Marston & Grundy LLP
Consulting Engineers

FLOOD RISK ASSESSMENT
& OUTLINE DRAINAGE STRATEGY REPORT

at

PROPOSED REAR OUTBUILDING AT
2 LADYBARN CRESCENT, WITHINGTON, M14 6UU

For

AJESTATES

Marston & Grundy LLP
Consulting Engineers

Quality Management

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1. Executive Summary

1.1 The proposal is for the construction of a single storey outbuilding encompassing a garage for five vehicles and adjoining storage space, to the rear of 2 Ladybarn Crescent, Withington, M14 6UU.

1.2 According to the Environment Agency (EA) Indicative flood maps, the development site holds a Flood Zone 3 classification from the surcharging of Cringle Brook, located some 250m to the northeast. This is land assessed as having greater than a 1 in 100 (>1%) annual probability of fluvial flooding in any year. As the site is located in Flood Zone 3, detailed flood modelling data was obtained from the EA via a Flood Risk Assessment Data request.

1.3 Assessing the existing ground levels at the location of the new outbuilding against the hydraulic flood data has confirmed that the land will be both above and marginally below the fluvial flood influence for the 1 in 100 year, 1 in 100 year plus 35% climate change and 1 in 1000-year events. It is noted that the flooding associated with the site is related to an overland flood flow routing where the surcharged water passes out of the Cringle Brook channel immediately upstream where the watercourse enters a culvert. The water then flows overland both between the houses and along the adopted highways towards the site boundary.

1.4 Assessing the Manchester Council Places for People SFRA and associated mapping has confirmed that the site is not located within Functional Flood Zone 3b.

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1.5 However, as there will be flooding associated with the 1 in 100 year plus 35% climate change event, the building will be constructed in such a way that it be allowed to flood, whilst remaining secure, and as such, flood volume compensation is therefore not required. Furthermore, although the building is non habitable, appropriate flood resilience measures commensurate with the development will be adopted.

1.6 The development target has been assessed against the NPPF ‘Sequential Test’. Taking into consideration that the application is for a non-habitable outbuilding in Flood Zone 3, Tables 1 & 2 of the NPPF have been appraised to confirm that the development is appropriate, and an Exception Test would not be required.

1.7 The Flood Risk Assessment has considered all other forms of flooding and overall, has found that the site is at low risk of flooding from all other sources.

1.8 There is no residual flood risk from the development site to the surrounding district as the surface water runoff will mimic the current scenario of water permeating into the ground at source. The development does not therefore increase the risk of surface water flooding to other adjacent neighbourhoods.

1.9 Sustainable Drainage Systems (SuDS) in the form of Prevention methods will be incorporated.

2 Introduction

2.1 Marston and Grundy LLP (M&G) have been appointed by AJ Estates to prepare this Flood Risk Assessment (FRA) to support a full planning submission for the construction of a single storey outbuilding within the grounds of 2 Ladybarn Crescent, Withington, M14 6UU. The assessment has been undertaken in line with Section 14 of the 'National Planning Policy Framework' plus the accompanying Technical Guidance on Flood Risk. The current outline Architectural Plans, which can be found in Appendix A, provides an indication of the proposed development within the site.

2.2 This FRA has been commissioned by AJ Estates and is specific to their interests in the development proposals as described by the Architectural plan in Appendix A.

2.3 The report has been prepared to identify any flood related issues associated with the proposed development and any likely constraints that could be imposed, along with considering the drainage strategy for it. The following issues have been suggested by the Environment Agency (EA) and Manchester City Council as Lead Local Flood Authority (LLFA), and subsequently addressed within this report.

- Identify available data relating to flood risk at the site.
- Determine whether the site is at risk from flooding from all sources, including from breach or overtopping of any existing flood defences, surface water flooding and/or ground water flooding.
- Assess the proposed flood levels affecting the site and provide a number of flood mitigation measures to remove this risk.
- Consider the flood risk from all other sources.
- Determine the current surface water drainage regime and assess any potential increase in surface water runoff as a result of the proposed development.
- Discuss Sustainable Drainage Systems (SuDS) as an option for reducing surface water flood risk.
- Consider the recommendations of the Manchester City Council Strategic Flood Risk Assessment (SFRA).
- Assess mitigation measures and off-site impacts and define any residual risks.
- Consider appropriate flood resistance and flood resilient measures as required.

3 Development Description and Location

3.1 Site Location

3.1.1 The site is referenced in Figure 1, and a site location map is provided in Appendix A.

Item	Brief Description
Project name	Proposed Outbuilding
Site address and location	Rear of 2 Ladybarn Crescent, Withington, M14 6UU.
Council Area	Manchester City Council
Approximate Grid Reference	OS: 385664, 393266
General Locality	The proposed development site is located 800m to the west of Withington Village Centre.

Figure 1 Site Referencing Information

3.2 Existing Site Description

3.2.1 The development site (Red Line Boundary) is rectangular in plan shape and encompasses an area of unmade land used for parking to the rear of 2 Ladybarn Crescent, Withington, M14 6UU.

3.2.2 Limited areas of shrubbery exist to the eastern and southern boundaries, with the existing residential dwelling to the east. For drainage purposes the development area therefore holds a Greenfield classification.

3.2.3 There are residential properties to all sides with apartments located to the west beyond Ladybarn Crescent. Access to the site will continue to be from Ladybarn Crescent to the west.

3.2.4 Figure 2 overleaf identifies the overall site location details. Further details of the existing layout can be seen on the Red Line Plans in Appendix A, along with photographs of the site in Appendix B.

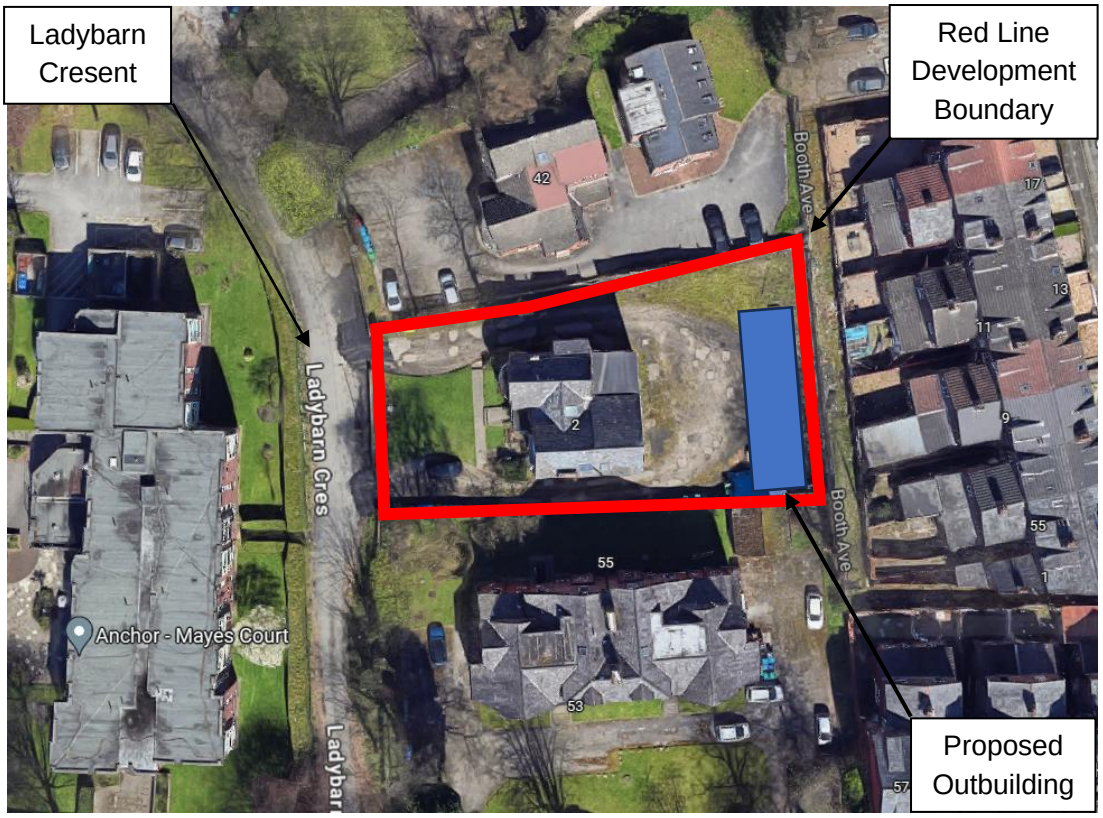


Figure 2 Site Location

3.3 Topography

3.3.1 No topographical survey has been completed at the site. However, a Light Detection & Ranging (LIDAR) survey has been obtained and assessed. This indicates the existing ground levels at four corners of the proposed outbuilding to range from 37.66m AOD to 37.99m AOD.

3.4 Hydrology

3.4.1 Cringle Brook watercourse, classed by the EA as Main River is located 250m to the northeast flowing generally in a westerly direction.

4 Planning Policy and Consultation

4.1 Planning Policy Framework

4.1.1 The flood maps provided by the Environment Agency (EA) locate the site in high-risk Flood Zone 3. This is land defined as having an annual probability of fluvial flooding of greater than 1 in 100 (>1.0%) in any year from the surcharging of Cringle Brook to the northeast. As a requirement of the new NPPF (2023), Section 14, the proposed development should satisfy the requirements of the Sequential Test and where applicable the Exception Test.

4.1.2 Sequential Test:

Under the NPPF (2023), Flood Zone 3 is defined as high probability flood risk. The proposal is for a non-habitable outbuilding, which in line with Table 1 is classified as 'Less Vulnerable'.

Placing both these criteria into Table 2 (Flood Risk Vulnerability and Flood Zone 'Incompatibility'), Less Vulnerable development in Flood Zone 3 determines that the development is appropriate, and the sequential test is passed.

4.1.3 Exception Test:

As the Sequential test is passed, the Exception test is therefore not required.

4.2 Strategic Flood Risk Assessment (SFRA)

4.2.1 SFRA's assess the risk associated with all types of flooding and provide the information required to identify the amount of development permitted in an area; how drainage systems in the area should function and also how risks in vulnerable areas can be reduced and/or mitigated. The NPPF states that regional planning bodies (RPB's) or local planning authorities should prepare SFRA's in consultation with the EA.

4.2.2 Manchester City Council in consultation with the Greater Manchester Combined Authority, produced the Greater Manchester Level 2 Strategic Flood Risk Assessment (2020) to demonstrate and define its understanding and role in managing flood risk. A fundamental aim of the strategy is that the Council embraces and supports its role as Lead Local Flood Authority, and this means taking the lead in helping with infrastructure development and re-development and working with other bodies in dealing with flood risk. The Council wants to encourage and wherever possible enforce current thinking and guidance and be able to provide improvements through working better together. The Strategy is aimed at providing an overview and assessment of local flood risk, setting out objectives and measures for how the Council will manage and reduce local flood risk. This Strategy builds on existing and developing approaches to flood risk management and promotes the use of a wide range of measures to manage flood risk. Risk should be managed in a co-ordinated way within catchments and balance the needs of communities, the economy and the environment.

4.2.3 A summary of the main elements from the SFRA associated with the district is detailed below. The full report can be obtained from the MCC website.

- The most significant sources of flood risk are fluvial and surface water.
- To better understand local flood risk and make best use of available information to better manage flood risk to people, businesses, property, infrastructure and the natural environment.
- To reduce the potential impact and costs of flooding in the area.
- To ensure resilience of local water bodies and drainage assets.
- To ensure appropriate development in areas of flood risk.
- To develop a collaborative partnership approach to flood risk management, and cooperate with other Risk Management Authorities (RMAs) and key stakeholders working across catchments.
- To assist communities in understanding information on flood risk and supporting themselves.
- Development should aim to deliver greenfield runoff rates on greenfield sites up to a 1 in 100-year storm event, considering climate change.
- Development should be designed so that there is no flooding to the development in a 1 in 30-year event and so that there is no property flooding in a 1 in 100 year plus climate change event.
- For all sites, development proposals should look at opportunities to incorporate SuDS to reduce the risk of surface water flooding.

4.3 Statutory Authority Correspondence

4.3.1 M&G have consulted with the EA via a Flood Risk Assessment Data request. Full details of the flood defence data and modelling outputs can be found in Appendix C.

5 Definition of Flood Hazard

5.1 Generally

Flood risk to the proposed development site is considered from all sources of flooding, as defined by the NPPF (2023).

5.2 Sources of Information

5.2.1 The NPPF (2023) requires the developer to consider the impact of runoff generated by the proposed development onto the downstream catchment, and to assess the risk of runoff from the surrounding district impacting on the development's footprint. Further, the report is to consider flood risk from all other sources. The following section defines the flood risk receptors and anticipated flood risk. Section 5.8 then tabulates the probability of flooding and the likely impacts.

5.2.2 Figure 3 summarises the main sources of information used in the identification of flood risk.

Source of Information	**Details**
Environment Agency	From EA website and Flood Risk Assessment Data Request
United Utilities	Sewer Records
Historic Maps/Reports	From various websites
Manchester SFRA	Report & Various Maps

Figure 3 Sources of information used in the identification of flood risk

5.3 Flooding from Rivers (Fluvial)

5.3.1 The closest known watercourse to the site is Cringle Brook located some 250m to the northeast, flowing generally in a westerly direction.

5.3.2 The National Planning Policy Framework (NPPF) categorises flood risk as follows:

- Zone 1 (low probability) – Land assessed as having less than a 1 in 1,000 annual probability of river or sea flooding (<0.1%);
- Zone 2 (medium probability) – Land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year; and
- Zone 3a (high probability) - Land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

- Zone 3b The Functional Floodplain - This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the EA. (Not separately distinguished from Zone 3a on the Flood Map).

5.3.2 Figure 4 locates the site on the Environment Agency's indicative floodplain map. It is clear from this that the red line boundary is located in high-risk Flood Zone 3. This is land defined as having an annual probability of fluvial flooding of greater than 1 in 100 (>1.0%) in any year from the surcharging of Cringle Brook.

