

Flood Risk Assessment AEG0708_SG9_Buntingford_01

degadea

Flood risk, water and environment

David Bright

Site Address: 5 Brookside

Chipping

Buntingford

Herts

SG9 0PH

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

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Flood risk, water and environment

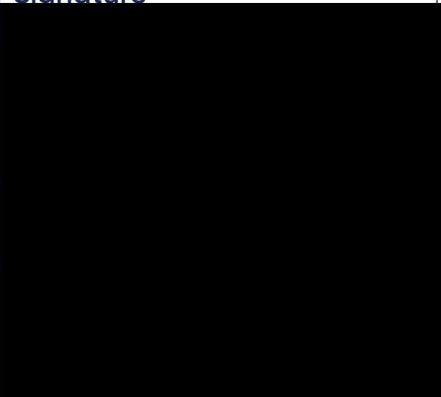
Document Issue Record

Project: Flood Risk Assessment

Prepared for: David Bright

Reference: AEG0708_SG9_Buntingford_01

Site Location: 5 Brookside, Chipping, Buntingford, Herts, SG9 0PH

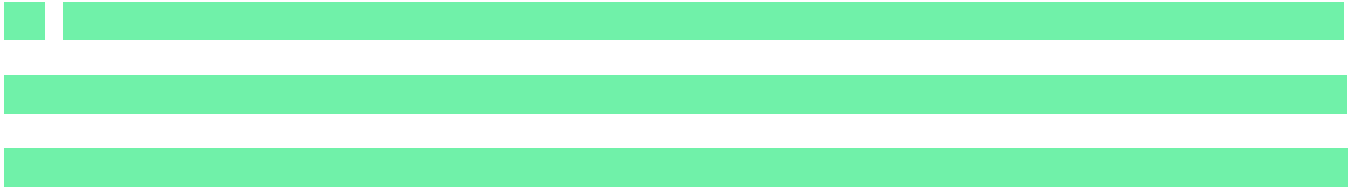
| Consultant | | Date | Signature |
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¹ not required for this assessment ² data not available.



1. Introduction

- 1.1. Aegaea were commissioned by David Bright 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 5 Brookside, Chipping, Buntingford, Hants, SG9 0PH (Figure 1). It is understood that the proposed development is for the construction of a single-storey ground floor extension to increase the habitable space of the existing dwelling.

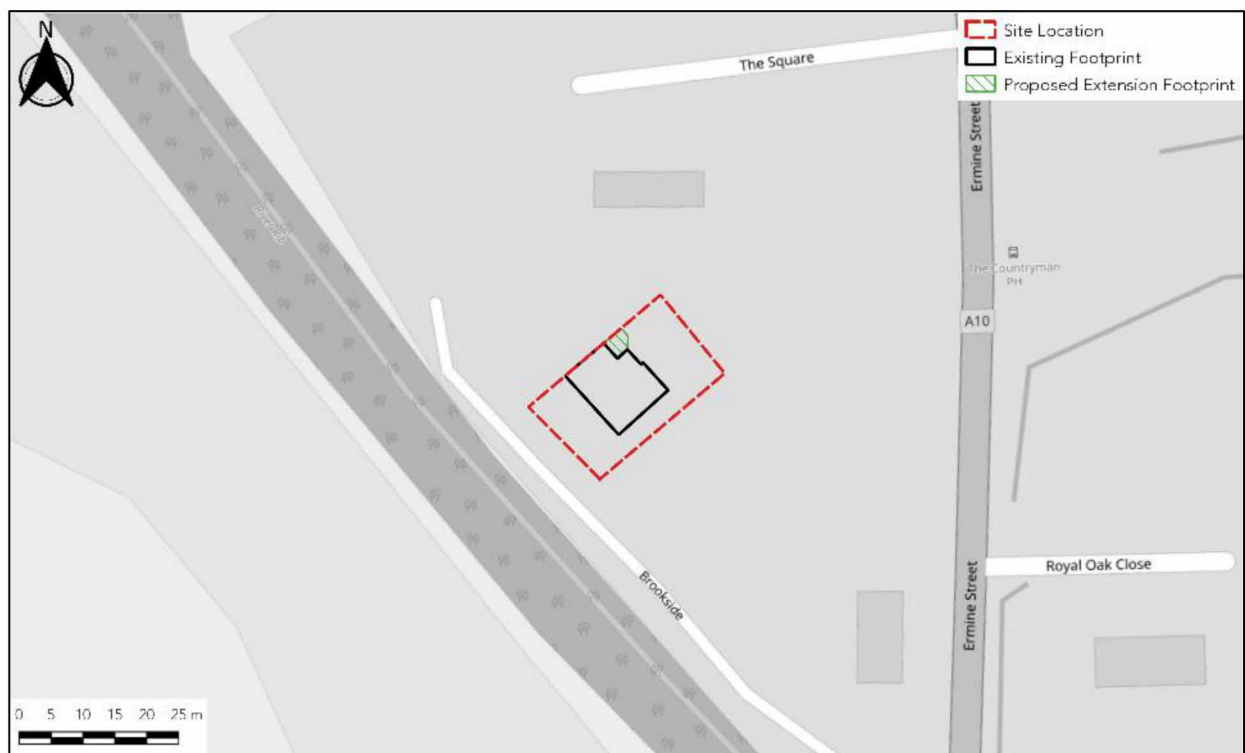


Figure 1: Site Location (Source: OpenStreetMaps © Contains public sector information licensed under the Open Government License v3.0)

- 1.4. In the absence of a topographical survey, Environment Agency Light Detection and Ranging (LiDAR) data Digital Terrain Model (1m resolution) has been utilised to review the topography

of the site (Figure 2). The LiDAR data shows the ground elevation of the site varies between approximately 101.40 metres Above Ordnance Datum (m AOD) and 101.65m AOD (1m LiDAR data). At the location of the proposed extension, the existing ground levels vary between 101.51m AOD to 101.55m AOD.

