Flood Risk Assessment for Planning

Prepared for:
Tarlok Singh Rawal

December 2024

Location:
46 - 48 Bury New Road
Manchester
M8 8EL

Our reference:
95054-Jagafa-BuryNewRoad

Unda Consulting Limited, Southpoint, Old Brighton Road, Gatwick, West Sussex, RH11 0PR
+44 (0) 1293 214 444
enquiries@unda.co.uk

Document Issue Record

Project: Flood Risk Assessment for Planning

Client: Tarlok Singh Rawal

Application: Change of use to 8 flats

Location: 46-48 Bury New Road, Manchester, M8 8EL

Our reference: 95054-Jagafa-BuryNewRoad

Version: v1.0 271224

Lead Consultant: Miss Jesy Ferry

Authorisation: Mr Edward Bouët

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Southpoint, Old Brighton Road, Gatwick, West Sussex, RH11 0PR

+44 (0) 1293 214 444

www.unda.co.uk

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1. Key Facts

1.1 Flood Risk Posed:

- Site within Flood Zone 3 (High Risk).
- The risk would appear to be predominantly fluvial, and originate from the River Irwell, 428m to the south of the site.
- Product 4 modelled flood levels and extents have been provided from the Environment Agency for use within this report, using the Lower Irwell (2017).
- The site is shown to be entirely outside of the defended 1:50 year, 1:75 year, 1:100 year and 1:200 year modelled flood extents. The site is within the defended 1:1000 year modelled flood extent.
- The site is shown to be partially within the undefended 1:50 year, 1:75 year, 1:100 year, 1:200 year and entirely within the 1:1000 year modelled flood extents.
- On site 2D nodes have also been given for the defended and undefended 1:00 year + 35% climate change allowance flood levels.
- The site has a maximum defended flood level of 28.00mAOD. Comparison of the these modelled flood levels to the topographic levels of the site (27.34mAOD and 27.70mAOD) shows that the on-site flood depth ranges from 0.30m – 0.66m, respectively.
- The site is shown to have a maximum undefended flood level of 28.62mAOD. Comparison of the these modelled flood levels to the topographic levels of the site (27.34mAOD and 27.70mAOD) shows that the on-site flood depth ranges from 0.92m and 1.28m, respectively.
- Engineered high ground (Asset ID 88893) present and located on the northern bank on the River Irwell, with a stand of protection of 75 years.
- Historical flooding was recorded on the site and surrounding area in 1866 and1946. On both accounts the Main River exceeded its channel capacity.
- Risk of pluvial flooding would appear to be “Low” to “Medium” at the site.
- Risk of flooding posed to the site by groundwater, sewer surcharge or reservoir flooding would appear to be low

1.2 Flood Risk Mitigation:

- The application is for the change of use of use to create 8 flats.
- No physical alterations to the exterior of the building or increase in impermeable areas are proposed at the site.
- No residential units are proposed at ground floor level.
- Floor levels post development will be set no lower than existing levels.

- Internal access will be maintained from the ground floor to the upper floors of the building.
- Flood proofing of the building will be incorporated as appropriate.
- Post development, there will be no unacceptable loss of floodplain storage.
- A formal flood warning and evacuation plan will be implemented post development.
- The applicant will register with the Environment Agency Floodline Alert/Warnings Direct service.
- Due to the scale of the development, a full Surface Water Drainage Strategy is not required at this stage of planning.

Assuming accordance with these flood risk management measures, UNDA Consulting Ltd consider the proposed application to pose no flood risk and therefore is suitable in flood risk terms.

2. Introduction

Unda Consulting Limited have been appointed by Tarlok Singh Rawal (hereinafter referred to as "the applicant") to undertake a Flood Risk Assessment for the proposed development at 46-48 Bury New Road, Manchester, M8 8EL. (hereinafter referred to as "the site"). The FRA has been undertaken in accordance with the National Planning Policy Framework (NPPF) and the associated technical guidance.

The site appears to be located within Flood Zone 3 as defined by the Environment Agency (EA) on their Flood Map for Planning. Under the National Planning Policy Framework (NPPF), a FRA is required if a proposed development:

- includes building or engineering works in Flood Zone 2 or 3;
- includes building or engineering works on land classified by the Environment Agency as having critical drainage problem;
- changes the use of land or buildings in a location at risk of flooding from rivers or the sea, or with critical drainage problems;
- changes the use of land or buildings in a way that increases the flood vulnerability of the development where it may be subject to other sources of flooding;
- is larger than 1 hectare.

The assessment should demonstrate to the Local Planning Authority (LPA) and EA how flood risk will be managed now and over the development's lifetime, taking climate change into account, and with regard to the vulnerability of its potential users.

- whether the proposed development is likely to be affected by current or future flooding from any source;
- whether it will increase flood risk elsewhere;
- whether the measures proposed to deal with these effects and risks are appropriate.

3. Existing Situation

3.1 Site Usage:

The site comprises of 2x three storey commercial units, providing office and storage space.

Existing plans are provided in the report Appendix.

Figure 1: Existing site location plan (Source: Mason and Marlowe Ltd)

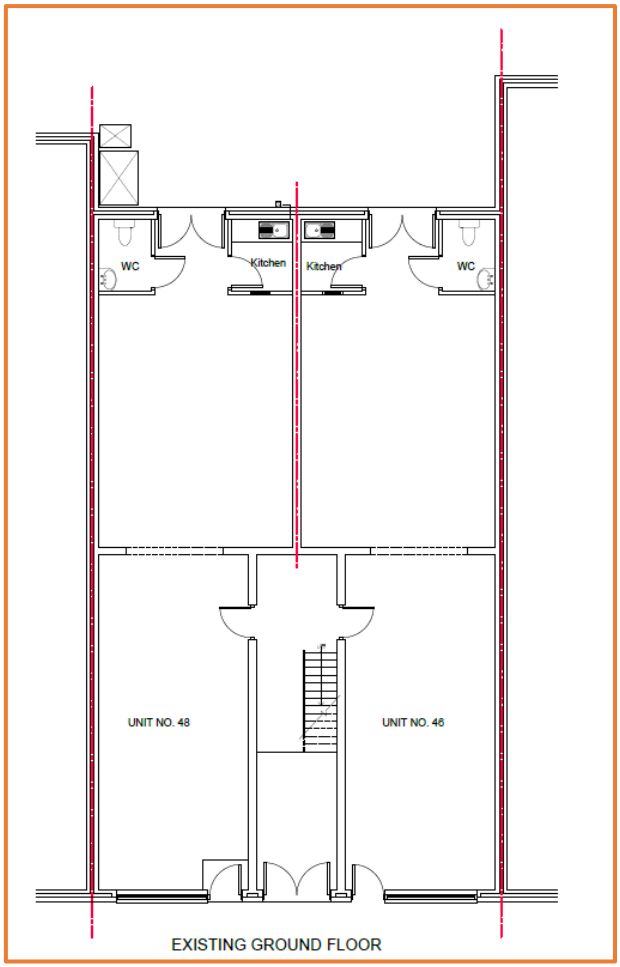


Figure 2: Existing ground floor plan (Source: Mason and Marlowe Ltd)

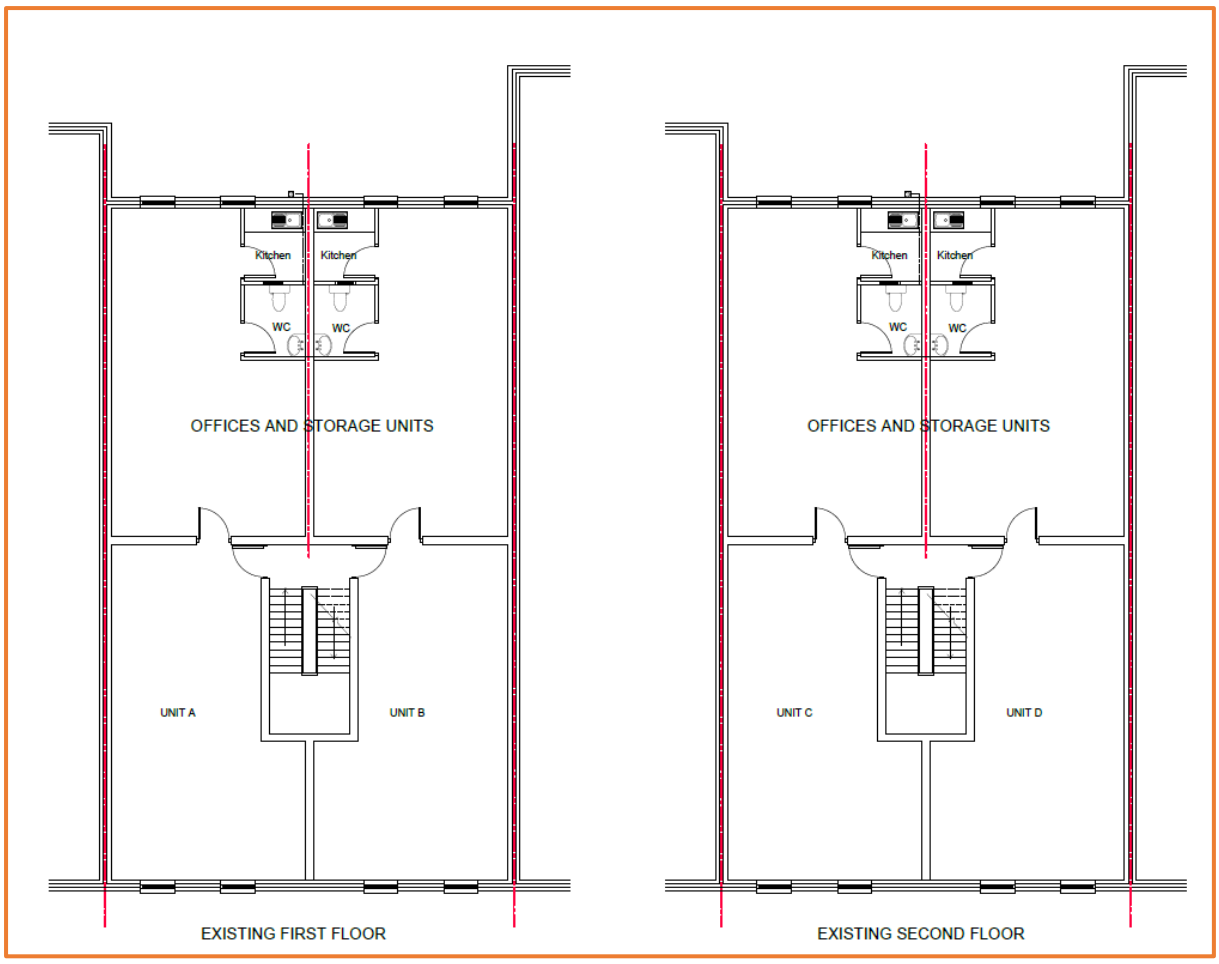


Figure 3: Existing first and second floor plans (Source: Mason and Marlowe Ltd)

Figure 4: Existing elevation plans (Source: Mason and Marlowe Ltd)

3.2 Topography:

Environment Agency LiDAR has been used to assess the topography across the site and wider area. Light Detection and Ranging (LIDAR) is an airborne mapping technique, which uses a laser to measure the distance between the aircraft and the ground surface. Up to 100,000 measurements per second are made of the ground, allowing highly detailed terrain models to be generated at high spatial resolutions. The EA's LIDAR data archive contains digital elevation data derived from surveys carried out by the EA's specialist remote sensing team. Accurate elevation data is available for over 70% of England. The LiDAR technique records an elevation accurate to +0.15m every 1m. This dataset is derived from a combination of our full dataset which has been merged and re-sampled to give the best possible coverage. The dataset can be supplied as a Digital Surface Model (DSM) produced from the signal returned to the LIDAR (which includes heights of objects, such as vehicles, buildings and vegetation, as well as the terrain surface) or as a Digital Terrain Model (DTM) produced by removing objects from the Digital Surface Model. 1.0m horizontal resolution DTM LiDAR data has been used for the purposes of this study.

