



Flood Risk Assessment

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Flood risk, water and environment

AEG0648_SL6_RBWM_1Simpson_01

Site Address: 1 Simpson Close
Maidenhead
Royal Borough of Windsor and Maidenhead
SL6 8RZ

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

degadea

Flood risk, water and environment

Document Issue Record

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Prepared for: Tahira Javed

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Site Location: 1 Simpson Close, Maidenhead, Royal Borough of Windsor and Maidenhead, SL6 8RZ

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Summary

Development Description	Existing	Proposed
Development Type	Residential dwelling	Extension to provide greater habitable space
EA Vulnerability Classification	More Vulnerable	More Vulnerable
Ground Floor Level	N/A ²	FFLs of extension should be set no lower than the existing FFLs in line with EA Standing Advice for Minor Developments
Level of Sleeping Accommodation	First floor	No change- proposal is for a porch
Impermeable Surface Area	N/A ¹	New hardstanding areas should be constructed using permeable surfacing
Surface Water Drainage	N/A ¹	Discharge runoff as per existing surface water drainage infrastructure. Betterment can be provided through small-scale SuDS such as rainwater planters and water butts.
Site Size	210m ²	No change
Development Size		<250m ²
Risk to Development	Summary	Comment
EA Flood Zone	Flood Zone 3	Area benefitting from the presence of defences
Flood Source	Fluvial	
SFRA Available	Royal Borough of Windsor and Maidenhead Strategic Flood Risk Assessment (2017)	
Management Measures	Summary	Comment
Ground floor level above extreme flood levels	N/A ¹	FFLs of extension should be set no lower than the existing FFLs in line with EA Standing Advice for Minor Developments
Safe Access/Egress Route	N/A ¹	Sign up to the EA Flood Warning and Alert Service. (The River Thames at Maidenhead to Windsor and Eton). Access/Egress arrangements would not differ from existing as proposal is Minor Development.
Flood Resilient Design	Yes	Constructed in flood resilient manner in accordance with CLG Report Improving the Flood Performance of New Buildings - Flood Resilient Construction (2007).
Site Drainage Plan	N/A ¹	Discharge runoff as per existing surface water drainage infrastructure. Betterment can be provided through small-scale SuDS such as rainwater planters and water butts.
Flood Warning & Evacuation Plan	Yes	EA Flood Warning Service
Offsite Impacts	Summary	Comment
Displacement of floodwater	Negligible	Proposal is Minor Development which may not result in significant impact of floodplain storage in isolation in accordance with paragraph 051 of the Flood Risk and Coastal Change PPG
Increase in surface run-off generation	No	Discharge runoff as per existing surface water drainage infrastructure. Betterment can be provided through small-scale SuDS such as rainwater planters and water butts.

Impact on hydraulic performance of channels

No

No nearby watercourses or channels

¹ not required for this assessment

² data not available.

1. Introduction

- 1.1. Aegaea were commissioned by Tahira Javed 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 1 Simpson Close, Maidenhead, Royal Borough of Windsor and Maidenhead, SL6 8RZ (Figure 1).

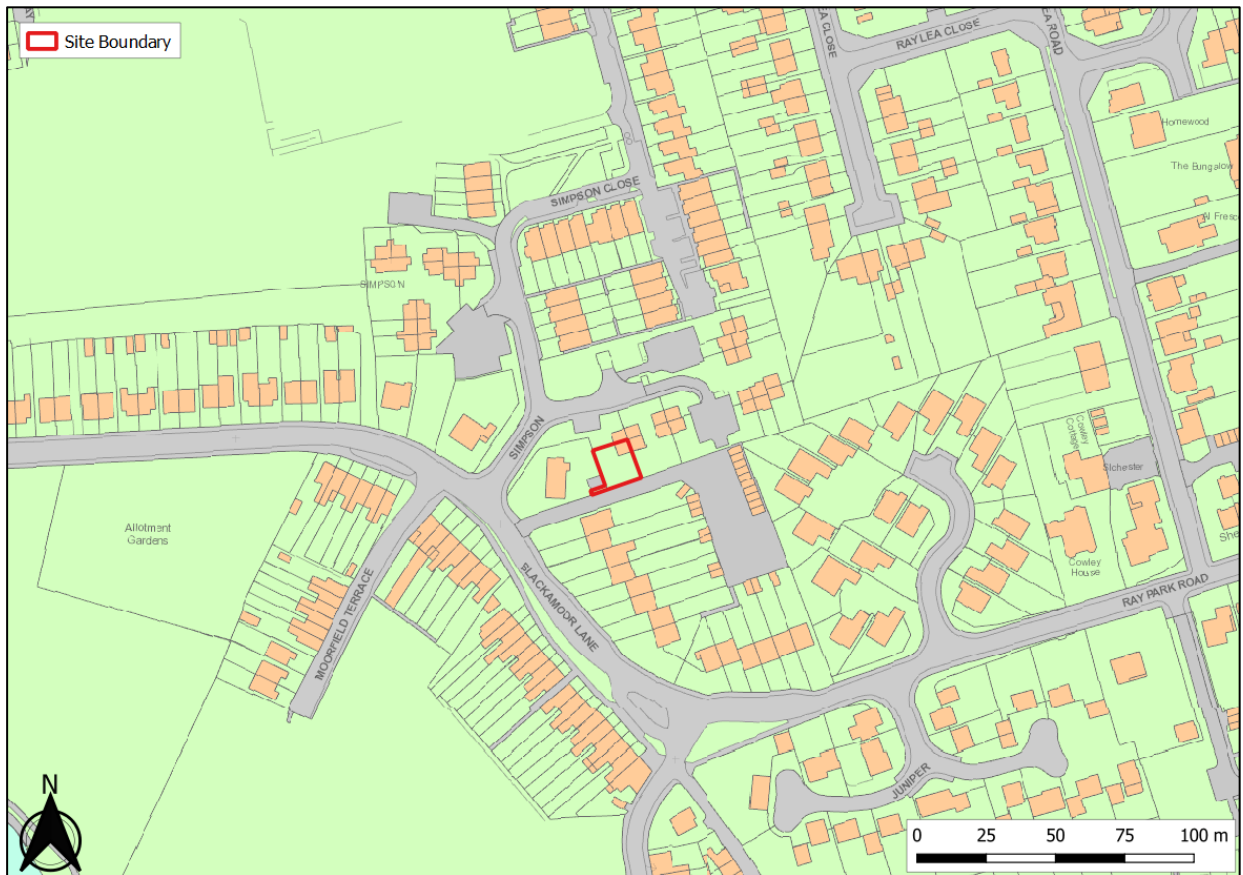


Figure 1: Site Location

- 1.4. The existing site consists of a single residential dwelling. The proposed development is for the construction of a single storey extension to the existing dwelling on site to provide greater habitable space (a porch).

- 1.5. 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). Upon review, it shows that the site is relatively flat, with levels varying between approximately 23.90m Above Ordnance Datum (AOD) adjacent to the road in the south and approximately 24.15m AOD to the north of the site.

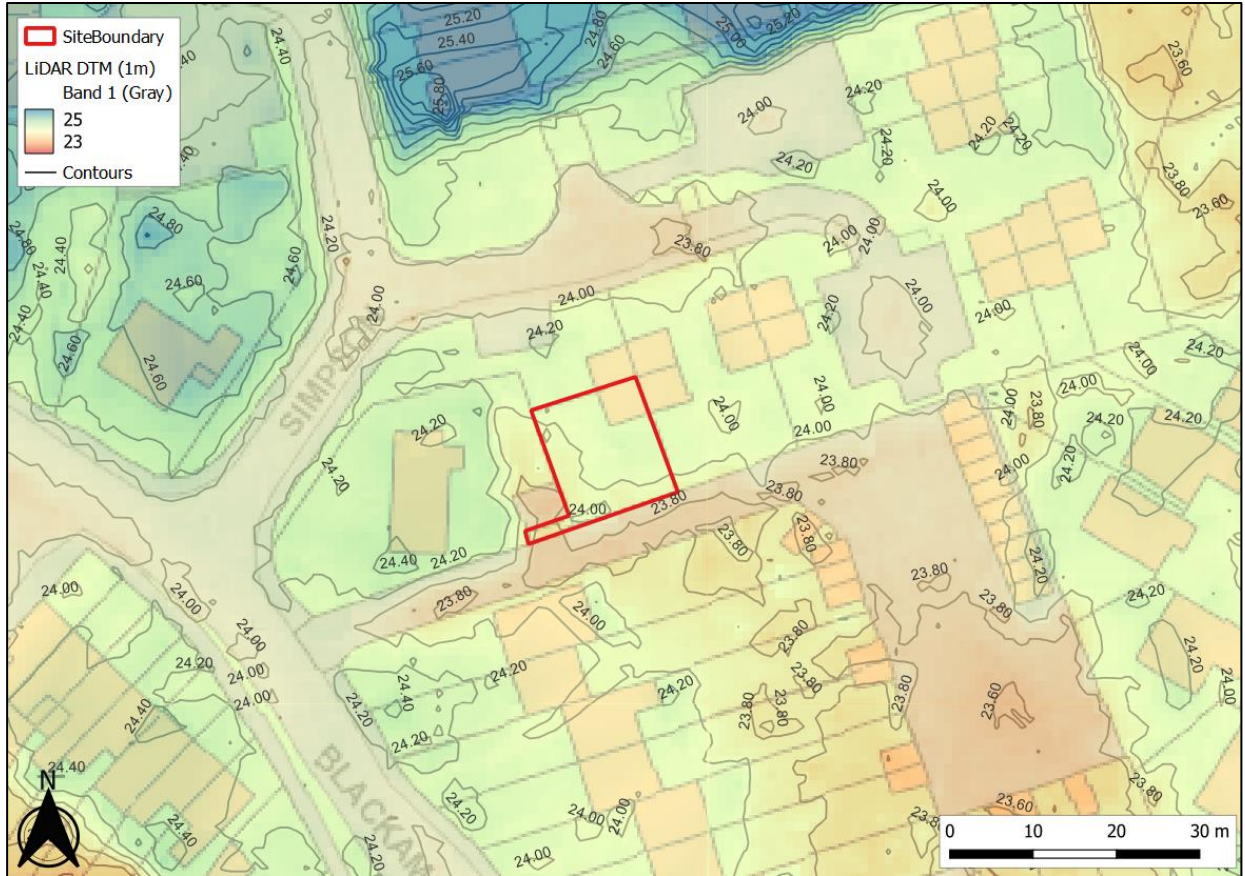


Figure 2: Site Topography in metres above Ordnance Datum.

- 1.6. Royal Borough of Windsor and Maidenhead is the Local Planning Authority (LPA) for the site, and also the designated Lead Local Flood Authority (LLFA). The site sits within the Environment Agency's Thames region.

Planning Requirement

1.7. UK government planning guidance states¹ that an FRA is required for sites which are:

- *In Flood Zone 2 or 3 including minor development (in terms of flood risk) and change of use*
- *More than 1 hectare 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 river and the sea (for example surface water drains or reservoirs)*
- *In an area within Flood Zone 1 which has critical drainage problems as notified by the Environment Agency*

1.8. The site is located within Flood Zone 3 therefore 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

¹ <https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications#when-you-need-an-assessment>

2. Planning Policy

National Planning Policy Framework

- 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.
- 2.2. The National Planning Policy Framework² (NPPF) (DCLG, 2021) includes Government policy on development and flood risk stating that:

“159. 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.

