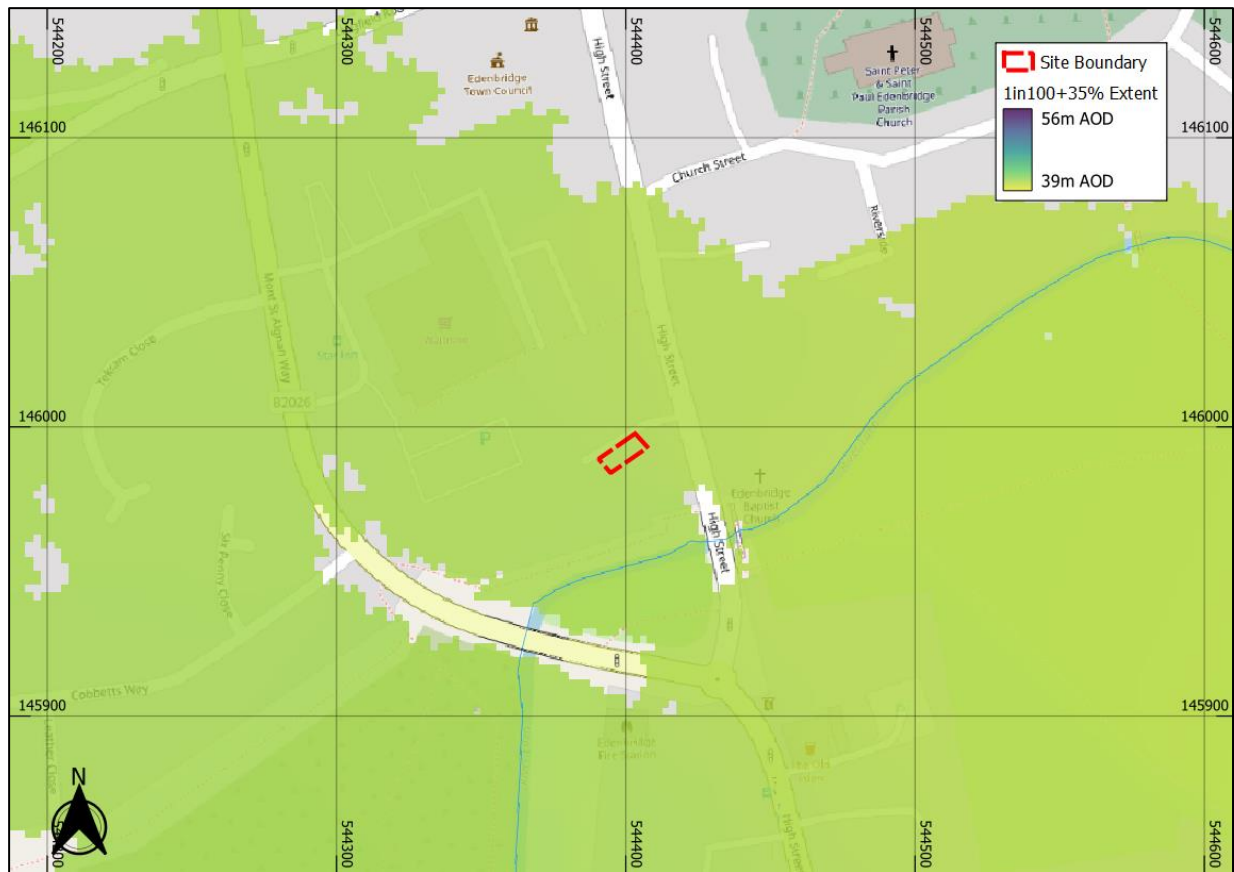


Figure 6: Modelled 1in100+35%CC Extent (River Medway Model, 2015) (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors)

- 4.12. Analysis of Figure 6 shows that the site may be affected by flooding during this event. The flood level on site is 41.25m AOD. Comparison with the lowest topographic level recorded (along the pavement of the northern site boundary) is circa. 40.30m AOD shows that the site may be affected by flood depths of approximately 0.95m.
- 4.13. Overall, based on the information available, the risk of flooding from fluvial sources is considered high.

Tidal

- 4.14. Tidal flooding occurs when a high tide and high winds combine to elevate sea levels. An area behind coastal flood defences can still flood if waves overtop the defences or break through them. Tidal flooding can also occur a long way from the coast by raising river levels. Water may overtop the river bank or river defences when tide levels are high. The site is a significant distance from any tidal source and above the anticipated extreme tidal levels, even when considering the impacts of climate change.

- 4.15. There is no record of historical tidal or sea flooding on-site.
- 4.16. The risk of flooding from tidal sources is considered low.

Canals

- 4.17. The Canal and River Trust (CRT) generally maintains canal levels using reservoirs, feeders, and boreholes and manages water levels by transferring it within the canal system.
- 4.18. There are no CRT maintained canals located within a 1km radius of the site.
- 4.19. The risk of flooding to this site from canals is considered to be low.

Pluvial

- 4.20. Pluvial flooding can occur during prolonged or intense storm events when the infiltration potential of soils, or the capacity of drainage infrastructure is overwhelmed leading to the accumulation of surface water and the generation of overland flow routes.
- 4.21. Annual surface water flood risk is labelled by the EA as:
- 'High Risk'; >3.3% AEP (annual probability greater than 1 in 30).
 - 'Medium Risk'; 1.1% to 3.3% AEP (annual probability between 1 in 100 and 1 in 30).
 - 'Low Risk'; 0.1% to 1% AEP (annual probability between 1 in 1000 and 1 in 100).
 - 'Very Low Risk'; <0.1% AEP (annual probability less than 1 in 1000).
- 4.22. The EA online 'Flood Risk from Surface Water' Map (Figure 7) indicates that the site and proposed development location is located within a 'low' risk area of flooding. There is a small area of 'high' risk of flooding on the private road to the north of the site.