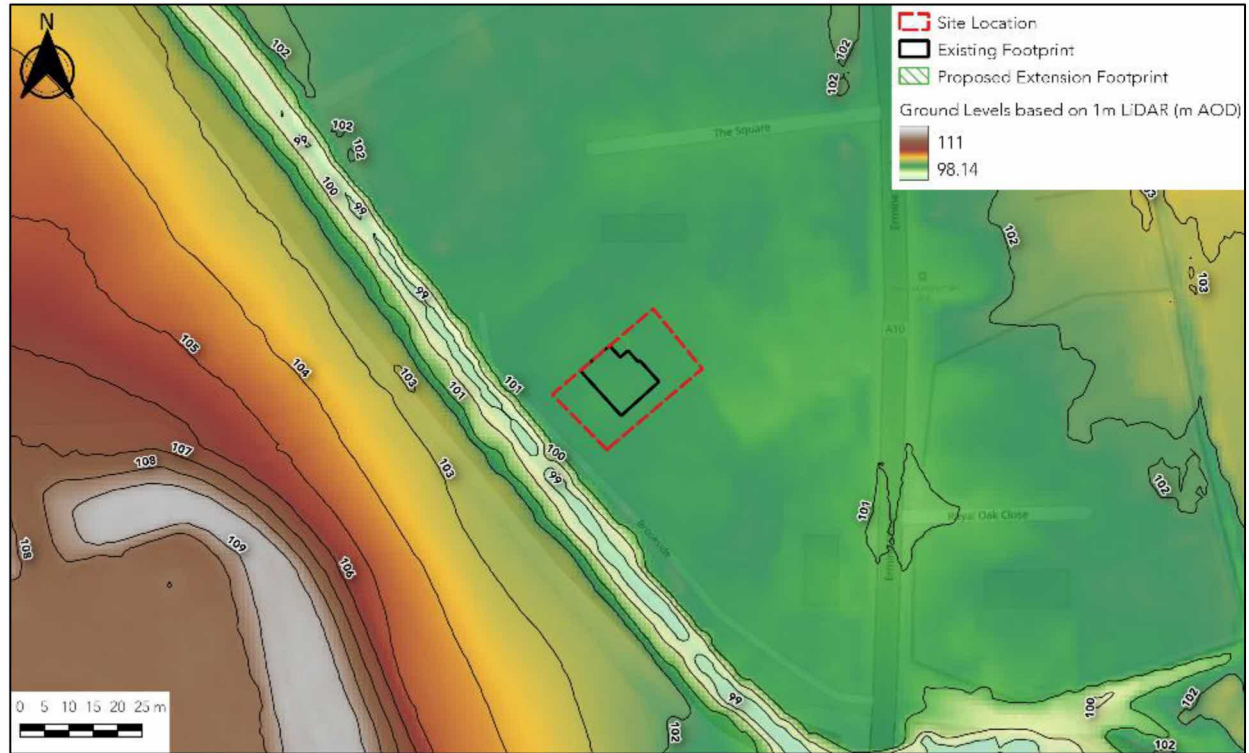


Figure 2: Site Topography (Source: Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA) © <https://www.openstreetmap.org> and contributors. Contains public sector information licensed under the Open Government License v3.0)

- 1.5. East Hertfordshire District Council is the Local Planning Authority (LPA) for the site, and Hertfordshire County Council is the designated Lead Local Flood Authority (LLFA). The site sits within the Environment Agency's Hertfordshire and North London region.



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4. Sources of Flood Risk

Fluvial Flood Risk

- 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 nearest watercourse to the site is the River Rib (an EA main river) which flows from north to south approximately 12m west of the site boundary.
- 4.3. The footprint of the proposed extension lies approximately 27m east of the River Rib.
- 4.4. There are no other ordinary watercourses within the vicinity of the site.

EA Flood Map for Planning

- 4.5. The site is located wholly within Flood Zone 3 based on the EA Flood Map for Planning (Figure 3 and Figure 4). Flood Zone 3 denotes a risk of flooding from fluvial sources greater than 1 in 100 (1.0%).

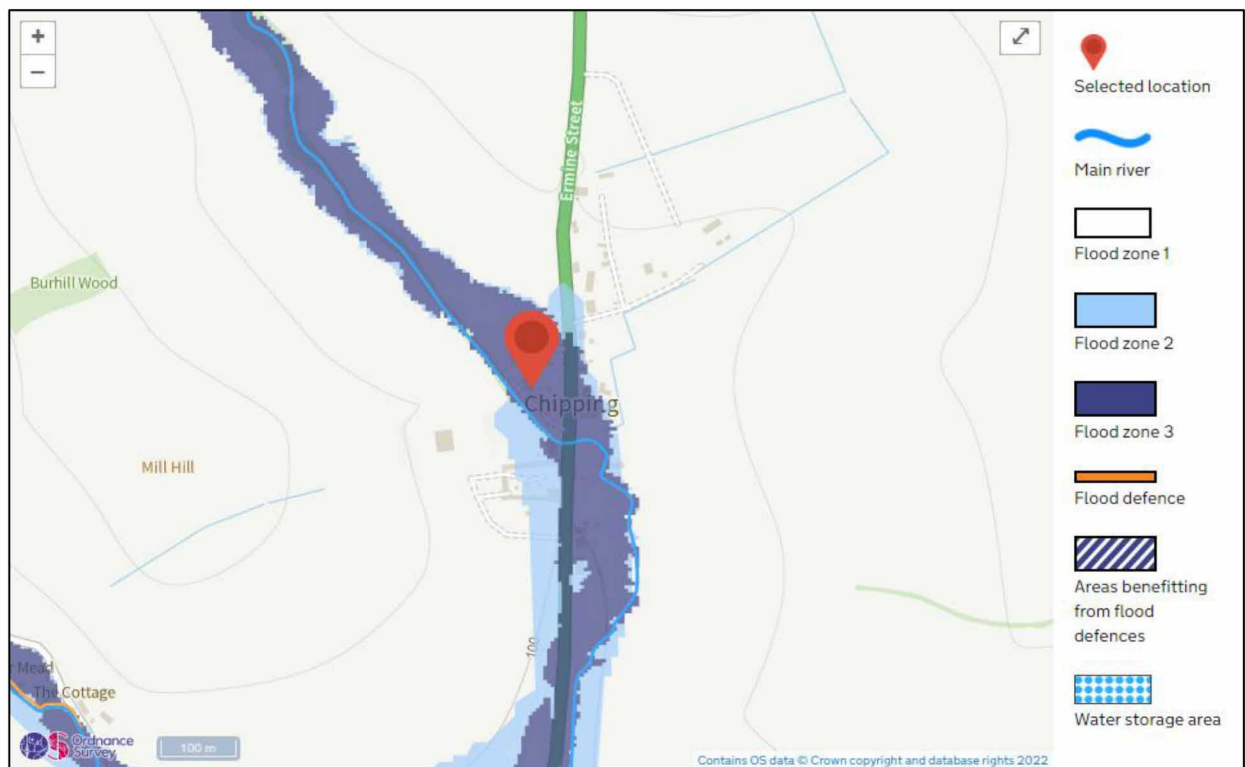


Figure 3: EA Flood Map for Planning



Figure 4: Site Specific Flood Zones from EA Flood Zone for Mapping GIS Layers (Source: OpenStreetMaps © Contains public sector information licensed under the Open Government License v3.0)

East Herts SFRA

- 4.6. The East Herts SFRA (2016) provides mapping which delineates the various flood zones within the district. The SFRA corroborates the EA Flood Map for Planning results that the site is within Flood Zone 3. Flood Zone 3 is broken down further into Flood Zone 3a and Flood Zone 3b. Flood Zone 3b (functional floodplain) is described within the SFRA as;

The SFRA identifies this Flood Zone as land which would flood with an annual probability of 1 in 20 years (5%AEP); where detailed modelling exists, the 1 in 20-year flood extent has been used to represent Flood Zone 3b (provided by the Environment Agency). In the absence of detailed hydraulic model information, a precautionary approach has been adopted with the assumption that the extent of Flood Zone 3b would be equal to Flood Zone 3a (i.e., indicative extent of Flood Zone 3b). If development is shown to be in Flood Zone 3a, further work should be undertaken as part of a detailed site-specific flood risk assessment to define the extent of Flood Zone 3b.

- 4.7. The SFRA also notes that;

Only water compatible and essential infrastructure are permitted in this zone and should be designed to remain operational in times of flood, resulting in no loss of floodplain or blocking of water flow routes. Infrastructure must also not increase flood risk elsewhere.

- 4.8. Figure 5 shows that the site lies outside the extent of Flood Zone 3b though, as stated above, the SFRA (2016) has adopted the assumption that Flood Zone 3a is equal to Flood Zone 3b and as such the site is shown to be within the indicative Flood Zone 3b. Moreover, no detailed flood modelling for the area is available (as confirmed by the EA) and as such, it must be assumed that the site lies within the indicative Flood Zone 3b.
- 4.9. It should be noted though that since the publication of the SFRA (2016), the definition of Flood Zone 3b has been updated (August 2022) so that now it is defined by the PPG as land having a 3.3% or greater annual probability of flooding, rather than a 5% Annual Exceedance Probability (AEP) of flooding. Therefore, it may be necessary for the East Herts Council to revise the definition of the indicative Flood Zone 3b.