167. 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;*
- 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.*

168. 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 55. “

² <https://www.gov.uk/guidance/national-planning-policy-framework>, last updated July 2021

2.3. Footnote 55 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 has to flow or be stored in times of flood.</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. Paragraph 051 of the Flood Risk and Coastal Change Planning Practice Guidance (PPG) states:

Minor development means:

- *minor non-residential extensions (industrial/commercial/leisure etc): extensions with a floorspace not in excess of 250 square metres.*
- *alterations: development that does not increase the size of buildings, e.g. alterations to external appearance.*
- *householder development: for example, sheds, garages, games rooms etc within the curtilage of the existing dwelling, **in addition to physical extensions to the existing dwelling itself**. This definition excludes any proposed development that would create a separate dwelling within the curtilage of the existing dwelling (eg subdivision of houses into flats) or any other development with a purpose not incidental to the enjoyment of the dwelling.*

2.6. As such, the proposal would be considered a “Minor Development (in terms of flood risk)” under the PPG.

2.7. 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.

- 2.8. 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.

Sequential and Exception Tests

- 2.9. As per Paragraph 169 of the NPPF, minor development (in terms of flood risk) should not be subject to the Sequential and Exception Tests.
- 2.10. However, the planning application submitted by the applicant is required to be accompanied by an FRA which shows that the development can be achieved in a sustainable manner, with an overall reduction of flood risk to the site and surrounding area.

Local Plan

- 2.11. The Local Plan prepared by the Local Planning Authority, Royal Borough of Windsor and Maidenhead, sets out the policies for development in the local area.
- 2.12. Policy NR1 Managing Flood Risk and Waterways outlines the requirements for new development within the area. It states:

1. *Flood zones are defined in the National Planning Practice Guidance and the Council's Strategic Flood Risk Assessment (Level 1). Within designated Flood Zones 2 and 3 (and also in Flood Zone 1 on sites of 1 hectare or more in size and in other circumstances as set out in the NPPF) development proposals will only be supported where an appropriate flood risk assessment has been carried out and it has been demonstrated that development is located and designed to ensure that flood risk from all sources of flooding is acceptable in planning terms.*

2. *The sequential test is required for all development in areas at risk of flooding, except for proposed developments on sites allocated in this Plan or in a made Neighbourhood Plan which accord with the provisions of those Plans so far as material to the application. In applying this test, development proposals should show how they have had regard to:*

- a. the availability of suitable alternative sites in areas of lower flood risk*
- b. the vulnerability of the proposed use and the Flood Zone designation*
- c. the present and future flood risk*
- d. the scale of potential consequences e. site evacuation plan in the event of potential flooding.*

Only water compatible uses and essential infrastructure development will be supported in the area defined as functional floodplain. The exception test will still apply.

3. *The sequential approach should be followed by developers for all development so that the most vulnerable development is located in the lowest risk flood areas within a site, taking account of all sources of flood risk.*
4. *Development proposals should include an assessment of the impact of climate change using appropriate climate change allowances over the lifetime of the development so that future flood risk is taken into account.*
5. *In all cases, development should not itself, or cumulatively with other development, materially:*
 - a. *impede the flow of flood water*
 - b. *reduce the capacity of the floodplain to store water*
 - c. *increase the number of people, property or infrastructure at risk of flooding*
 - d. *cause new or exacerbate existing flooding problems, either on the proposal site or elsewhere.*
 - e. *reduce the waterway's viability as an ecological network or habitat for notable species of flora or fauna.*

Summary

- 2.13. This flood risk assessment has been prepared with due consideration to the above local and national policy.

3. Consultation and Review

Sources of Information

Consultation

- 3.1. The site is within the remit of Royal Borough of Windsor and Maidenhead as Lead Local Flood Authority (LLFA). Aegaea hold the Lower Thames Model (2019) on file and as such consultation with the EA has not been carried out at this stage.

Documents

- 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:
- Interactive Flood Risk Mapping available on the Environment Agency (EA) website⁵.
 - The National Planning Policy Framework (NPPF) (Communities and Local Government, 2021).
 - Planning Practice Guidance - Flood Risk and Coastal Change (2022)
 - British Geological Survey - Geindex Onshore (British Geological Survey, 2022).
 - Local Plan, Royal Borough of Windsor and Maidenhead (2022)
 - Royal Borough of Windsor and Maidenhead Strategic Flood Risk Assessment ⁶(2017).
 - Royal Borough of Windsor & Maidenhead Local Flood Risk Management Strategy⁷ (2014).

Strategic Flood Risk Assessment (SFRA)

- 3.4. The SFRA, published in 2017, provides the evidence base for the 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.

⁵ Environment Agency, Flood Map for Planning, <https://flood-map-for-planning.service.gov.uk/>, 2017

⁶ <https://www.rbwm.gov.uk/home/planning/planning-policy/strategic-flood-risk-assessment>

⁷ Royal Borough of Windsor and Maidenhead Local Flood Risk Management Strategy 2014

https://www.rbwm.gov.uk/sites/default/files/2020-04/highways_flood_risk_management_strategy.pdf

- 3.5. The SFRA online mapping provided by the SFRA has been used throughout production of this report as a source of information, particularly pertaining to historic flood incidents.

Royal Borough of Windsor and Maidenhead Local Flood Risk Management Strategy (LFRMS)

- 3.6. The Royal Borough of Windsor and Maidenhead LFRMS sets out how the Council carries out its flood risk responsibilities that are a statutory requirement of the Flood and Water Management Act 2010.
- 3.7. The LFRMS is referenced where applicable within the report.

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.
- 4.2. The site is located within Flood Zone 3 according to the EA Flood Map for Planning (Figure 3). Flood Zone 3 denotes a risk of flooding from fluvial sources of greater than 1 in 100 years. The EA Flood Map for Planning also indicates that the site is within an area benefitting from the presence of flood defences.

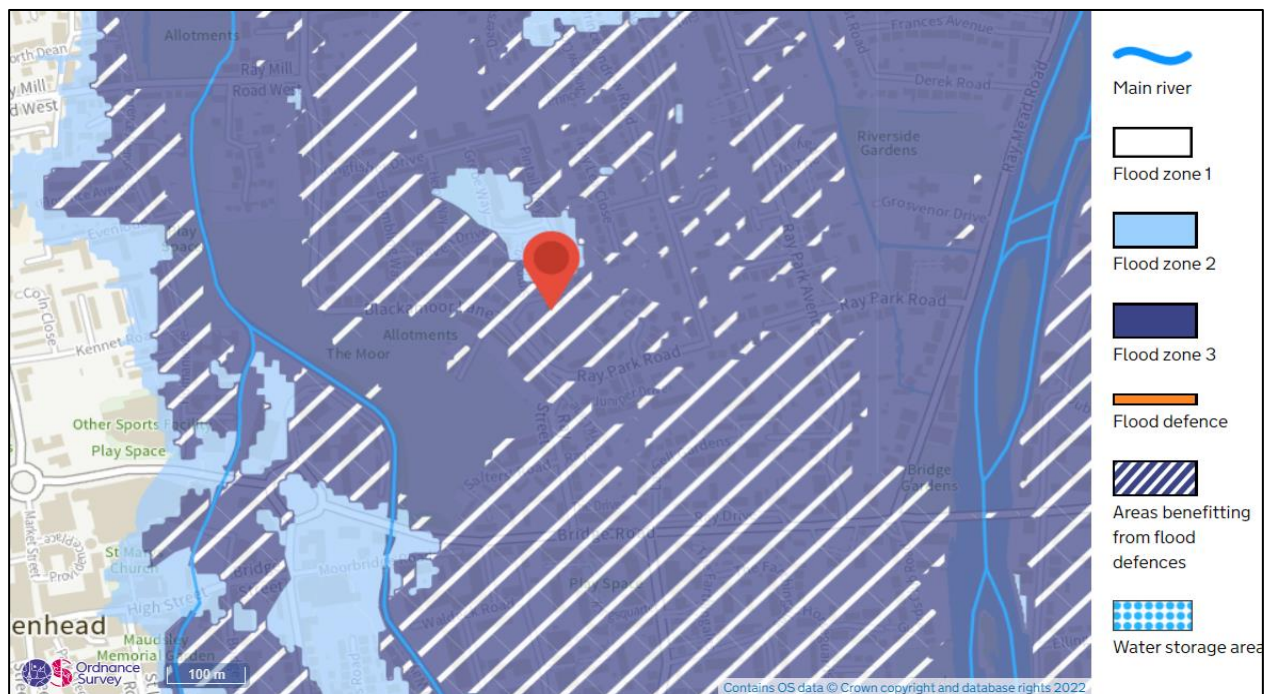


Figure 3: EA Flood Map for Planning

Main Rivers

- 4.3. The nearest Main River to the site is the Maidenhead Ditch/ York Stream, which flows north to south approximately 250m southwest of the site. The River Thames (also classified as a Main River) flows north to east approximately 550m east of the site.

Ordinary Watercourses

- 4.4. There are no other watercourses in the vicinity of the site.

Historical Flooding

- 4.5. Based on the EA Recorded Flood Outlines dataset (Figure 9) the site is within the recorded flood extent of the March 1947 fluvial event on the River Thames, caused by channel capacity exceedance prior to the construction of the defences. The dataset also suggests flooding in the surrounding area in November 1974, February 1990 and January 2003, however the site is not within the recorded flood outlines from these events.

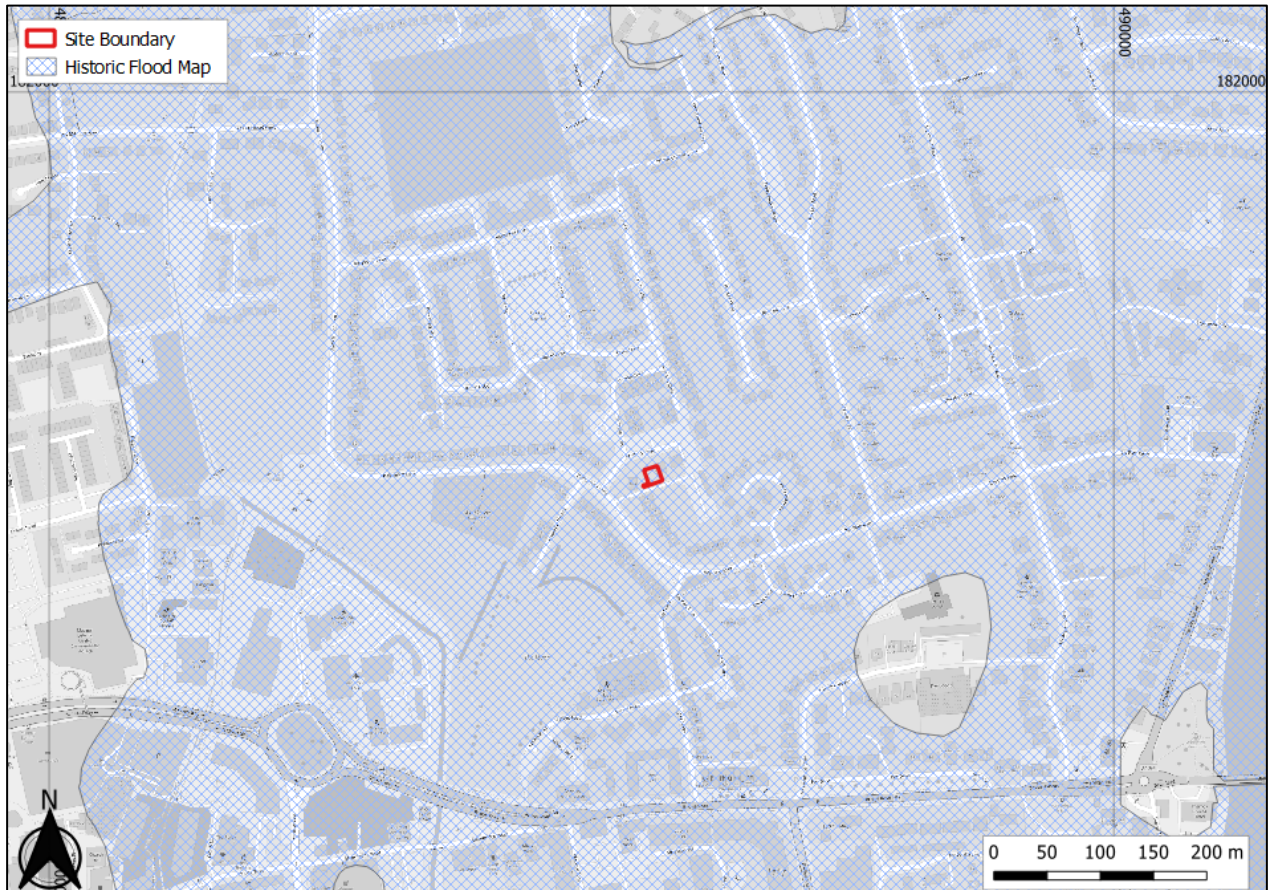


Figure 4: EA Historic Flood Mapping

Lower Thames Model (2019)

- 4.6. Aegaea have previously been provided with Product 6 (raw data) for this area by the Environment Agency which has been used to inform this FRA. This information is based on the Lower Thames model, dated 2019. This is understood to be the best available information for this area.
- 4.7. The Lower Thames model includes three separate model domains – the Thames Domain; the Hammersmith Domain, and the Hurley to Teddington (tributaries) Domain. The site is located outside of the Hammersmith Domain and the Hurley to Teddington (tributaries) Domain. Therefore, the Thames Domain has been used in the analysis.