LiDAR remotely sensed digital elevation data suggests that the ground topography on the site ranges from 27.34mAOD to 27.70mAOD.

3.3 Geology and Soil:

The British Geological Survey (BGS) Map indicates that the bedrock underlying the site is Chester Formation - Sandstone.

The British Geological Survey (BGS) Map indicates that the superficial deposits underlying the site are Alluvium – Clay, Silt, Sand and Gravel.

The soil type taken from the UK Soil Observatory website is relatively deep soils from Riverine Clay and Floodplain Sands and Gravels parent material, with a Clay to Sandy loam texture.

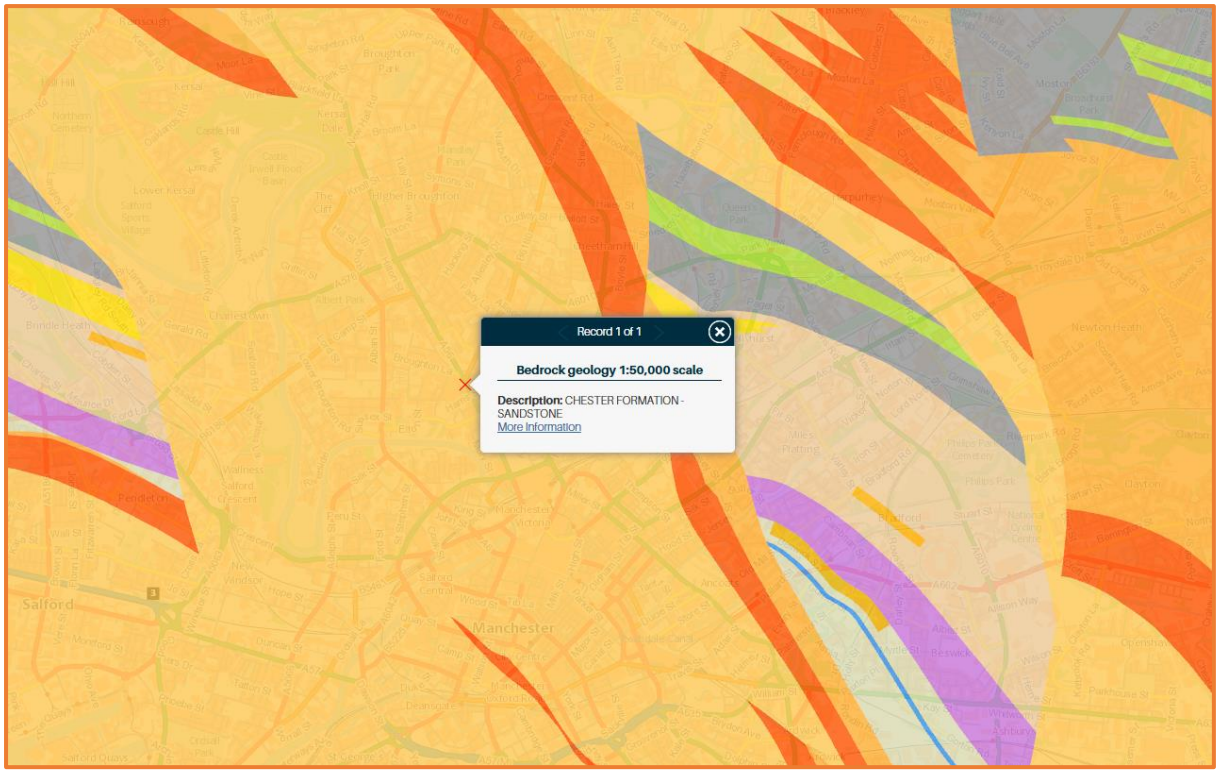


Figure 5: Local bedrock geology (Source: BGS)

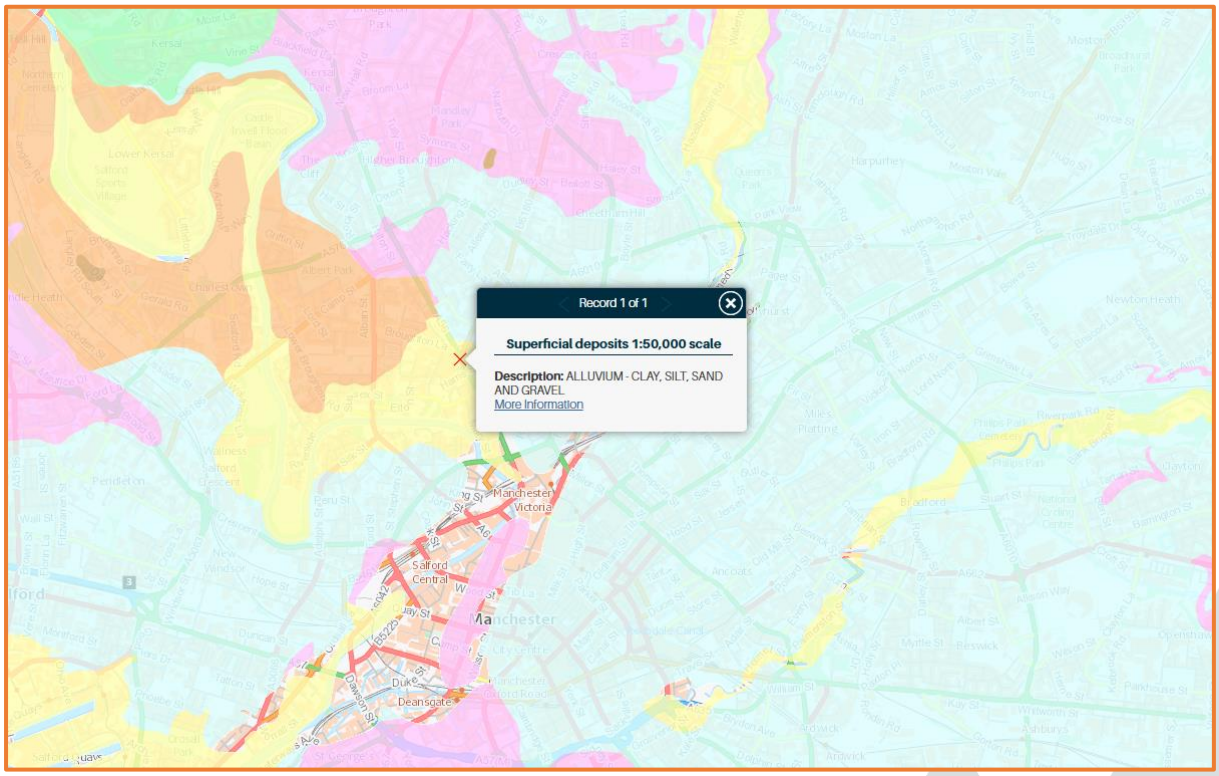


Figure 6: Local superficial deposits (Source: BGS)

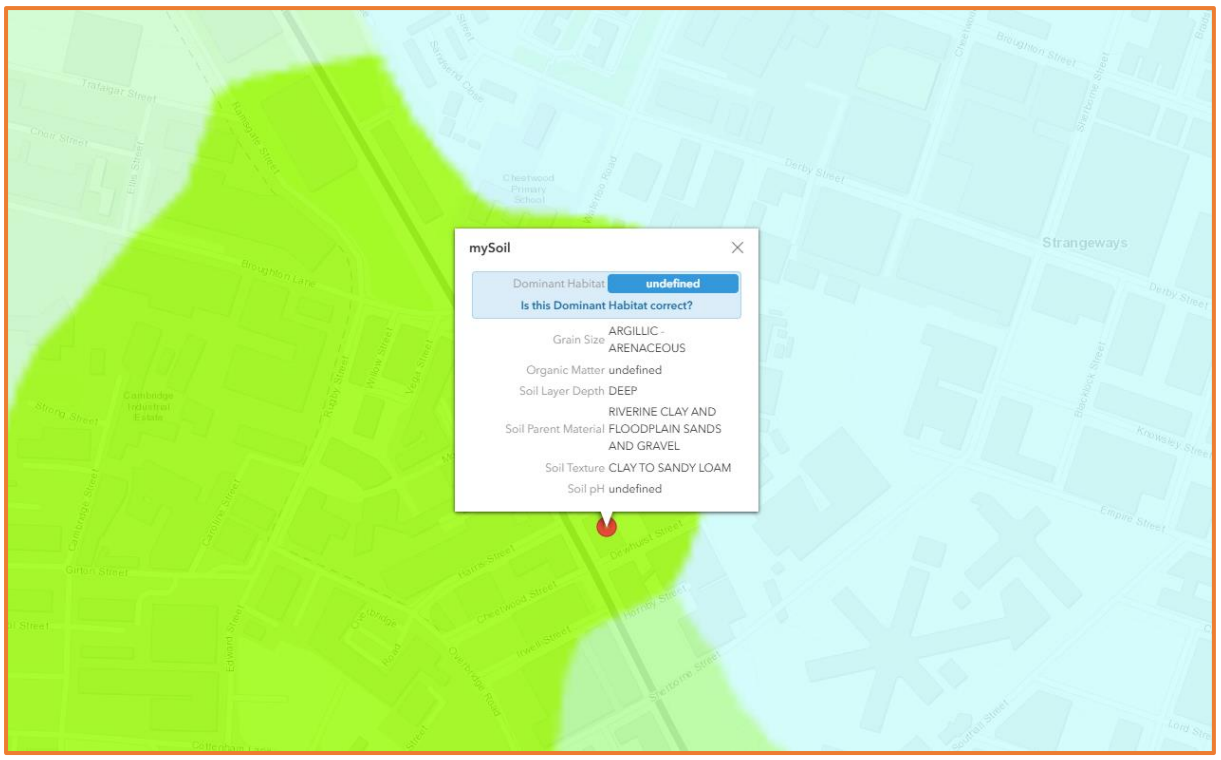


Figure 7: Local soil types (Source: UKSO)

4. Development Proposal

The proposed application is for the change of use to 8 flats on the first and second floors. The ground floor will remian the same (Commercial - Class E).

There would be no physical alterations to the exterior of the building or increase in impermeable areas.

No increase in built footprint is proposed at the site.

The proposed plans are provided in the report Appendix.