Figure 5: East Herts SFRA Flood Zone Extents (Site Located within Red Circle)

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Figure 6: EA Historic Flood Mapping (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors, © EA copyright and/or database right 2015)

Summary

- 4.15. Based on the information above, the site is considered to be at a high risk of fluvial flooding.

Tidal Flooding

- 4.16. 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 riverbank or river defences when tide levels are high.
- 4.17. 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. Therefore, the risk of flooding from tidal sources is considered low.

Canals

- 4.18. 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.

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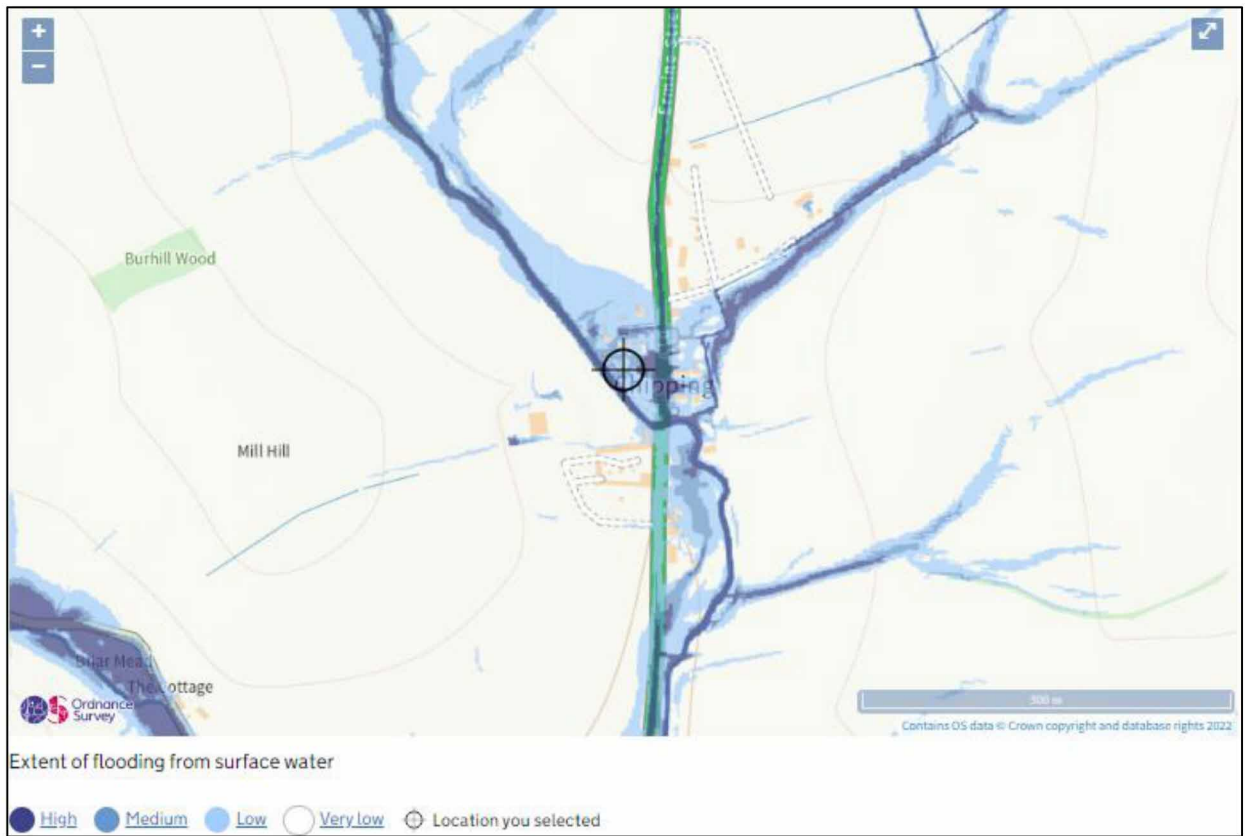


Figure 7: EA Surface Water Flood Risk Mapping

- 4.24. The Risk of Flooding from Surface Water (RoFSW) datasets provided by DEFRA have also been used to determine the pluvial flood risk to the site. This dataset is available at a closer scale and is therefore more relevant in determining the risk to the site.
- 4.25. In the modelled 3.3%AEP event (Figure 8), the site remains unaffected by surface water flooding. The largest depths during this event are contained to the channel of the River Rib to the east of the site.



Figure 8: EA Surface Water Flood Risk Mapping 3.3% AEP (Source: Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors, © EA copyright and/or database right 2015)

- 4.26. In the modelled 1.0%AEP event (Figure 9) the site is affected by surface water flooding, with depths within the site boundary reaching up to 300mm. However, the proposed footprint of the extension remains unaffected by flooding in this event.
- 4.27. Within the vicinity of the site both Brookside Road immediately adjacent to the site, and Ermine Road to the west of the site experience flooding. Depths on Brookside Road could reach up to 150mm, whilst on Ermine Road, they could reach up to 900mm.
- 4.28. Analysis of the EA hazard ratings for the flood extent in the modelled 1.0%AEP event show that safe access/egress should be possible from the site via Brookside Road, then heading south on Ermine Road. The flood extent on these roads in the directions described previously are either unaffected or have a 'Low' hazard rating.
- 4.29. It should be noted that on the mapping in Figure 9, the flood extent is shown to have an 'Extreme' hazard rating to the south of the junction from Brookside Road to Ermine Road. However, this relates to the flood extent within the Rib channel, not to the flood extent on the Ermine Road bridge which crosses the river.