- 4.8. This model includes the Jubilee River (part of the Maidenhead, Windsor and Eton Flood Alleviation Scheme). The design capacity for the Jubilee River is limited to approximately 215m³/s and is designed to remain in-bank irrespective of any increase in flows in the River Thames. The flood alleviation scheme was designed to protect the area from flooding up to a return period of 1 in 65 years.
- 4.9. For development located within Flood Zone 3, it is first necessary to delineate between Flood Zones 3a and 3b, as defined in Figure 5. Based on the Lower Thames models, the site is out with the modelled 1:20 year flood extent (Figure 4). It should be noted that the definition of Flood Zone 3b has changed since the modelling was undertaken in 2019. Flood Zone 3b is now classified as the 1:30 year (3.3% AEP) event. No modelled data has been provided for the 30 year fluvial flood event.
- 4.10. However, the site is located within an area that benefits from the presence of flood defences and is also located outside of the modelled 100 year flood extents (Figure 5). Therefore, the site would not be considered Flood Zone 3b/Functional Floodplain.

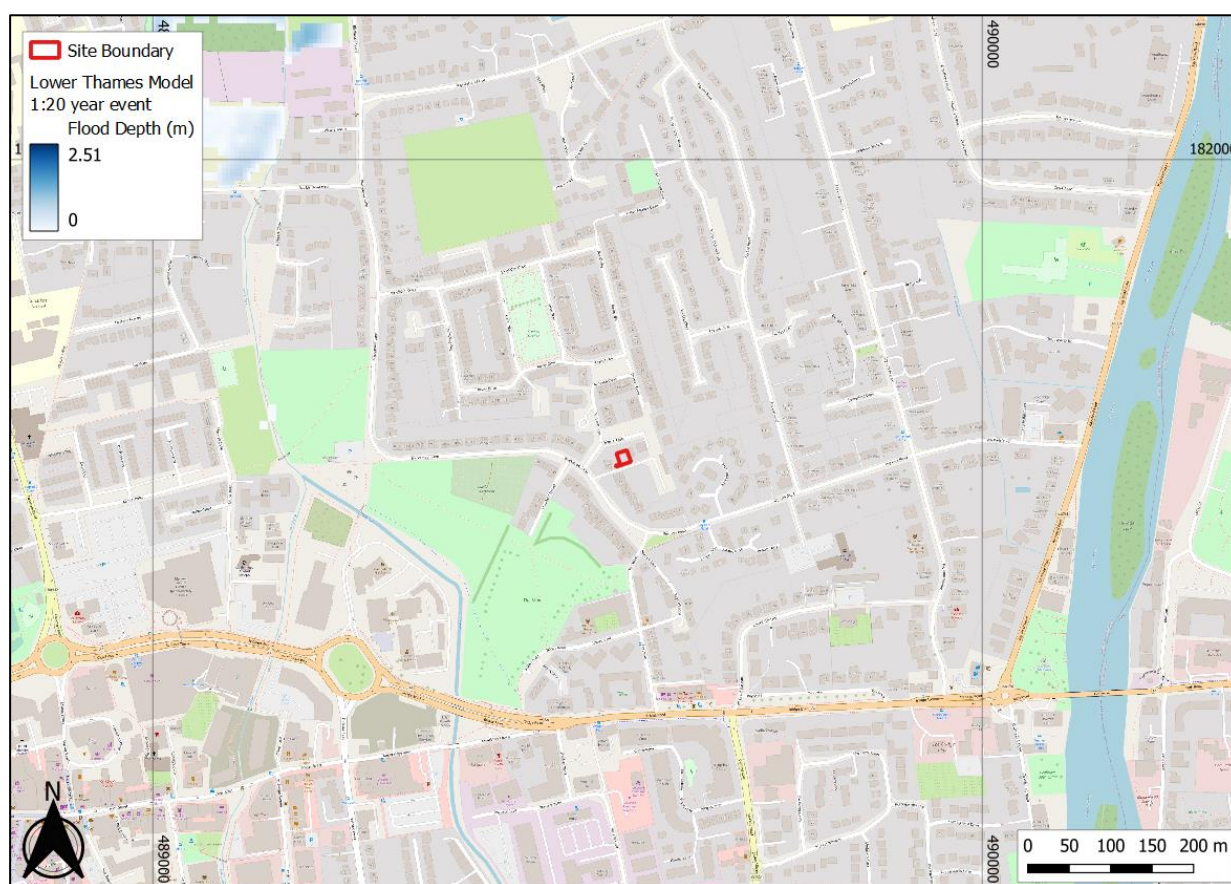


Figure 5 Lower Thames 20 Year Fluvial Flood Event Flood Depths (Contains public sector information licensed under the Open Government Licence v3.0)

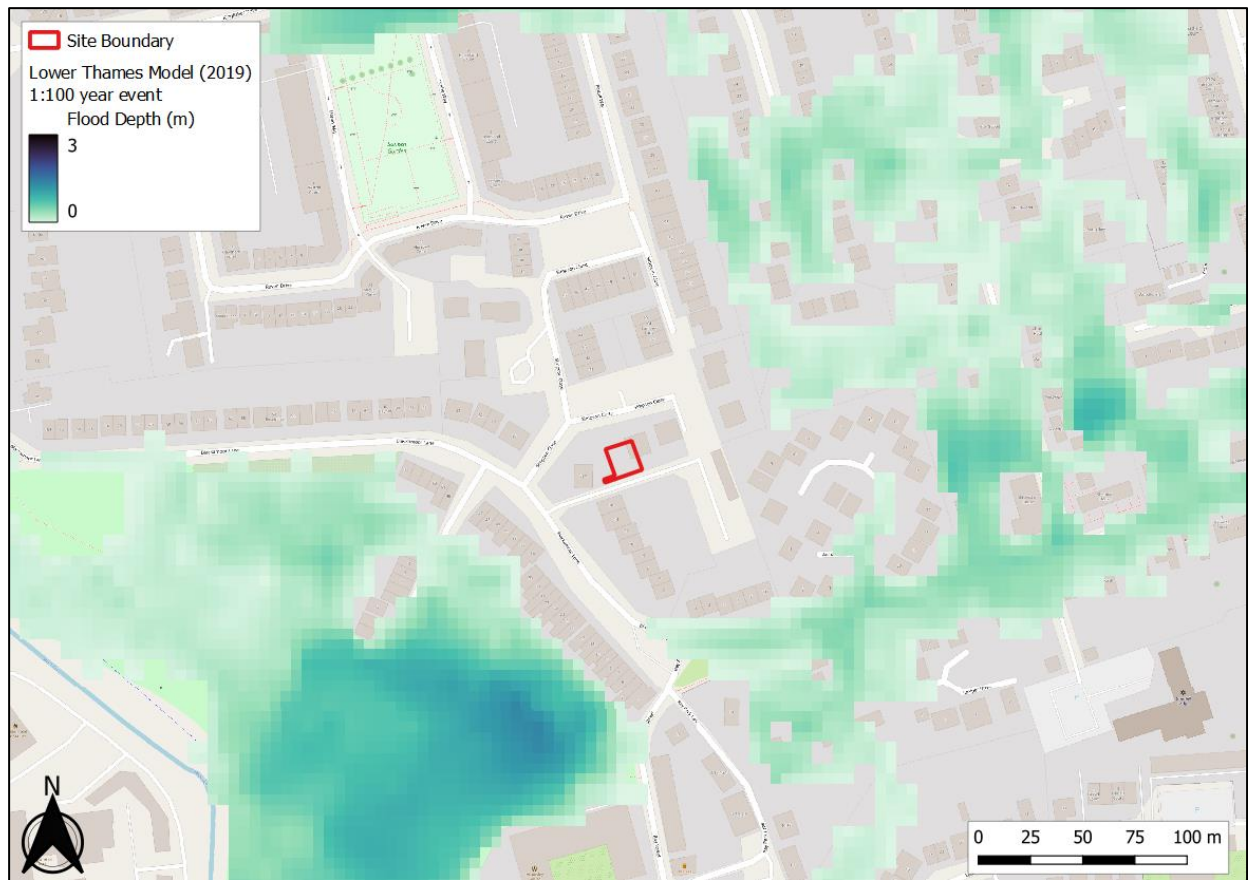


Figure 6 Lower Thames 100 Year Fluvial Flood Event Flood Depths (Contains public sector information licensed under the Open Government Licence v3.0)

- 4.11. The site is shown to be within the extent of the 1:1000 year defended fluvial flood event with maximum flood depths on site of approximately 0.88m (based on the lowest topographic level of 23.90m AOD), with a flood level of 24.78m AOD (Figure 6).