5.3.3 The risk from fluvial flood water therefore requires further consideration. Refer to Section 6.0 for details.

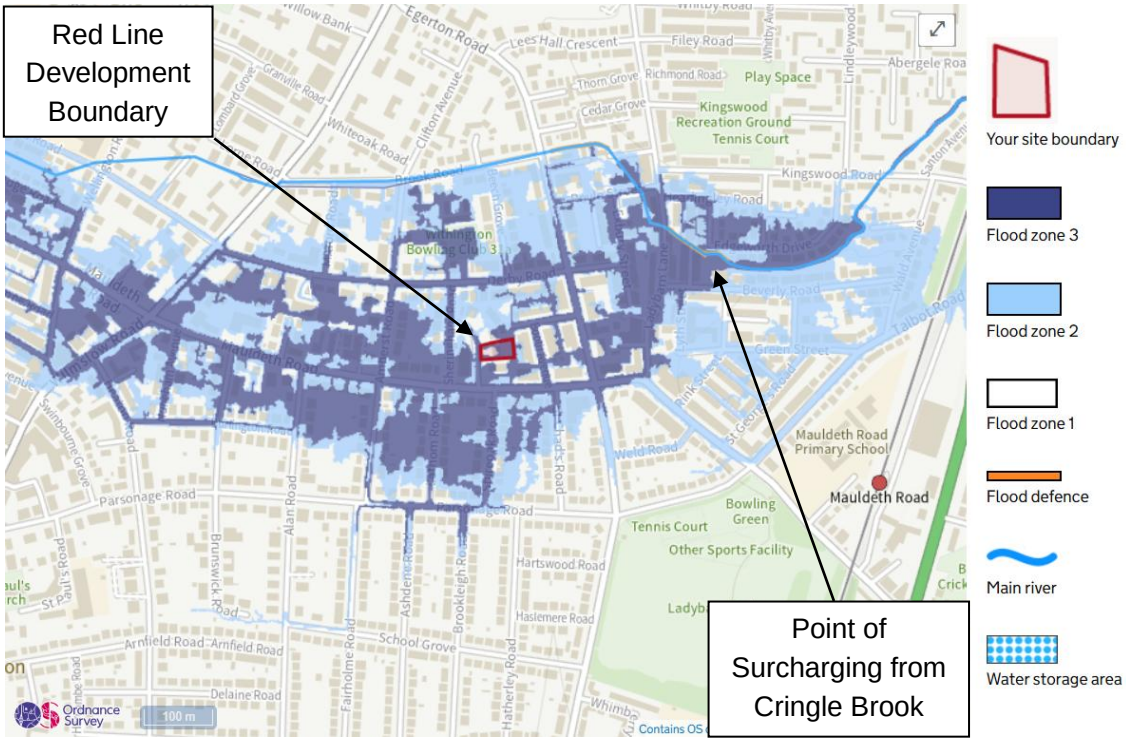


Figure 4 The EA's Indicative 100-year Flood Plain Map

5.4 Flooding from Land (Overland Flow)

5.4.1 The EA descriptions for the High, Medium and Low risk scenarios for surface water flooding are as follows:

- High risk means that each year this area has a chance of flooding of greater than 3.3%.
- Medium risk means that each year this area has a chance of flooding of between 1% and 3.3%.
- Low risk means that each year this area has a chance of flooding of between 0.1% and 1%.
- Very Low risk means that each year this area has a chance of flooding of less than 0.1.

5.4.2 The existing site and the surrounding land generally falls in a westerly direction to mimic the fall of Cringle Brook.

5.4.3 According to the EA's Indicative Surface Water Floodplain map (Figure 5 below) the site area is classified as at very low risk of surface water flooding with the extent of flooding very similar to the fluvial mapping.

5.4.4 These maps are prepared utilising LIDAR data and thus the overland flood maps do not take account of the extensive drainage infrastructure located along the route such as gullies and channel drains that connect to a below ground drainage network to remove this excess surface water.

5.4.5 Taking this into account the risk from surface water flooding can be considered to be low.

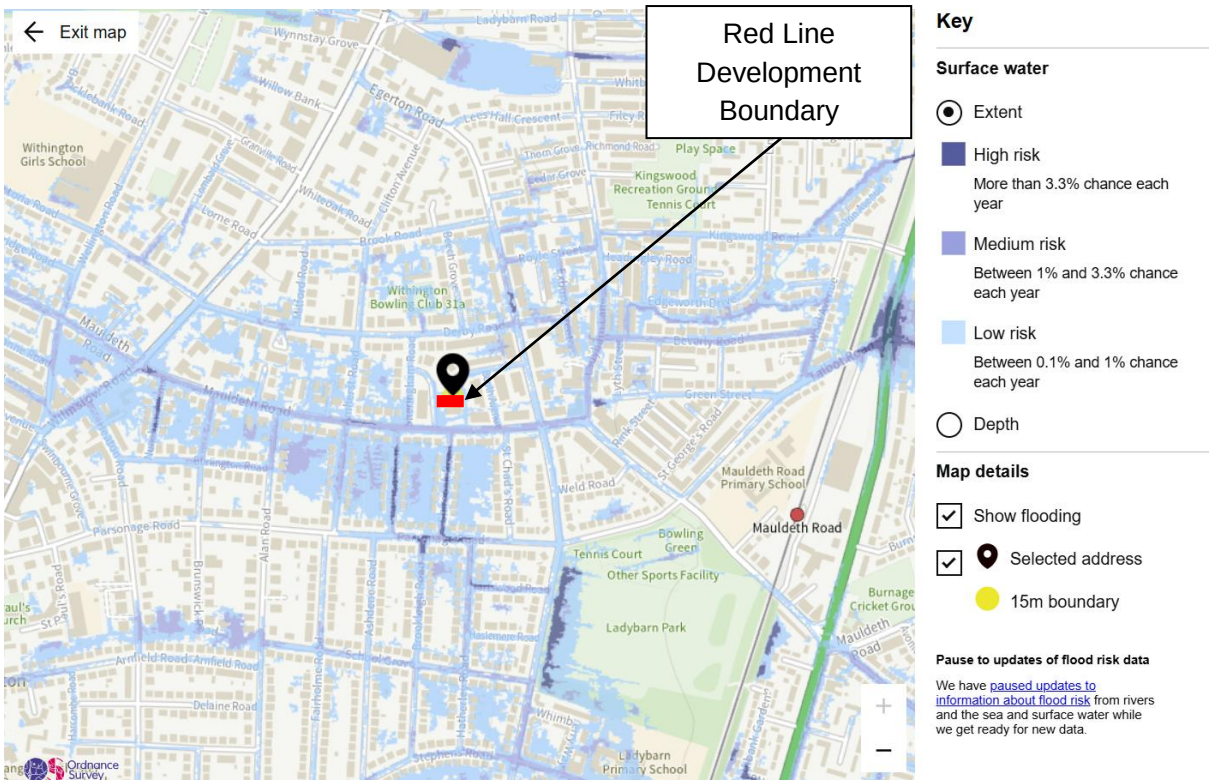


Figure 5 The EA's Indicative Surface Water Flood Map

5.5 Flooding from Sewers and Private Drainage

5.5.1 The United Utilities (UU) sewer records have been reviewed and confirm that there is a 375mm diameter combined water sewer flowing south within Ladybarn Crescent. No surface water sewers have been identified in close proximity.

5.5.2 The development area is unmade with no positive drainage.

5.5.3 The extensive UU adopted and private drainage networks serving the surrounding district ensures that the development footprint is protected from the impact of both upstream and downstream runoff. It would be anticipated that complete protection

may well exist beyond a storm event equivalent to the 30-year statistical event. Beyond this projection, there may be a small degree of peripheral 'Exceedance' flooding within the lower lying St Marks Street above the sewers. However, this is expected to be localised and restricted to the location of specific manhole covers. Thus, flood risk to the site from sewers is diminished to acceptable levels.

5.6 Flooding from Groundwater

5.6.1 In general terms, groundwater flooding can occur from three main sources, raised water tables, seepage and percolation, and groundwater recovery or rebound. If groundwater levels are naturally close to the surface, then this can present a flood risk during intense rainfall.

5.6.2 At the time of writing no specific intrusive phase 2 site investigation has been carried out at the site. A review of the BGS dataset would indicate the superficial deposits to encompass Till – Silts and clays, with the bedrock comprising the Chester Formation – Sandstone. A local BGS borehole has not indicated any groundwater.

5.6.3 According to information contained within the SFRA there are no documented records of groundwater flooding within the district.

5.6.4 In light of these findings, the site is considered to have a low susceptibility to groundwater flooding.

5.7 Flooding from Artificial Sources

5.7.1 Reservoir flooding is extremely unlikely to happen and there has been no loss of life in the UK from reservoir flooding since 1925. The Environment Agency is the enforcement authority and ensures that reservoirs are inspected regularly, and essential safety work is carried out.

5.7.2 The Long-Term Flood Risk Assessment (Flood Risk from Reservoirs) map shows that the site is at a low risk of Reservoir flooding.

5.8 Summary

5.8.1 Below is a summary of the flood risks associated with the development site.

Source	Flood Risk	Likely Impacts	Remarks
Tidal	Low	Low	Low risk of tidal flooding.
Fluvial (Watercourse)	High	Medium - High (with Mitigation)	Site located in Flood Zone 3 (High risk). Further assessment required.
Surface Water (Overland Flood Flow)	Medium	Low - Medium (with Mitigation)	Site at medium risk of surface water flooding.
Sewers	Low	Low	Public sewers located outside of the development site. Low risk from both private and adopted drainage.
Groundwater	Low	Low	No indication through SFRA and online mapping that site at risk of groundwater flooding.
Artificial Sources	Low	Low	No Artificial sources in close proximity.

Figure 6 Flood Risk Summary

6.0 Assessment Of Flood Risk on Proposed Development

6.1 Summary

6.1.1 As discussed in Section 3, the development site has been categorised in accordance with the SFRA and EA Flood Maps as being located within a High flood risk area from fluvial flooding of Cringle Brook to the northeast.

6.1.2 Other flood risk sources such as groundwater, sewer and overland flows have been considered and have been found not to be a flood risk generator to the site.

6.2 Flooding From the Cringle Brook

6.2.1 Cringle Brook, designated by the EA as Main River, is located approximately 250m to the northeast of the site and flows generally in a westerly direction.

6.2.2 The EA have been consulted via a Flood Risk Assessment Data request and have subsequently provided the flood level data for Cringle Brook from the Cringle Black Brook 2017 Study. A variety of outputs for the defended and defences removed scenarios have been provided. Refer to Appendix B for full details.

6.2.3 Figure 7 provides the various flood level data for the nearest node point adjacent the site from this fluvial runoff model scenario for the various storm events, with climate change also taken into account.

1 in 20 year defended (0.5% AEP)	**1 in 50 year defended (0.2% AEP)**	**1 in 100 year defended (1% AEP)**	**1 in 100 year + 35% CC defended (1% AEP + 35%)**	**1 in 1000 year defended (0.1 AEP)**
37.71m AOD	37.74m AOD	37.75m AOD	37.79m AOD	37.84m AOD

Figure 7. Peak Flood Level from Cringle Brook

6.2.4 Assessing the existing ground levels at the location of the new outbuilding against the hydraulic flood data as provided by the Environment Agency via the Flood Risk Assessment Data request has confirmed that the land will be located both above and marginally below the fluvial flood influence for the 1 in 100 year, 1 in 100 year plus 35% climate change and 1 in 1000-year events. It is noted that the flooding associated with the site is related to an overland flood flow routing where the surcharged water passes out of the Cringle Brook channel immediately upstream where the watercourse enters a culvert. The water then flows overland both between the houses and along the adopted highways towards the site boundary.

6.2.5 Although the levels from the EA modelling would indicate that the development maybe located in Functional Flood Zone 3b, assessing the Manchester Council Places for People SFRA and associated mapping has confirmed that the site is not located within Functional Flood Zone 3b. Refer to Figure 8 below.

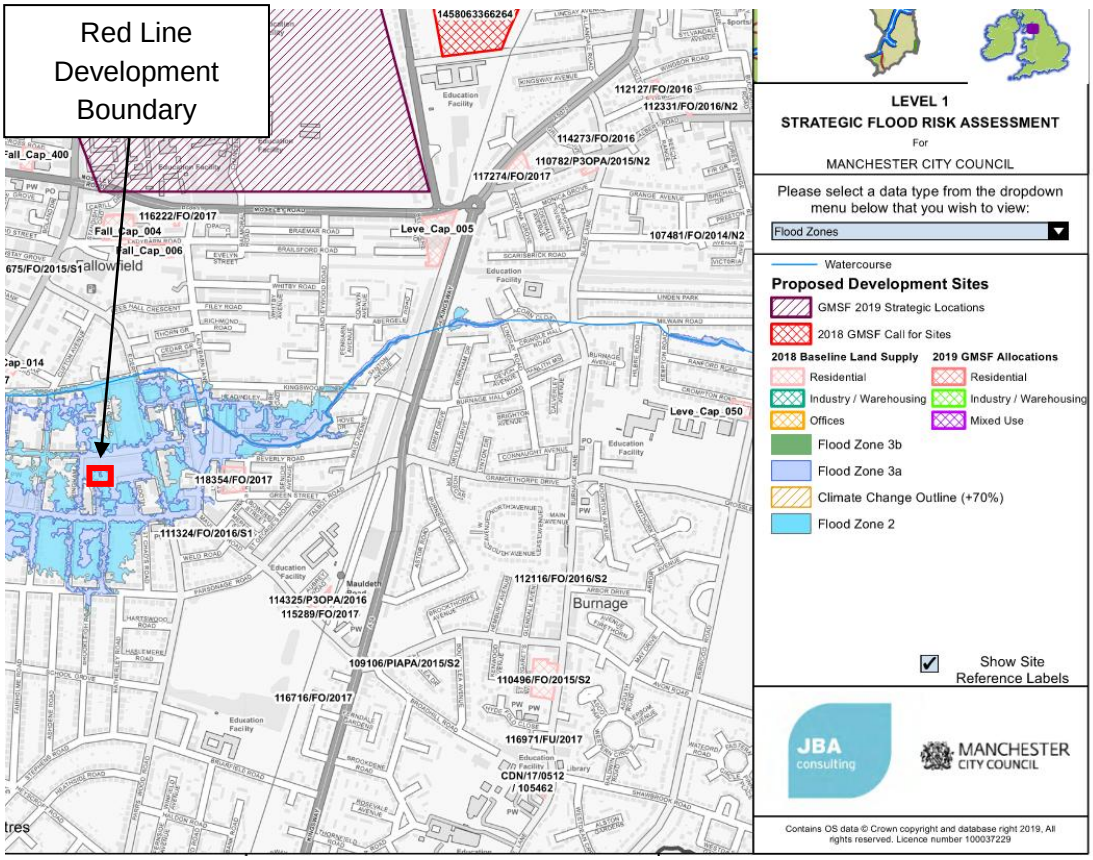


Figure 8. Extract from the GMCA SFRA Flood Mapping

6.2.6 However, as there will be flooding associated with the 1 in 100 year plus 35% climate change and 1 in 1000 year events, the existing ground levels will be maintained and the building floor slab level set at 37.66m AOD to allow the building to flood by up to 180mm for the 1 in 1000 year event. With the building allowed to flood, flood volume compensation is therefore not required.

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6.2.7 Although the building is not habitable the following flood resilience measures will be incorporated into the design:

- Masonry walls and concrete floors slabs with no finishes susceptible to damage by flood waters will be used in the construction of the building.
- Electrical equipment will be raised 600mm above estimated flood levels.
- Where possible storage areas 600mm above estimated flood levels will be provided.
- The building owner/operator will subscribe to the Environment Agencies flood warning service.
- Items stored at ground level will be moved to areas that will not be affected by flooding should relevant warnings be issued.

Finally, the nature of the building construction (masonry and concrete) will simplify and reduce cleaning and drying out times.

7.0 Outline Drainage Strategy

7.1 Existing Drainage

As discussed in Section 5, the UU sewer records have been reviewed and confirm that there is a 375mm diameter combined water sewer in Ladybarn Crescent flowing south. No surface water sewers have been identified in close proximity.