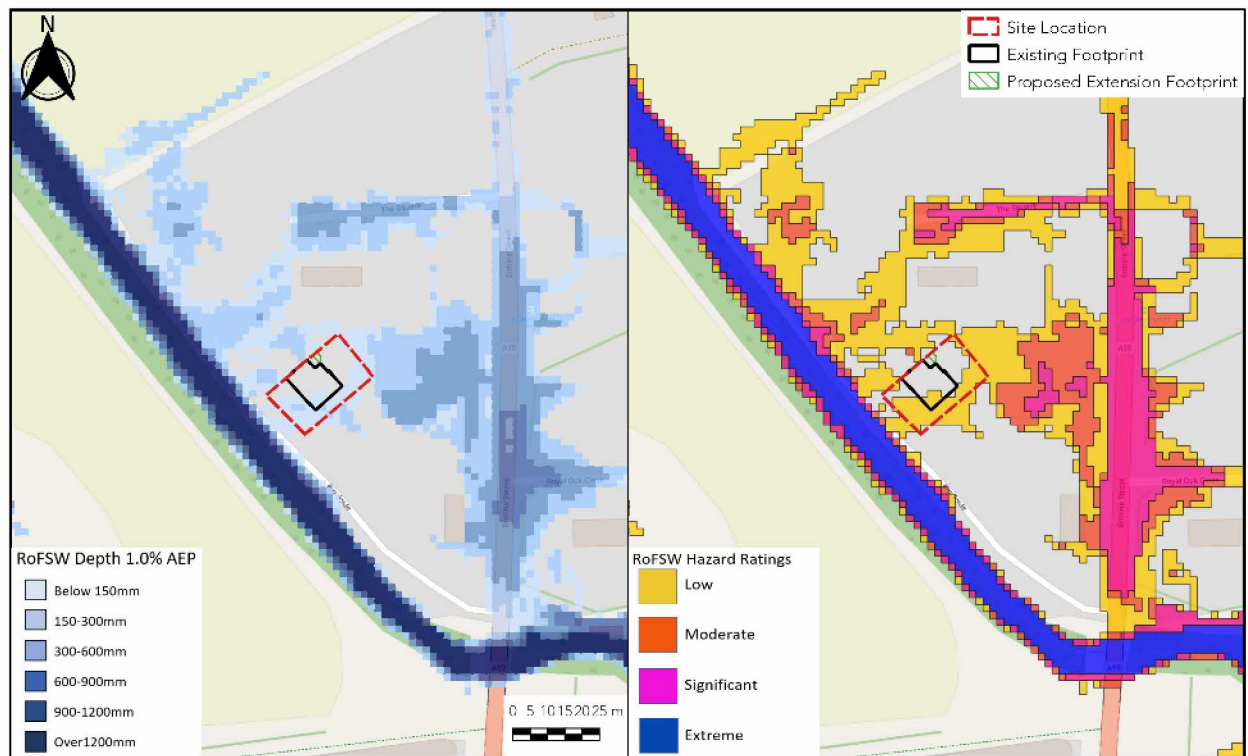


Figure 9: EA Surface Water Flood Risk Mapping 1.0% AEP (Source: Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors, © EA copyright and/or database right 2015)

- 4.30. In the modelled 0.1%AEP event (Figure 10), the site is affected by surface water flooding, with depths within the site boundary ranging between below 150mm to 900mm. At the location of the proposed extension, depths range between 150mm to 600mm.
- 4.31. Within the vicinity of the site, both Brookside Road and Ermine Road experience surface water flooding in this event. The hazard rating on both roads range between 'Significant' to 'Extreme'. As such, safe access/egress should not be possible in this event and refuge should be sought on site at the first floor level of the existing dwelling.

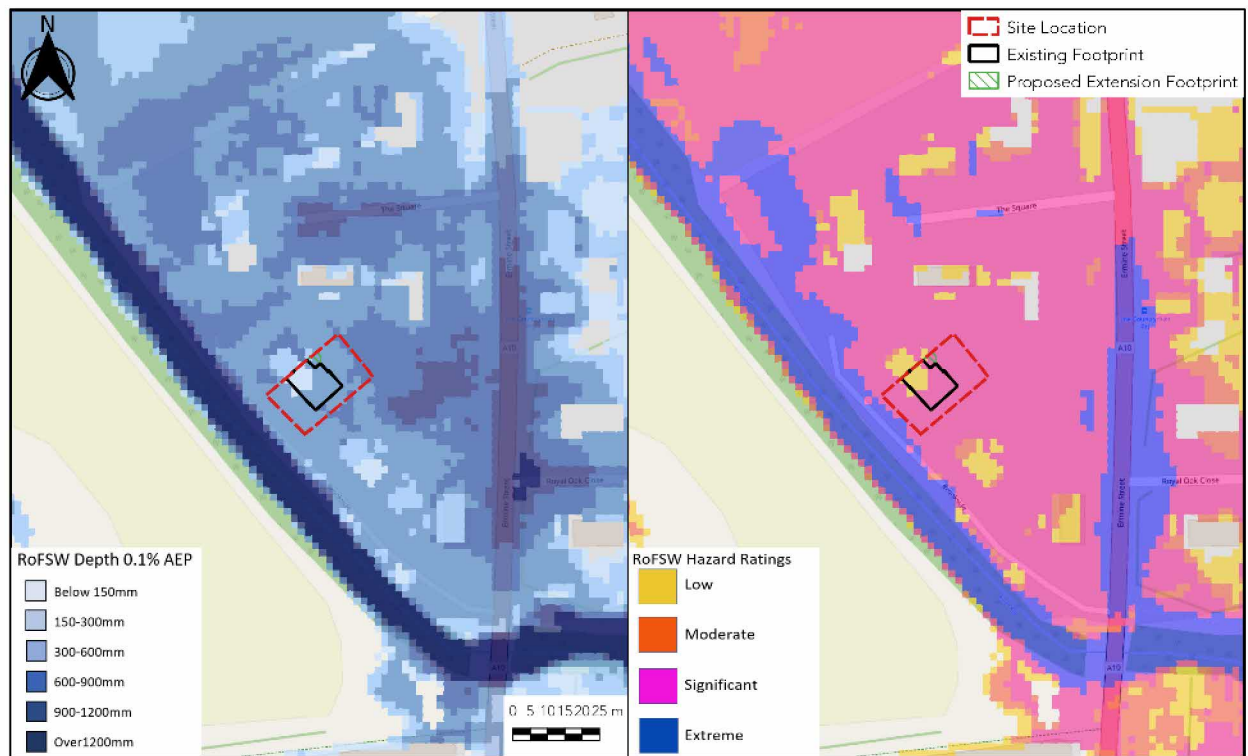


Figure 10: EA Surface Water Flood Risk Mapping 0.1% AEP (Source: Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors, © EA copyright and/or database right 2015)

4.32. Based on the information above, the proposed development is considered to be at a low risk of surface water flooding.

Reservoirs

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

4.34. According to the EA's Flood Risk from Reservoirs mapping the site is outside flood extents in the event of reservoir flooding.

4.35. Additionally, according to the EA, there has been no loss of life in the UK from reservoir flooding since 1925. All large reservoirs must be inspected and supervised by reservoir panel engineers as detailed by the enforcement authority for the Reservoirs Act 1975 in England. The EA are responsible to ensure that reservoirs are inspected regularly, and essential safety work carried

out. 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

- 4.36. Groundwater flooding occurs in areas where underlying geology is permeable, and water can rise within the strata sufficiently to breach the surface.
- 4.37. The British Geological Survey's (BGS) mapping shows superficial deposits of Head comprising of clay, silt, sand, and gravel underlying the site. The bedrock underlying the site is Lewes Nodular Chalk Formation comprising of chalk and Seaford Chalk Formation comprising of chalk.
- 4.38. There are no publicly available Historical BGS borehole records within the vicinity of the site (1km radius).
- 4.39. The SFRA presents the EA's Areas Susceptible to Groundwater Flooding mapping, which assesses the future risk of groundwater flooding. The site is within a 1km square grid of which between 25% to 50% is susceptible to groundwater flooding.