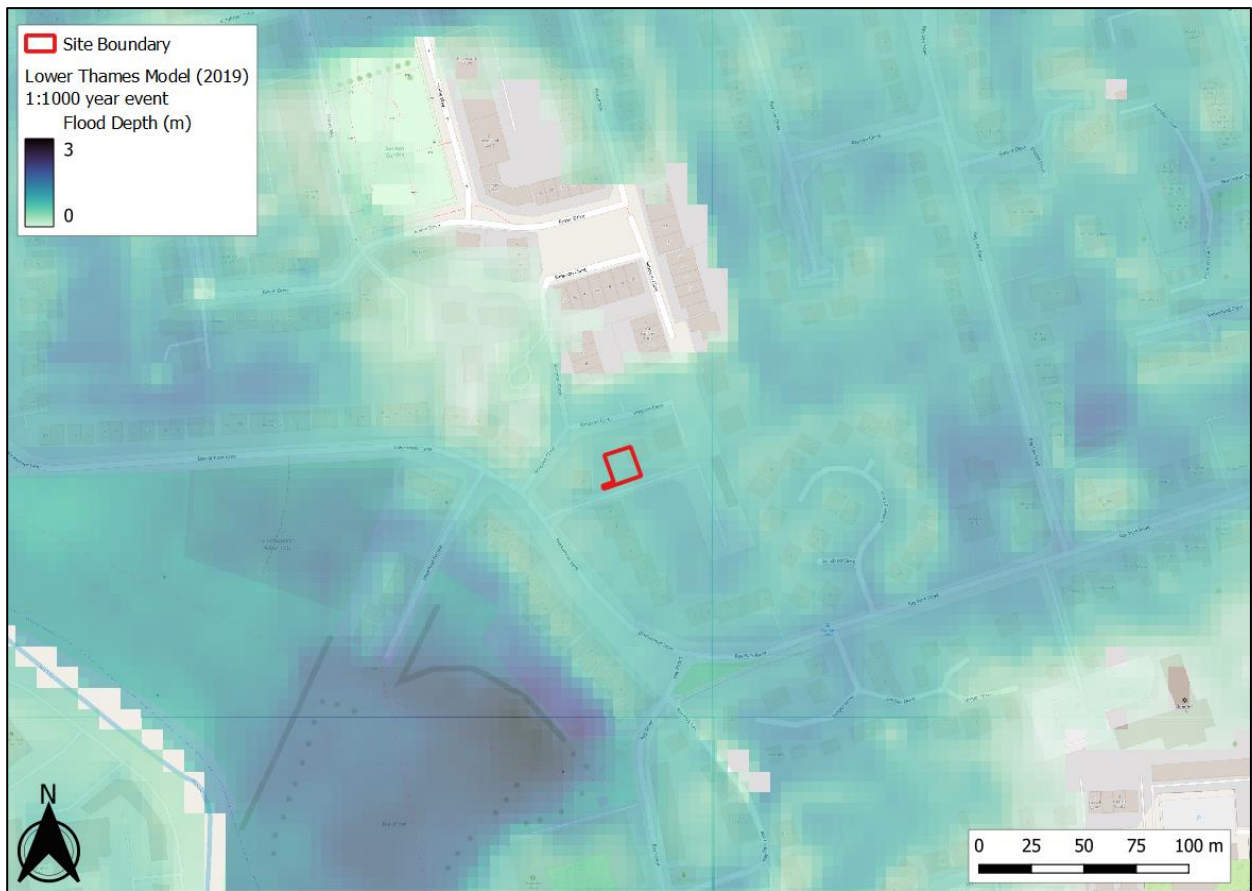


Figure 7 Lower Thames 100 Year Fluvial Flood Event Flood Depths (Contains public sector information licensed under the Open Government Licence v3.0)

Climate Change

- 4.12. 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'.
- 4.13. The site is located within the Thames River Basin District and the 'Maidenhead and Sunbury' Management Catchment. The relevant peak river flow allowances for this river basin district are identified below.

Table 1: Maidenhead and Sunbury Management Catchment Climate Change Allowances

Epoch	Central	Higher	Upper
2020s	14%	19%	32%
2050s	17%	25%	45%
2080s	35%	47%	81%

- 4.14. The proposed development is for the construction of an extension to the existing residential dwelling on site. Residential development should be considered to have an anticipated lifetime of a minimum of 100 years.
- 4.15. Guidance suggests that ‘More Vulnerable’ developments in Flood Zone 2 or 3a should utilise the ‘central’ climate change allowance. The increase in peak river flow for the 2080’s epoch for the ‘central’ allowance is +35%.
- 4.16. Data has been provided from the Lower Thames Model (2019) for the 1:100+35%CC event. Analysis of this event shows possible maximum flood depths on site of approximately 0.74m (based on the lowest topographic level of 23.90m AOD), with a flood level of 24.64 AOD (Figure 7).

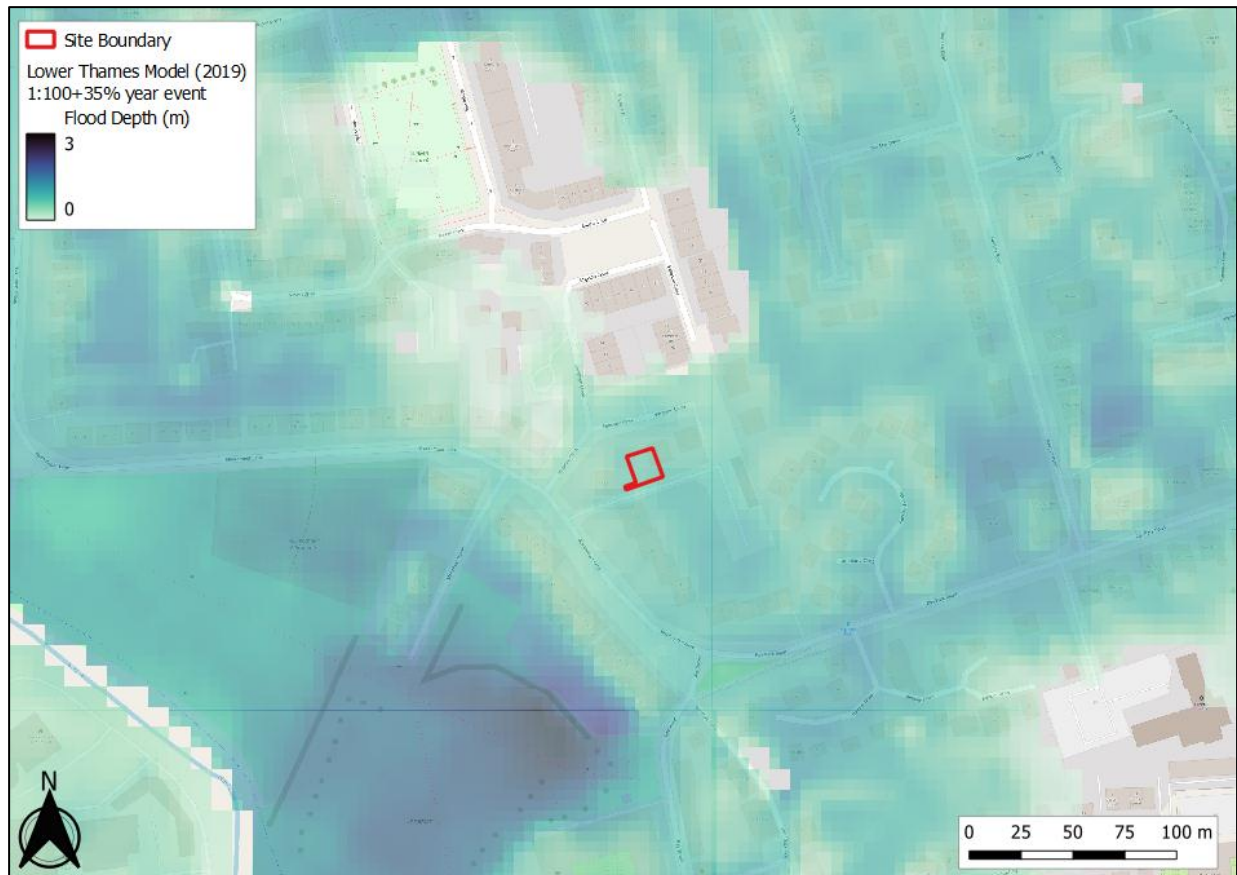


Figure 8: Lower Thames 100+35%CC Year Fluvial Flood Event Flood Depths (Contains public sector information licensed under the Open Government Licence v3.0)

Defence Breach

- 4.17. The site is within an area benefitting from the presence of flood defences based on the EA Flood Map for Planning. The EA Lower Thames Model (2019) does not include defence breach scenarios.
- 4.18. However, the RBWM SFRA (2017) has provided breach outlines using the ‘simple approach’ established in FD2320 (Flood Risk Assessment Guidance for New Development). The ‘simple approach’ provides a straightforward relationship between the height of the raised defence, and the distance that the flood wave might extend should the flood wall collapse suddenly. This methodology assumes a flat floodplain behind the defences, and is therefore a conservative assessment of the area that may be at risk.
- 4.19. Figure 8 of indicates that the site is located outside an area at risk of flooding following defence failure.

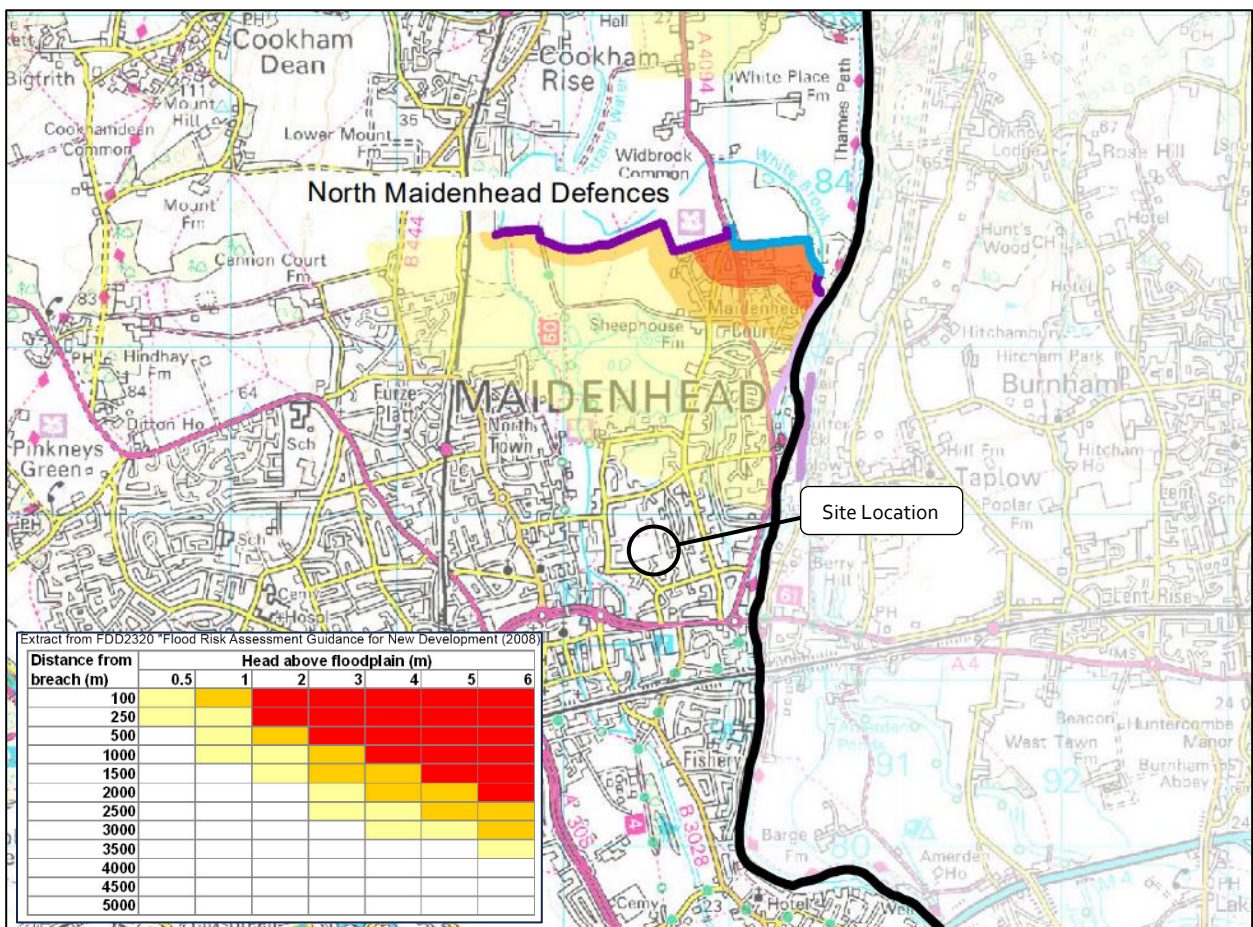


Figure 9: Excerpt of Figure F, Hazard due to Defence Failure (RBWM SFRA, 2017)

Summary

- 4.20. As such, given the flood defences in the area (including the Jubilee River and linear flood defences along the River Thames and York Stream), the present day flood risk to the flood to the site is considered low to moderate. If the defences in the local area are upgraded and maintained to the

current standard of protection in the future, then the flood risk would be considered to remain relatively low.