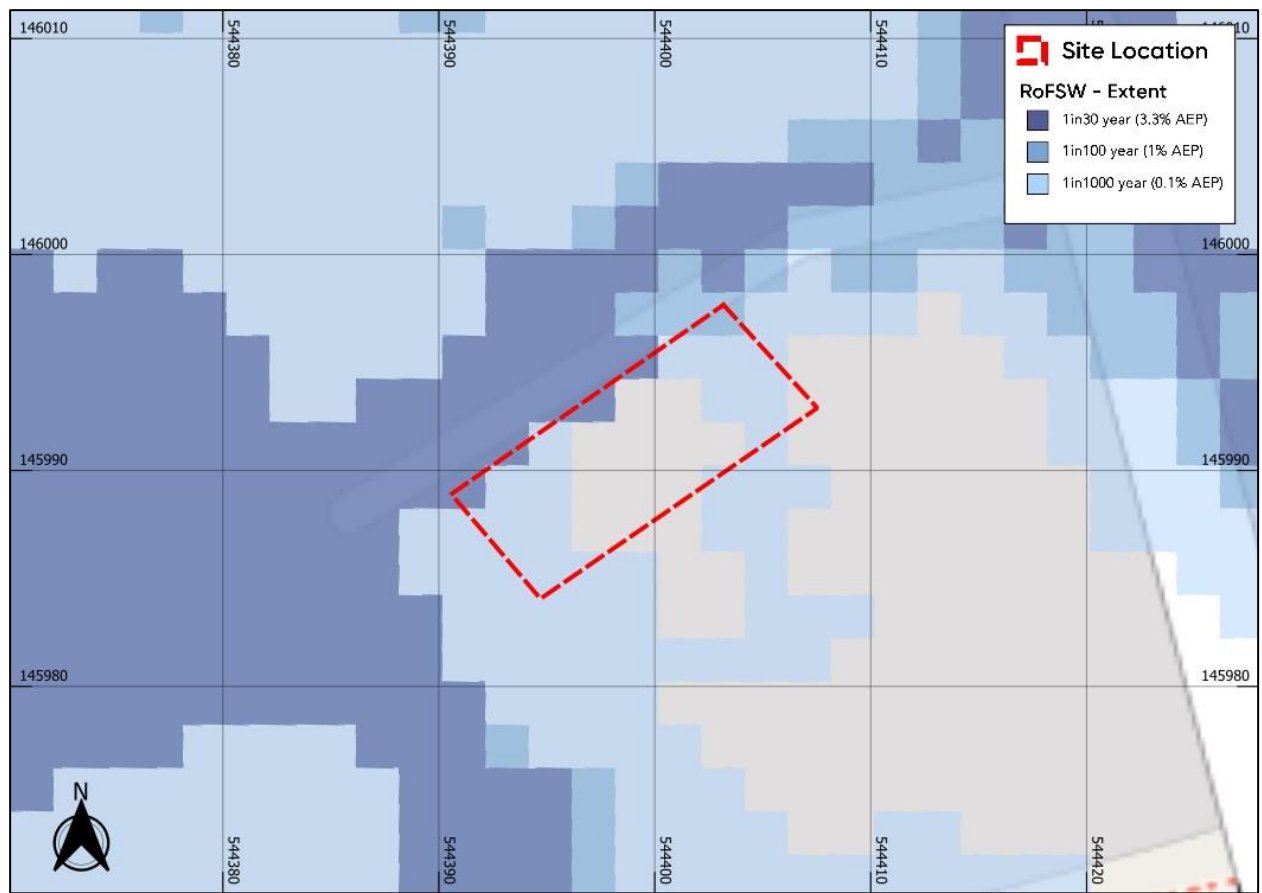


Figure 7: EA Surface Water Flood Risk Mapping (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors. Contains public sector information licensed under the Open Government Licence v3.0)

4.23. Analysis of the ‘high’ risk event (equivalent to the 30 year event) (Figure 8) shows that the majority of the site would remain unaffected by flooding. A small part of the site, located adjacent to the northern site boundary, may be affected by flooding of between 150mm and 300mm.