7.2 Existing Runoff

7.2.1 The existing site is comprised of undeveloped land and is thus considered to be Greenfield for drainage purposes. Figure 9 below defines the existing Greenfield runoff rate.

Existing Permeable Area (ha)	**Greenfield Rates**
0.013	**Q_1 0.1 l/s** **Q_{30} 0.1 l/s** **Q_{100} 0.1 l/s**

Figure 9 Existing Greenfield Runoff Rate

7.3 Geology

7.3.1 No detailed site-specific site investigation has been completed at the site. However from historical site investigation data the near surface geology comprises of significant depths of cohesive material underlain by bedrock of the Chester Formation. Therefore, based on the cohesive underlying geology, infiltration is not considered viable for the site.

7.4 Hydrological Assessment

7.4.1 As discussed in previous sections, the Cringle Brook culvert is located approximately 200m to the north of the site.

7.5 Sustainable Drainage Systems (SuDS) Assessment

7.5.1 SuDS Objectives

Sustainable drainage, developed in line with the ideals of sustainable development, is collectively referred to as Sustainable Drainage Systems (SuDS). At a particular site, these systems are designed both to manage the environmental risks resulting from the urban runoff and to contribute wherever possible to environmental enhancement. SuDS objectives are therefore to minimise the impacts from the development on the quantity and quality of the runoff and maximise amenity and biodiversity opportunities (CIRIA C753, 2015).

7.5.2 SuDS Design Themes

The 'Management Train Approach' should be central to the surface water drainage strategy of the proposed site. The main objective is treatment and control of runoff as near to the source as possible protecting downstream habitats and further enhancing the amenity value of the site. This concept uses a hierarchy of drainage techniques to incrementally reduce pollution, flow rates and volumes of storm water discharge from the site, and is as follows:

i. **Prevention** – The use of good site design and housekeeping measures to prevent runoff and pollution and includes the use of rainwater reuse / harvesting.

ii. **Source Controls** – Control of runoff at source or as close to source as possible (e.g. soakaways, green roofs, pervious pavements).

iii. **Site Control** – Management of water in a local area and can include below ground storage / attenuation, detention basins, large infiltration devices.

iv. **Regional Control** – Management of water from a site or various sites and can include wetlands and balancing ponds.

7.5.3 SuDS Site Constraints

SuDS techniques are suitable for all sites; therefore, an assessment of the existing site is required so that SuDS limitations can be determined.

- *Land Use Characteristics:* The small size and type of development reduces the potential range of source control and site control SuDS devices to be considered.
- *Site Characteristics:* Cohesive underlying geology means infiltration is not a viable means of surface water discharge.
- *Catchment Characteristics:* The site is currently classed as 'Greenfield' and the discharge rate from the site will need to be no greater than the existing Greenfield runoff rates or at a minimum rate to prevent blockage.
- *Environmental and Amenity Performance:* The inclusion of SuDS within the overall development is a key driver in providing both amenity and habitat creation. All types of SUDs including where possible Ponds, swales and both wet and dry basins should be considered and blended into the landscaping zone, if possible. Safety to all future users is paramount and so best practice guidance will be incorporated so that these devices blend into the surrounding without the need for significant safety precautions. Maintenance plans will be prepared for all SuDS devices that are included.

7.5.4 SuDS Methods

Figure 10 and 11 on the following pages provide an assessment of various above and below ground SuDS methods that can provide water quality treatment and management of flows to reduce runoff rates and volumes and whether they can be suitably incorporated at this development site. The purpose of this assessment is to set out options to be considered at the planning stage with consideration to time constraints, viability and lifetime maintenance of the commercial development.

Method	Comment	Suitability for Development
Green Roofs	• Can be used on suitable low-rise buildings to provide retention, attenuation and treatment of rainwater, and promotes evaporation and local biodiversity.	*Not suitable*: • Pitched roof negates a green roof from being considered.
Water Butts	• Plastic tanks placed at the base of rainwater down pipes to collect rainwater runoff from the roof areas.	*Suitable*: • To be placed at the base of all rainwater pipes.
Rainwater Harvesting	• Rainwater harvesting reduces the total runoff volume from the developed site and reduces treated water consumption.	*Not Suitable*: • No use in the development for harvested rain water. • Additional costs of installation would have severe effect on viability of the development. • Running and maintenance costs would not be acceptable to our client and future occupiers. • The ability to restrict peak flow rates and short-term peak volumes is non-existent where a critical storm event occurs.
Infiltration Options	• Reduces total run off volume from the development.	*Not Suitable*: • The cohesive underlying geology precludes the use of infiltration.
Permeable Surfacing (Infiltration)	• Reduces total run off volume from the development. • Can be used to enhance water quality.	*Not Suitable*: • No new external areas.

Permeable Surfacing (Standard)	• Can be used to enhance quality of runoff water. • Sub-base provides 'source' storage and reduces the volume of storage downstream. • The storage can be created with selection of the stone fill or use of plastic box stems. • Impermeable membrane at base of construction to prevent impact on pavement stability.	*Not suitable:* • No new external areas.
Swales, basins and ponds	• Provide areas for above ground surface runoff storage. • Swales also allow filtering of particulate matter, improving water quality	*Not suitable:* • No space within the development area to include Green SuDS.
Bio-Retention	• Collect and retain run-off to help improve water quality, prior to discharge in piped system on infiltration.	*Suitable:* • Rainwater planters placed on the outlet from the waterbutts to take the excess roof water.

Figure 10 Surface SuDS Methods

Method	Comment	Suitability for Development
Geocellular Storage	• Suitable for sites with insufficient space for basins etc. • Suitable for sites where topography prevents the use of open basins etc. • Can be very effective infiltration devices subject to ground conditions.	*Not suitable:* • No offsite flows proposed.
Large Diameter Pipes, Culverts or Tanks	• Suitable for sites with insufficient space for basins etc. • Provide a volume of below ground storage with a high void ratio and good man entry provision to allow for future maintenance and cleaning. • Generally, be suitable for adoption by the statutory water company (e.g. United Utilities).	*Not suitable:* • More suited to large residential developments.

Figure 11 Sub-Surface SuDS Methods

7.5.5 *SuDS Hierarchal Approach*

Based on the SuDS assessment in Figure 10 and 11, plus an assessment of the local site conditions, the SuDS hierarchal approach for discharge of surface water at the development site is considered in greater detail below:

Method	Suitability	Suitability for Development
Infiltration to Ground	Yes	Cohesive underlying geology precludes the use of infiltration. However, water butts and new planting adjacent the building will take the runoff from the roof water.
Connection to Watercourse	No	No watercourse in close proximity.
Connection to Surface Water Sewer	No	No surface water sewers in close proximity.
Connection to a Combined Sewer	No	Higher option available.

Figure 12 SuDS Hierarchal Approach

7.6 Outline Surface Water Drainage Strategy

7.6.1 The general principal of the surface water drainage strategy is to collect the runoff from the roof of the new outbuilding and outfall to a number of waterbutts located at the base. These will then outfall to new planting areas adjacent the building.

8.0 Management Measures, Off Site Impacts & Residual Risk

8.1 Flood Risk Management Measures

8.1.1 The assessment has determined that the finished floor level of the new outbuilding will be set no higher than the existing ground level of 37.66m AOD and constructed in such as a way to allow some minor internal flooding and maintain the current Flood Zone 3b scenario. The scheme is for a non-habitable building and so no flood resilience and flood resistance measures are proposed.

8.1.2 All other flood risks have been considered and found not to be a flood risk generator to the development.

8.1.3 The use of SUDS in the form of prevention and Source Control measures will help to minimise the flood risk impact to the surrounding sewers.

8.1 Offsite Impacts

8.2.1 The development of the site does not impair the hydraulic continuity of any watercourse and the current ‘‘local hydraulics’’ of distributing watercourses / outfalls.

8.2.2 The Development footprint does not cross or cover any existing or declared future catchment flood defences. Consequently, the Applicant does not propose to augment or compromise the current catchment defences.

8.2.3 By mimicking the pre-development drainage scenario peak by the inclusion of SuDS, this will reduce surface water flooding impact onto the downstream catchment.

8.2.4 As there is no flood displacement or increased rate of runoff as part of this proposal into the adjacent sewers, the proposed development will therefore not increase flood risk onto its locality.

8.3 Residual Risk

8.3.1 With careful design of the drainage elements as described above there will be no residual flood-related risks that will remain after the development has been completed.

03

8.3.2 Flood resilience measures outlined in section 6.2.7 will be introduced into the design to reduce the impact of a flood event.

Appendix A – Architects Drawings



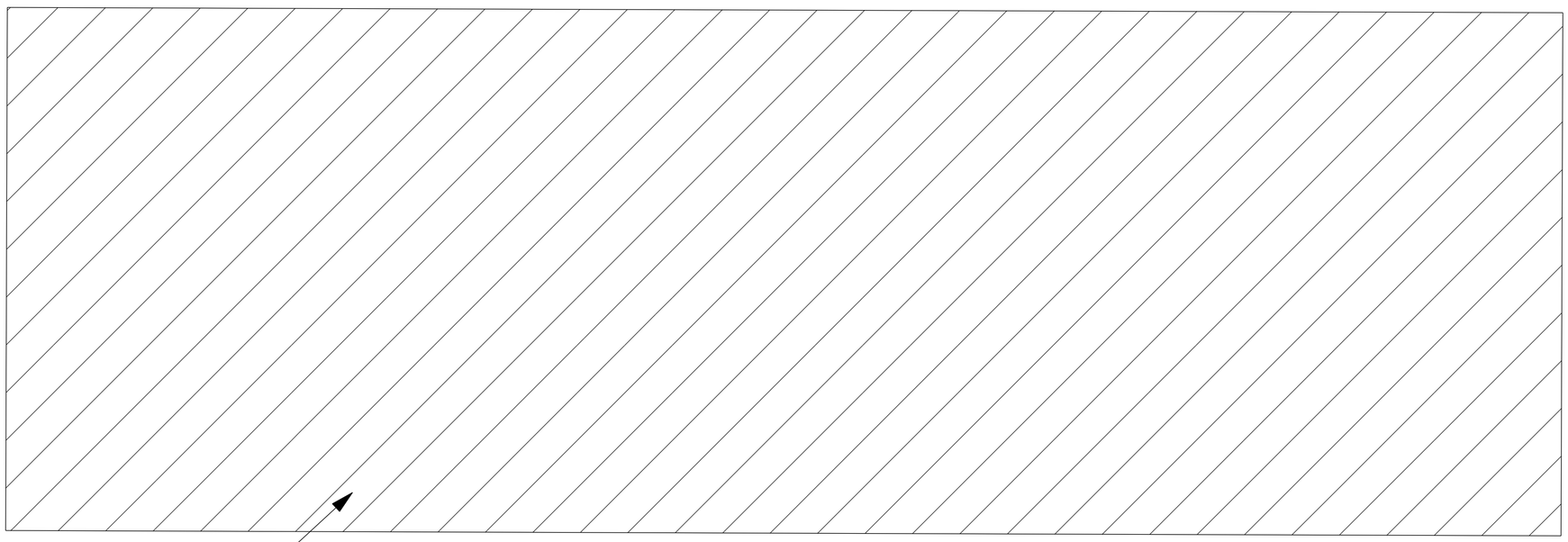
20 0 20 40 60 80 100

Metres

LOCATION PLAN FOR

2, LADYBARN CRESCENT, WITHINGTON.

SCALE 1:1250



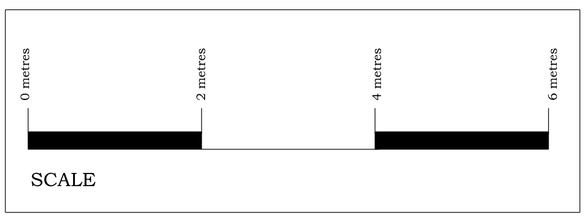
Proposed
outbuilding

Combined I.C.
530 invert

Combined I.C.
800 invert

Combined I.C.
1600 invert

BRADLEY BUILDING DESIGN LTD.
KEEPERS COTTAGE,
LYME PARK,
DISLEY,
STOCKPORT.
SK12 2NS.
01625 858244
Mob 07989 326039
bradleybuildingdesign@btopenworld.com



SCALE

SITE PLAN

CONSTRUCTION OF REAR OUTBUILDING

for

A.J.ESTATES.