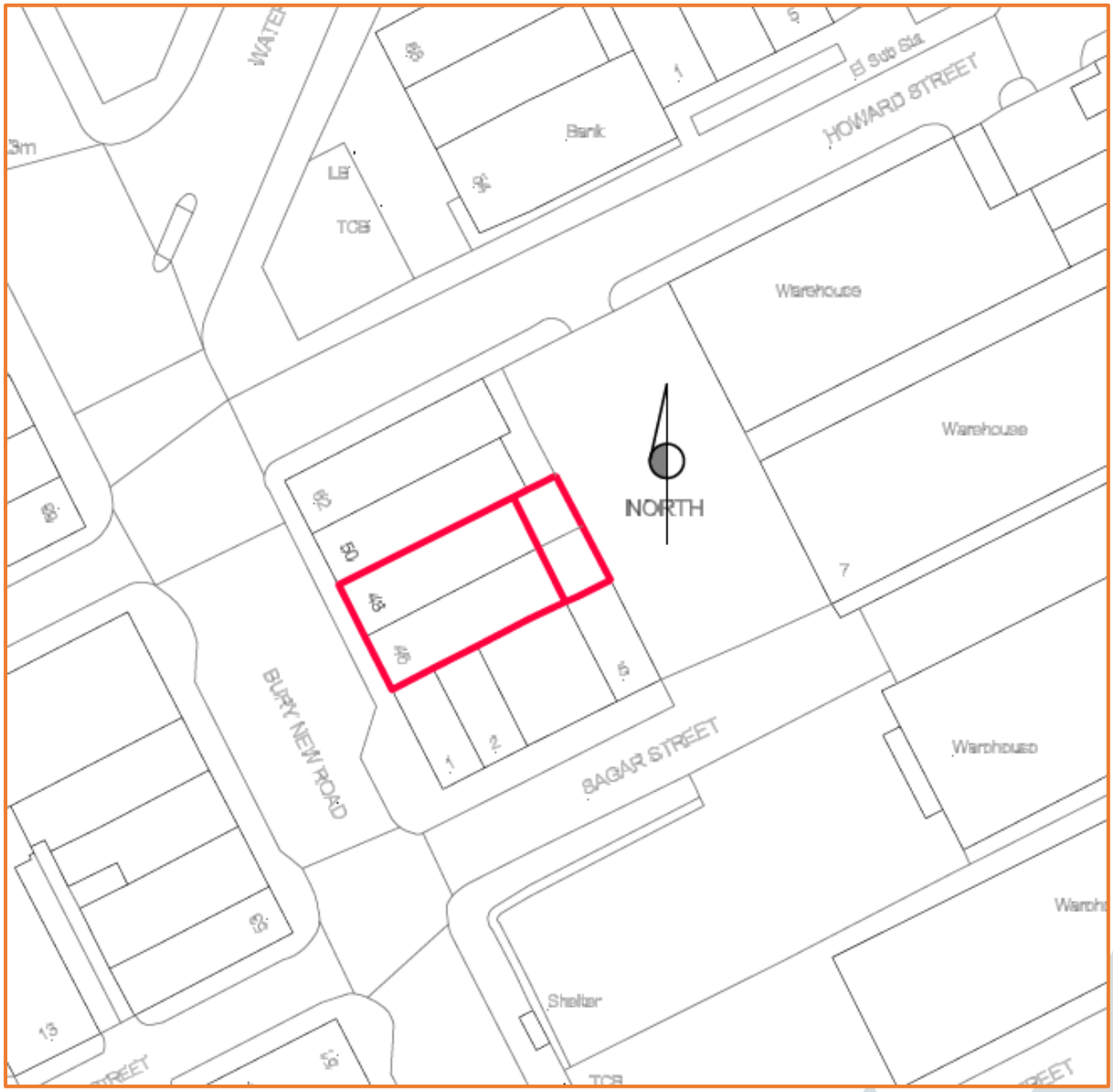


Figure 8: Proposed location plan (Source: Mason and Marlowe Ltd)

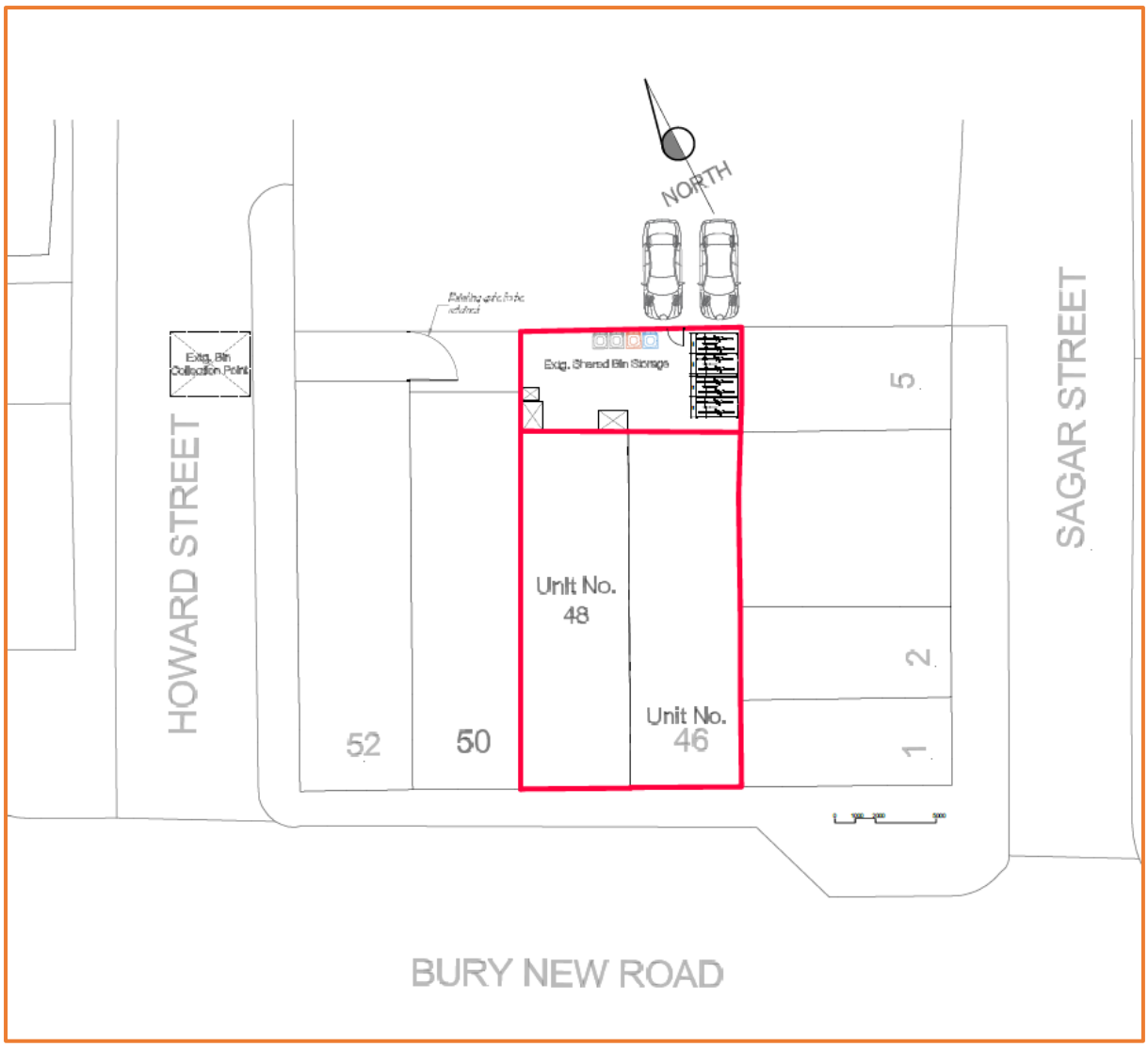


Figure 9: Proposed site plan (Source: Mason and Marlowe Ltd)

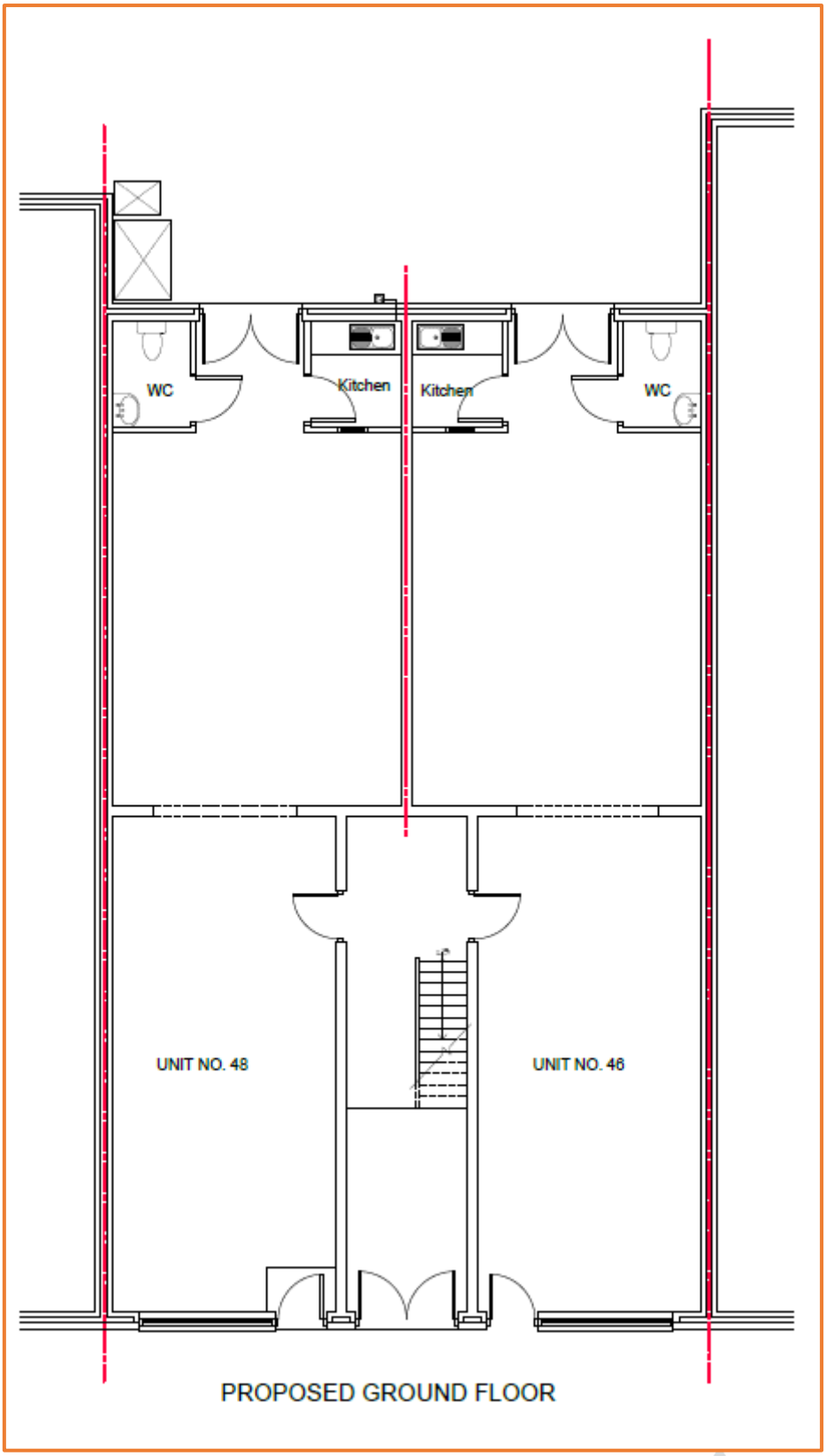


Figure 10: Proposed ground floor plan (Source: Mason and Marlowe Ltd)