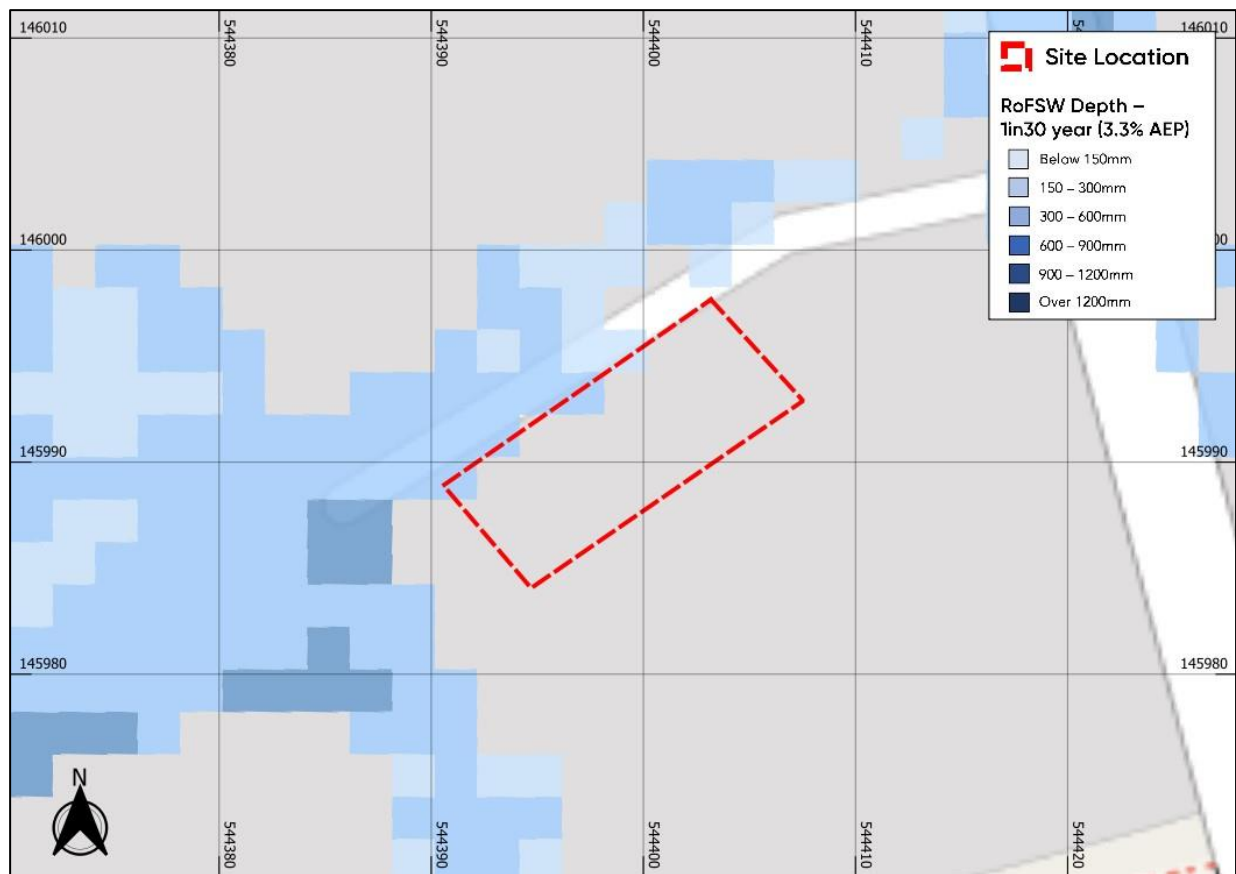


Figure 8 RoFSW Surface Water Depths for a High Risk (1 in 30 year) Scenario (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors. Contains public sector information licensed under the Open Government Licence v3.0)

4.24. Analysis of the medium-risk event (equivalent to the 1 in 100 year event) (Figure 9) shows that the site would generally remain unaffected by flooding. The areas shown to be at high risk of flooding on the private road to the north of the property could experience flood depths of between 300mm to 600mm.

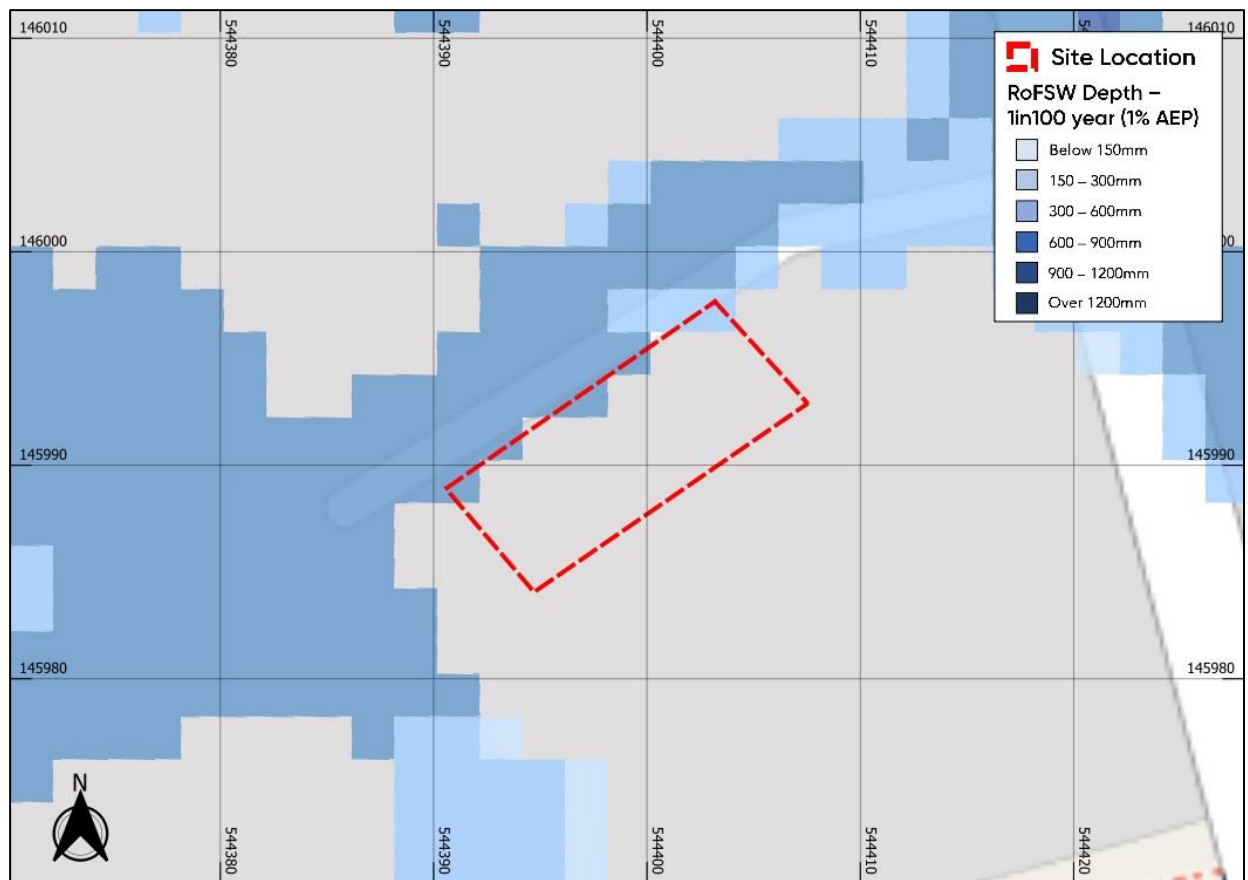


Figure 9 RoFSW Surface Water Depths for a Moderate Risk (1 in 100 year) Scenario (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors. Contains public sector information licensed under the Open Government Licence v3.0)

4.25. Analysis of the low-risk event (equivalent to the 1 in 1000 year event) (Figure 10) shows that the site could experience flood depths of between 300mm to 600mm. Some areas at the northern and southern boundaries could experience depths of 600mm to 900mm – and thus pluvial depths are not dissimilar to those of the modelled fluvial events.