at

2, LADYBARN CRESCENT,

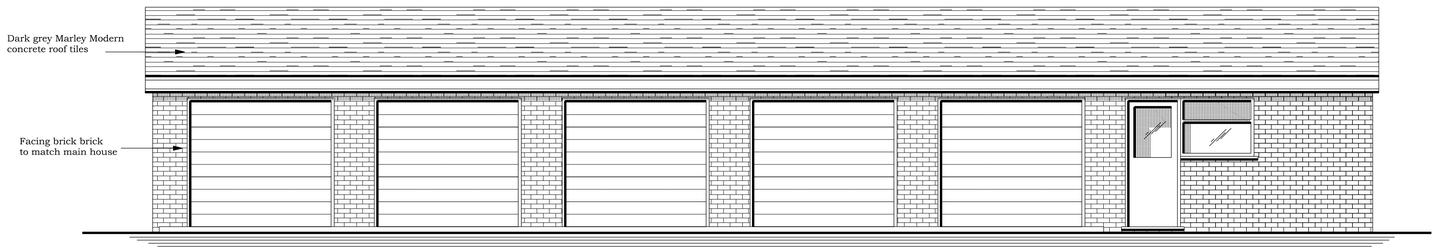
WITHINGTON,

M14 6UU

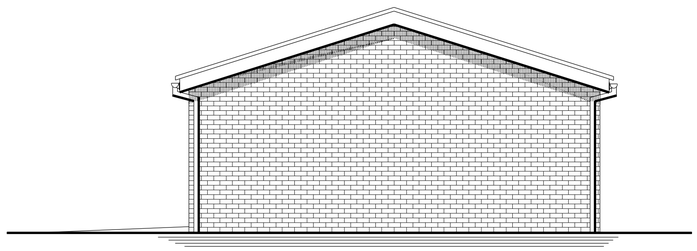
Scale 1:50 @ A1

Date MARCH 2024

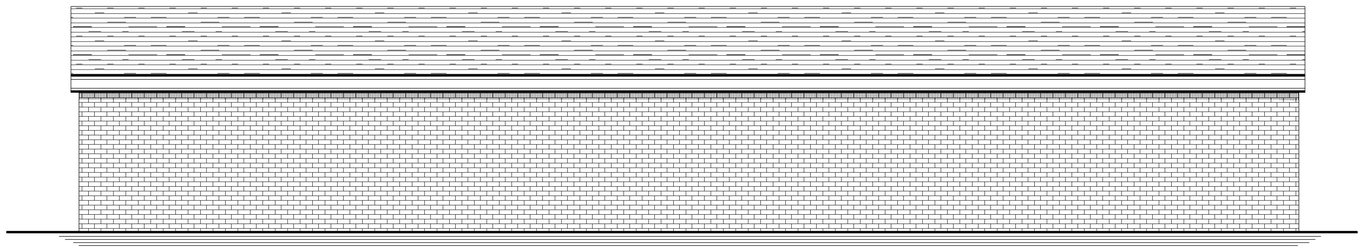
Drawing Number 2220/1



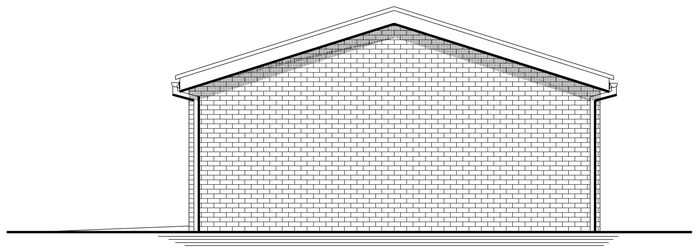
WEST FACING FRONT ELEVATION



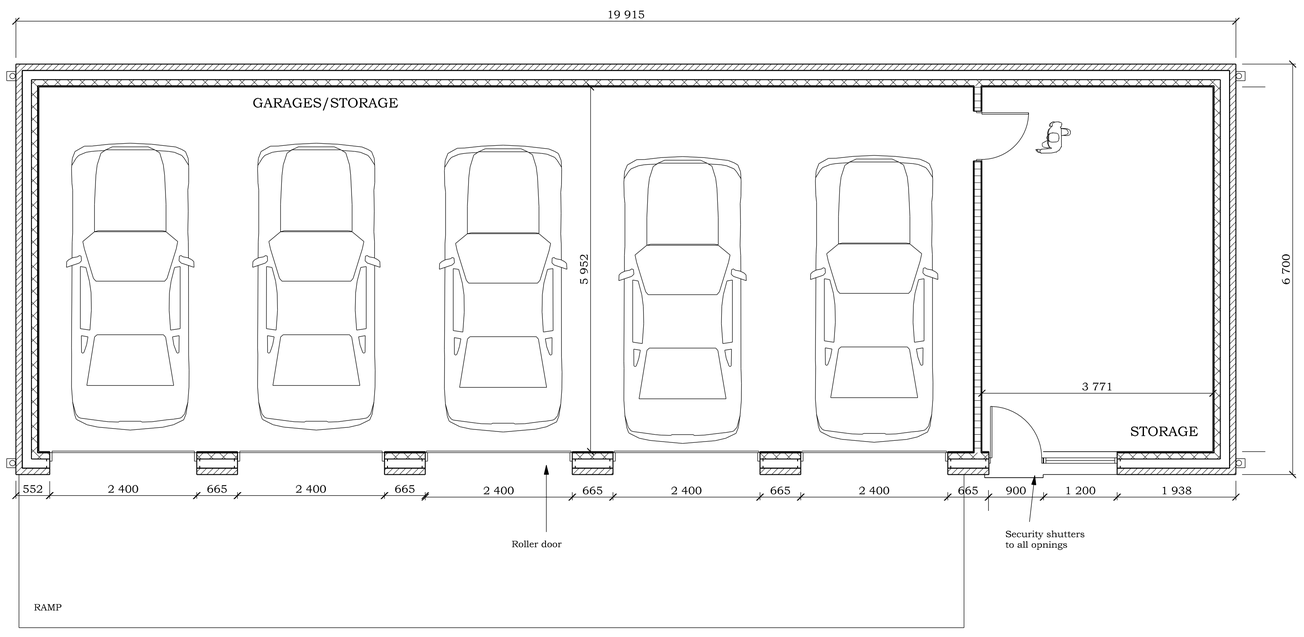
SOUTH FACING SIDE ELEVATION



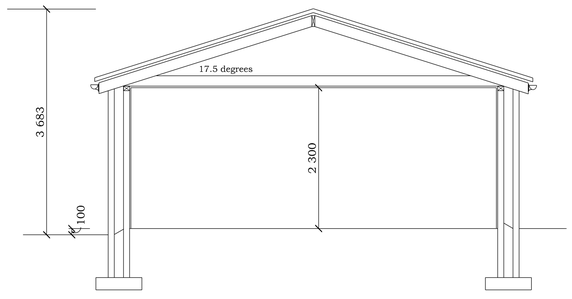
EAST FACING REAR ELEVATION



NORTH SIDE ELEVATION

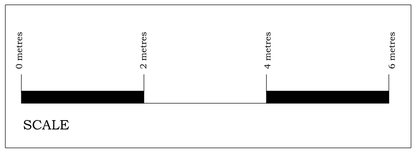


PROPOSED FLOOR PLAN



TYPICAL SECTION

BRADLEY BUILDING DESIGN LTD.
KEEPERS COTTAGE,
LYME PARK,
DISLEY,
STOCKPORT.
SK12 2NS.
01625 858244
Mob 07989 326039
bradleybuildingdesign@btopenworld.com



SCALE

PROPOSED BUILDING

CONSTRUCTION OF REAR OUTBUILDING

for

A.J.ESTATES.

at

2, LADYBARN CRESCENT,

WITHINGTON,

M14 6UU

Scale 1:50 @ A1

Date MARCH 2024

Drawing Number 2220/2/A

Appendix B – Site Photographs




HS19 PNO

Appendix C – Environment Agency Flood Data

Flood risk assessment data

Location of site: 385668 / 393240 (shown as easting and northing coordinates)
Document created on: 23 June 2024
This information was previously known as a product 4.
Customer reference number: 265JDYR7WCAM

Map showing the location that flood risk assessment data has been requested for.



How to use this information

You can use this information as part of a flood risk assessment for a planning application. To do this, you should include it in the appendix of your flood risk assessment.

We recommend that you work with a flood risk consultant to get your flood risk assessment.

Included in this document

In this document you'll find:

- how to find information about surface water and other sources of flooding
- information on the models used
- definitions for the terminology used throughout
- flood map for planning (rivers and the sea)
- historic flooding
- flood defences and attributes
- information to help you assess if there is a reduced flood risk from rivers and the sea because of defences
- modelled data
- climate change modelled data
- information about strategic flood risk assessments
- information about this data
- information about flood risk activity permits
- help and advice

Surface water and other sources of flooding

Use the long term flood risk service to find out about the risk of flooding from:

- surface water
- ordinary watercourses
- reservoirs

For information about sewer flooding, contact the relevant water company for the area.

About the models used

Model name: Cringle Black Brook 2017
Scenario(s): Defended fluvial, defences removed fluvial, defended climate change fluvial, defences removed climate change fluvial
Date: 1 April 2018

These models contain the most relevant data for your area of interest.

Terminology used

Annual exceedance probability (AEP)

This refers to the probability of a flood event occurring in any year. The probability is expressed as a percentage. For example, a large flood which is calculated to have a 1% chance of occuring in any one year, is described as 1% AEP.

Metres above ordnance datum (mAOD)

All flood levels are given in metres above ordnance datum which is defined as the mean sea level at Newlyn, Cornwall.

Flood map for planning (rivers and the sea)

Your selected location is in flood zone 3.

Flood zone 3 shows the area at risk of flooding for an undefended flood event with a:

- 0.5% or greater probability of occurring in any year for flooding from the sea
- 1% or greater probability of occurring in any year for fluvial (river) flooding

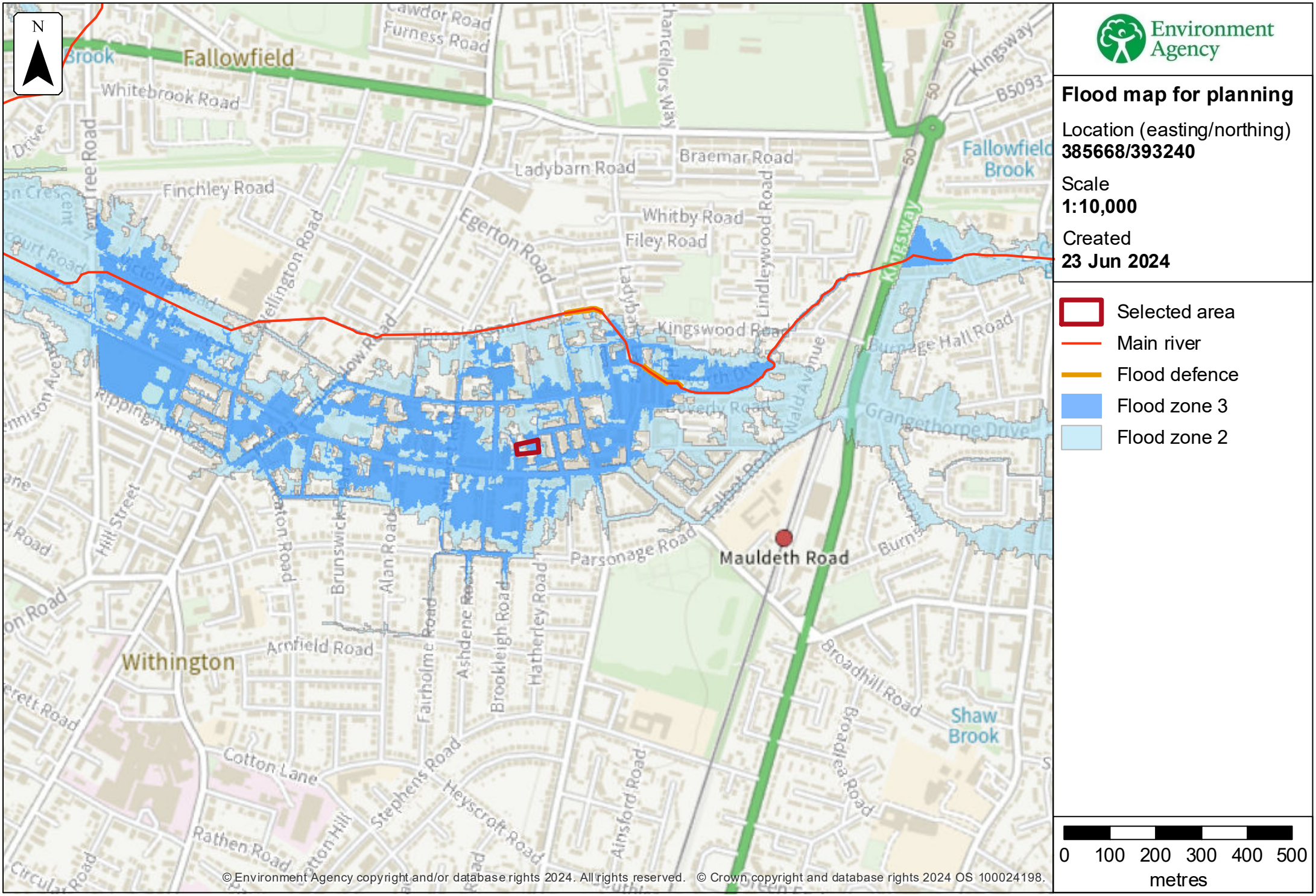
Flood zone 2 shows the area at risk of flooding for an undefended flood event with:

- between a 0.1% and 0.5% probability of occurring in any year for flooding from the sea
- between a 0.1% and 1% probability of occurring in any year for fluvial (river) flooding

It's important to remember that the flood zones on this map:

- refer to the land at risk of flooding and do not refer to individual properties
- refer to the probability of river and sea flooding, ignoring the presence of defences
- do not take into account potential impacts of climate change

The flood zones are not currently being updated. The last update was in November 2023. Some of the flood zones may have changed, however all source data is included in the models below.


N
Fallowfield
Whitebrook Road
Finchley Road
Ladybarn Road
Braemar Road
Whitby Road
Filey Road
Egerton Road
Kingswood Road
Lindleywood Road
Kingsway
Fallowfield Brook
Mauldeth Road
Parsonage Road
Withington
Arnfield Road
Cotton Lane
Broadhill Road
Shaw Brook
Heyscroft Road
Rathen Road
Stephens Road
Hatherley Road
Brookleigh Road
Ashdene Road
Fairholme Road
Alan Road
Brunswick
Hill Street
Grangethorpe Drive
Burnage Hall Road
Lapwing Lane
Chancellors Way
Furness Road
Lawdor Road
B5093
Environment Agency
Flood map for planning
Location (easting/northing)
385668/393240
Scale
1:10,000
Created
23 Jun 2024
Selected area
Main river
Flood defence
Flood zone 3
Flood zone 2
0 100 200 300 400 500
metres
© Environment Agency copyright and/or database rights 2024. All rights reserved. © Crown copyright and database rights 2024 OS 100024198.

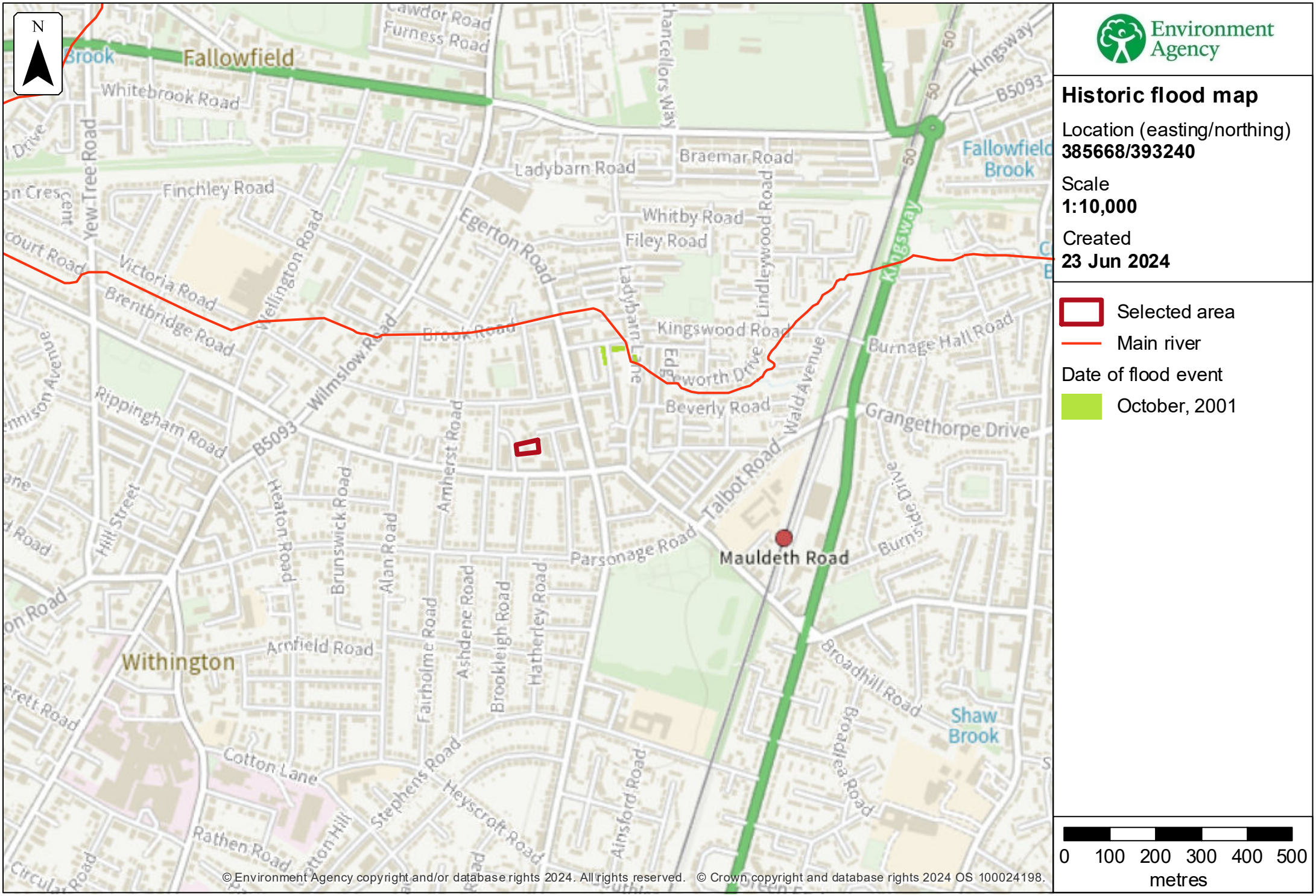
Historic flooding

This map is an indicative outline of areas that have previously flooded. Remember that:

- our records are incomplete, so the information here is based on the best available data
- it is possible not all properties within this area will have flooded
- other flooding may have occurred that we do not have records for
- flooding can come from a range of different sources - we can only supply flood risk data relating to flooding from rivers or the sea

You can also contact your Lead Local Flood Authority or Internal Drainage Board to see if they have other relevant local flood information. Please note that some areas do not have an Internal Drainage Board.