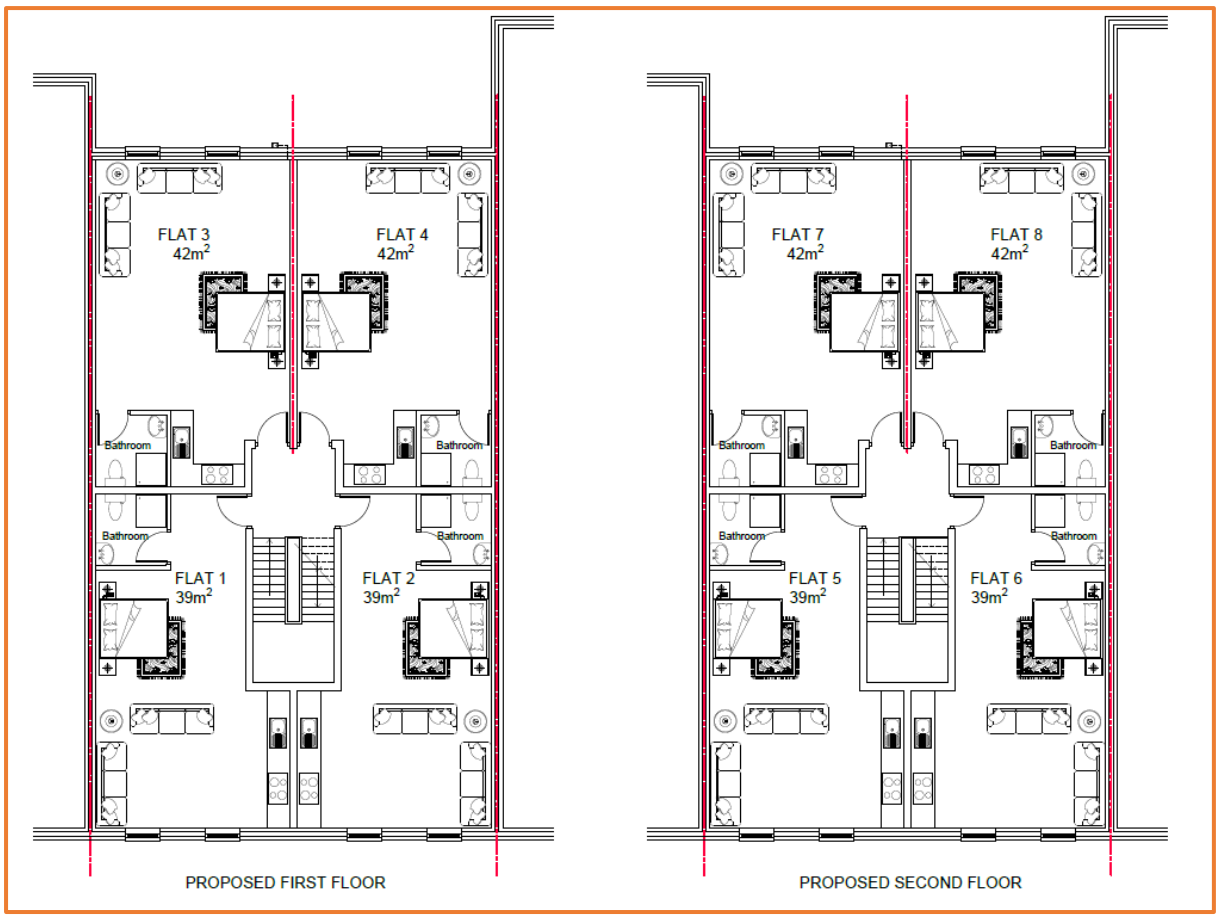


Figure 11: Proposed first and second floor plan (Source: Mason and Marlowe Ltd)

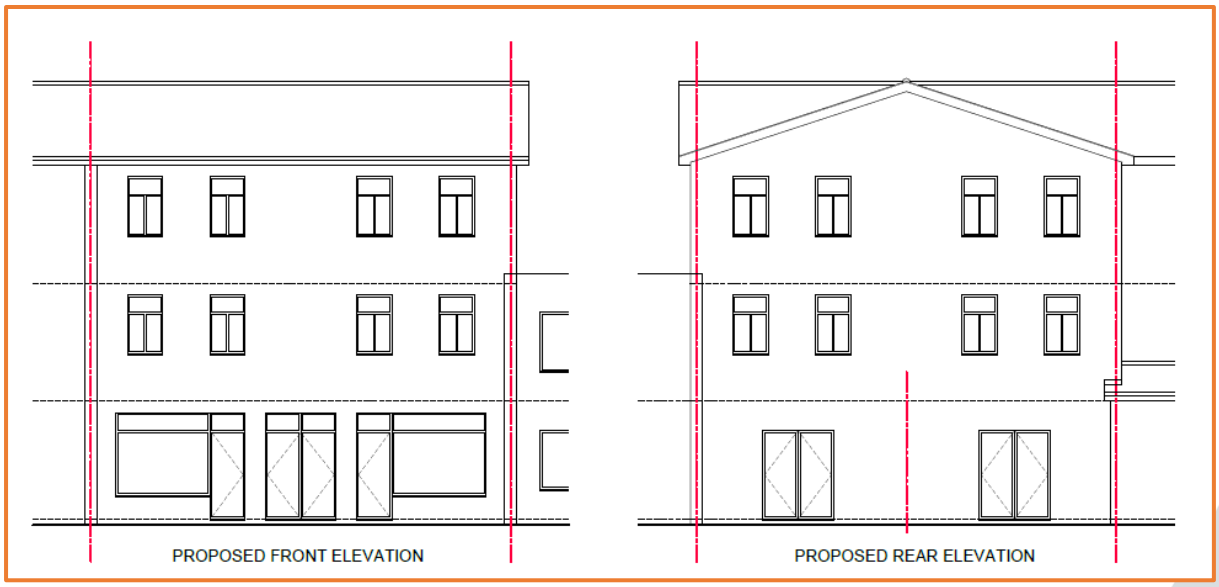


Figure 12: Proposed elevation plans (Source: Mason and Marlowe Ltd)

5. Assessment of Flood Risk

5.1 Flood Zones:

Within planning, Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. They are shown on the Environment Agency's Flood Map for Planning (Rivers and Sea), available on the Environment Agency's website.

Flood Zone	Definition
Zone 1 **Low Probability**	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – 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. (Land shown in light blue on the Flood Map)
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. (Land shown in dark blue on the Flood Map)
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 Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Table 1: Flood Zones

The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding.

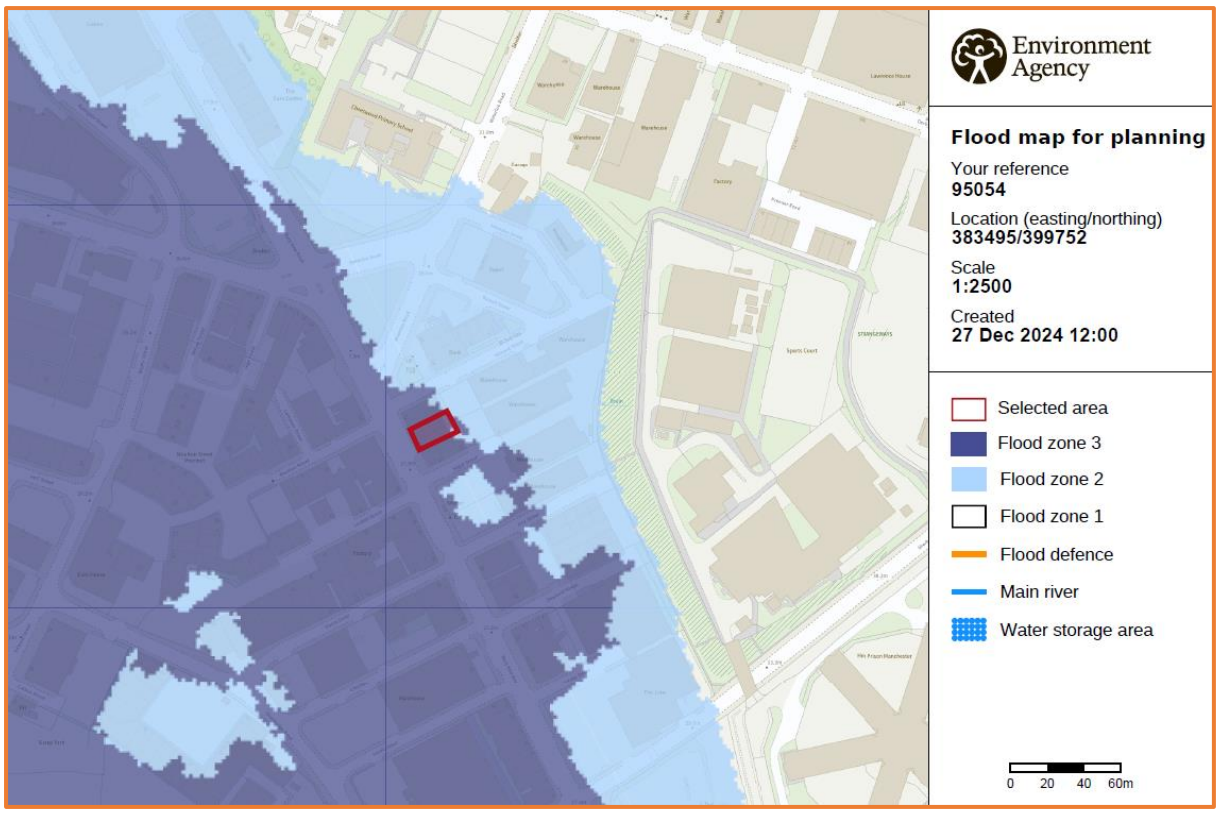


Figure 13: Environment Agency Flood Map for Planning (Rivers and Sea) (Source: EA)

The site is located partially within Flood Zone 2 (Medium Probability), which means it is defined as land having between a 1 in 100 and 1 in 1,000 annual probability of river and sea flooding and Flood Zone 3 (High Probability), which means it is defined as land having at least a 1:100 annual probability of fluvial flooding.

The risk would appear to be predominantly fluvial, and originate from the River Irwell, 428m to the south of the site.

5.2 Fluvial (River Irwell):

The River Irwell is a tributary of the River Mersey in north west England. From its source to the confluence with the River Mersey the Irwell is about 63 km long. Rising on the moors above Cliviger, it flows south through Bacup, Rawtenstall, Ramsbottom and Bury before merging with the River Roch near Radcliffe. Turning west, it joins the River Croal near Farnworth before turning southeast through Kearsley, Clifton and the Agecroft area of Pendlebury. It then meanders around Lower Kersal and Lower Broughton. It bisects Salford and Manchester, joining the rivers Irk and Medlock, and then turns west toward Irlam, as part of the Manchester Ship Canal. Its course ends just east of Irlam, where it empties into the Mersey.

The River Irwell is classified as a Main River by the Environment Agency.

5.2.1 Modelled flood levels and extents:

Product 4 modelled flood levels and extents have been provided from the Environment Agency for use within this report, provided in the report appendix. Modelled extents for undefended and defended scenarios have been provided for the Lower Irwell (2017).

The site is shown to be entirely outside of the defended 1:50 year, 1:75 year, 1:100 year and 1:200 year modelled flood extents.

The site is within the defended 1:1000 year modelled flood extent.