Canals

- 4.21. 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.
- 4.22. Water in a canal is typically maintained at predetermined levels by control weirs. When rainfall or other water enters the canal, the water level rises and flows out over the weir. If the level continues rising it will reach the level of the storm weirs. The control weirs and storm weirs are normally designed to take the water that legally enters the canal under normal conditions. However, it is possible for unexpected water to enter the canal or for the weirs to become obstructed. In such instances the increased water levels could result in water overtopping the towpath and flowing onto the surrounding land.
- 4.23. Flooding can also occur where a canal is impounded above surrounding ground levels and the retaining structure fails.
- 4.24. The site is not located within the vicinity of any canals and as such the risk from this source of flooding can be considered low.

Pluvial Flood Risk

- 4.25. 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.
- 4.26. The EA 'Flood Risk from Surface Water' online map provides a high-level indication of the risk of flooding. The following definitions of the annual surface water flood risk labels are given by the EA:
 - 'High Risk'; >3.3% AEP (greater than 1 in 30 probability in any year).
 - 'Medium Risk'; 3.3% to 1.1% AEP (between 1 in 30 and 1 in 100 probability in any year).
 - 'Low Risk'; 1% to 0.1% AEP (between 1 in 100 and 1 in 1000 probability in any year).
 - 'Very Low Risk'; <0.1% AEP (less than 1 in 1000 probability in any year).
- 4.27. The map indicates the site is located within a 'very low' risk of flooding area, however the surrounding areas are within an area at 'low' and 'high' risk of flooding.

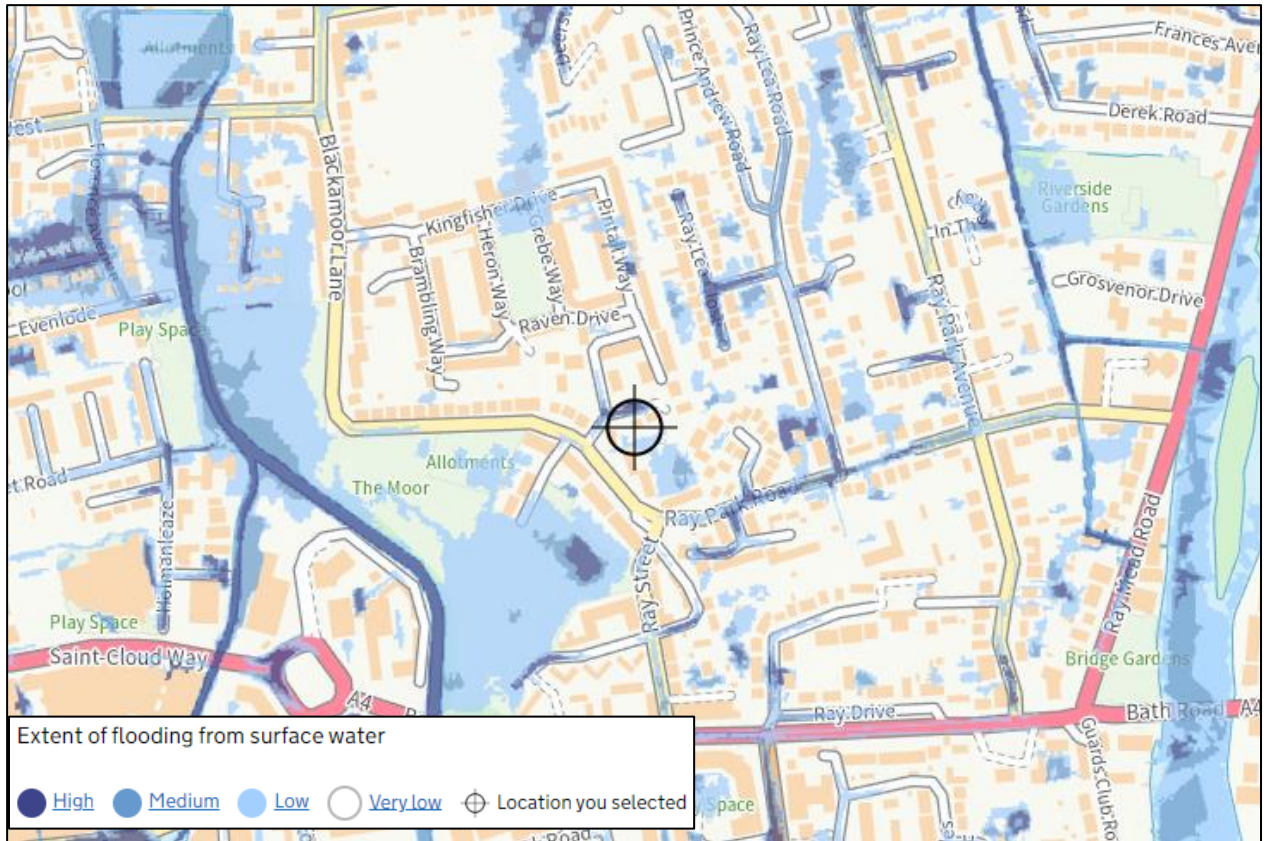


Figure 10: EA Surface Water Flood Risk Mapping

- 4.28. Given that the site is shown to be located in an area at 'Very Low' risk of flooding, the EA Surface Water Depth map for the 'High' risk event (equivalent to the 1 in 30 year event) and for the 'Medium' risk event (equivalent to the 1 in 100 year event) shows that the site would remain unaffected by flooding.



Figure 11 RoFSW Surface Water Depths for a Moderate Risk (1 in 100 year) Scenario (Contains public sector information licensed under the Open Government Licence v3.0)

- 4.29. The Low-risk event (equivalent to the 1 in 1000 year event) is shown in Figure 12. The majority of the site would remain unaffected by flooding during this modelled event, including the area where the extension is proposed. Only a small corner of the south western side of the site may experience flooding, however modelled flood depths would be below 150mm.
- 4.30. The SFRA provides mapping of historical surface water flood incident records. No historical pluvial incidents have been recorded in the vicinity of the site.
- 4.31. As such, the risk to the site is considered to be low.



Figure 12 RoFSW Surface Water Depths for a Moderate Risk (1 in 1000 year) Scenario (Contains public sector information licensed under the Open Government Licence v3.0)

Reservoirs

- 4.32. 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.
- 4.33. According to EA flood risk from reservoirs mapping the site is outside flood extents in the event of reservoir flooding (Figure 13).
- 4.34. The risk of flooding from this source is therefore considered to be low.

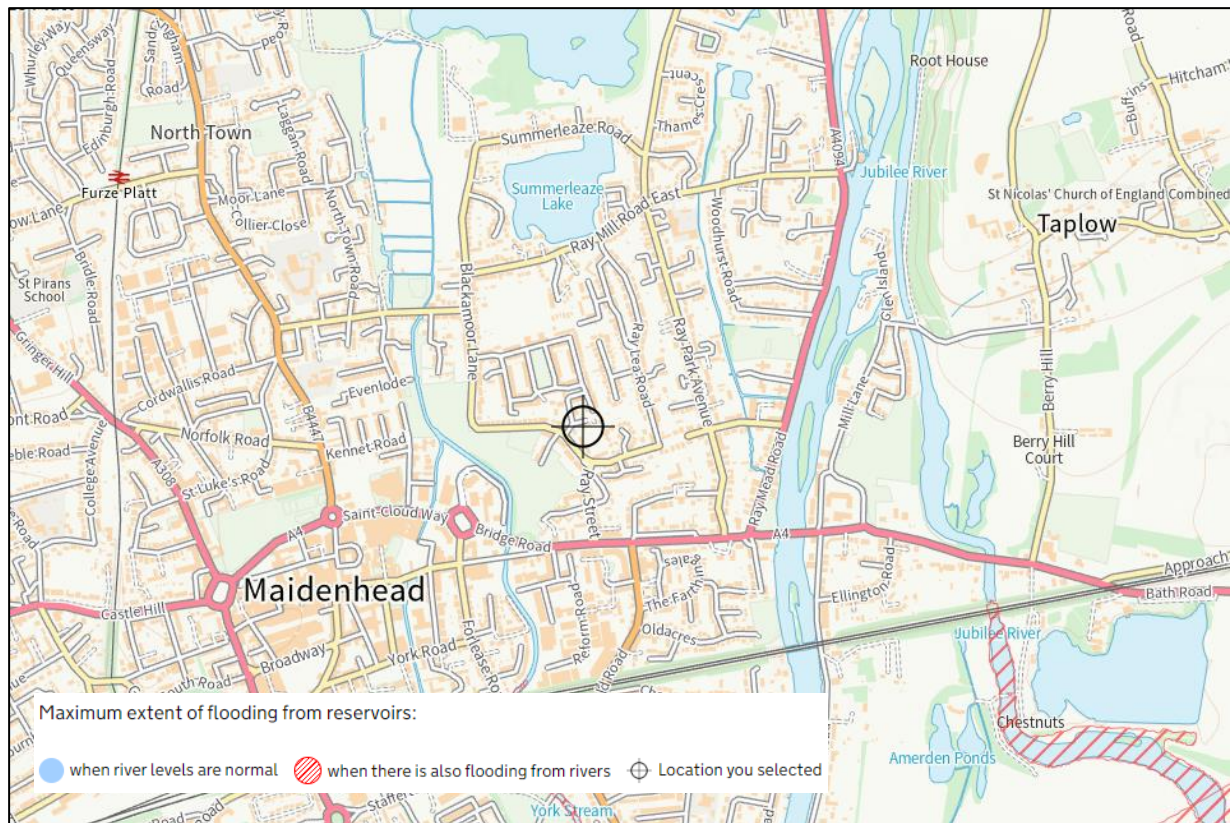


Figure 13: EA Reservoir Flood Risk Mapping

Groundwater

- 4.35. Groundwater flooding occurs in areas where underlying geology is permeable, and water can rise within the strata sufficiently to breach the surface.
- 4.36. The British Geological Survey (BGS) Geology of Britain Viewer indicates that the bedrock underlying the site is Seaford Chalk Formation and Newhaven Chalk Formation (undifferentiated). This formation is considered to be a Principal aquifer (Source: EA; Magic Map online resource). A Principal aquifer is highly permeable, supporting water supply and/or river base flow on a strategic scale.
- 4.37. The British Geological Survey (BGS) Geology of Britain Viewer indicates that the superficial deposits underlying the site are Shepperton Gravel Member comprising sand and gravel. This formation is a Principal aquifer (Source: EA; Magic Map online resource). A Principal aquifer is highly permeable, supporting water supply and/or river base flow on a strategic scale.
- 4.38. Source Protection Zones are defined around large potable groundwater abstraction sites and indicate the risk of contamination from activities in the vicinity of the abstraction site. The site is within a Zone II - Outer Protection Zone. There is a predicted travel-time of 400 days for pollutants below the water table to reach the abstraction point.
- 4.39. Figure E of the SFRA (2017) indicates that the site is located within a 1km grid square of which $\geq 75\%$ is considered susceptible to groundwater flooding based on BGS data. An excerpt of Figure E is shown in Figure 14 below.