Download recorded flood outlines in GIS format


N
Fallowfield
Whitebrook Road
Finchley Road
Victoria Road
Brentbridge Road
Wellington Road
Wilmslow Road
Egerton Road
Ladybarn Road
Braemar Road
Whitby Road
Filey Road
Lindleywood Road
Kingswood Road
Edgeworth Drive
Beverly Road
Brook Road
Ladybarn Lane
Rippingham Road
B5093
Amherst Road
Brunswick Road
Alan Road
Heaton Road
Hill Street
Parsonage Road
Talbot Road
Wald Avenue
Mauldeth Road
Grangethorpe Drive
Burnage Hall Road
Kingsway
Withington
Arnfield Road
Fairholme Road
Ashdene Road
Brookleigh Road
Hatherley Road
Cotton Lane
Stephens Road
Heyscroft Road
Ainsford Road
Broadhill Road
Broadlea Road
Shaw Brook
Fallowfield Brook
Chancellors Way
Furness Road
Yew Tree Road
Rathen Road
Circular Road
Burnside Drive
Environment Agency
Historic flood map
Location (easting/northing)
385668/393240
Scale
1:10,000
Created
23 Jun 2024
Selected area
Main river
Date of flood event
October, 2001
0 100 200 300 400 500
metres
© Environment Agency copyright and/or database rights 2024. All rights reserved. © Crown copyright and database rights 2024 OS 100024198.

Historic flood event data

Start date	End date	Source of flood	Cause of flood	Affects location
26 October 2001	27 October 2001	main river	obstruction/blockage - channel	No

Flood defences and attributes

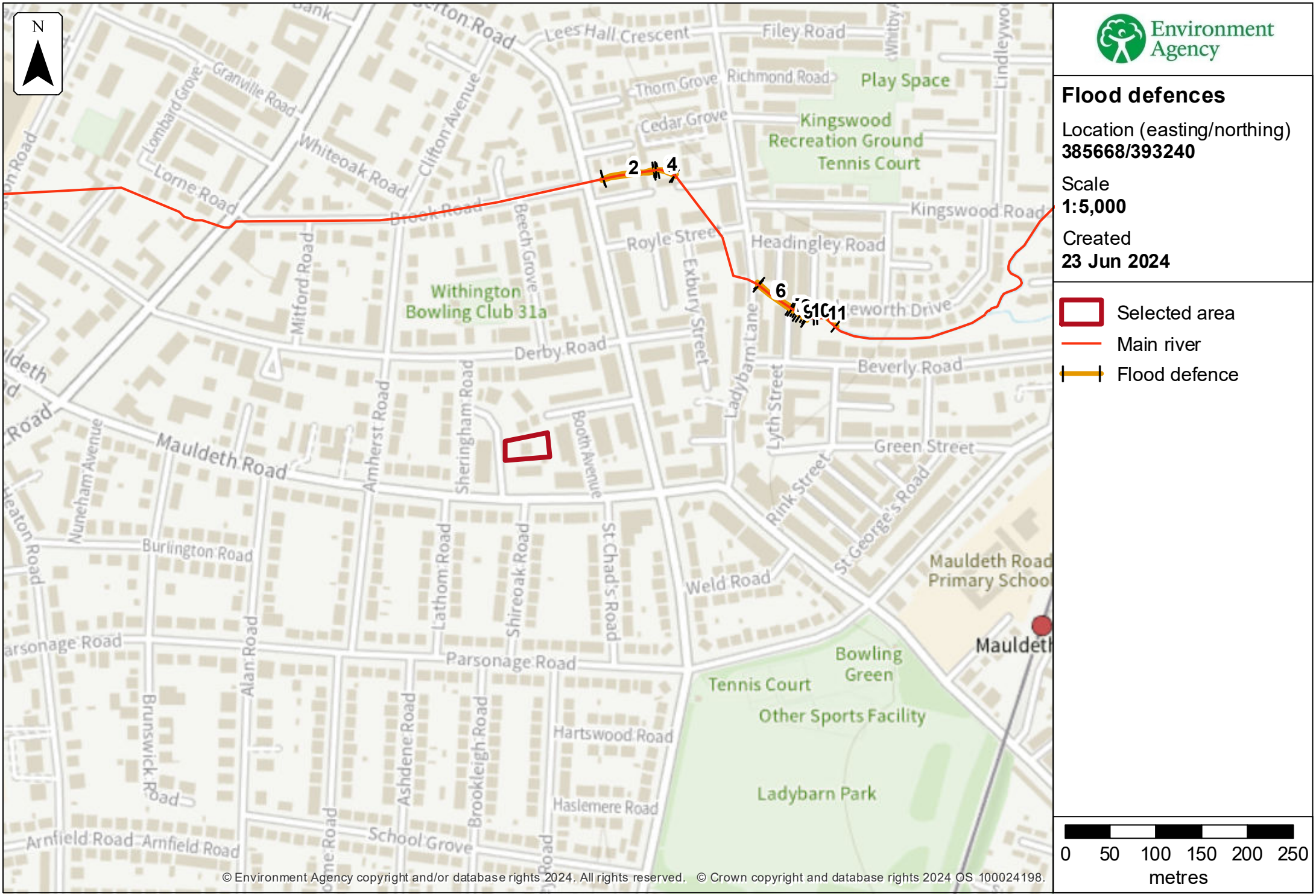
The flood defences map shows the location of the flood defences present.

The flood defences data table shows the type of defences, their condition and the standard of protection. It shows the height above sea level of the top of the flood defence (crest level). The height is In mAOD which is the metres above the mean sea level at Newlyn, Cornwall.

It's important to remember that flood defence data may not be updated on a regular basis. The information here is based on the best available data.

Use this information:

- to help you assess if there is a reduced flood risk for this location because of defences
- with any information in the modelled data section to find out the impact of defences on flood risk


N
Environment Agency
Flood defences
Location (easting/northing)
385668/393240
Scale
1:5,000
Created
23 Jun 2024
Selected area
Main river
Flood defence
2
4
6
9
10
11
Withington Bowling Club 31a
Kingswood Recreation Ground
Tennis Court
Play Space
Mauldeth Road Primary School
Bowling Green
Tennis Court
Other Sports Facility
Ladybarn Park
Lees Hall Crescent
Filey Road
Thorn Grove
Richmond Road
Cedar Grove
Kingswood Road
Headingley Road
Royle Street
Exbury Street
Ladybarn Lane
Lyth Street
Beverley Road
Green Street
Rink Street
St George's Road
Whiteoak Road
Clifton Avenue
Granville Road
Lombard Grove
Lorne Road
Brook Road
Beech Grove
Mitford Road
Derby Road
Amherst Road
Sheringham Road
Booth Avenue
Mauldeth Road
Nuneham Avenue
Burlington Road
Lathom Road
Shireoak Road
St Chad's Road
Weld Road
Parsonage Road
Alan Road
Brunswick Road
Ashdene Road
Brookleigh Road
Hartswood Road
Haslemere Road
School Grove
Arnfield Road
0 50 100 150 200 250
metres
© Environment Agency copyright and/or database rights 2024. All rights reserved. © Crown copyright and database rights 2024 OS 100024198.

Flood defences data

Label	Asset ID	Asset Type	Standard of protection (years)	Current condition	Downstream actual crest level (mAOD)	Upstream actual crest level (mAOD)	Effective crest level (mAOD)
1	121699	Wall	100		39.28	39.24	
2	32270	Wall	100		39.21	39.28	
3	32271	Wall	100		39.40	39.73	
4	32836	Wall	100		39.40	39.36	
5	32357	Wall	100		40.67	40.97	
6	121698	Wall	100		40.70	40.96	
7	32358	Wall	100		40.72	40.71	
8	59161	Wall	100		40.13	40.13	
9	8870	Wall	100		39.84	39.83	
10	8872	Embankment	100		39.78	39.77	
11	9557	Engineered High Ground	100		39.86	39.89	

Any blank cells show where a particular value has not been recorded for an asset.

Modelled data

This section provides details of different scenarios we have modelled and includes the following (where available):

- outline maps showing the area at risk from flooding in different modelled scenarios
- modelled node point map(s) showing the points used to get the data to model the scenarios and table(s) providing details of the flood risk for different return periods
- map(s) showing the approximate water levels for the return period with the largest flood extent for a scenario and table(s) of sample points providing details of the flood risk for different return periods

Climate change

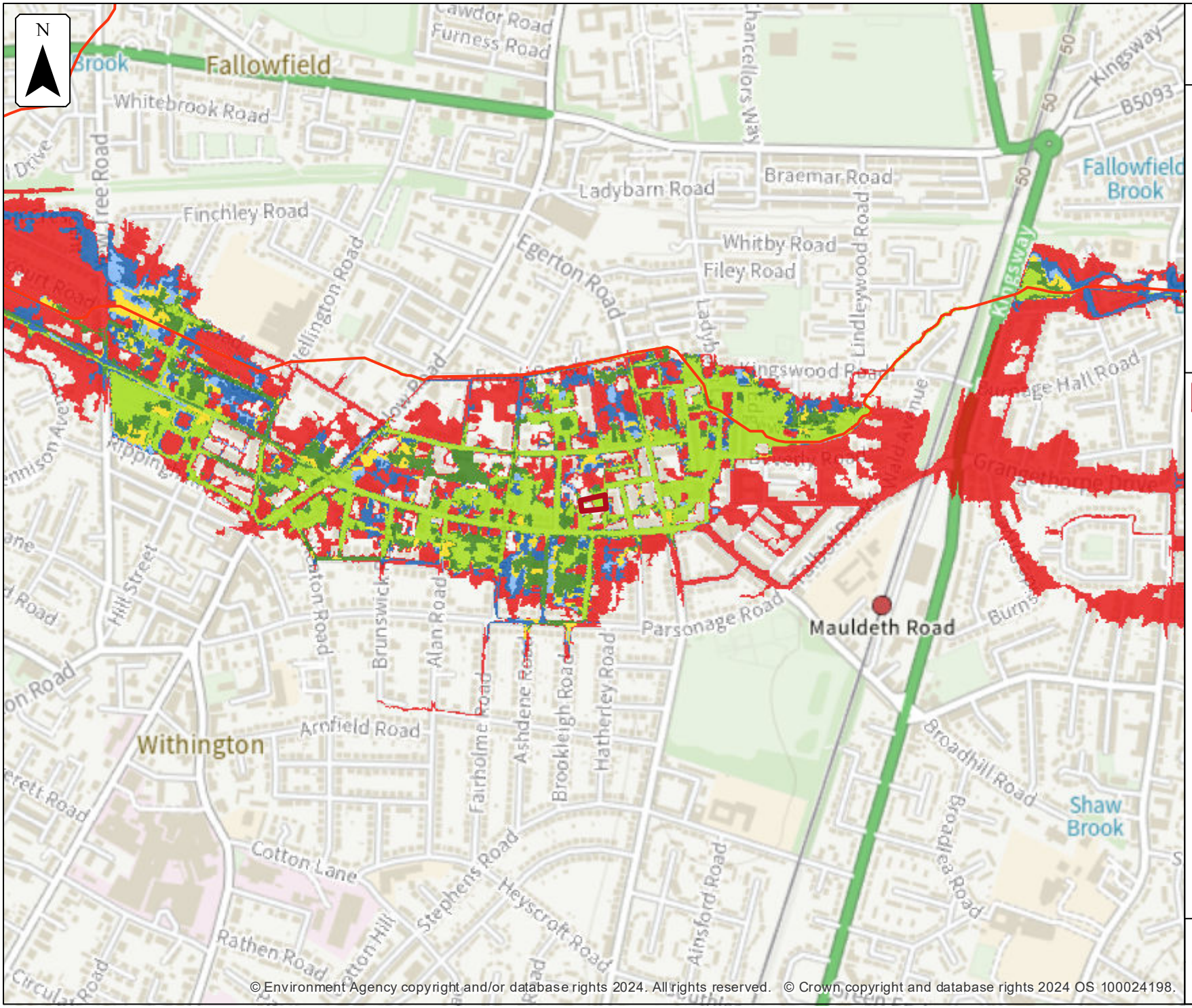
The climate change data included in the models may not include the latest flood risk assessment climate change allowances. Where the new allowances are not available you will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding.

The Environment Agency will incorporate the new allowances into future modelling studies. For now, it's your responsibility to demonstrate that new developments will be safe in flood risk terms for their lifetime.