The site is shown to be partially within the undefended 1:50 year, 1:75 year, 1:100 year, 1:200 year and entirely within the 1:1000 year modelled flood extents.

For the Lower Irwell model, the closest in-channel node point to the site is 1545294.

The following in-channel flood levels have been provided:

	Node 1545294 – Lower Irwell 2017 (mAOD)			
	1:100yr	1:100yr +CC	1:200yr	1:1000yr
Undefended	26.80	28.42	27.32	30.59
Defended	26.66	27.50	26.96	30.24

Table 2: Modelled flood level data (Source EA)

Comparison of these modelled flood levels with topographic site levels (27.34mAOD and 27.70mAOD) shows that the site is completely above the present day defended and undefended 1:100 year and 1:200 year modelled flood levels. The site is entirely below the defended and undefended 1:1000 year modelled flood levels.

The climate change guidance was published in February 2016 (and last updated in May 2022). The proposed development is “more vulnerable” and the 2010 Level 1 Manchester City, Salford City and Trafford Council Strategic Flood Risk Assessment (SFRA) states residential development a lifetime of 100 years. For “more vulnerable” development in Flood Zone 3 – the Central climate change allowance should be used – which for the Irwell Management Catchment is a 35% increase in river flows.

Modelled flood extents with 35% climate change allowance have also been provided.

The site appears to be within both defended and undefended modelled flood extents with 35% climate change allowance.

According to the in-channel node, the site appears to be 0.20m above and 0.16m below the defended 1:100 year + 35% climate change allowance modelled flood level.

According to the in-channel node, the site appears to be 1.08m below the modelled undefended 1:100 year + 35% climate change allowance flood level.

On site 2D nodes have also been given for the defended and undefended 1:00 year + 35% climate change allowance flood levels.

The site has a maximum defended flood level of 28.00mAOD. The site is shown to have a maximum undefended flood level of 28.62mAOD.

Comparison of the these modelled flood levels to the topographic levels of the site (27.34mAOD and 27.70mAOD) shows that the has a maximum on site flood depth of 0.66m and 1.28m, respectively for the 1:100 year + 35% climate change allowance event.

5.2.2 Flood Defences:

A flood defence or EA Asset is any man-made or natural feature – such as a raised defence, retaining structure, channel, pumping station or culvert – that performs a flood defence or land drainage function.

According to the EA there are Environment Agency maintained raised defences that defend the site directly. Engineered high ground (Asset ID 88893) is located on the northern bank on the River Irwell, with a stand of protection of 75 years. This asset has a downstream actual crest level of this defence is 27.20mAOD and an upstream actual crest level is 27.44mAOD. The condition of this asset is unknown.

5.2.3 Residual risk (breach or overtopping of flood defences):

Breaching of flood defences can cause rapid inundation of areas behind flood defences as flow in the river channel discharges through the breach. A breach can occur with little or no warning, although they are much more likely to concur with extreme river levels or tides when the stresses on flood defences are highest. Flood water flowing through a breach will normally discharge at a high velocity, rapidly filling up the areas behind the defences, resulting in significant damage to buildings and a high risk of loss of life. Breaches are most likely to occur in soft defences such as earth embankments although poorly maintained hard defences can also be a potential source of breach.

Overtopping of flood defences occurs when water levels exceed the protection level of raised flood defences. The worst case occurs when the fluvial or tidal levels exceed the defence level as this can lead to prolonged flooding. Less severe overtopping can occur when flood levels are below defence levels, but wave action causes cyclic overtopping, with intermittent discharge over the crest level of the defence. Flood defences are commonly designed with a freeboard to provide protection against overtopping from waves. The risk from overtopping due to exceedance of the flood defence level is much more significant than the risk posed by wave overtopping. Exceedance of the flood defence level can lead to prolonged and rapid flooding with properties immediately behind the defences at highest risk.

Flood defences act to defend the site from direct inundation, but there is residual risk from each (failure) and overtopping (exceedance) of flood defences.

5.2.4 Historical flood events:

According to EA records, historical flooding has occurred at the site and surrounding area in 1866 and 1946 from the River Irwell exceeding channel capacity (no raised defences).

5.3 Pluvial (Surface Water):

Pluvial flooding is the term used to describe flooding which occurs when intense, often short duration rainfall is unable to soak into the ground or to enter drainage systems and therefore runs over the land surface causing flooding. It is most likely to occur when soils are saturated (or baked hard) so that they cannot infiltrate any additional water or in urban areas where buildings tarmac and concrete prevent water soaking into the ground. The excess water can pond (collect) in low points and result in the development of flow pathways often along roads but also through built up areas and open spaces. This type of flooding is usually short lived and associated with heavy downpours of rain.

The potential volume of surface runoff in catchments is directly related to the size and shape of the catchment to that point. The amount of runoff is also a function of geology, slope, climate, rainfall, saturation, soil type, urbanisation and vegetation.

Pluvial flooding can occur in rural and urban areas, but usually causes more damage and disruption in the latter. Flood pathways include the land and water features over which floodwater flows. These pathways can include drainage channels, rail and road cuttings. Developments that include significant impermeable surfaces, such as roads and car parks may increase the volume and rate of surface water runoff.

Urban areas which are close to artificial drainage systems, or located at the bottom of hill slopes, or in valley bottoms and hollows, may be more prone to pluvial flooding. This may be the case in areas that are down slope of land that has a high runoff potential including impermeable areas and compacted ground.

Pluvial flooding can affect all forms of the built environment, including:

- Residential, commercial and industrial properties;
- Amenity and recreation facilities; and
- Infrastructure, such as roads and railways, electrical infrastructure, telecommunication systems and sewer systems.

This type of flooding is usually short-lived and may only last as long as the rainfall event. However occasionally flooding may persist in low-lying areas where ponding occurs. Due to the typically short duration, this type of flooding tends not to have consequences as serious as other forms of flooding, such as flooding from rivers; however it can still cause significant damage and disruption on a local scale.

In 2013 the EA, working with Lead Local Flood Authorities (LLFAs), produced an updated Flood Map for Surface Water. It is considered to represent a significant improvement on the previous surface water flood maps available, both in terms of method and representation of the risk of flooding. The modelling techniques and data used are considerably improved, and also incorporated locally produced mapping where this is available to represent features best modelled at a local scale.

The Flood Map for Surface Water assesses flooding scenarios as a result of rainfall with the following chance of occurring in any given year (annual probability of flooding is shown in brackets):

- High: Greater than or equal to 3.3% (1 in 30) chance in any given year (3.3%)

- Medium: Less than 3.3% (1 in 30) but greater than or equal to 1% (1 in 100) chance in any given year
- Low: Less than 1% (1 in 100) but greater than or equal to 0.1% (1 in 1,000) chance in any given year
- Very Low: Less than 0.1% (1 in 1,000) chance in any given year

The mapping below shows the Risk of Flooding from Surface Water centred on the postcode. Please note that the EA to not consider this information suitable to be used to identify the risk to individual properties or sites. It is useful to raise awareness in areas which may be at risk and may require additional investigation.

The EA Risk of Flooding from Surface Water Map suggests that the site lies in an area at "Low" to "Medium" risk from surface water. It should be noted that north west and south east of the site on Bury New Road is within an area of "High" risk of surface water flooding.

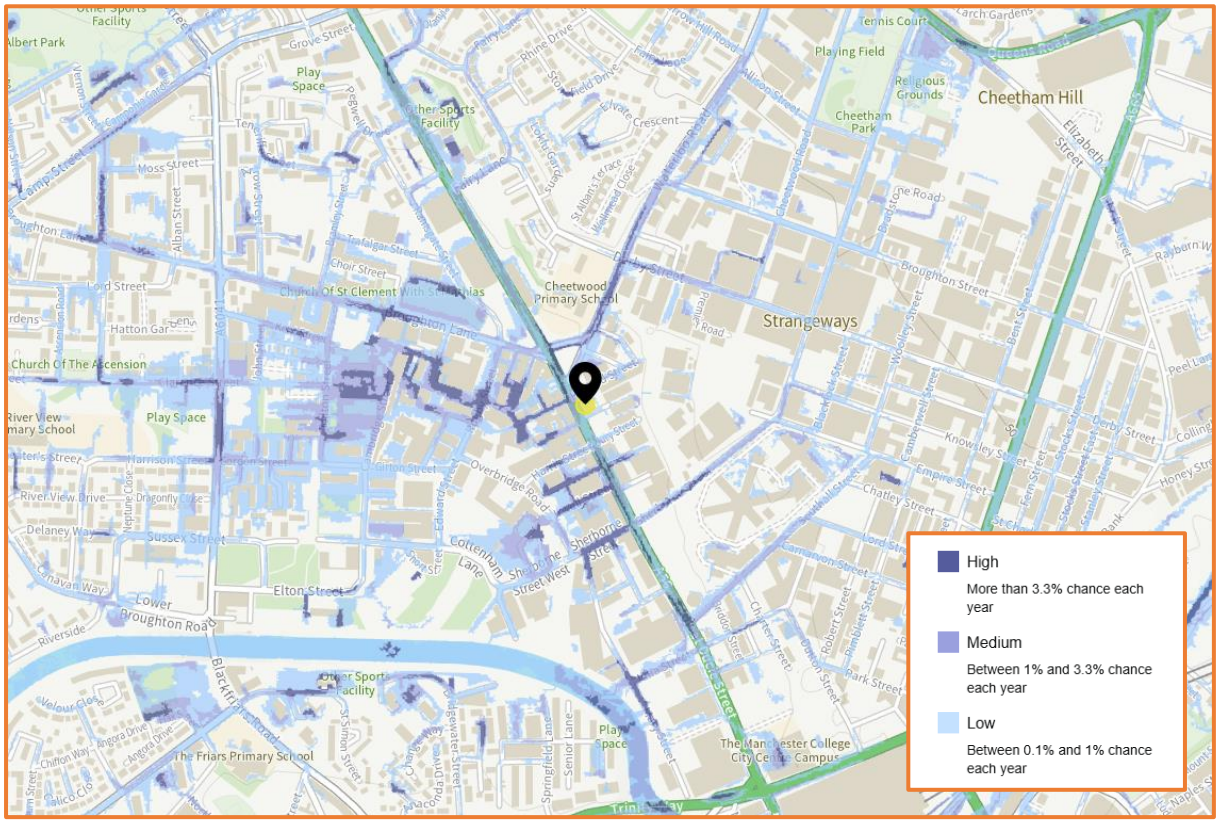


Figure 14: Extract from Environment Agency Surface Water Flood Map centred on Postcode (Source: EA)

The EA also provided surface water flood depths for the 1 in 100 year surface water flood event. The site is shown to be entirely outside of this flood event. It should be noted that Bury New Road has a maximum surface water flood depth of 0.30m near the site.