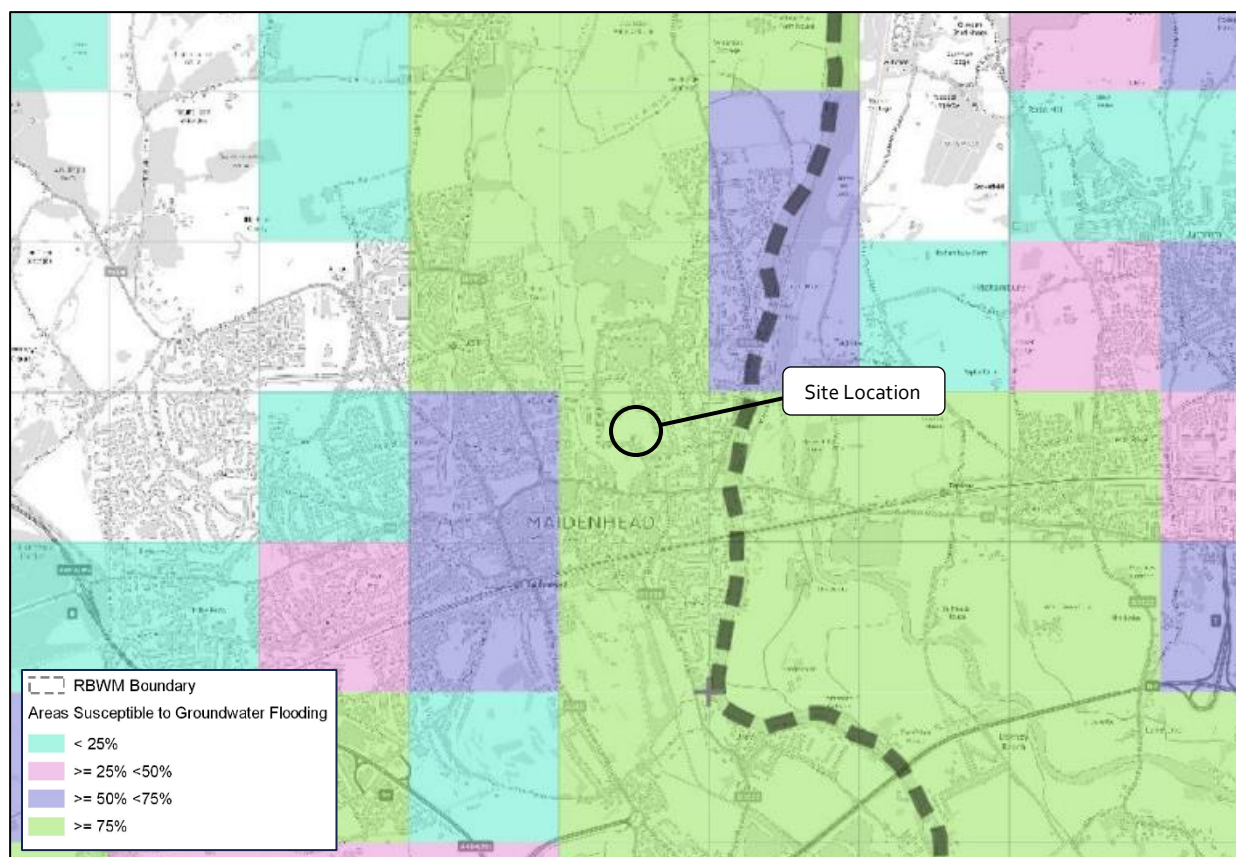


Figure 14 Extract of Figure E, Areas Susceptible to Groundwater Flooding (RBWM SFRA, 2017)

- 4.40. Neither the RBWM SFRA (2017) or EA provided any records to indicate that the site, or immediate surrounding area, has been previously affected by flooding from this source.
- 4.41. The proposals do not include any below ground development or basement excavations. The risk of flooding to the site is therefore considered moderate. Appropriate waterproofing should minimise the risk of groundwater flooding.

Sewer Flooding

- 4.42. Sewers can be a cause of flooding where the drainage network has become overwhelmed, either by blockage or due to local development beyond the designed capabilities of the drainage system.
- 4.43. The SFRA provides mapping of historical sewer flood incident records. No historical sewer surcharging incidents have been recorded in the vicinity of the site.
- 4.44. Local policy documentation does not identify the site as being in a Critical Drainage Area.
- 4.45. The development is therefore considered to be at low risk of flooding from sewers. Any new sewer connection from the site should be agreed with the local sewer provider and fitted with non-return valves to minimise the risk of flooding from sewer sources.

5. Flood Risk Mitigation

Fluvial

- 5.1. The development should comply with relevant EA Standing Advice (Minor Developments Standing Advice) which states that *'floor levels are either no lower than existing floor levels or 300mm above the estimated flood level. You will also need to use flood resistant materials up to at least 300mm above the estimated flood level.'*
- 5.2. Analysis of 1:100+35%CC event shows possible maximum flood depths on site of approximately 0.74m (based on the lowest topographic level of 23.90m AOD), with a flood level of 24.64 AOD.
- 5.3. The proposed extension should be constructed in a flood resilient manner, in accordance with CLG 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:
 - In accordance with the Environment Agency's Standing Advice for Minor Extensions, the finished floor levels will be no lower than the existing floor levels.
 - Exterior ventilation outlets, utility points and air bricks to be fitted with removable waterproof covers.
 - Ground floor to be solid (i.e. concrete floors), with waterproof membrane/screed
 - Patio doors may be susceptible to ingress of flood water. Any PVC window/door sills should be adequately sealed. Double glazing should be used to provide resistance against external flood water pressure.
 - Residents to sign up to EA Flood Warning/Alerts and formalise a flood plan/evacuation procedures.

Pluvial

- 5.4. The site itself is considered to be at relatively low risk of flooding, however surrounding roads may be at risk of flooding. Therefore, it is recommended the following mitigation measures be implemented where possible:
 - External threshold levels raised 150mm above external ground levels.
 - Any new hardstanding should be constructed using permeable paving (or similar) permeable surfacing. Small SuDS features could also be implemented such as installing a water butt or planters, connected to an existing rainwater downpipe to provide betterment over existing.
 - Non-return valves should be fitted to any new sewer connections to minimise the risk of internal sewer flooding.

Groundwater

- 5.5. The risk of flooding from groundwater sources is considered to be moderate. The proposals do not include any below ground development or basement excavations. Appropriate waterproofing, detailed above, should minimise the risk of groundwater flooding.

Reservoirs and Canals

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

Increase to Flood Risk Elsewhere

- 5.7. The proposed development is for the construction of an extension to the existing dwelling on site. As such, the proposal constitutes a Minor Development (in terms of flood risk) under the NPPF.
- 5.8. Paragraph 051 of the Flood Risk and Coastal Change Planning Practice Guidance (PPG) states:

Minor developments are unlikely to raise significant flood risk issues unless:

- they would have an adverse effect on a watercourse, floodplain or its flood defences;
- they would impede access to flood defence and management facilities, or;
- where the cumulative impact of such developments would have a significant effect on local flood storage capacity or flood flows.

- 5.9. As such, the proposed development in isolation should have a negligible impact on flood risk elsewhere.

EA Flood Warning Service

- 5.10. As a further precaution and risk reduction, the owner of the site should sign up the EA flood warning service. This service allows site owners 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.
- 5.11. 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.
- 5.12. It is understood that residents are subscribed to weather warnings from the Environment Agency. It is recommended that flood plan/evacuation procedures are reviewed and updated periodically.
- 5.13. In addition to the Environment Agency flood warning service. These provide an indication of when weather warnings (e.g. extreme rainfall) are forecast and enable appropriate action to be taken.

Met Office Warnings

- 5.14. The analysis within the report has shown that some surrounding roads may be at risk from surface water flooding. The Met Office issues weather warnings up to 5 days in advance, through the National Severe Weather Warning Service, when severe weather has the potential to bring impacts to the UK. It is also possible to stay up to date with weather warnings through the Met Office app (available on both android and apple), social media (twitter, Facebook) or email alerts.
- 5.15. It is understood that the residents are signed up to Met Office Weather Warning. During periods of bad weather, site users should monitor local weather reports. Warnings can be monitored through an Apple/Android app, Twitter or directly via emails.

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 1 Simpson Close, Maidenhead, Royal Borough of Windsor and Maidenhead, SL6 8RZ. It has been written to support a planning application and has been prepared with due consideration to the nature of the proposed development to provide the appropriate level of detail.
- 6.2. 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.

Source of Flooding	Flood Risk Summary
Fluvial	The site is located in Flood Zone 3 and within an area that benefits from the presence of flood defences. The site may be at risk of flooding during the 1:100+35%CC (design event). The risk of flooding to the site through failure/breach of the defences is considered low.
Pluvial	The site itself is considered to be at very low risk from pluvial sources. The surrounding roads are shown to be at higher risk. Safe access/egress can be provided in both the 100- and 1000-year scenarios.
Groundwater	The site is considered to be at moderate risk. The proposals do not include any below ground development or basement excavations. Appropriate waterproofing should minimise the risk of groundwater flooding.
Reservoirs Sewers	The site is generally considered to be at low risk from other sources

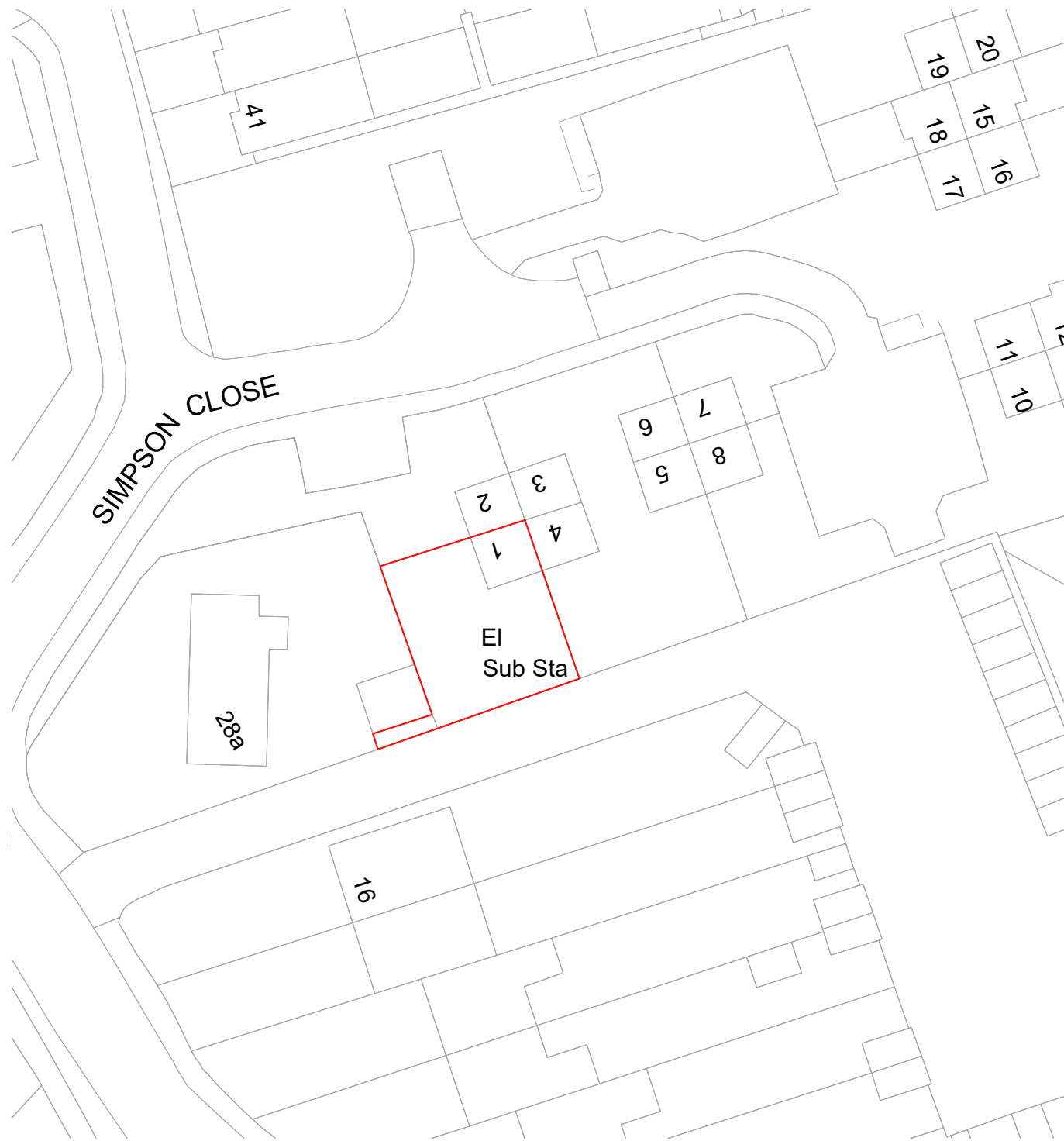
- 6.3. The following conclusions can be drawn from this level 1 FRA:
- This FRA has identified no prohibitive constraints in developing the proposed site for the proposed usage.
 - With reference to the Environment Agency (EA) Flood Map for Planning, the proposed development is located within Flood Zone 3. The site is located in an area that benefits from the presence of flood defences.
 - The existing site currently consists of a single residential dwelling and therefore, due to the residential use, would be classified as 'More Vulnerable'. The proposed development is for the construction of an extension to an existing dwelling and therefore the site will continue to be classified as 'More Vulnerable' post-development.
 - The proposals are classified as 'minor development (in terms of flood risk)' and therefore the Sequential and Exception Test are not applicable.