Modelled scenarios

The following scenarios are included:

- Defended modelled fluvial: risk of flooding from rivers where there are flood defences
- Defences removed modelled fluvial: risk of flooding from rivers where flood defences have been removed
- Defended climate change modelled fluvial: risk of flooding from rivers where there are flood defences, including estimated impact of climate change
- Defences removed climate change modelled fluvial: risk of flooding from rivers where flood defences have been removed, including estimated impact of climate change



Environment Agency

Defended modelled fluvial extent

Location (easting/northing)
385668/393240

Scale
1:10,000

Created
23 Jun 2024

Model name
Cringle Black Brook 2017

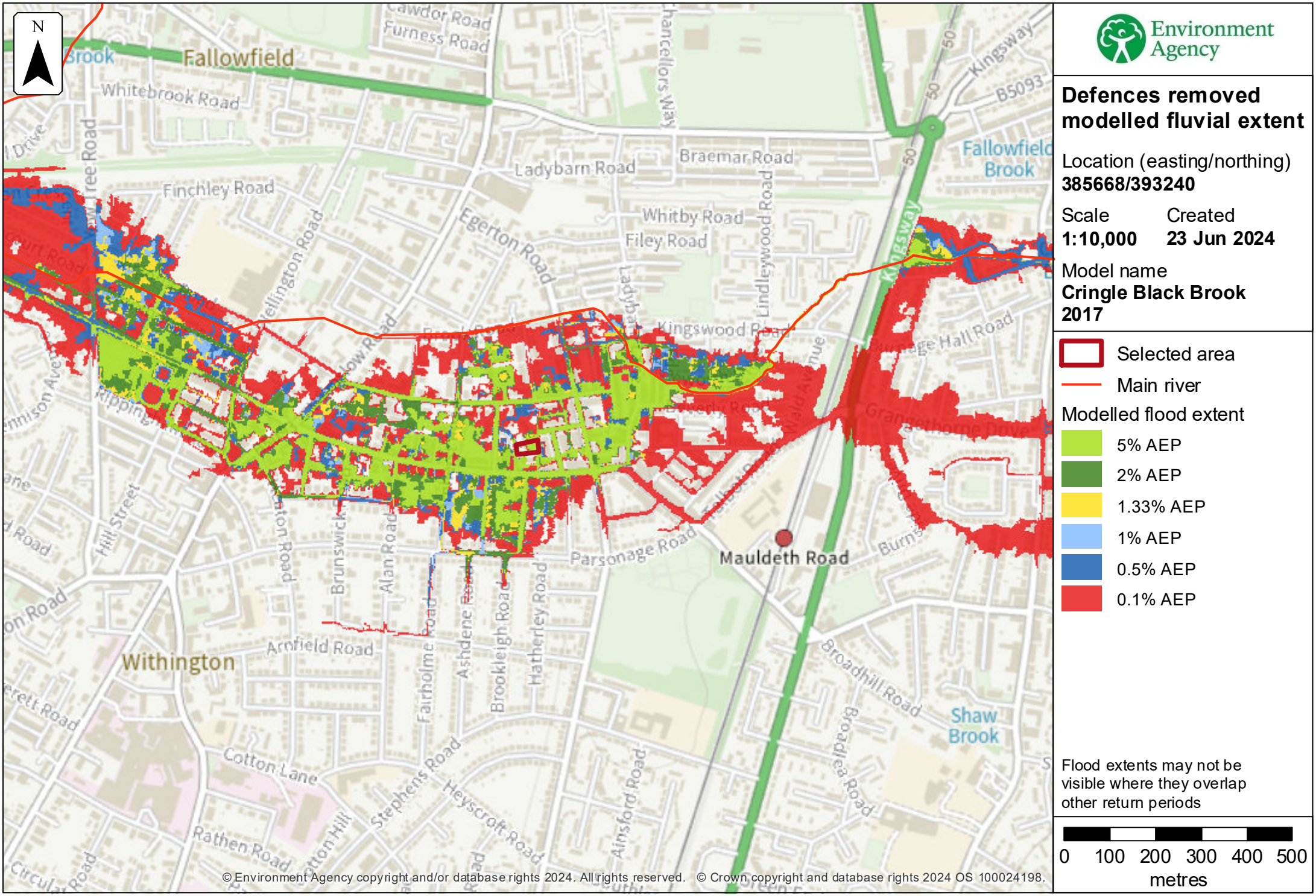
- Selected area
- Main river

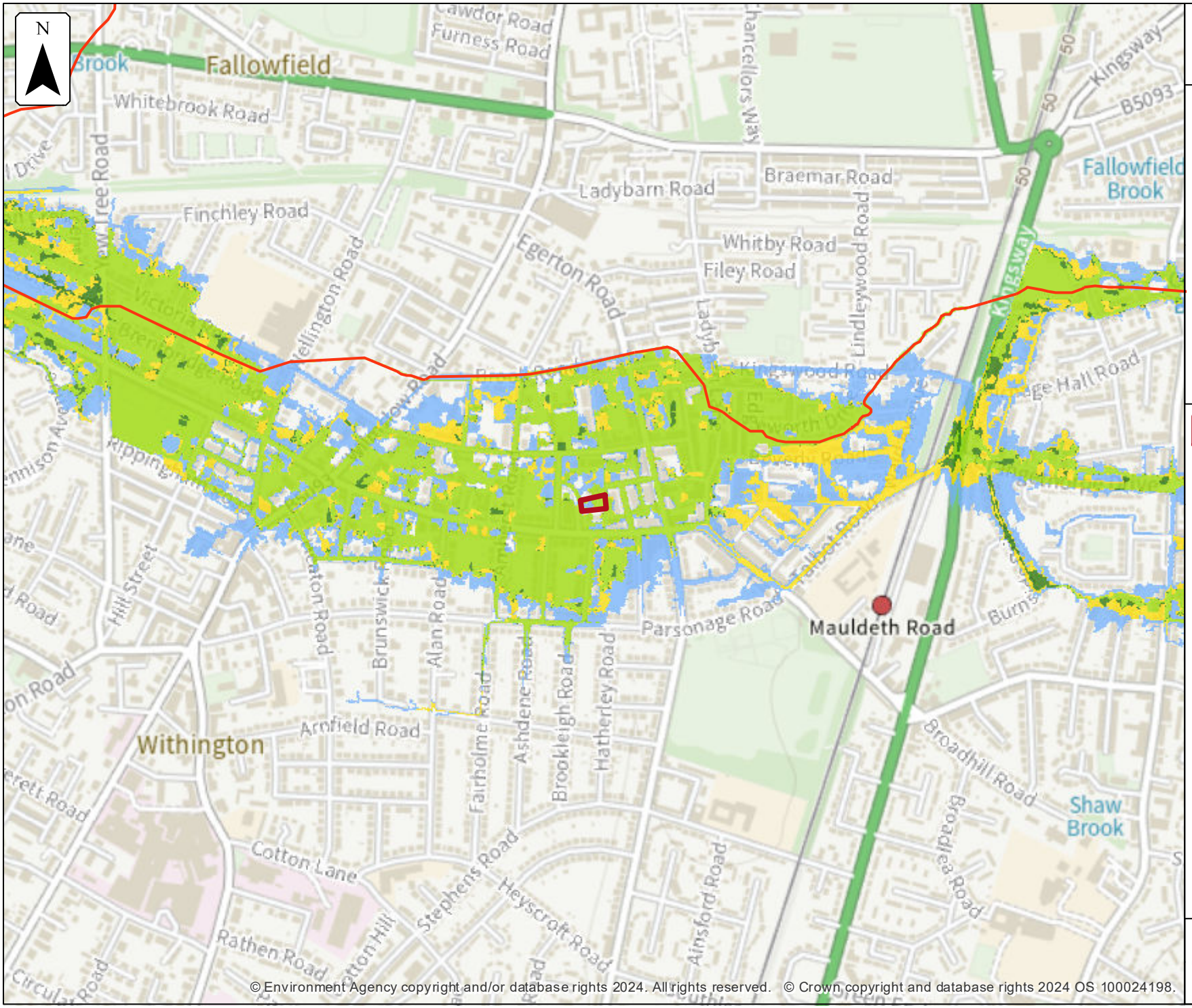
Modelled flood extent

- 5% AEP
- 2% AEP
- 1.33% AEP
- 1% AEP
- 0.5% AEP
- 0.1% AEP

Flood extents may not be visible where they overlap other return periods

0 100 200 300 400 500
metres


N
Fallowfield
Whitebrook Road
Finchley Road
Ladybarn Road
Braemar Road
Whitby Road
Filey Road
Egerton Road
Kingsway
Mauldeth Road
Parsonage Road
Withington
Arnfield Road
Cotton Lane
Broadhill Road
Shaw Brook
Fallowfield Brook
Environment Agency
Defences removed modelled fluvial extent
Location (easting/northing)
385668/393240
Scale
1:10,000
Created
23 Jun 2024
Model name
Cringle Black Brook 2017
Selected area
Main river
Modelled flood extent
5% AEP
2% AEP
1.33% AEP
1% AEP
0.5% AEP
0.1% AEP
Flood extents may not be visible where they overlap other return periods
0 100 200 300 400 500
metres
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Environment Agency

Defended climate change modelled fluvial extent

Location (easting/northing)
385668/393240

Scale
1:10,000

Created
23 Jun 2024

Model name
Cringle Black Brook 2017

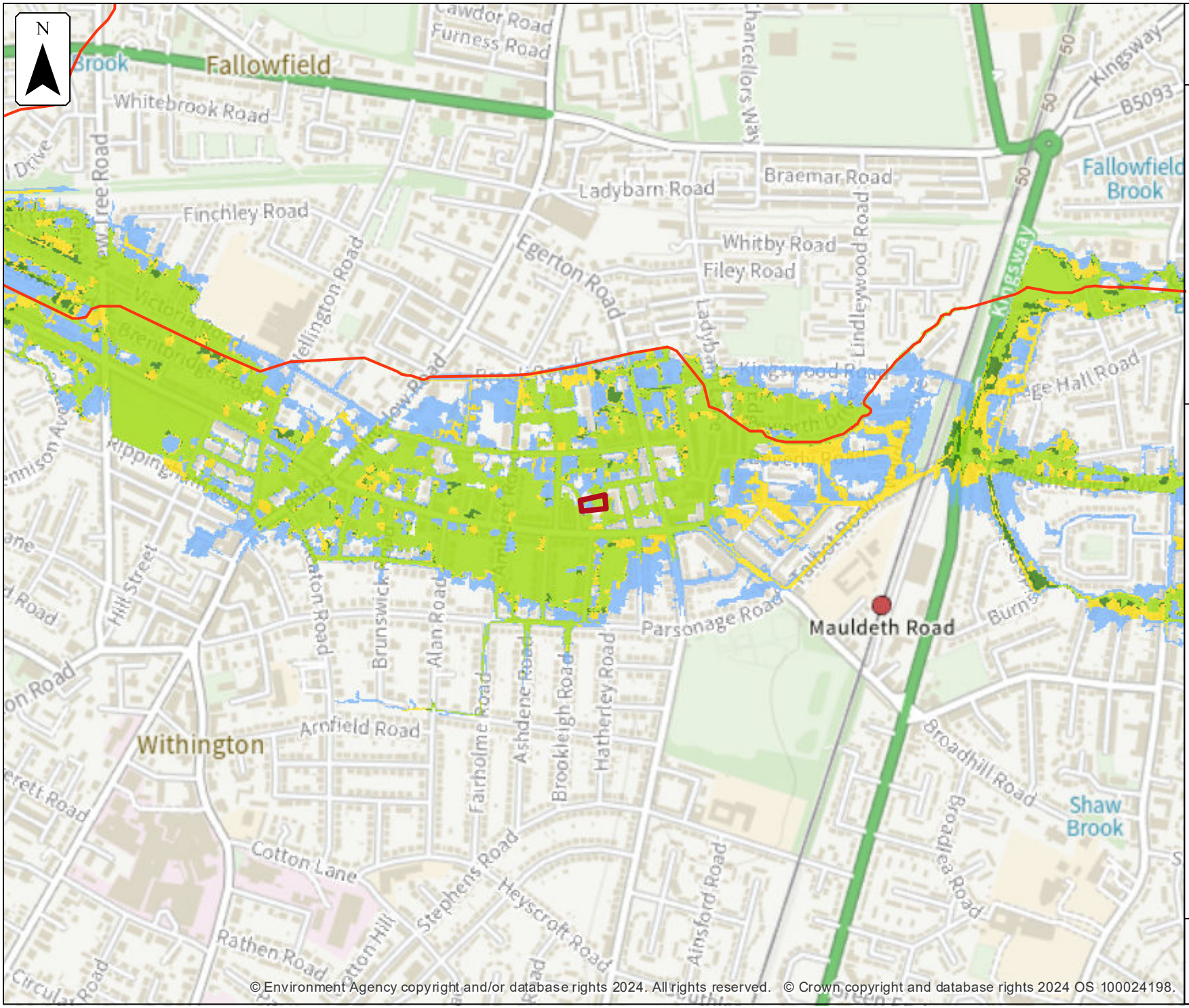
- Selected area
- Main river

Modelled flood extent

- 1.0% AEP (+30%)
- 1.0% AEP (+35%)
- 1.0% AEP (+70%)
- 0.1% AEP (+30%)

Flood extents may not be visible where they overlap other return periods

0 100 200 300 400 500
metres



Environment Agency

Defences removed climate change modelled fluvial extent

Location (easting/northing)
385668/393240

Scale
1:10,000

Created
23 Jun 2024

Model name
Cringle Black Brook 2017

Selected area

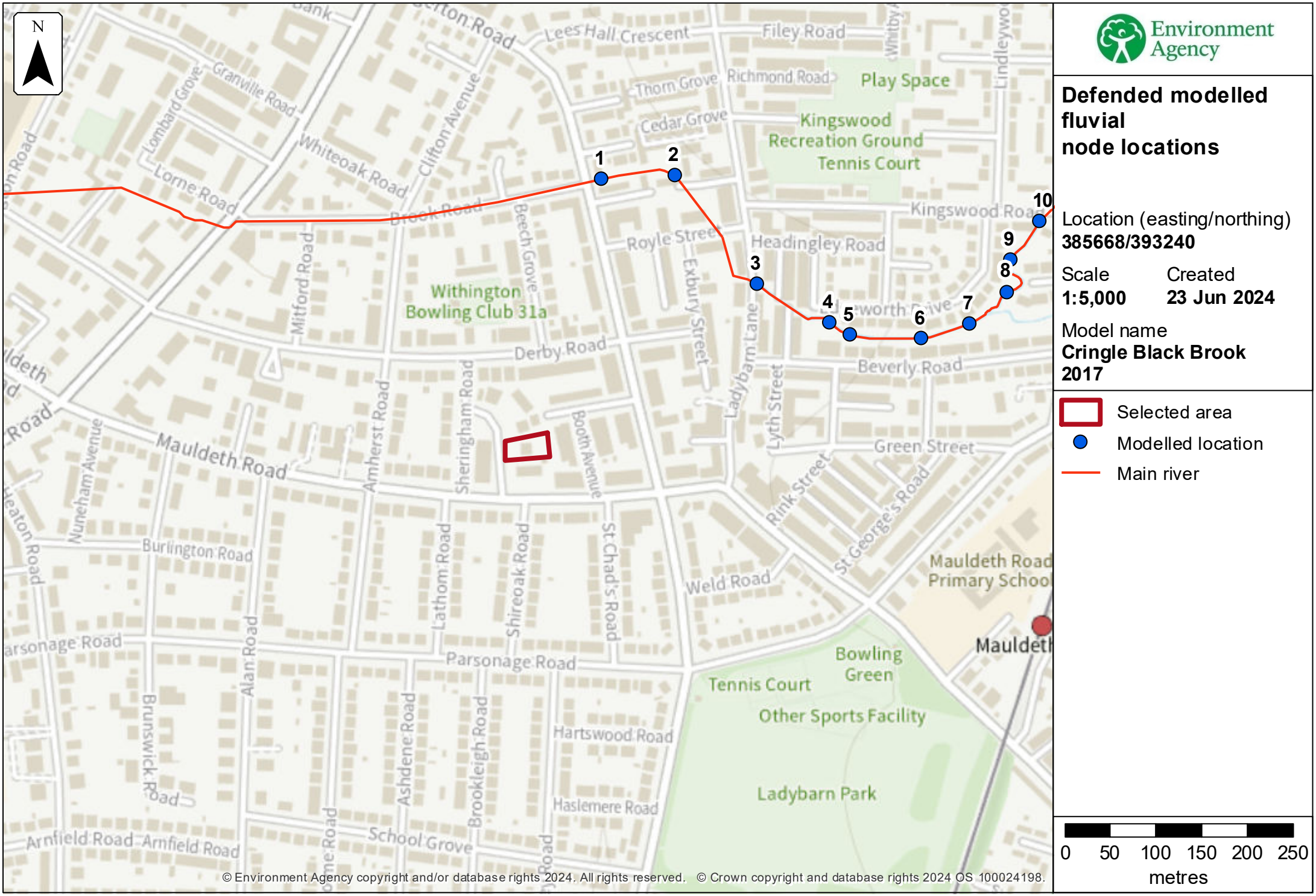
Main river

Modelled flood extent

- 1.0% AEP (+30%)
- 1.0% AEP (+35%)
- 1.0% AEP (+70%)
- 0.1% AEP (+30%)