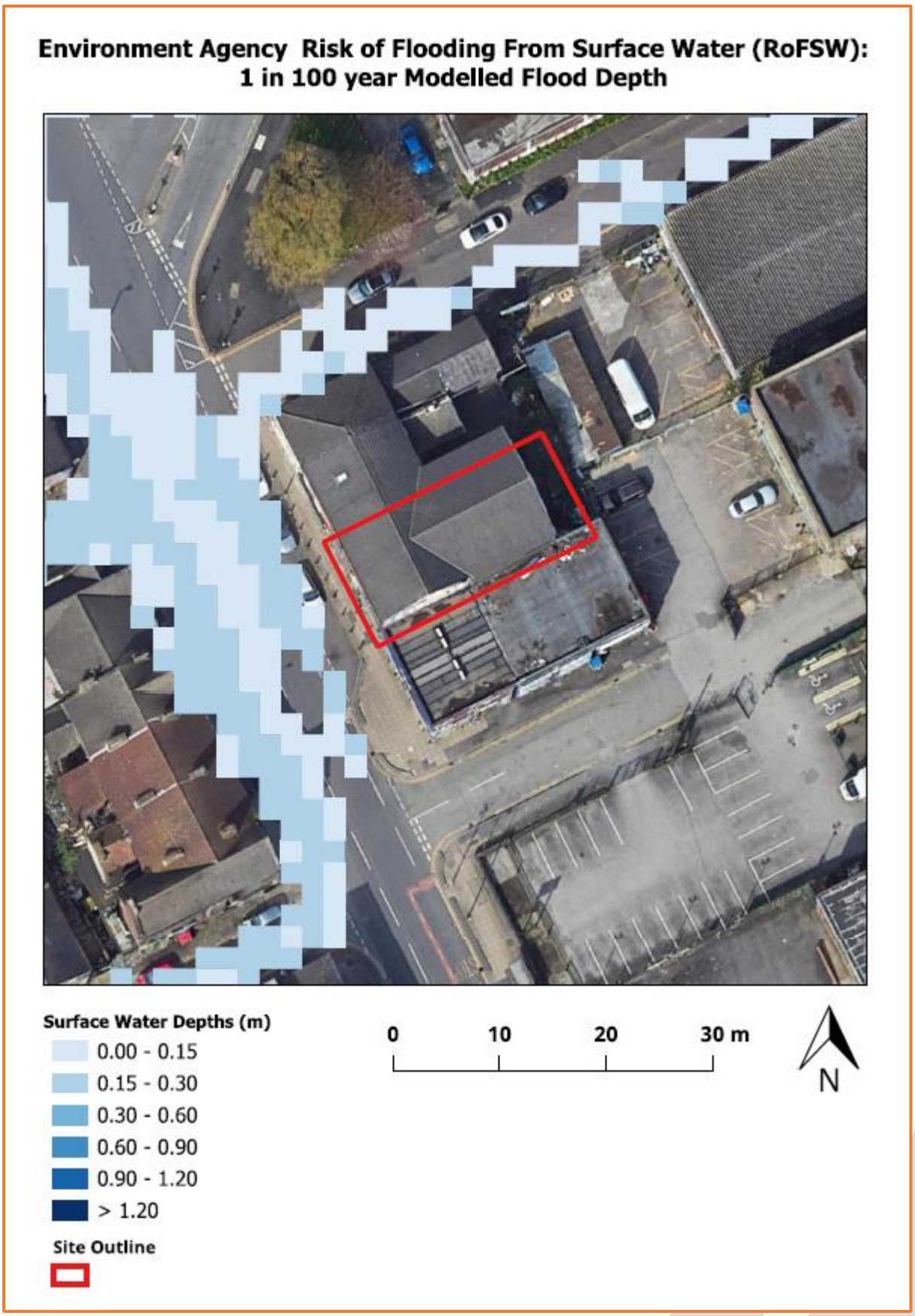


Figure 15: EA 1:100yr Risk of Flooding from Surface Water Depth Mapping (Source: EA, OS)

5.3.1 Critical Drainage Area

A Critical Drainage Area (CDA) is an area that has critical drainage problems and which has been notified to the local planning authority as such by the Environment Agency in line with the National Planning Policy Framework (NPPF). In these locations, there is a need for surface water to be managed to a higher standard than normal to ensure any new development will contribute to a reduction in flooding risks in line with NPPF. These higher standards are determined by the Environment Agency.

According to the 2011 Level 2 Manchester City, Salford City and Trafford Councils SFRA Council, 5 CDA's have currently been identified.

The site is located within the Conurbation Core CDA.

5.4 Groundwater:

Groundwater flooding occurs as a result of water rising up from the underlying rocks or from water flowing from abnormal springs. This tends to occur after much longer periods of sustained high rainfall. Higher rainfall means more water will infiltrate into the ground and cause the water table to rise above normal levels. Groundwater tends to flow from areas where the ground level is high, to areas where the ground level is low. In low-lying areas, the water table is usually at shallower depths anyway, but during very wet periods, with all the additional groundwater flowing towards these areas, the water table can rise up to the surface causing groundwater flooding.

Groundwater flooding is most likely to occur in low-lying areas underlain by permeable rocks (aquifers). These may be extensive, regional aquifers, such as chalk or sandstone, or may be localised sands or river gravels in valley bottoms underlain by less permeable rocks. Groundwater flooding takes longer to dissipate because groundwater moves much more slowly than surface water and will take time to flow away underground.

According to the 2010 Level 1 Manchester City, Salford City and Trafford Council SFRA, the site is not within an area at risk of groundwater flooding. In addition, the EA state that flooding from groundwater is unlikely in this area.

No records have been provided to suggest that the site has flooded from this source previously.

5.5 Sewer Surcharge:

Sewer flooding occurs when the sewer network cannot cope with the volume of water that is entering it. It is often experienced during times of heavy rainfall when large amounts of surface water overwhelm the sewer network causing flooding. Temporary problems such as blockages, siltation, collapses and equipment or operational failures can also result in sewer flooding.

All Water Companies have a statutory obligation to maintain a register of properties/areas which have reported records of flooding from the public sewerage system, and this is shown on the DG5 Flood Register. This includes records of flooding from foul sewers, combined sewers and surface water sewers which are deemed to be public and therefore maintained by the Water Company. The DG5 register records of flood incidents resulting in both internal property flooding and

external flooding incidents. Once a property is identified on the DG5 register, water companies can typically put funding in place to address the issues and hence enable the property to be removed from the register. It should be noted that flooding from land drainage, highway drainage, rivers/watercourses and private sewers is not recorded within the register.

No information has been provided to suggest that the site is susceptible to sewer surcharge flooding.

5.6 Other Sources:

Reservoirs with an impounded volume in excess of 25,000 cubic metres (measured above natural ground level) are governed by the Reservoirs Act and are listed on a register held by the Environment Agency. The site is within the maximum inundation extent when river levels are normal on the EA Reservoir Inundation Map. The EA also advise on their website that reservoir flooding is extremely unlikely. There has been no loss of life in the UK from reservoir flooding since 1925. All major reservoirs have to be inspected by specialist dam and reservoir Engineers. In accordance with the Reservoirs Act 1975 in England, these inspections are monitored and enforced by the EA themselves. The risk to the site from reservoir flooding is therefore minimal and is far lower than that relating to the potential for fluvial / tidal flooding to occur. The Environment Agency Reservoir Flood Map illustrated below, illustrates the largest area that might be flooded if the storage area were to fail and release the water it is designed to hold during a flood event.

Records of flooding from reservoirs and canals are erratic as there is no requirement for the Environment Agency to provide information on historic flooding from canals and raised reservoirs on plans. In particular, the NPPF does not require flood risk from canals and raised reservoirs to be shown on the Environment Agency flood zones.

Overflows from canals can be common as they are often fed by land drainage, and often do not have controlled overflow spillways. Occasionally, major bank breaches also occur, leading to rapid and deep flooding of adjacent land.

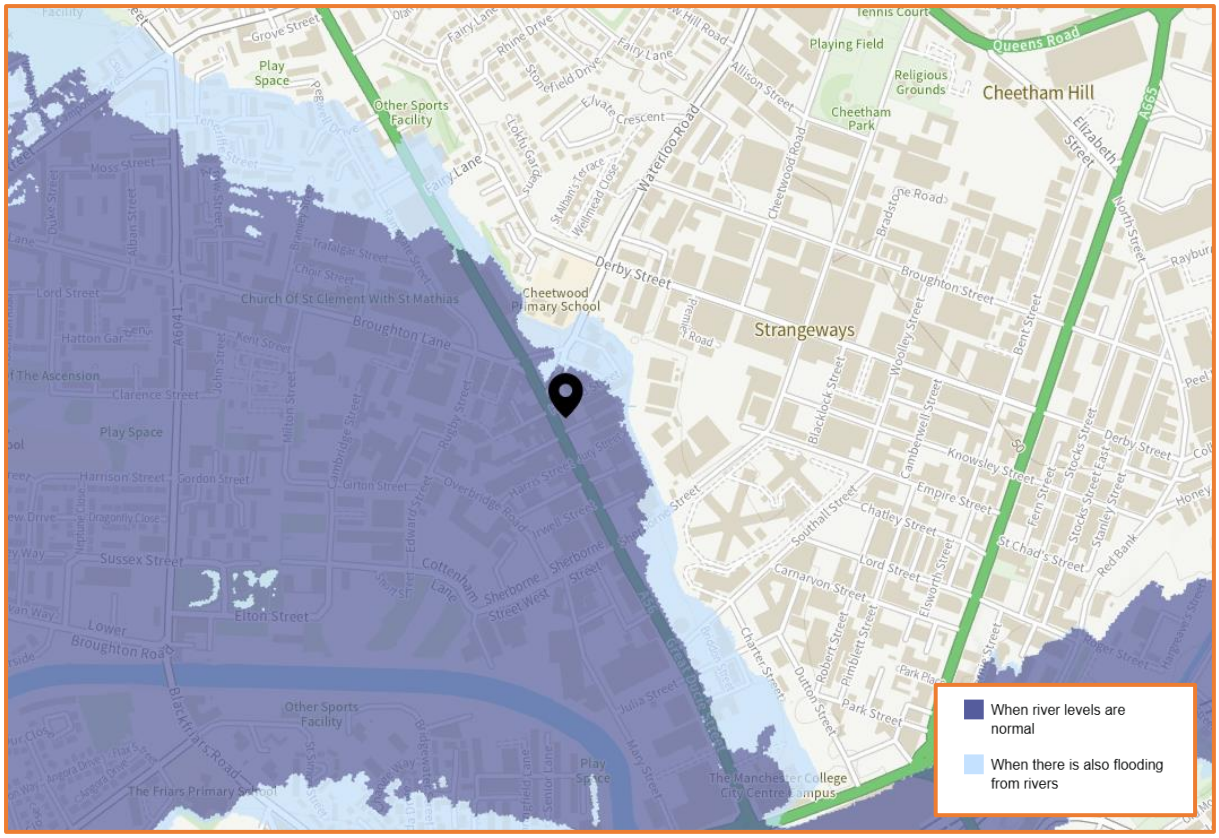


Figure 16: Extract from Environment Agency Risk of Flooding from Reservoirs Map (Source: EA)

6. Flood Risk Management

6.1 Vulnerability to flooding:

The NPPF classifies property usage by vulnerability to flooding.

The existing building is used as commercial units, providing office and storage space, which is classified as “less vulnerable” under the NPPF.

Post development, the site will become “more vulnerable” on the first and second floors as the application is for a change of use to create 8 flats.

No residential units are proposed on the ground floor and there will be no increase in impermeable area.

6.2 EA Standing Advice:

The EA Standing Advice guidance is for domestic extensions and non-domestic extensions where the additional footprint created by the development does not exceed 250m^2. It should not be applied if an additional dwelling is being created, e.g. a self-contained annex or additional commercial unit.