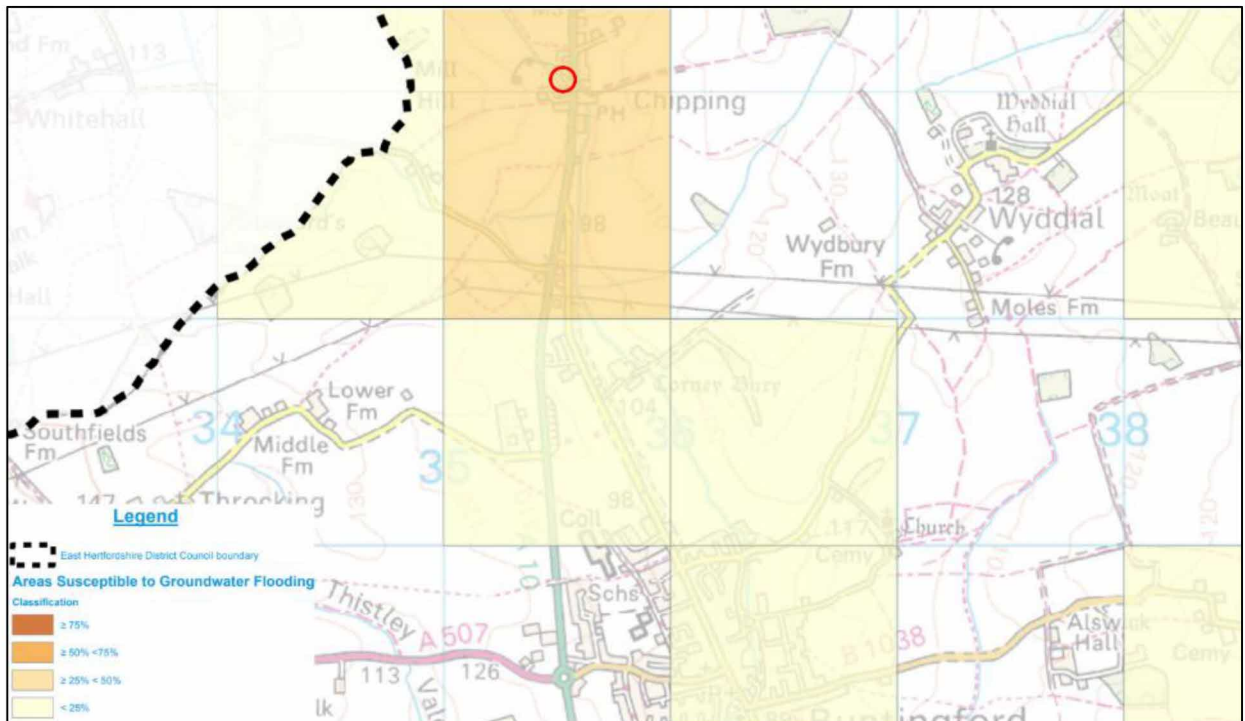


Figure 11: Areas Susceptible to Groundwater Flooding (East Herts SFRA) (Site Location at Red Circle)

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Table 5-8: DG5 Register recorded flood incidents

| Post Code | Recorded Flood Incidents | Post Code | Recorded Flood Incidents |
|---|--------------------------|-----------|--------------------------|
| AL6 0 | 4 | SG120 | 4 |
| CM210 | 6 | SG127 | 8 |
| CM219 | 16 | SG128 | 18 |
| CM226 | 1 | SG129 | 6 |
| CM231 | 1 | SG137 | 4 |
| CM232 | 14 | SG138 | 1 |
| CM233 | 16 | SG141 | 2 |
| CM234 | 2 | SG142 | 10 |
| CM235 | 8 | SG143 | 21 |
| RH4 3 | 0 | SG2 7 | 8 |
| SG106 | 2 | SG2 9 | 1 |
| SG111 | 3 | SG3 6 | 6 |
| SG112 | 4 | SG9 9 | 13 |
| Total: 179 | | | |
| Note: Based on information provided on 12/07/16 | | | |

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Flood Warning Services

- 5.12. As a further precaution and risk reduction, the owner of the site should sign up the Rivers Rib and Quin EA flood alert service which is covered by the site address (Figure 13). This service allows tenants to register an address, which is at risk of flooding, along with contact details so that in the event of a flood being forecast, the site owner will be sent an alert directly to their chosen method of contact.

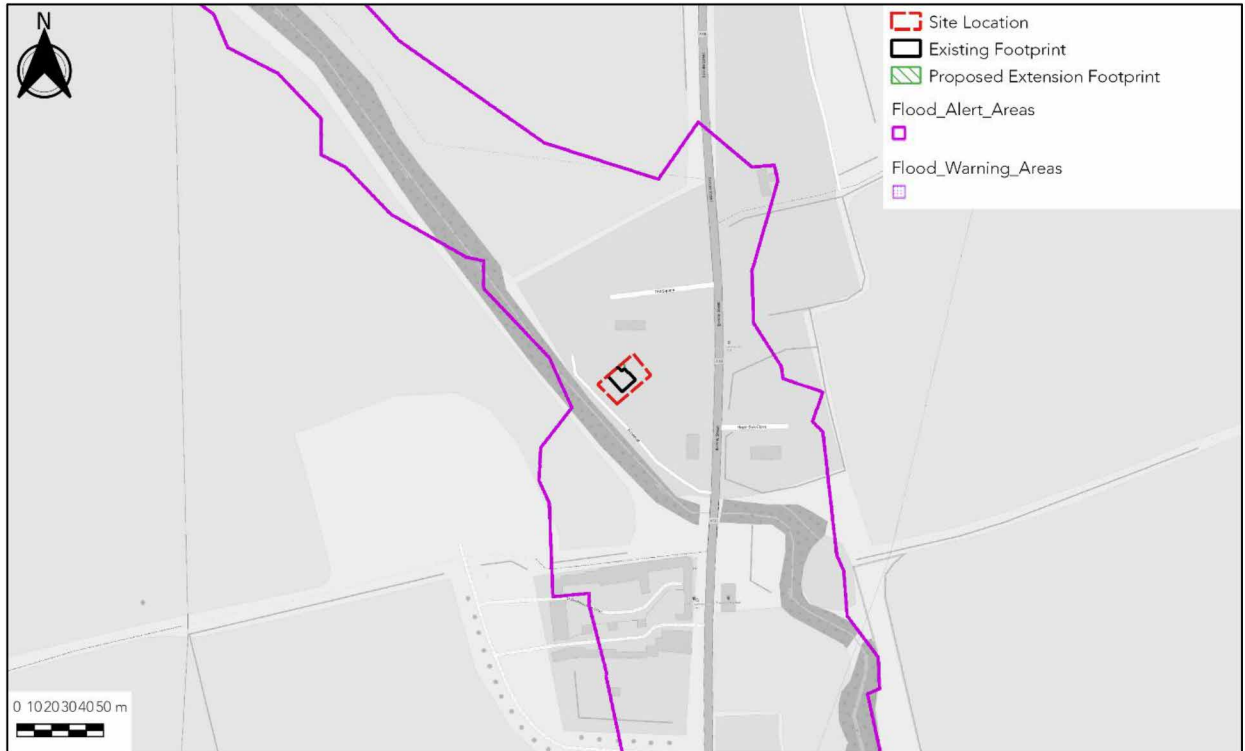


Figure 13: EA Flood Alert Area Coverage (Source: OpenStreetMaps © Contains public sector information licensed under the Open Government License v3.0)

- 5.13. Flood warnings/alerts can be enforced at any time of the day or night. Signing up for this service provides tenants 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.