Flood extents may not be visible where they overlap other return periods

0 100 200 300 400 500
metres

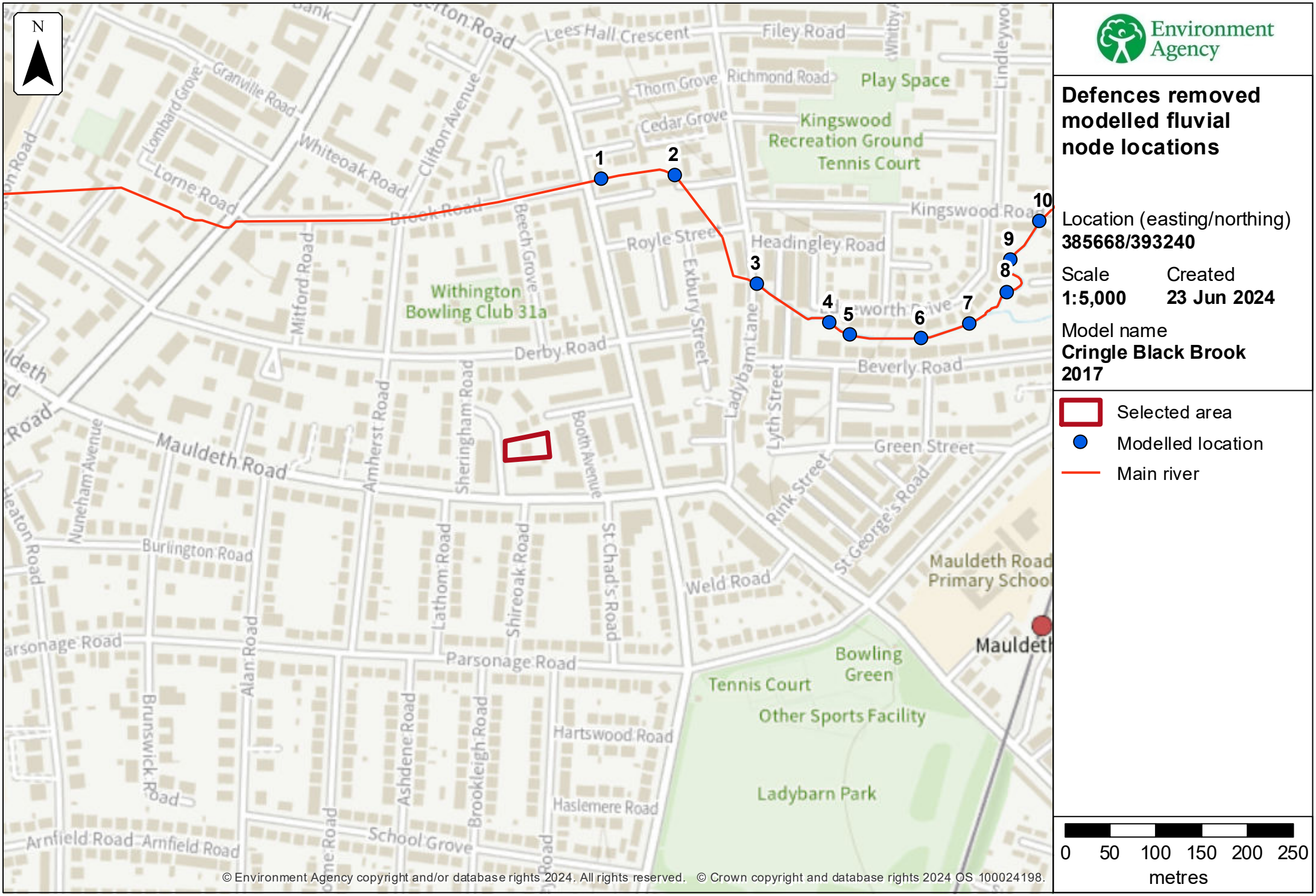

N
Environment Agency
Defended modelled fluvial node locations
Location (easting/northing)
385668/393240
Scale
1:5,000
Created
23 Jun 2024
Model name
Cringle Black Brook 2017
Selected area
Modelled location
Main river
0 50 100 150 200 250
metres
1
2
3
4
5
6
7
8
9
10
Lees Hall Crescent
Filey Road
Thorn Grove
Richmond Road
Play Space
Cedar Grove
Kingswood Recreation Ground
Tennis Court
Kingswood Road
Headingley Road
Royle Street
Exbury Street
Ladybarn Lane
Lyth Street
Beverly Road
Green Street
Rink Street
St George's Road
Mauldeth Road Primary School
Weld Road
Withington Bowling Club 31a
Derby Road
Mauldeth Road
Booth Avenue
Sheringham Road
Amherst Road
Mitford Road
Beech Grove
Whiteoak Road
Clifton Avenue
Granville Road
Lombard Grove
Lorne Road
Brook Road
Burlington Road
Parsonage Road
Lathom Road
Shireoak Road
St Chad's Road
Alan Road
Brunswick Road
Ashdene Road
Brookleigh Road
Hartswood Road
Haslemere Road
School Grove
Arnfield Road
Bowling Green
Tennis Court
Other Sports Facility
Ladybarn Park
Nuneham Avenue
Heaton Road
Lindleywood
Whitby
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Modelled node locations data

Defended

Label	Modelled location ID	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
				Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow
1	1440137	385748	393534	38.45	4.37	38.47	4.40	38.47	4.41	38.47	4.42	38.48	4.43	38.56	4.46
2	1440084	385830	393538	38.53	4.38	38.55	4.40	38.55	4.41	38.56	4.42	38.56	4.44	38.64	4.48
3	1440079	385920	393420	39.33	4.39	39.35	4.40	39.35	4.41	39.36	4.42	39.37	4.44	39.43	4.48
4	1440131	385999	393377	39.76	5.04	39.80	5.61	39.81	5.84	39.81	5.97	39.83	6.43	39.89	9.67
5	1440066	386022	393364	39.73	5.07	39.76	5.66	39.77	5.90	39.77	6.04	39.78	6.51	39.87	9.72
6	1440070	386099	393360	40.04	5.07	40.09	5.54	40.11	5.71	40.12	5.81	40.16	6.16	40.29	9.19
7	1440144	386152	393376	40.26	5.07	40.32	5.54	40.34	5.71	40.35	5.81	40.40	6.16	40.62	9.18
8	1440143	386194	393411	40.51	4.83	40.60	5.10	40.62	5.29	40.63	5.42	40.67	5.97	40.78	10.89
9	1440040	386197	393446	40.55	3.80	40.60	4.12	40.62	4.29	40.63	4.37	40.66	4.57	40.75	5.54
10	1440069	386229	393488	40.63	3.80	40.68	4.11	40.70	4.29	40.71	4.37	40.73	4.57	40.84	5.54

Data in this table comes from the Cringle Black Brook 2017 model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.

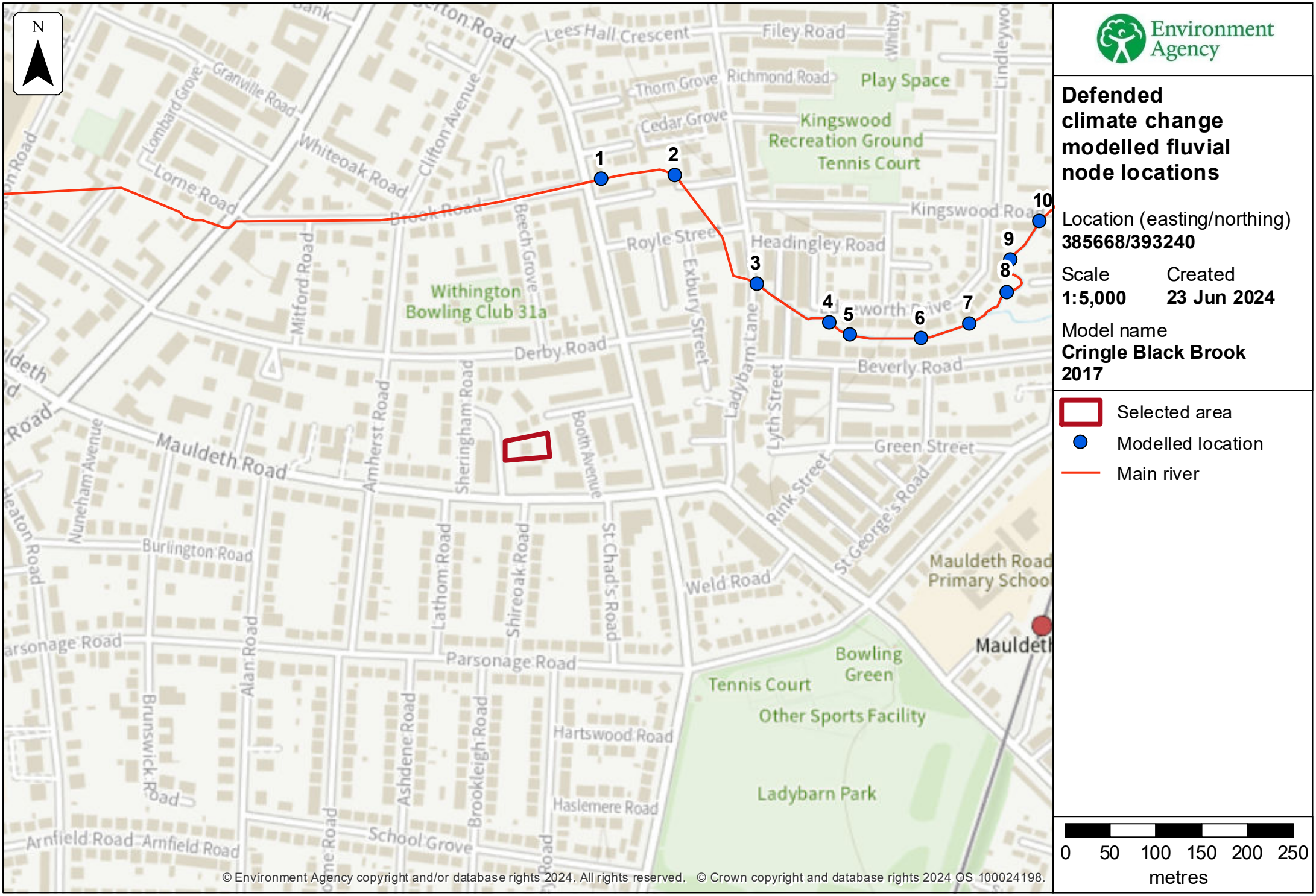

N
Environment Agency
Defences removed modelled fluvial node locations
Location (easting/northing)
385668/393240
Scale
1:5,000
Created
23 Jun 2024
Model name
Cringle Black Brook 2017
Selected area
Modelled location
Main river
0 50 100 150 200 250
metres
1
2
3
4
5
6
7
8
9
10
Withington Bowling Club 31a
Kingswood Recreation Ground
Tennis Court
Play Space
Mauldeth Road Primary School
Bowling Green
Tennis Court
Other Sports Facility
Ladybarn Park
Lees Hall Crescent
Filey Road
Thorn Grove
Richmond Road
Cedar Grove
Kingswood Road
Headingley Road
Royle Street
Exbury Street
Ladybarn Lane
Lyth Street
Beverly Road
Green Street
Rink Street
St George's Road
Weld Road
Derby Road
Mauldeth Road
Parsonage Road
Hartswood Road
Haslemere Road
School Grove
Arnfield Road
Brook Road
Whiteoak Road
Lorne Road
Granville Road
Clifton Avenue
Lombard Grove
Mitford Road
Beech Grove
Amherst Road
Sheringham Road
Booth Avenue
St Chad's Road
Lathom Road
Shireoak Road
Alan Road
Brunswick Road
Ashdene Road
Brookleigh Road
Nuneham Avenue
Burlington Road
Heaton Road
Lindleywood
Whitby
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Modelled node locations data

Defences removed

Label	Modelled location ID	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
				Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow
1	1440137	385748	393534	38.45	4.37	38.47	4.40	38.47	4.41	38.47	4.42	38.48	4.43	38.56	4.46
2	1440084	385830	393538	38.53	4.38	38.55	4.40	38.55	4.41	38.56	4.42	38.56	4.44	38.64	4.48
3	1440079	385920	393420	39.33	4.39	39.35	4.40	39.35	4.41	39.36	4.42	39.37	4.44	39.43	4.48
4	1440131	385999	393377	39.76	5.04	39.80	5.61	39.81	5.84	39.81	5.97	39.83	6.43	39.89	9.67
5	1440066	386022	393364	39.73	5.07	39.76	5.66	39.77	5.90	39.77	6.04	39.78	6.51	39.87	9.72
6	1440070	386099	393360	40.04	5.07	40.09	5.54	40.11	5.71	40.12	5.81	40.16	6.16	40.29	9.19
7	1440144	386152	393376	40.26	5.07	40.32	5.54	40.34	5.71	40.35	5.81	40.40	6.16	40.62	9.18
8	1440143	386194	393411	40.51	4.83	40.60	5.10	40.62	5.29	40.63	5.42	40.67	5.97	40.78	10.89
9	1440040	386197	393446	40.55	3.80	40.60	4.12	40.62	4.29	40.63	4.37	40.66	4.57	40.75	5.54
10	1440069	386229	393488	40.63	3.80	40.68	4.11	40.70	4.29	40.71	4.37	40.73	4.57	40.84	5.54

Data in this table comes from the Cringle Black Brook 2017 model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.