The proposed application is for a change of use. No residential units are proposed on the ground floor and there will be no increase in impermeable area.

6.3 Physical Design Measures:

The proposed application is for the change of use to create 8 flats. There will be no residential units at ground floor level and no increase to impermeable areas.

Finished floor levels will be set no lower than existing floor levels, and internal access will be maintained from the ground floor to the upper floors of the building.

The EA Standing Advice states that the design should be appropriately flood resistant and resilient by:

- Using flood resistant materials that have low permeability to at least 600mm above the estimated flood level;
- Making sure any doors, windows or other openings are flood resistant to at least 600mm above the estimated flood level;
- Using flood resilient materials (for example lime plaster) to at least 600mm above the estimated flood level;
- By raising all sensitive electrical equipment, wiring and sockets to at least 600mm above the estimated flood level;
- Making it easy for water to drain away after flooding such as installing a sump and a pump
- Making sure there is access to all spaces to enable drying and cleaning;
- Ensuring that soil pipes are protected from back-flow such as by using non-return valves.

To help protect against flooding during extreme events, the applicant has agreed to implement flood resistant design measures into the building, in consultation with the Local Authority building control department. These measures can include the following:

- Solid (concrete) ground floor;
- Closed-cell foam used in wall cavities;
- Waterproof ground floor internal render;
- External walls rendered resistant to flooding to first floor level;
- Exterior ventilation outlets, utility points and air bricks fitted with removable waterproof covers;
- Ground floor electrical main ring run from first floor level; and on separately switched circuit from first floor;
- Electrical incomer and meter situated at first floor level or above;
- Boilers, control and water storage / immersion installed at first floor level or above;
- Gas meter installed at first floor level or above;
- Plumbing insulation of closed-cell design;
- Non-return valves fitted to all drain and sewer outlets;
- Manhole covers secured;
- Kitchen units of solid, water resistant material;
- Use of MDF carpentry (i.e. skirting, architrave, built-in storage) avoided at ground floor level;
- Stairs of solid hardwood construction with wood faces treated to resist water penetration;

All external doors to be flood proof / flood defence doors, or 600mm demountable flood defence barriers installed if flood proof doors are not practical or other planning constraints prevent it.

6.4 Safe Escape and Flood Action Plan:

The NPPF requires a route of safe escape for all residents and users to be provided from “more vulnerable” in Flood Zone 3a. Safe escape is usually defined as being though slow moving flood water no deeper than 25cm.

In the case of an extreme flood event without warning, users should seek refuge on the upper floors of the building. The applicant has agreed that a permanent means of internal access be provided to the upper floors of the building, thus providing safe refuge.

Safe escape will be provided by a formal flood warning and evacuation plan which will be prepared in liaison with the Council’s Emergency Planners and tied in with the existing emergency plans for the area.

In the absence of safe escape, users should follow the warning and evacuation procedure detailed in the following section.

Users should follow the warning and evacuation procedure detailed in the following section.

6.5 Flood Warning:

The EA is responsible for issuing flood warnings. Flood warnings are issued to the emergency services and local authorities. Both private individuals and organisations can sign-up to receive warnings via phone, text or email. This system of receiving warnings is currently voluntary.

Advice regarding severe flood warnings will generally be given during weather forecasts on local radio and TV. In the case of extreme events, warnings can also be disseminated via door to door visits by the police or locally appointed flood wardens.

The EA issue flood warnings/alerts to specific areas when flooding is expected. It is recommended that the applicant registers online with the free Environment Agency Floodline Warnings/Alert Direct service at www.gov.uk/sign-up-for-flood-warnings to receive flood warnings by phone, text or email.

The site is located within EA's Alert and Warning areas namely, River Irwell at Salford, Lower Broughton (quick dial code 305000) flood warning area.

The flood warning service has three types of warnings that will help you prepare for flooding and take action:

Flood Warning	**Flood Alert**	**Flood Warning**	**Severe Flood Warning**
What it means?	Flooding is possible. Be prepared.	Flooding is expected. Immediate action required.	Severe flooding. Danger to life.
When it's used?	Two hours to two days in advance of flooding.	Half an hour to one day in advance of flooding.	When flooding poses a significant threat to life.
What to do?	Be prepared to act on your flood plan. Prepare a flood kit of essential items. Monitor local water levels and the flood forecast on our website.	Move family, pets and valuables to a safe place. Turn off gas, electricity and water supplies if safe to do so. Put flood protection equipment in place.	Stay in a safe place with a means of escape. Be ready should you need to evacuate from your home. Co-operate with the emergency services. Call 999 if you are in immediate danger.

Table 2: EA Flood Warning Service

6.6 Flood Plan:

It is recommended that the applicant and future owners, occupiers and Landlords of the property prepare a flood plan to protect life and property during a flood event:

Before a flood:

- Prepare and keep a list of all your important contacts to hand or save them on your mobile phone.
- Think about what items you can move now and what you would want to move to safety during a flood.
- Know how to turn off electricity and water supplies to the site.
- Prepare a flood kit of essential items and keep it handy. It can include copies of important documents, a torch, a battery-powered or wind-up radio, blankets and warm clothing, waterproofs, rubber gloves and a first aid kit including all essential medication.

During a flood:

- Activate the evacuation plan and evacuate the site.
- Remove cars from the site if there is sufficient warning and the water levels are not rising rapidly.
- Switch off water and electricity for the site.
- Tune into your local radio station on a battery or wind-up radio.
- Listen to the advice of the emergency service and evacuate if told to do so.
- Avoid walking or driving through flood water. Six inches of fast-flowing water can knock over an adult and two feet of water can move a car.

After a flood:

- If you have flooded, contact your insurance company as soon as possible.
- Take photographs and videos of your damaged property as a record for your insurance company.
- If you don't have insurance, contact your local authority for information on grants and charities that may help you.
- Flood water can contain sewage, chemicals and animal waste. Always wear waterproof outerwear, including gloves, wellington boots and a face mask.
- Have your electrics and water checked by qualified engineers before switching them back on.

6.7 Off-Site Impacts:

6.7.1 Fluvial floodplain storage:

The NPPF requires that where development is proposed in undefended areas of floodplain, which lie outside of the functional floodplain, the implications of ground raising operations for flood risk elsewhere needs to be considered. Raising existing ground levels may reduce the capacity of the floodplain to accommodate floodwater and increase the risk of flooding by either increasing the depth of flooding to existing properties at risk or by extending the floodplain to cover properties normally outside of the floodplain. Flood storage capacity can be maintained by lowering ground levels either within the curtilage of the development or elsewhere in the floodplain, in order to maintain at least the same volume of flood storage capacity within the floodplain.

In undefended tidal areas, raising ground levels is unlikely to impact on maximum tidal levels so the provision of compensatory storage should not be necessary.

For development in a defended flood risk area, the impact on residual flood risk to other properties needs to be considered. New development behind flood defences can increase the residual risk of flooding if the flood defences are breached or overtopped by changing the conveyance of the flow paths or by displacing flood water elsewhere. If the potential impact on residual risk is unacceptable then mitigation should be provided.

The site is situated in Flood Zone 3 when using the Environment Agency Flood Map for Planning (Rivers and Sea). The application is for a change of use with no increase in built footprint. Post development, there will be no loss of fluvial floodplain storage.

6.7.2 Surface Water Drainage:

The development will utilise Sustainable drainage systems (SuDS) design in accordance with the NPPF for Planning Applications and the drainage hierarchy as follows:

1. Store rainwater for later use;
2. Infiltration techniques;
3. Attenuate rainwater by storing in tanks for gradual release;
4. Discharge rainwater direct into watercourse;
5. Discharge rainwater into surface water sewer;
6. Discharge rainwater into a combined sewer;

A full Surface Water Drainage Strategy is not required at this stage of planning.

The property will continue to utilise the existing method for disposal for surface water post development.

7. Sequential and Exception Test

The Sequential Test aims to ensure that development does not take place in areas at high risk of flooding when appropriate areas of lower risk are reasonably available.

The Sequential Test is applied to developments in areas identified as being at risk of any source of flooding now or in the future. The Sequential Test ensures that a sequential, risk-based approach is followed to steer new development to areas with the lowest risk of flooding, taking all sources of flood risk and climate change into account.

The sequential approach is designed to ensure that areas at little or no risk of flooding from any source are developed in preference to areas at higher risk. This means avoiding, so far as possible, development in current and future medium and high flood risk areas considering all sources of flooding including areas at risk of surface water flooding. Other forms of flooding need to be treated consistently with river and tidal flooding in mapping probability and assessing vulnerability, so that the sequential approach can be applied across all areas of flood risk.

The site is situated in Flood Zone 3 when using the Environment Agency Flood Map for Planning (Rivers and Sea). Post development, the site will become "more vulnerable" on the first and second floors, as the application is for a change of use to create 8 flats.

Flood Zones	**Flood Risk Vulnerability Classification**				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a	Exception Test required	✗	Exception Test required	✓	✓
Zone 3b	Exception Test required	✗	✗	✗	✓

Table 3: Flood risk vulnerability and flood zone 'compatibility'

Using the table above, the proposed application is considered to be suitable within Flood Zone 3, after passing the exception test. The Sequential and Exception Tests do not need to be applied to minor developments and changes of use (this application is for a change of use).

8. Discussion and Conclusions

Unda Consulting Limited have been appointed by Tarlok Singh Rawal to undertake a Flood Risk Assessment for the proposed development at 46 - 48 Bury New Road, Manchester, M8 8EL. The FRA has been undertaken in accordance with the National Planning Policy Framework (NPPF) and the associated technical guidance.

The site comprises of 2x three storey commercial units, providing office and storage space. The proposed application is for the change of use to 8 flats There would be no physical alterations to the exterior of the building or increase in impermeable areas.

No residential units are proposed on the ground floor and there will be no increase to impermeable area at the site.

Post development, the site will become “more vulnerable” as the application is for a change of use to create 8 flats. Accordingly, it is considered that the vulnerability of the site as a whole will increase, post development.

The site is located partially within Flood Zone 3 (High Probability), which means it is defined as land having at least a 1:100 annual probability of fluvial flooding.

The risk would appear to be predominantly fluvial, and originate from the River Irwell, 428m to the south of the site.

Product 4 modelled flood levels and extents have been provided from the Environment Agency for use within this report, provided in the report appendix. Modelled extents for undefended and defended scenarios have been provided for the Lower Irwell (2017).

The site is shown to be entirely outside of the defended 1:50 year, 1:75 year, 1:100 year and 1:200 year modelled flood extents.

The site is within the defended 1:1000 year modelled flood extent.

The site is shown to be partially within the undefended 1:50 year, 1:75 year, 1:100 year, 1:200 year and entirely within the 1:1000 year modelled flood extents.

Comparison of these modelled flood levels with topographic site levels (27.34mAOD and 27.70mAOD) shows that the site is completely above the present day defended and undefended 1:100 year and 1:200 year modelled flood levels. The site is entirely below the defended and undefended 1:1000 year modelled flood levels.

The climate change guidance was published in February 2016 (and last updated in May 2022). The proposed development is “more vulnerable” and the 2010 Level 1 Manchester City, Salford City and Trafford Council Strategic Flood Risk Assessment (SFRA) states residential development a lifetime of 100 years. For “more vulnerable” development in Flood Zone 3 – the Central climate change allowance should be used – which for the Irwell Management Catchment is a 35% increase in river flows.