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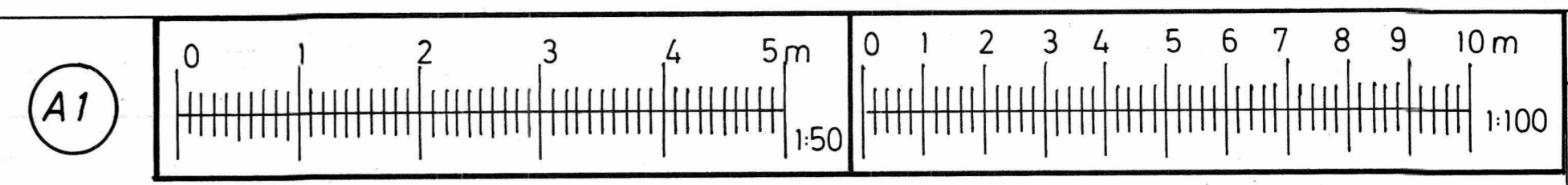
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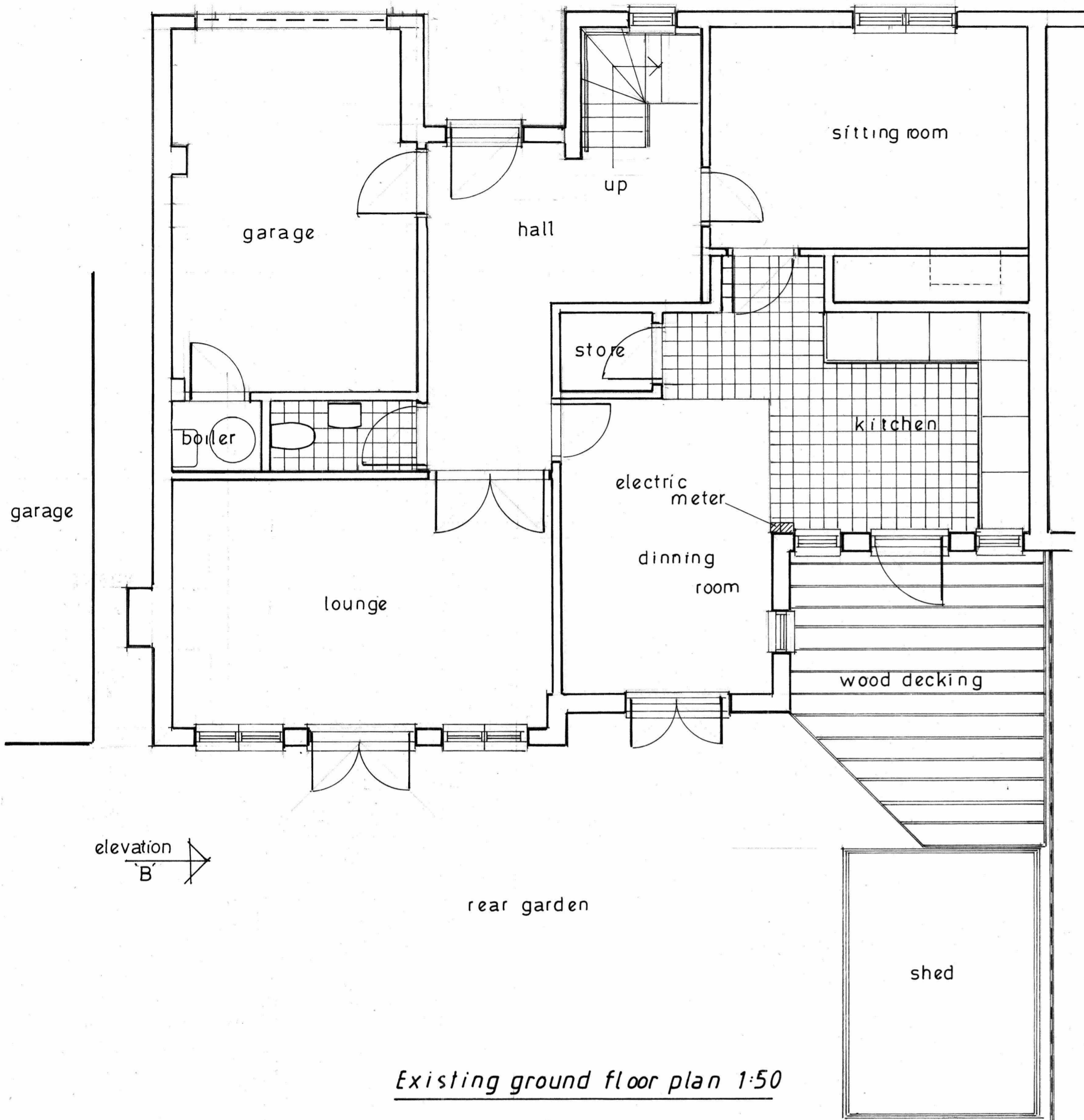
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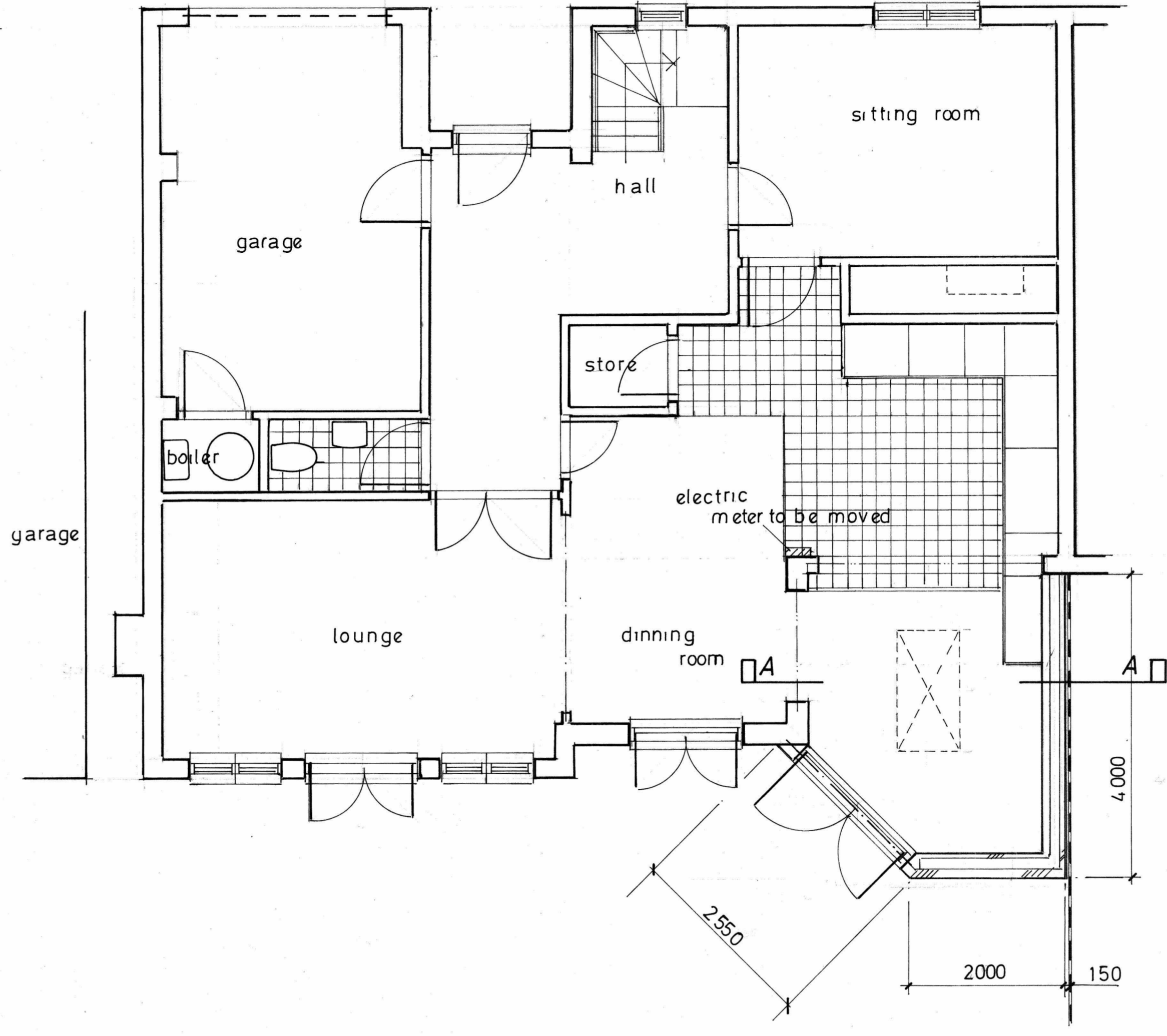