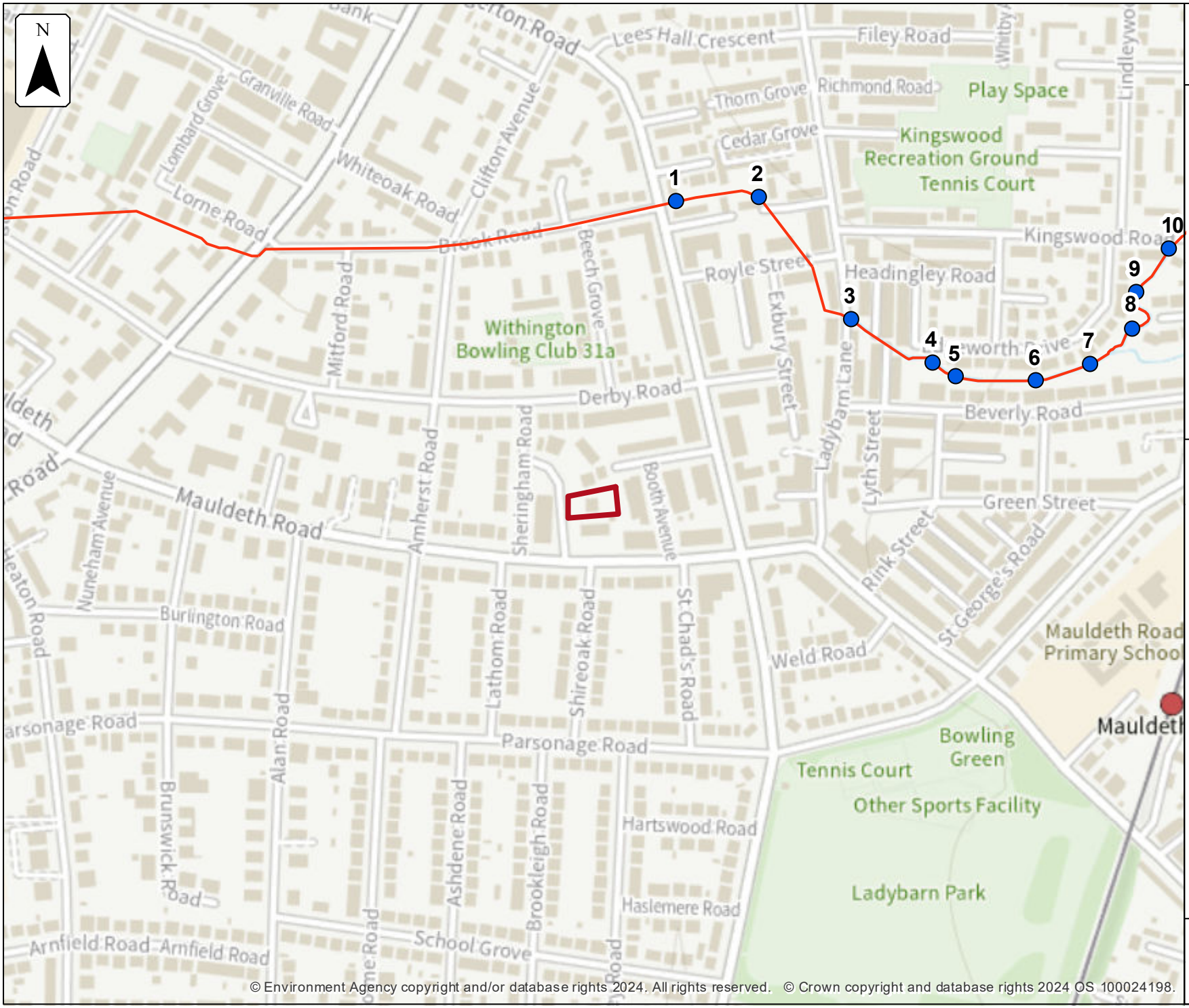

N
Environment Agency
Defended climate change modelled fluvial node locations
Location (easting/northing)
385668/393240
Scale
1:5,000
Created
23 Jun 2024
Model name
Cringle Black Brook 2017
Selected area
Modelled location
Main river
0 50 100 150 200 250
metres
1
2
3
4
5
6
7
8
9
10
Withington Bowling Club 31a
Kingswood Recreation Ground
Tennis Court
Play Space
Mauldeth Road Primary School
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Other Sports Facility
Ladybarn Park
Lees Hall Crescent
Filey Road
Thorn Grove
Richmond Road
Cedar Grove
Kingswood Road
Headingley Road
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Ladybarn Lane
Lyth Street
Beverly Road
Green Street
Rink Street
St George's Road
Weld Road
Derby Road
Mauldeth Road
Parsonage Road
Hartswood Road
Haslemere Road
School Grove
Arnfield Road
Brook Road
Whiteoak Road
Lorne Road
Granville Road
Clifton Avenue
Lombard Grove
Mitford Road
Beech Grove
Amherst Road
Sheringham Road
Booth Avenue
St Chad's Road
Lathom Road
Shireoak Road
Alan Road
Brunswick Road
Ashdene Road
Brookleigh Road
Burlington Road
Nuneham Avenue
Heaton Road
Lindleywood
Whitby
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Modelled node locations data

Defended climate change

Label	Modelled location ID	Easting	Northing	1.0% AEP (+30%)		1.0% AEP (+35%)		1.0% AEP (+70%)		0.1% AEP (+30%)	
				Level	Flow	Level	Flow	Level	Flow	Level	Flow
1	1440137	385748	393534	38.49	4.43	38.50	4.44	38.53	4.44	38.60	4.49
2	1440084	385830	393538	38.57	4.44	38.57	4.44	38.61	4.45	38.68	4.50
3	1440079	385920	393420	39.37	4.44	39.38	4.44	39.39	4.49	39.46	4.50
4	1440131	385999	393377	39.84	6.70	39.84	6.80	39.85	7.65	39.91	10.93
5	1440066	386022	393364	39.78	6.78	39.78	6.88	39.80	7.74	39.91	10.79
6	1440070	386099	393360	40.17	6.37	40.18	6.46	40.23	7.27	40.31	10.57
7	1440144	386152	393376	40.42	6.38	40.43	6.46	40.50	7.27	40.71	10.45
8	1440143	386194	393411	40.69	6.33	40.70	6.49	40.72	7.76	40.81	13.25
9	1440040	386197	393446	40.67	4.73	40.68	4.79	40.70	5.06	40.79	5.79
10	1440069	386229	393488	40.75	4.73	40.76	4.79	40.79	5.06	40.88	5.78

Data in this table comes from the Cringle Black Brook 2017 model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.



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Environment Agency

Defences removed climate change modelled fluvial node locations

Location (easting/northing)
385668/393240

Scale
1:5,000

Created
23 Jun 2024

Model name
Cringle Black Brook 2017

- Selected area
- Modelled location
- Main river

0 50 100 150 200 250
metres

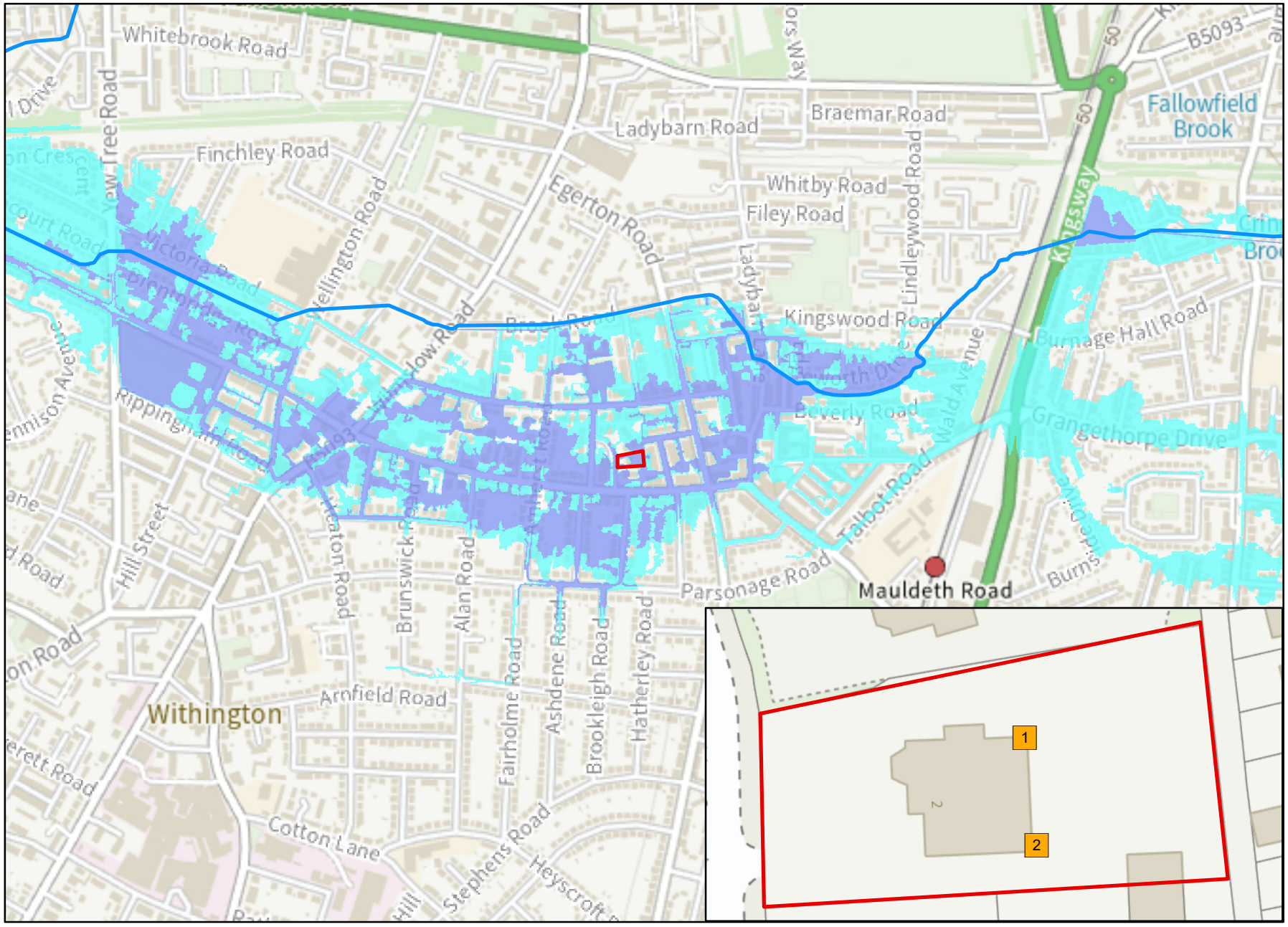
Modelled node locations data

Defences removed climate change

Label	Modelled location ID	Easting	Northing	1.0% AEP (+30%)		1.0% AEP (+35%)		1.0% AEP (+70%)		0.1% AEP (+30%)	
				Level	Flow	Level	Flow	Level	Flow	Level	Flow
1	1440137	385748	393534	38.49	4.43	38.50	4.44	38.53	4.44	38.60	4.49
2	1440084	385830	393538	38.57	4.44	38.57	4.44	38.61	4.45	38.68	4.50
3	1440079	385920	393420	39.37	4.44	39.38	4.44	39.39	4.49	39.46	4.50
4	1440131	385999	393377	39.84	6.70	39.84	6.80	39.85	7.65	39.91	10.93
5	1440066	386022	393364	39.78	6.78	39.78	6.88	39.80	7.74	39.91	10.79
6	1440070	386099	393360	40.17	6.37	40.18	6.46	40.23	7.27	40.31	10.57
7	1440144	386152	393376	40.42	6.38	40.43	6.46	40.50	7.27	40.71	10.45
8	1440143	386194	393411	40.69	6.33	40.70	6.49	40.72	7.76	40.81	13.25
9	1440040	386197	393446	40.67	4.73	40.68	4.79	40.70	5.06	40.79	5.79
10	1440069	386229	393488	40.75	4.73	40.76	4.79	40.79	5.06	40.88	5.78

Data in this table comes from the Cringle Black Brook 2017 model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.

Detailed Flood Map Centred on Ladybarn Crescent, Manchester, M14 6UU.
Created 28/06/2024 [GMMC365372LB]



Environment Agency

1:10,001

N

Legend

- Site Location
- 2D Levels
- Main River
- Flood Zone 3
- Flood Zone 2

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Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

					Undefended												Defended											
Map Reference	Model Node Reference	Easting	Northing	Data	10 % AEP (1 in 10 year)	5 % AEP (1 in 20 year)	4 % AEP (1 in 25 year)	2 % AEP (1 in 50 year)	1.33 % AEP (1 in 75 year)	1 % AEP (1 in 100 year)	1 % AEP (1 in 100 year) + 30% increase in flow	1 % AEP (1 in 100 year) + 35% increase in flow	1 % AEP (1 in 100 year) + 70% increase in flow	0.5 % AEP (1 in 200 year)	0.1 % AEP (1 in 1000 year)	0.1 % AEP (1 in 1000 year) + 30% increase in flow	10 % AEP (1 in 10 year)	5 % AEP (1 in 20 year)	4 % AEP (1 in 25 year)	2 % AEP (1 in 50 year)	1.33 % AEP (1 in 75 year)	1 % AEP (1 in 100 year)	1 % AEP (1 in 100 year) + 30% increase in flow	1 % AEP (1 in 100 year) + 35% increase in flow	1 % AEP (1 in 100 year) + 70% increase in flow	0.5 % AEP (1 in 200 year)	0.1 % AEP (1 in 1000 year)	0.1 % AEP (1 in 1000 year) + 30% increase in flow
1	2D Levels	385671	393245	Modelled Water Level (m aodh)	37.64	37.71	37.71	37.74	37.74	37.75	37.78	37.78	37.80	37.77	37.85	37.88	37.62	37.70	37.71	37.74	37.75	37.75	37.78	37.79	37.80	37.77	37.84	37.88
2		385673	393234	Modelled Water Level (m aodh)	36.64	37.71	37.71	37.73	37.74	37.75	37.78	37.78	37.80	37.77	37.84	37.88	37.62	37.69	37.71	37.73	37.75	37.75	37.78	37.78	37.80	37.77	37.84	37.88

Model data taken from Cringle Black Brook 2017
AEP - Annual Exceedence Probability
m aodN - metres above ordnance datum Newlyn
cumecs - cubic metres per second

Notes:

*Climate Change Scenario - 30%, 35% and 70% increases in flow calculated for the 2080's (2070 - 2115).
Please see https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances for more information regarding the new climate change guidance.
The location of the site and the type (vulnerability) of development determine the climate change allowances to consider in any flood risk assessment.

Strategic flood risk assessments

We recommend that you check the relevant local authority's strategic flood risk assessment (SFRA) as part of your work to prepare a site specific flood risk assessment.

This should give you information about:

- the potential impacts of climate change in this catchment
- areas defined as functional floodplain
- flooding from other sources, such as surface water, ground water and reservoirs

About this data

This data has been generated by strategic scale flood models and is not intended for use at the individual property scale. If you're intending to use this data as part of a flood risk assessment, please include an appropriate modelling tolerance as part of your assessment. The Environment Agency regularly updates its modelling. We recommend that you check the data provided is the most recent, before submitting your flood risk assessment.

Flood risk activity permits

Under the Environmental Permitting (England and Wales) Regulations 2016 some developments may require an environmental permit for flood risk activities from the Environment Agency. This includes any permanent or temporary works that are in, over, under, or nearby a designated main river or flood defence structure.

Find out more about flood risk activity permits

Help and advice

Contact the Greater Manchester Merseyside and Cheshire Environment Agency team at inforequests.gmmc@environment-agency.gov.uk for:

- more information about getting a product 5, 6, 7 or 8
- general help and advice about the site you're requesting data for