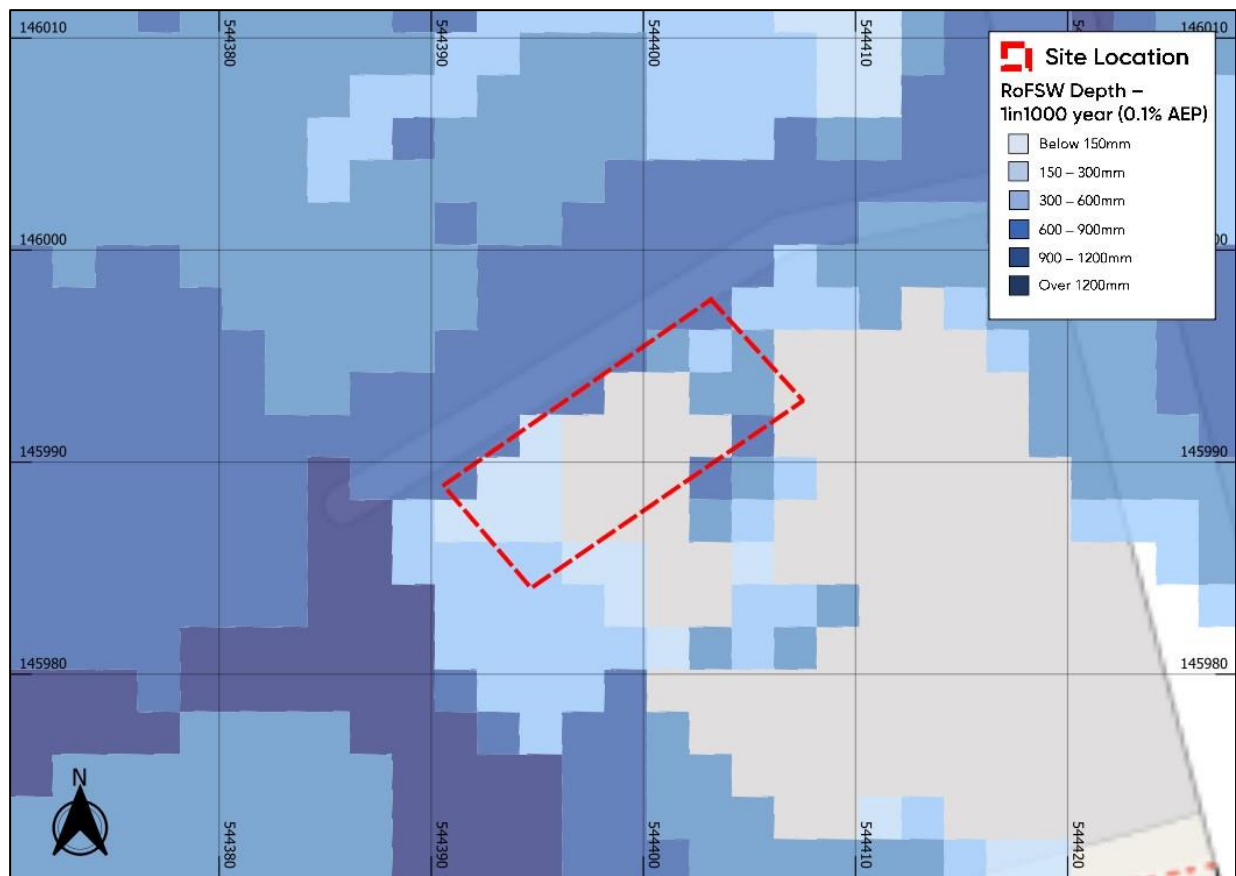


Figure 10 RoFSW Surface Water Depths for a Low Risk (1 in 1000 year) Scenario (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors. Contains public sector information licensed under the Open Government Licence v3.0)

4.26. Overall, the risk of flooding from pluvial sources can be considered to be moderate.

Reservoirs

4.27. Flooding can occur from large waterbodies or reservoirs if they are impounded above the surrounding ground levels or are used to retain floodwater. Although unlikely, reservoirs and large waterbodies could overtop or breach leading to rapid inundation of the downstream floodplain.

4.28. According to the EA's Flood Risk from Reservoirs mapping the site is at risk of flooding in the event of a breach at Bay Pond, Hedgecourt Lake, Leigh Place Pond and Wiremill Lake. The worst reservoir failure model is a 'wet day' scenario meaning that it would have to happen at the same time as other flooding for there to be enough water to reach the site.

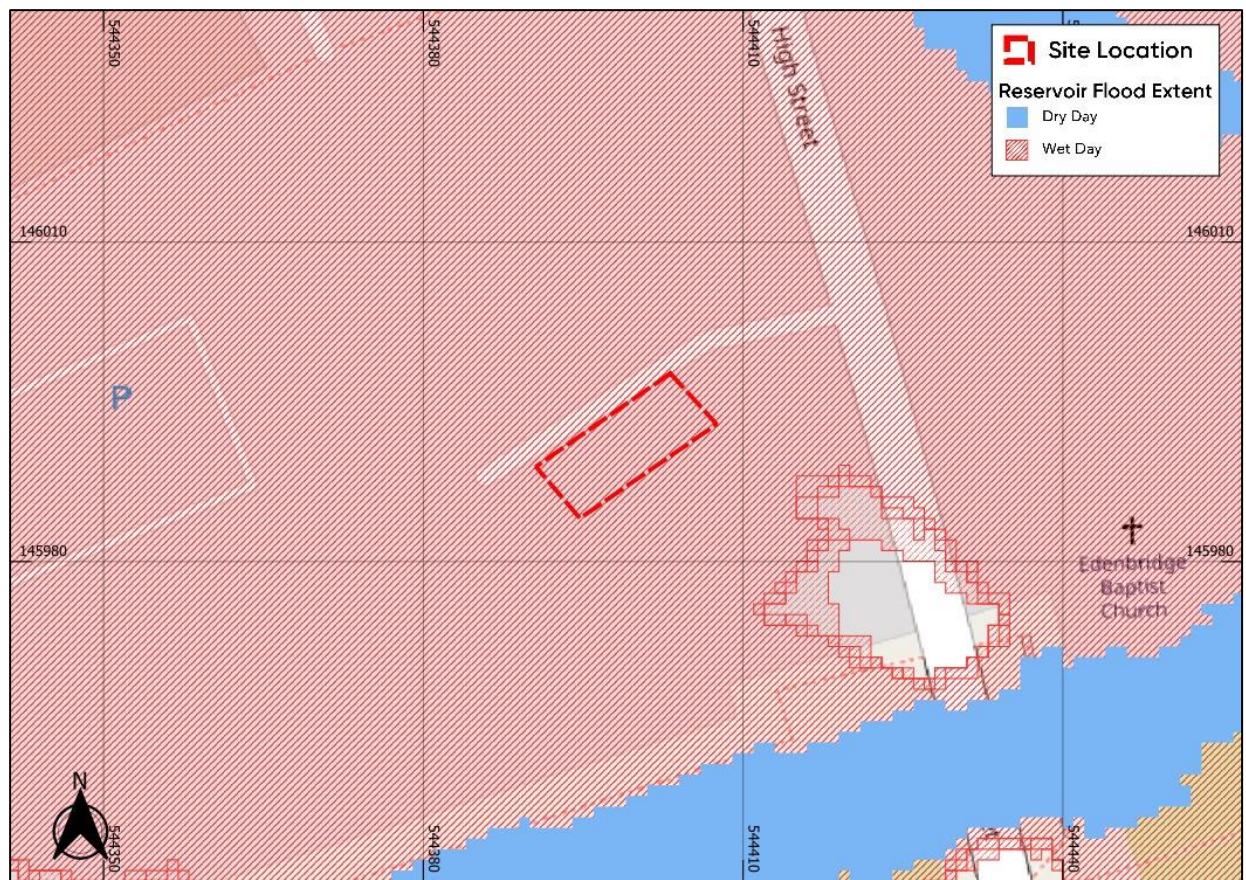


Figure 11: EA Reservoir Flood Risk Mapping (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). ©<https://www.openstreetmap.org> and contributors. Contains public sector information licensed under the Open Government Licence v3.0)