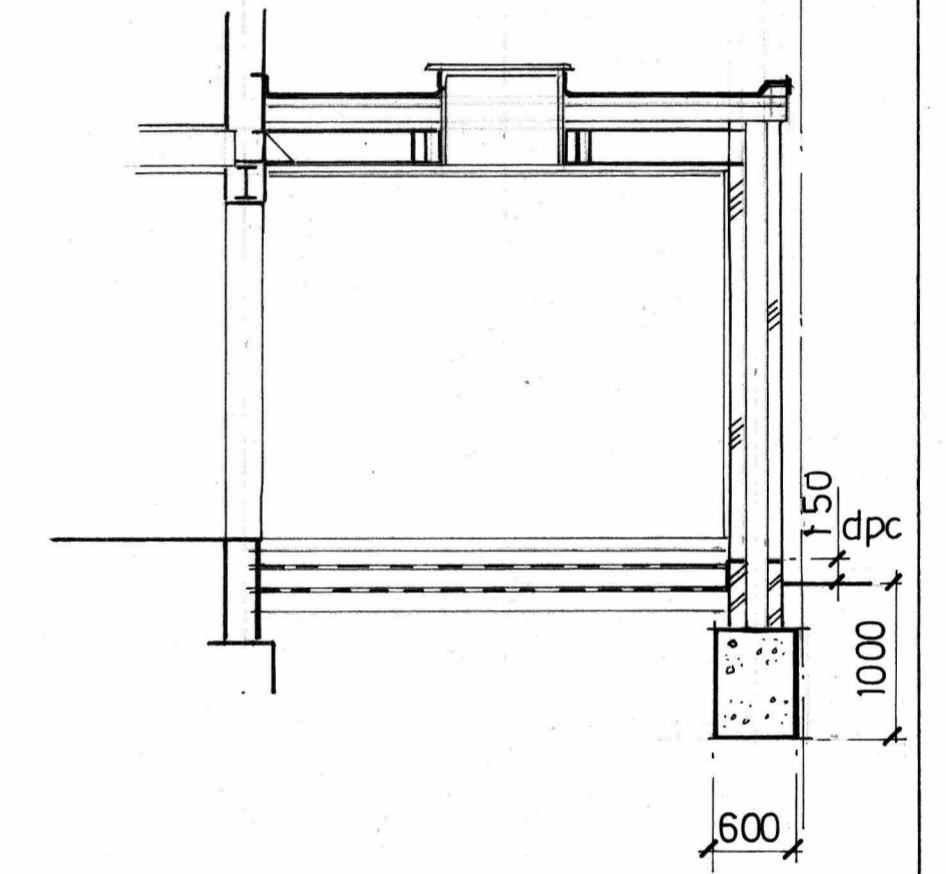
Notes



Existing ground floor plan 1:50



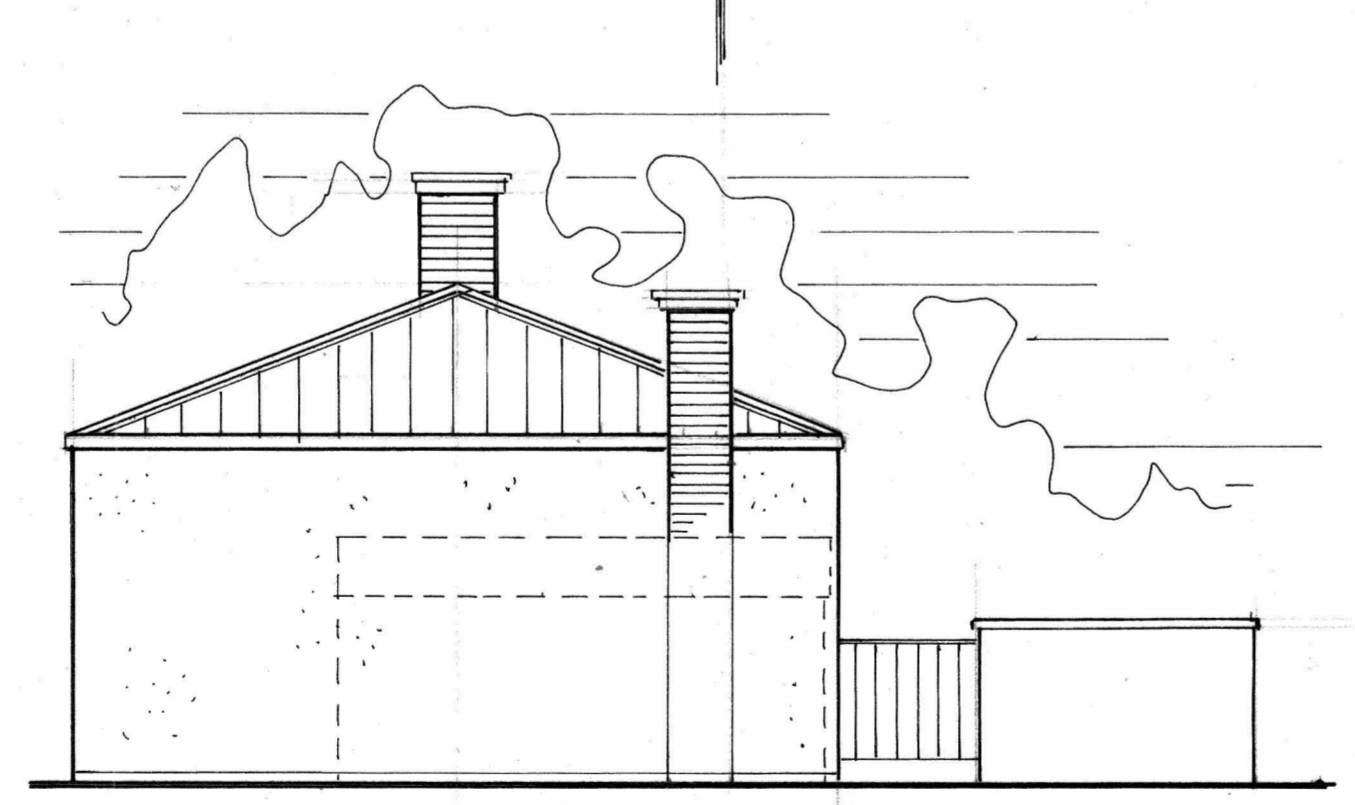
Proposed ground floor plan 1:50



Section A-A 1:50



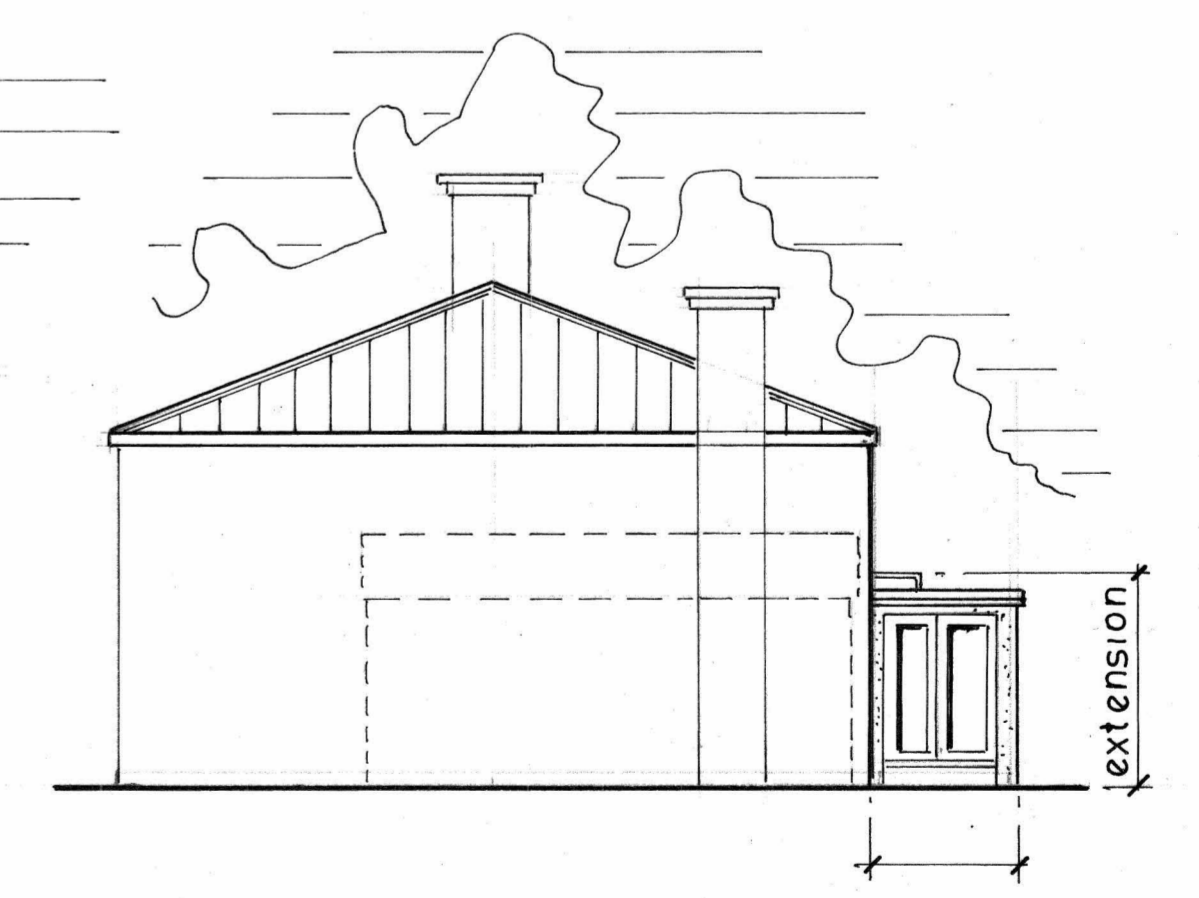
Existing rear elevation 1:100



Existing side elevation B' 1:100



Proposed rear elevation 1:100



Proposed side elevation B' 1:100

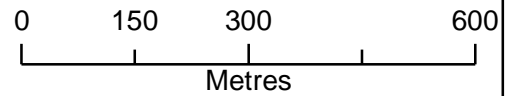
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| Location 5 Brookside Chipping Buntingford SG9 0PH | | |
| Scale As shown | Date Aug 2022 | |
| Drw N ^o DB/MS/100 | Amendment | |



Historic Flood Map centred on: 5 Brookside, Chipping, Buntingford, SG9 0PH- 01/11/2022 - HNL 285085 BC



Environment Agency