- When considering the risk of flooding from fluvial sources, the site has been shown to remain unaffected by flooding during the present day 1:20 and 1:100 year scenarios. At the peak of the 1:100+35%CC event, the possible maximum flood depths on site is approximately 0.74m.
- The present-day flood risk to the flood to the site is considered low to moderate. If the defences in the local area are upgraded and maintained to the current standard of protection in the future, then the flood risk may remain low. It is acknowledged that the upgrading of flood defences cannot be relied upon.
- As per EA Standing Advice, the proposed floor levels of the extension are to be set no lower than existing.
- Mitigation measures, in line with guidance set out in 'Improving the flood performance of new buildings, 2007' (standards for the installation and retrofit of resistance measures are available in British Standard 851188-1:2019+A1:2021) are incorporated into the proposed development, where possible.
- Pluvial flooding on site is generally considered to be 'Low'. The surrounding roads may be at slightly higher risk of flooding, however safe access/egress can be provided during both the 100- and 1000-year scenarios.
- The site is located within a 1km grid square of which $\geq 75\%$ is considered susceptible to groundwater. There is no evidence of any historic flooding from this source. Appropriate waterproofing should minimise the risk of groundwater flooding.
- It is understood that residents are subscribed to both flood warnings from the Environment Agency and weather warnings from the Met Office. It is recommended that flood plan/evacuation procedures are reviewed and updated periodically.

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

APPLICATION SITE HIGHLIGHTED IN RED



BLOCK PLAN 1.500

LAYOUT 1: LOCATION PLAN & BLOCK PLAN



LOCATION PLAN 1.1250

NOTES:

All dimensions are in metric. It is advice not to scale off the drawing but to seek the Consultant's advice.

MATERIALS

- Walls - New cavity wall to be constructed using multi facing red brick to match existing building and thermal light weight concrete block on the inner side to give the required U-value 0.18W/m²k.
- Windows - New windows are to be double glazed UPVC to match existing. Obscure glass to be used where there are issues of privacy.
- Door - UPVC double glazed single leaf external door to match existing.
- Roof - Mono pitch roof design pitch @ 18° finish with Stonewold MK2 Roof Slate to match existing roofing system to achieve the required U-Value 0.13 W/m²K Part L of the building regulations 2010.
- Flooring - New porch floor level finish at 100mm using tiles or wood flooring or similar to achieve a required U-Value of 0.13 W/m²K.

This drawing to be read in conjunction with drawing nos. A3 TJ 01 - A3 TJ 03 inc

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Project

1 Sampson Close
Maidenhead
SL6 8RZ

Title

LOCATION & BLOCK PLANS

Client

TAHIRA JAVED

Drawn By

L.Cordner

Architectural Consultant

Date

26.06.2022

Scale

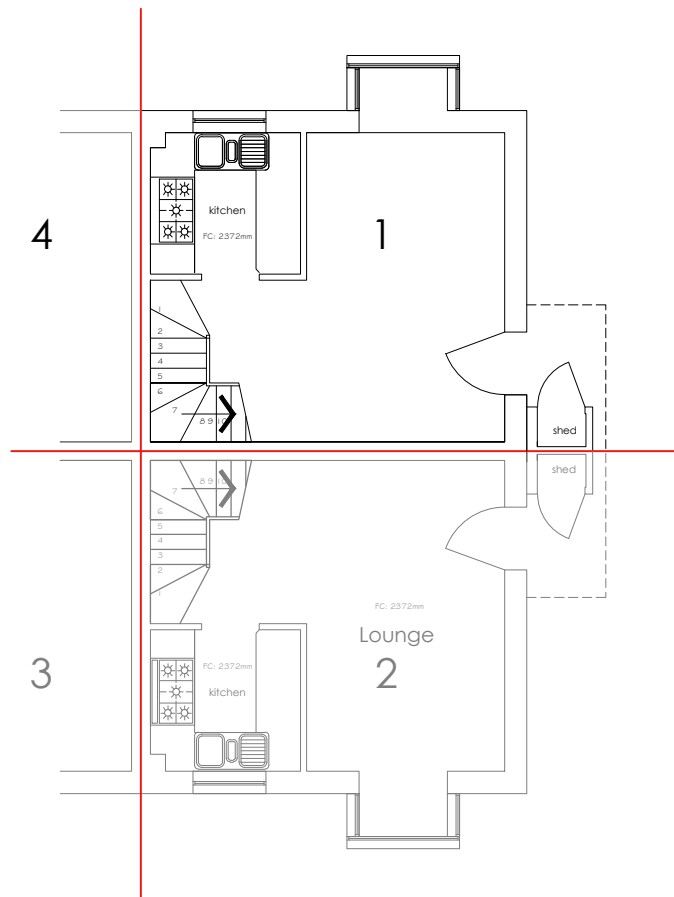
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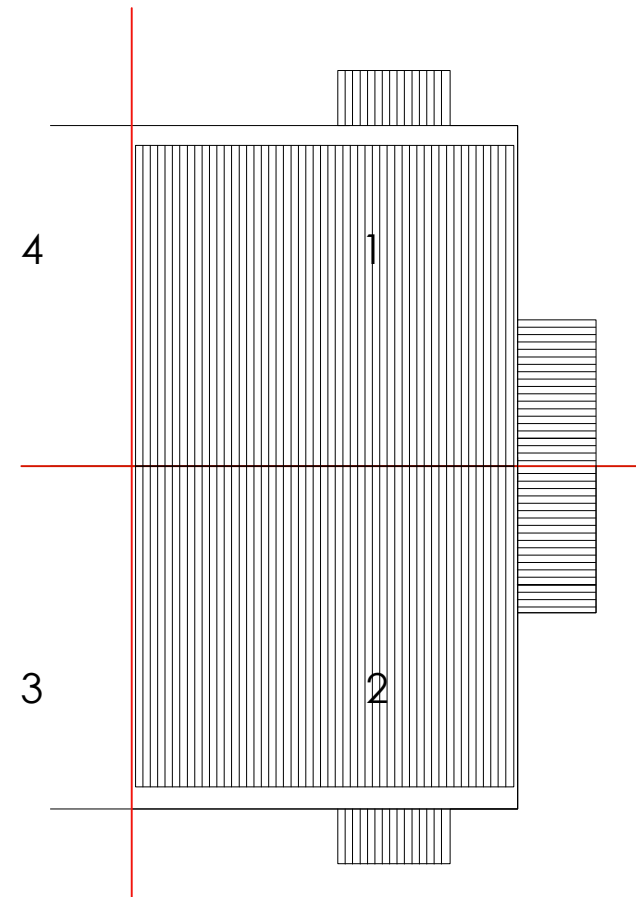
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Revision