- 4.29. All large reservoirs must be inspected and supervised by reservoir panel engineers as detailed by the Reservoirs Act 1975 in England and Wales. The EA are responsible to ensure that reservoirs are inspected regularly, and essential safety work carried out. As reservoirs are highly managed the maximum flood extent provided in the EA Risk of Flooding from Reservoirs mapping is considered a worst-case scenario.
- 4.30. As reservoir flooding is unlikely and the modelled flood depths are based on the worst-case scenario, flooding from this source may be considered as a relatively low risk.

Groundwater

- 4.31. Groundwater flooding occurs in areas where underlying geology is permeable and water can rise within the strata sufficiently to breach the surface.
- 4.32. The British Geological Survey (BGS) Geology of Britain Viewer indicates that the bedrock underlying the site is Weald Clay Formation comprising mudstone. Superficial deposits have

been recorded in the area, classified as being River Terrace Deposits consisting of sand and gravel. Superficial deposits of Alluvium (clay, silt, sand and gravel) have also been recorded to the west of the site, associated with the channel/floodplain of the River Eden.

- 4.33. As part of the SFRA deliverables, mapping of the whole district has been provided showing the groundwater flood risk map. The site is shown to be located within an area defined as having 'groundwater levels between 0.025m and 0.5m below the ground surface'.
- 4.34. This zone is defined as having a risk of groundwater flooding to both surface and subsurface assets. There is the possibility of groundwater emerging at the surface locally. This strongly links to the geology in these areas, with the alluvial deposits (clay, silt, sand and gravel) being a contributing factor.
- 4.35. Neither the EA nor Sevenoaks SFRA (2022) have provided any records to indicate that the site has been previously affected by flooding from this source.

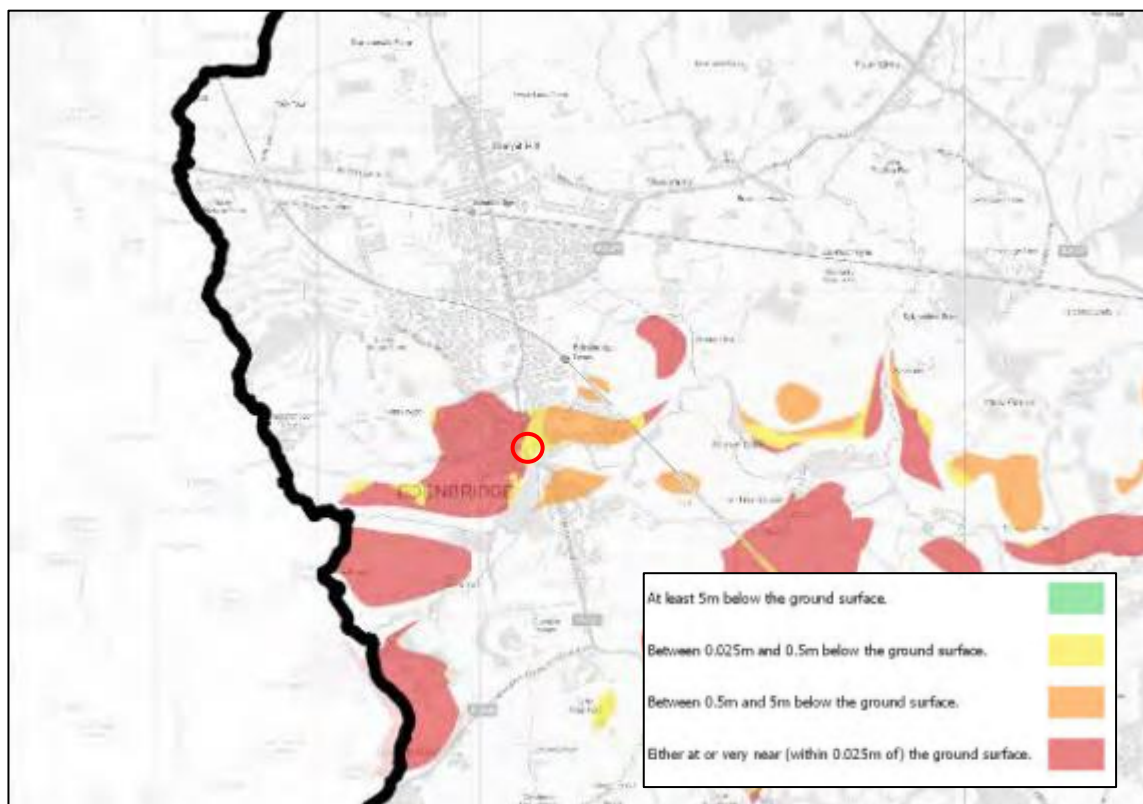


Figure 12 Groundwater Susceptibility. (Source: Sevenoaks DC SFRA 2017). Red circle marks site location

- 4.36. Based on the above information, the flood risk to the surrounding area from groundwater flooding may be considered to be low to moderate. However, there have not been any specific incidents related to groundwater flooding.

Sewers

- 4.37. Foul or surface water sewers can be a cause of flooding if the drainage network becomes overwhelmed, either by blockage or due to local development beyond the designed capabilities of the drainage system.
- 4.38. The Sevenoaks SFRA (2022) states that historical incidents of flooding are detailed by Southern Water and Thames Water in their DG5 register. The databases record incidents of flooding relating to public foul, combined or surface water sewers and displays which properties suffered flooding. For confidentiality reasons, this data has been supplied on a postcode basis from the Sewer Incident Report Form hydraulic overload database. The database covers reported incidents of sewer flooding in the last 26 years.
- 4.39. The data indicates that the TN8 5 postcode area has 3 recorded incidents of sewer flooding.
- 4.40. The development is therefore considered to be at low risk of flooding from sewers.