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Welwyn Garden City,
Hertfordshire,
AL7 1HE



Legend

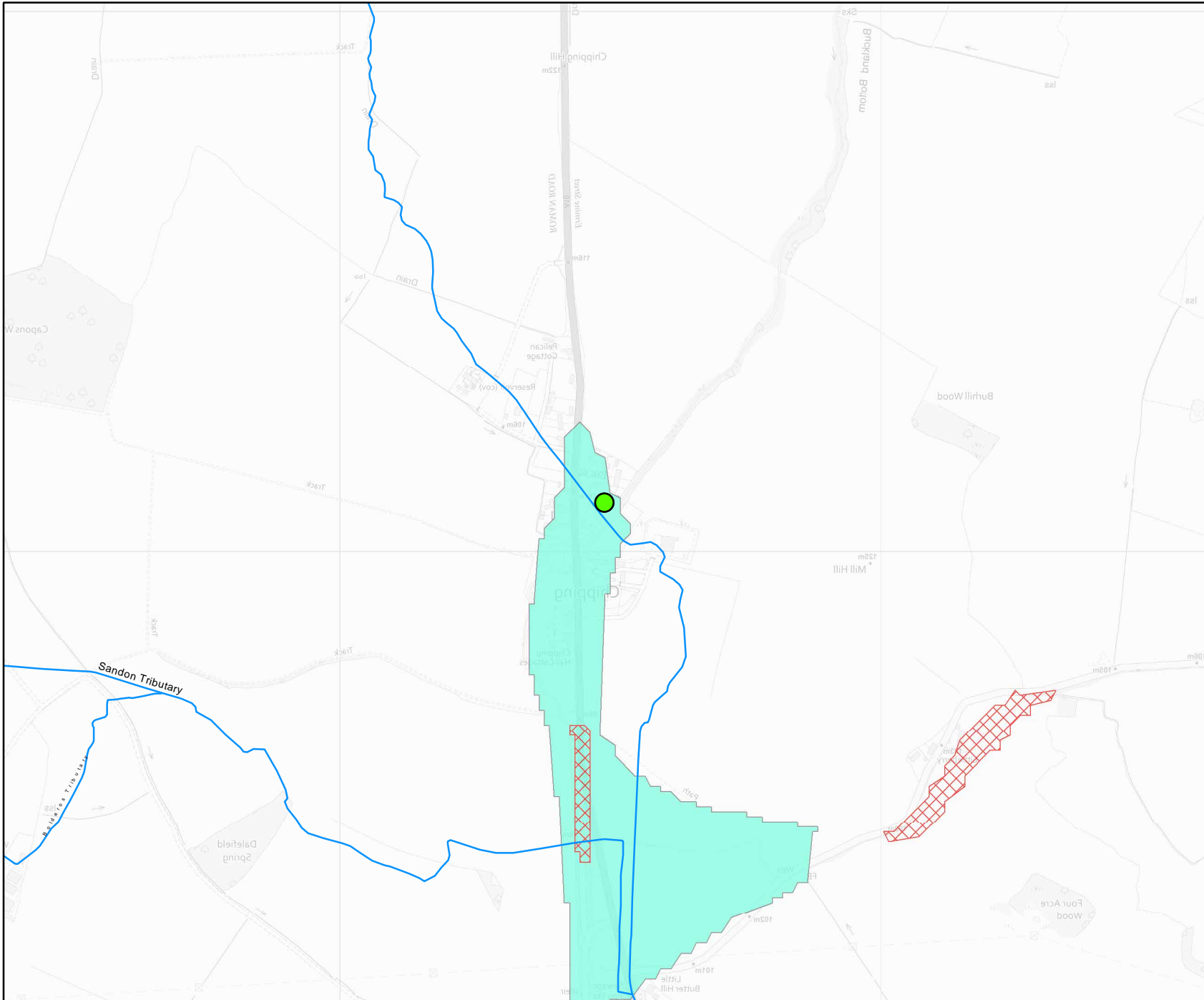
- Main Rivers
- Site location

Flood Event Outlines

- 1947
- 1968

The historic flood event outlines are based on a combination of anecdotal evidence, Environment Agency staff observations and survey. Our historic flood event outlines do not provide a definitive record of flooding. It is possible that there will be an absence of data in places where we have not been able to record the extent of flooding. It is also possible for errors occur in the digitisation of historic records of flooding.

Produced by:
Partnerships & Strategic Overview,
Hertfordshire & North London



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