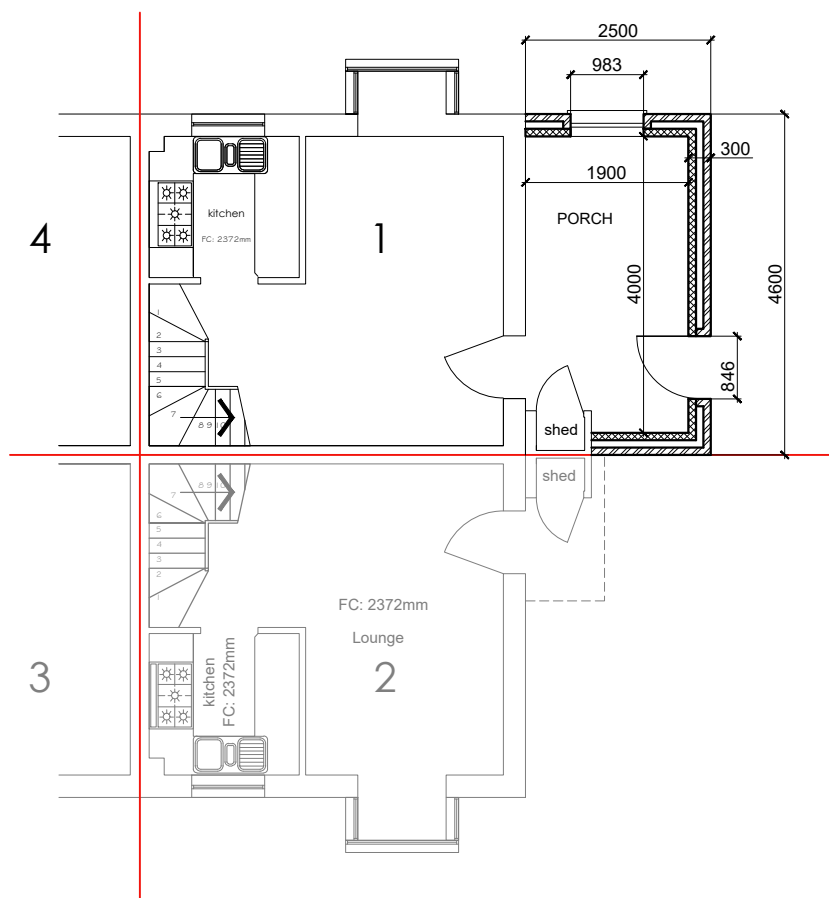
NORTH



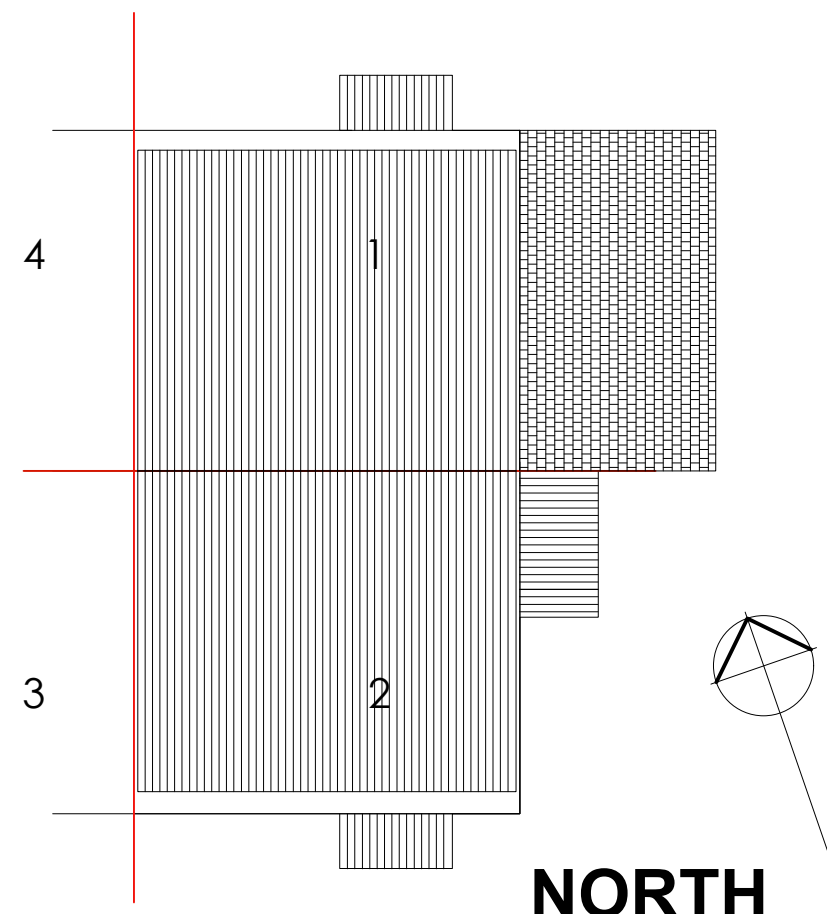
EXISTING GROUND FLOOR PLAN 1:100



EXISTING ROOF PLAN 1:100



PROPOSED GROUND FLOOR PLAN 1:100



PROPOSED ROOF PLAN 1:100

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Project

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SL6 8RZ

Title

EXISTING & PROPOSED FLOOR & ROOF PLANS

Client

TAHIRA JAVED

Drawn By

L.Cordner

Architectural Consultant

Date

26.06.2022

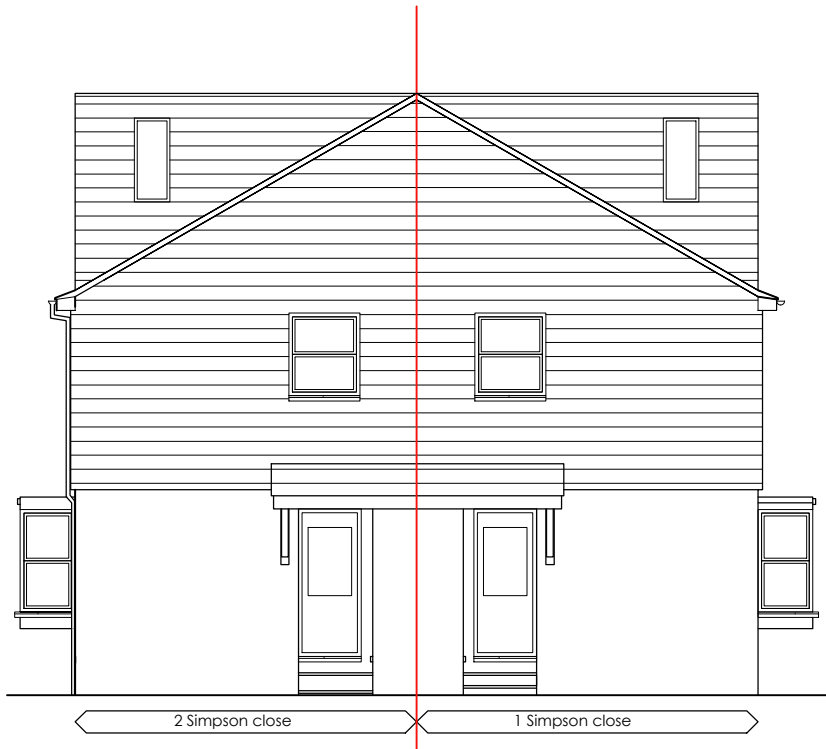
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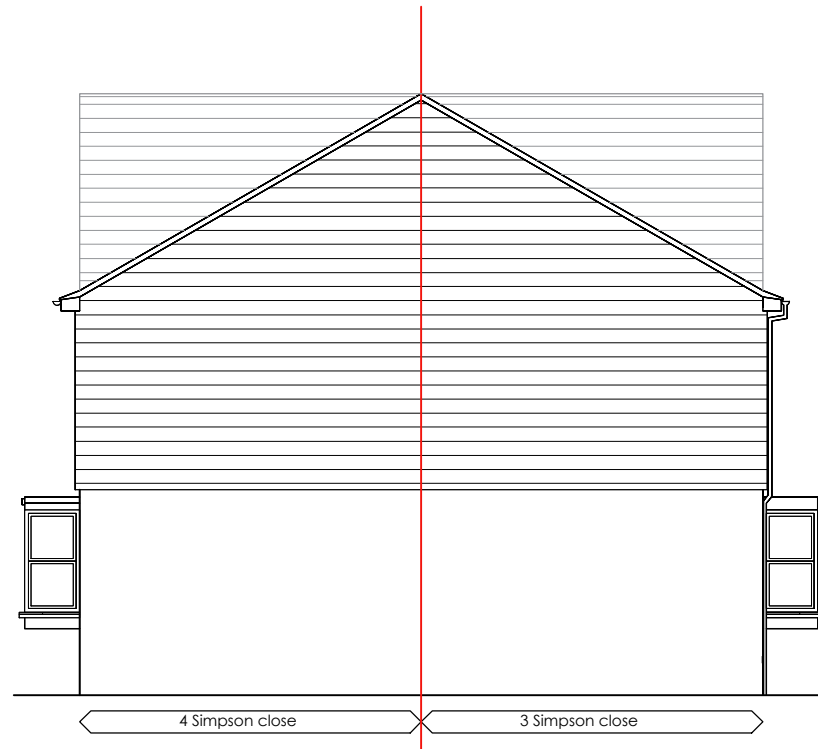
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A3 TJ 01

Revision



EXISTING FRONT ELEVATION (WEST) 1:100



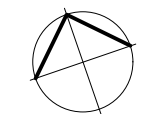
EXISTING REAR ELEVATION (EAST) 1:100



EXISTING SIDE ELEVATION (NORTH) 1:100



EXISTING SIDE ELEVATION (SOUTH) 1:100



NORTH

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EXISTING ELEVATIONS

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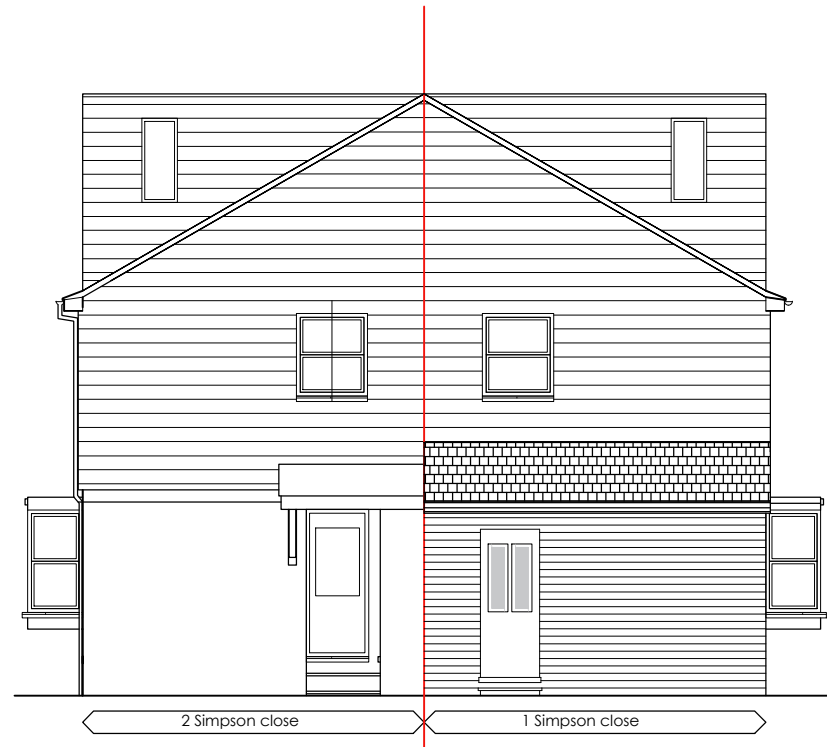
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Drawing Size & No

A3 TJ 02

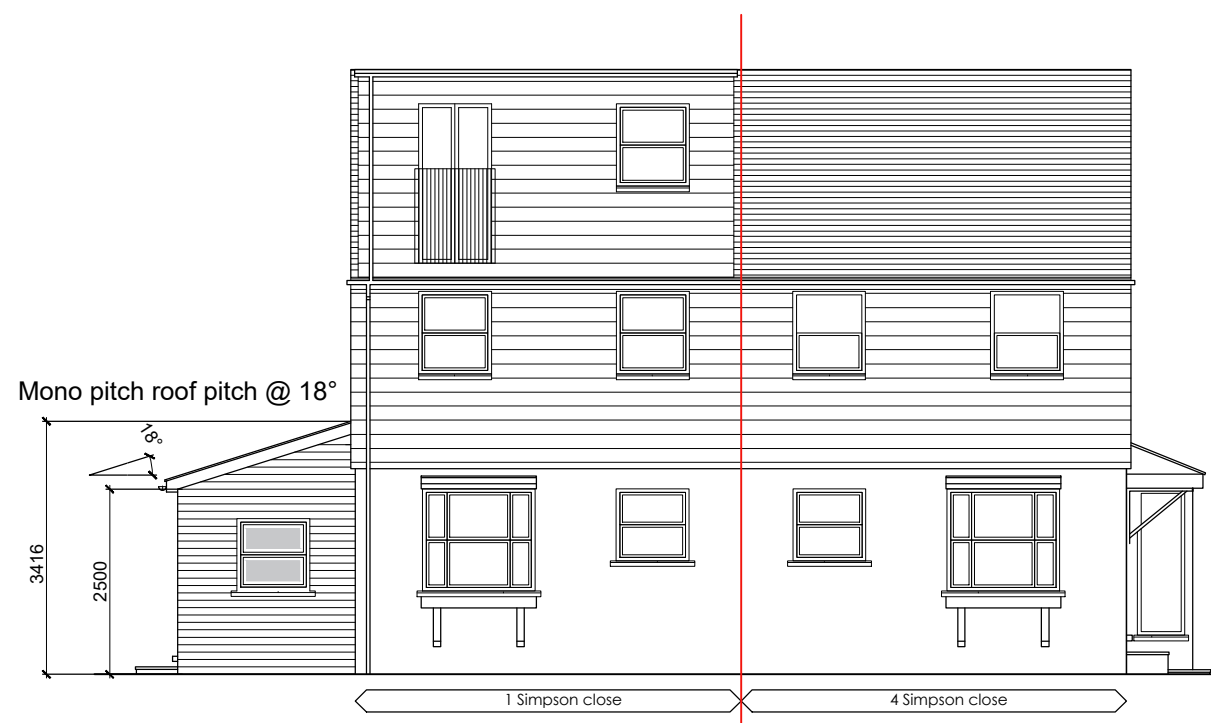
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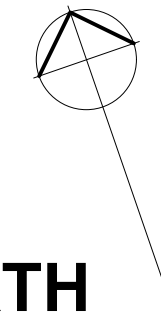
PROPOSED FRONT ELEVATION (WEST) 1:100



PROPOSED SIDE ELEVATION (NORTH) 1:100



PROPOSED SIDE ELEVATION (SOUTH) 1:100



NORTH

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Drawing Size & No

A3 TJ 03

Revision