5. Flood Risk Mitigation

Fluvial and Pluvial

- 5.1. Analysis within this FRA shows that the site may be affected during the 1 in 100+35%CC scenario with possible flood depths of 0.95m.
- 5.2. The proposed development should be retrofit in a flood resilient manner, in accordance with DCLG Report *Improving the Flood Performance of New Buildings Flood Resilient Construction (2007)* (standards for the installation and retrofit of resistance measures are available in British Standard 851188-1:2019+A1:2021). The following mitigation measures are recommended:
- No bedrooms or sleeping accommodation should be located on the ground floor.
 - Internal access to upper floors should be maintained for the lifetime of the development.
 - Demountable barriers to be fitted to all external doors.
 - Damp proof membranes should be included within the design of the dwelling to minimise the passage of water through ground floors. Impermeable polythene membranes should be at least 1200 gauge to minimise ripping. Effective methods of joining membrane sections are overlaps of 300mm, and also taping (mastic tape with an overlap of 50mm minimum).
 - External doors may be susceptible to ingress of flood water. Any PVC window/door sills should be adequately sealed.
 - Cavity insulation should preferably incorporate rigid closed cell materials as these retain integrity and have low moisture take-up.
 - Non-return valve fitted to any new sewer connections.
 - Residents to sign up to EA Flood Warning/Alerts and formalise a flood plan

Groundwater

- 5.3. The risk from groundwater sources is considered low to moderate. The mitigation measures recommended for fluvial and pluvial flooding should also provide mitigation for groundwater flooding.

Reservoirs, Canals, and Sewers

- 5.4. Flood risk from other sources is considered to be low, therefore mitigation is not required.

Increase to Flood Risk Elsewhere

- 5.5. The proposed development is for change of use to a residential dwelling. There will be no increase in built footprint as a result of the development and therefore there will be no increase to flood risk elsewhere.

Flood Warnings

- 5.6. The site is in the Environment Agency (EA) 'Rivers Eden and Eden Brook from Crowhurst to Penshurst' flood warning service area. This service allows site owners to register an address along with contact details so that, in the event of a flood being forecast, they are sent an alert. As a further precaution and risk reduction, the owner of the site should sign up.
- 5.7. Flood warnings/alerts can be enforced at any time of the day or night. Signing up for this service provides site owners some notice before a flood event. The amount of time afforded before a flood occurs depends on the site-specific location (e.g. proximity to the source of flooding, topography of the surrounding area) and the flood mechanism (e.g. bank over topping versus a breach event). Flood alerts and warnings provide site managers with time to take necessary action, e.g. communication of the risk of flooding to occupants/employees etc, evacuation of occupants offsite or to a safe level, removal of valuable items out of reach of flooding and the mounting of site-specific flood defences.

6. Conclusions

- 6.1. This FRA has been undertaken with reference to the requirements of NPPF and Planning Practice Guidance with respect to the development at Land rear of 102 High Street, Edenbridge, TN8 5AR. It has been written to support a planning application and prepared with due consideration to the nature of the proposed development to provide the appropriate level of detail.
- 6.2. An assessment of the risk of flooding from all sources has been undertaken and is summarised in the table below:

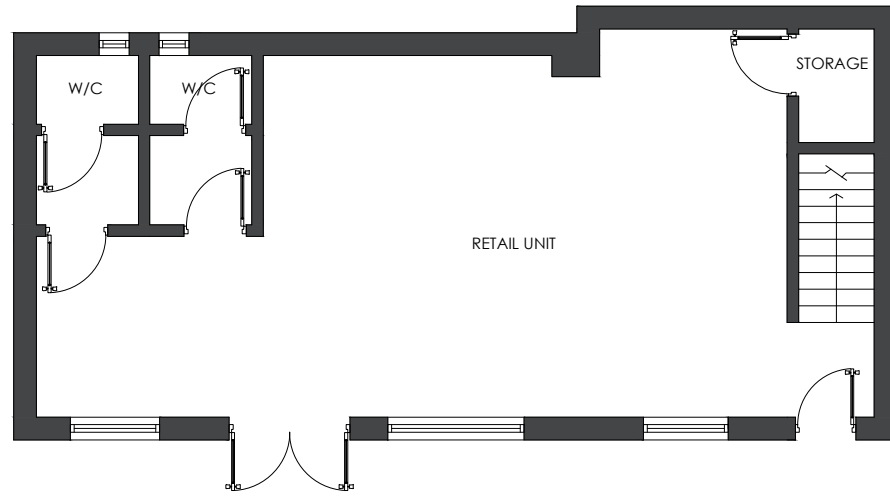
Source of Flooding	Flood Risk Summary
Fluvial	<p>The site is located within Flood Zone 3, its proposed vulnerability according to government guidelines (“more Vulnerable”), is considered appropriate for the Flood Zone subject to the exception test.</p> <p>A review of the EA Recorded and Historical Flood Outlines shows main river fluvial flooding on-site caused by channel capacity exceeded (no raised defences) in September 1950, November 1960, September 1968 and December 2013.</p> <p>The site is shown to be within the extent of the modelled 1:100 year defended fluvial flood event. The flood level associated with this event is 40.90m AOD. Comparison with the lowest topographic level recorded (along the pavement of the northern site boundary) is circa. 40.30m AOD shows that the site may be affected by flood depths of approximately 0.6m.</p> <p>No data has been provided as part of the Medway Model for the 1in100+27%CC scenario. However, data has been provided for the 1in100+35%CC scenario, which is deemed to be an appropriate proxy for the +27% event. The modelled flood level on site is 41.25m AOD. Comparison with the lowest topographic level recorded (along the pavement of the northern site boundary) is circa. 40.30m AOD shows that the site may be affected by flood depths of approximately 0.95m.</p> <p>The risk of flooding from fluvial sources is considered to be high.</p>
Pluvial	<p>The site is shown to be at low to high risk from pluvial sources based on EA mapping. Safe access and egress are to be maintained at all time to the northeast, towards cliff street, where there is no identified risk of surface water flooding.</p> <p>Analysis of the ‘high’ risk event (equivalent to the 30 year event) shows that the majority of the site would remain unaffected by flooding. A small part of the site,</p>

	<p>located adjacent to the northern site boundary, may be affected by flooding of between 150mm and 30mm.</p> <p>Analysis of the medium-risk event (equivalent to the 1 in 100 year event) shows that the site would generally remain unaffected by flooding. The areas shown to be at high risk of flooding on the private road to the north of the property could experience flood depths of between 300mm to 600mm.</p> <p>Analysis of the low-risk event (equivalent to the 1 in 1000 year event) shows that the site could experience flood depths of between 300mm to 600mm. Some areas at the northern and southern boundaries could experience depths of 600mm to 900mm – and thus pluvial depths are not dissimilar to those of the modelled fluvial events.</p> <p>Overall, the risk of flooding is considered moderate.</p>
Groundwater	The risk from groundwater sources is considered low to moderate. The mitigation measures recommended for fluvial and pluvial flooding should also provide mitigation for groundwater flooding.
Tidal Reservoirs Sewers Canals	The site is considered to be at low risk from other sources.

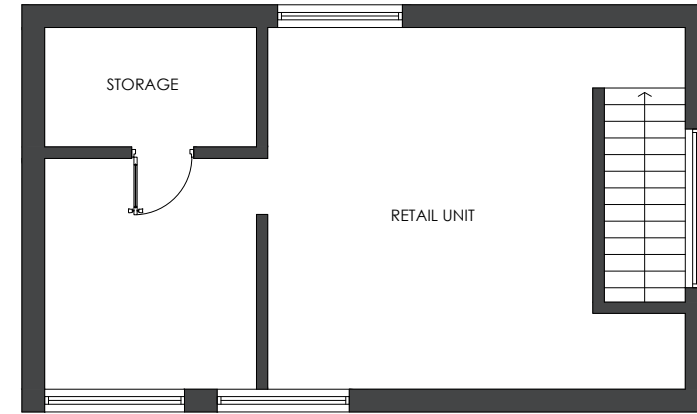
- 6.3. The FRA supports the planning application and demonstrates that there is an acceptable level of flood risk to the site if the mitigation strategies recommended are implemented in the scheme. The development does not increase flood risk off site or to the wider area.
- 6.4. This Flood Risk Assessment should be submitted as part of the planning application to satisfy the requirements under NPPF.

Appendix A - Development Proposals

Appendix B - Consultation



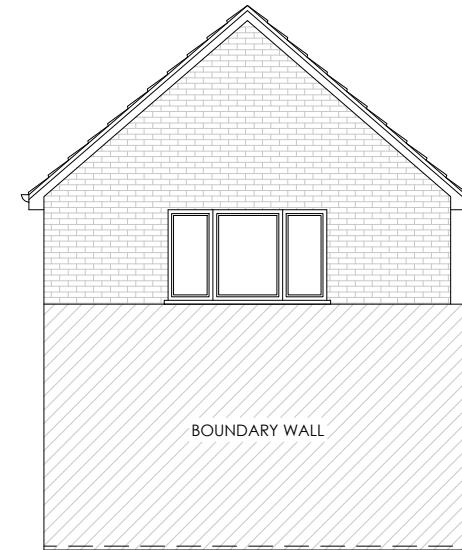
EXISTING GROUND FLOOR PLAN
1:100



EXISTING FIRST FLOOR PLAN
1:100



EXISTING FRONT ELEVATION
1:100



EXISTING SIDE ELEVATION
1:100

0M 1M 2M 3M 4M 5M

LIABILITY

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CONTRACTORS MUST VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING ANY WORK ON SITE OR PREPARING CONSTRUCTION DRAWINGS.

PARTY WALL

WORKS TO A PARTY WALL STRUCTURE OR WITHIN 3 METRES OF THE LINE OF JUNCTION WILL REQUIRE NOTICES SERVED UPON YOUR NEIGHBOUR(S).

WHERE DISPUTES ARISE, A PARTY WALL AWARD MAY NEED TO BE PREPARED PRIOR TO ANY WORKS COMMENCING ON SITE.

KEY

- MH MAXIMUM HEIGHT
- RH ROOF HEIGHT
- EH EAVES HEIGHT
- FFL FINISH FLOOR LEVEL
- PTL PATIO LEVEL
- GL GROUND LEVEL

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EXISTING PLANS AND ELEVATIONS

SITE LOCATION: REAR OF 102 HIGH STREET

DRAWING NO: 19/492/002

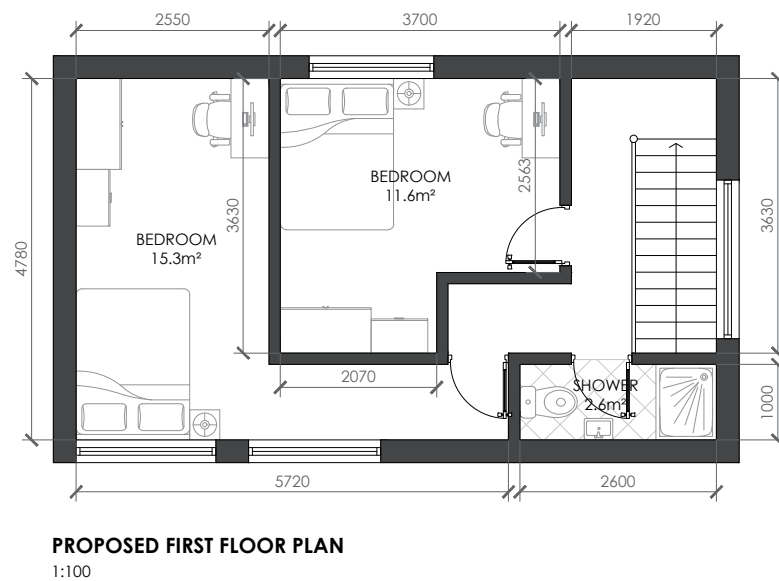
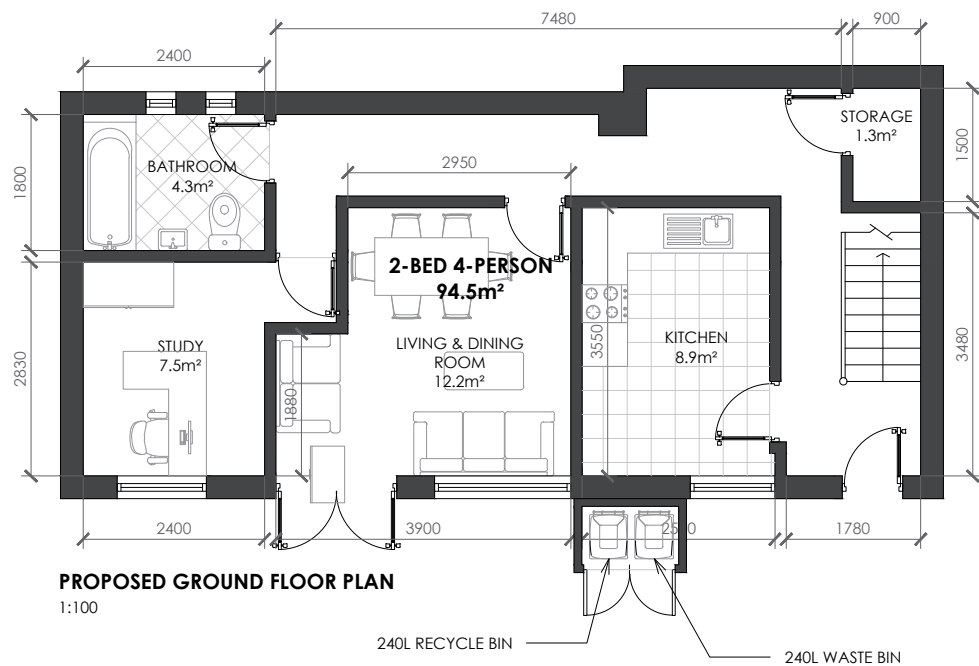
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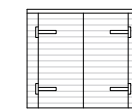
DATE: 28 DEC 2023

DRAWN BY: MC

CHECKED BY: MA



BIN STORE



FRONT ELEVATION
1:100



REAR ELEVATION
1:100



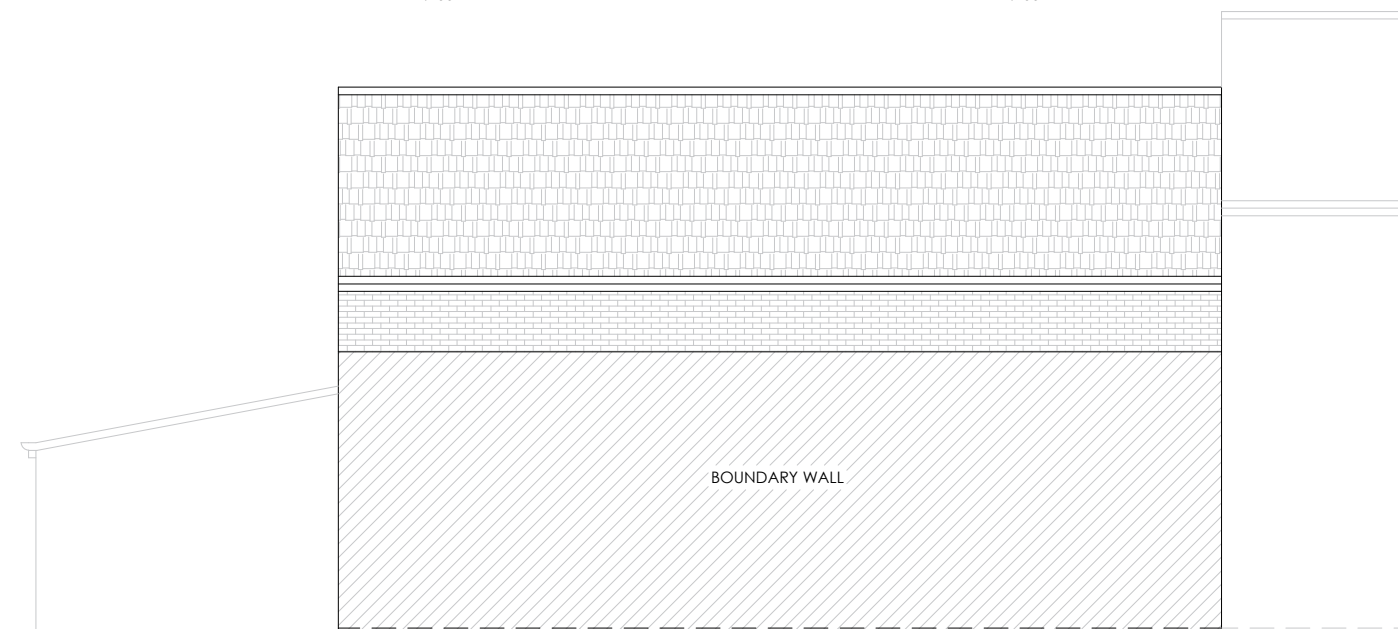
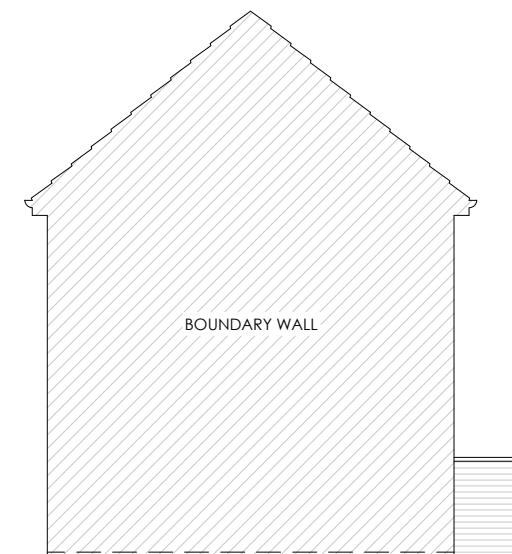
SIDE ELEVATION
1:100



SIDE ELEVATION
1:100



BIN STORE



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- EH EAVES HEIGHT
- FFL FINISH FLOOR LEVEL
- PTL PATIO LEVEL
- GL GROUND LEVEL

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PROPOSED PLANS AND ELEVATIONS

SITE LOCATION: REAR OF 102 HIGH STREET

DRAWING NO: 19/492/003

REVISION: -

SCALE: 1:100@A3

DATE: 28 DEC 2023

DRAWN BY: MC

CHECKED BY: MA