The site appears to be within both defended and undefended modelled flood extents with 35% climate change allowance.

According to the in-channel node, the site appears to be 0.20m above and 0.16m below the defended 1:100 year + 35% climate change allowance modelled flood level.

According to the in-channel node, the site appears to be 1.08m below the modelled undefended 1:100 year + 35% climate change allowance flood level.

On site 2D nodes have also been given for the defended and undefended 1:00 year + 35% climate change allowance flood levels.

The site has a maximum defended flood level of 28.00mAOD. Comparison of the these modelled flood levels to the topographic levels of the site (27.34mAOD and 27.70mAOD) shows that the on-site flood depth ranges from 0.30m – 0.66m, respectively.

The site is shown to have a maximum undefended flood level of 28.62mAOD. Comparison of the these modelled flood levels to the topographic levels of the site (27.34mAOD and 27.70mAOD) shows that the on-site flood depth ranges from 0.92m and 1.28m, respectively.

According to the EA there are Environment Agency maintained raised defences that defend the site directly. Engineered high ground (Asset ID 88893) present and located on the northern bank on the River Irwell, with a stand of protection of 75 years. This asset has a downstream actual crest level of this defence is 27.20mAOD and an upstream actual crest level is 27.44mAOD. The condition of this asset is unknown.

According to EA records, historical flooding has occurred at the site and surrounding area in 1866 and 1946 from the River Irwell exceeding channel capacity (no raised defences).

The EA Risk of Flooding from Surface Water Map suggests that the site lies in an area at “Low” to “Medium” risk from surface water. It should be noted that north west and south east of the site on Bury New Road is within an area of “High” risk of surface water flooding.

The EA also provided surface water flood depths for the 1 in 100 year surface water flood event. The site is shown to be entirely outside of this flood event. It should be noted that Bury New Road has a maximum surface water flood depth of 0.30m near the site.

The site is within Conurbation Core CDA.

According to the 2010 Level 1 Manchester City, Salford City and Trafford Council SFRA, the site is not within an area at risk of groundwater flooding. In addition, the EA state that flooding from groundwater is unlikely in this area.

No information has been provided to suggest that the site is susceptible to sewer surcharge flooding.

Permanent means of internal access be provided to the upper floors of the building, thus providing safe refuge.

Safe escape will be provided by a formal flood warning and evacuation plan which will be prepared in liaison with the Council’s Emergency Planners and tied in with the existing emergency plans for the area.

A full Surface Water Drainage Strategy is not required at this stage of planning. The property will continue to utilise the existing method for disposal for surface water post development.

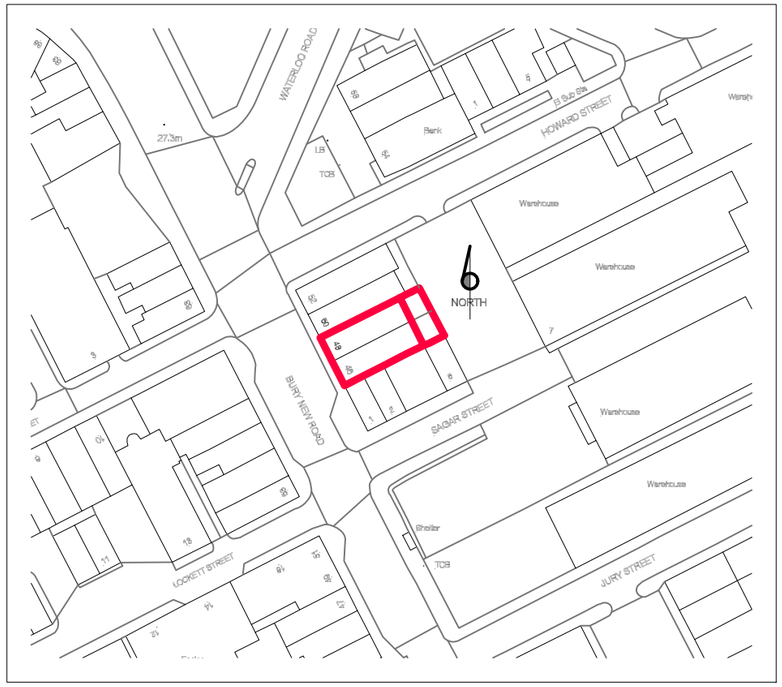
The applicant has confirmed that:

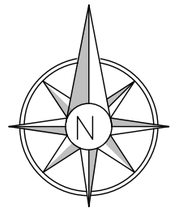
- The application is for the change of use of use to create 8 flats.
- No increase in impermeable areas are proposed at the site.
- No residential units are proposed at ground floor level.
- Floor levels post development will be set no lower than existing levels.
- Internal access will be maintained from the ground floor to the upper floors of the building.
- Flood proofing of the building will be incorporated as appropriate.
- Post development, there will be no unacceptable loss of floodplain storage.
- A formal flood warning and evacuation plan will be implemented post development.
- The applicant will register with the Environment Agency Floodline Alert/Warnings Direct service.
- Due to the scale of the development, a full Surface Water Drainage Strategy is not required at this stage of planning.

Assuming accordance with these flood risk management measures, UNDA Consulting Ltd consider the proposed application to pose no flood risk and therefore is suitable in flood risk terms.

Appendix

- Site location, existing and proposed plans;
- EA Flood Map for Planning.





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Existing Location Plan

General Notes

No.	Revision/Issue	Date

Firm Name and Address

Mason and Marlowe

Mason and Marlowe Ltd.
Project Managers and Quanity Surveyors

5 Picadilly Place
Manchester, M1 3BR

Project Name and Address

46-48 Bury New Rd
Manchester, M8 8EL

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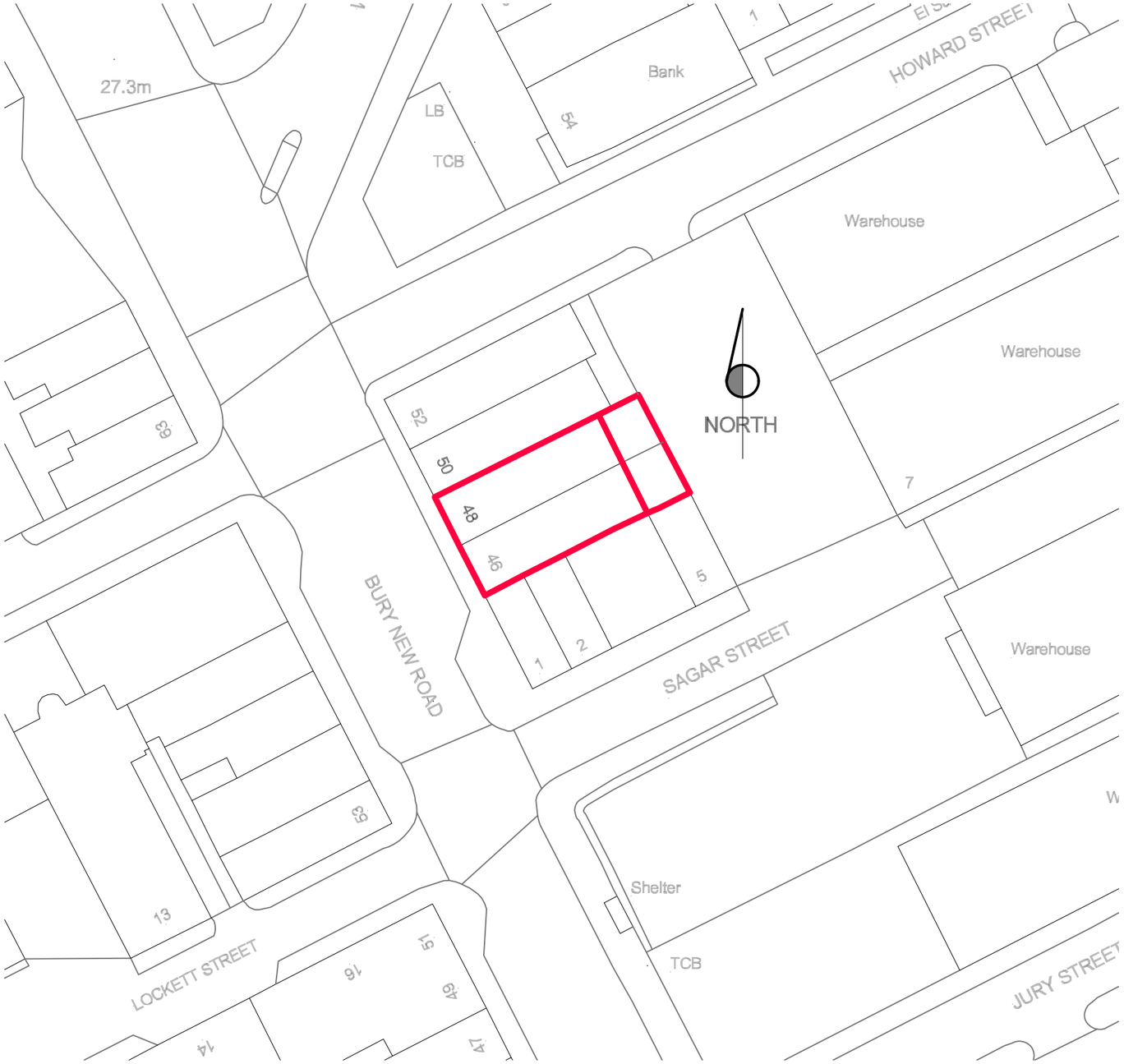

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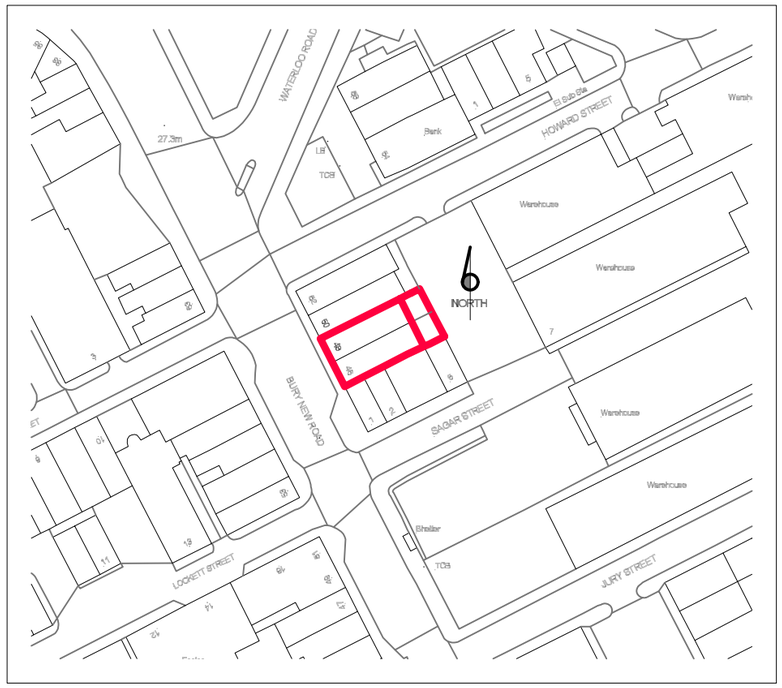

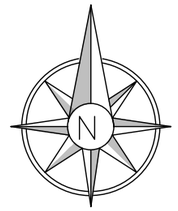

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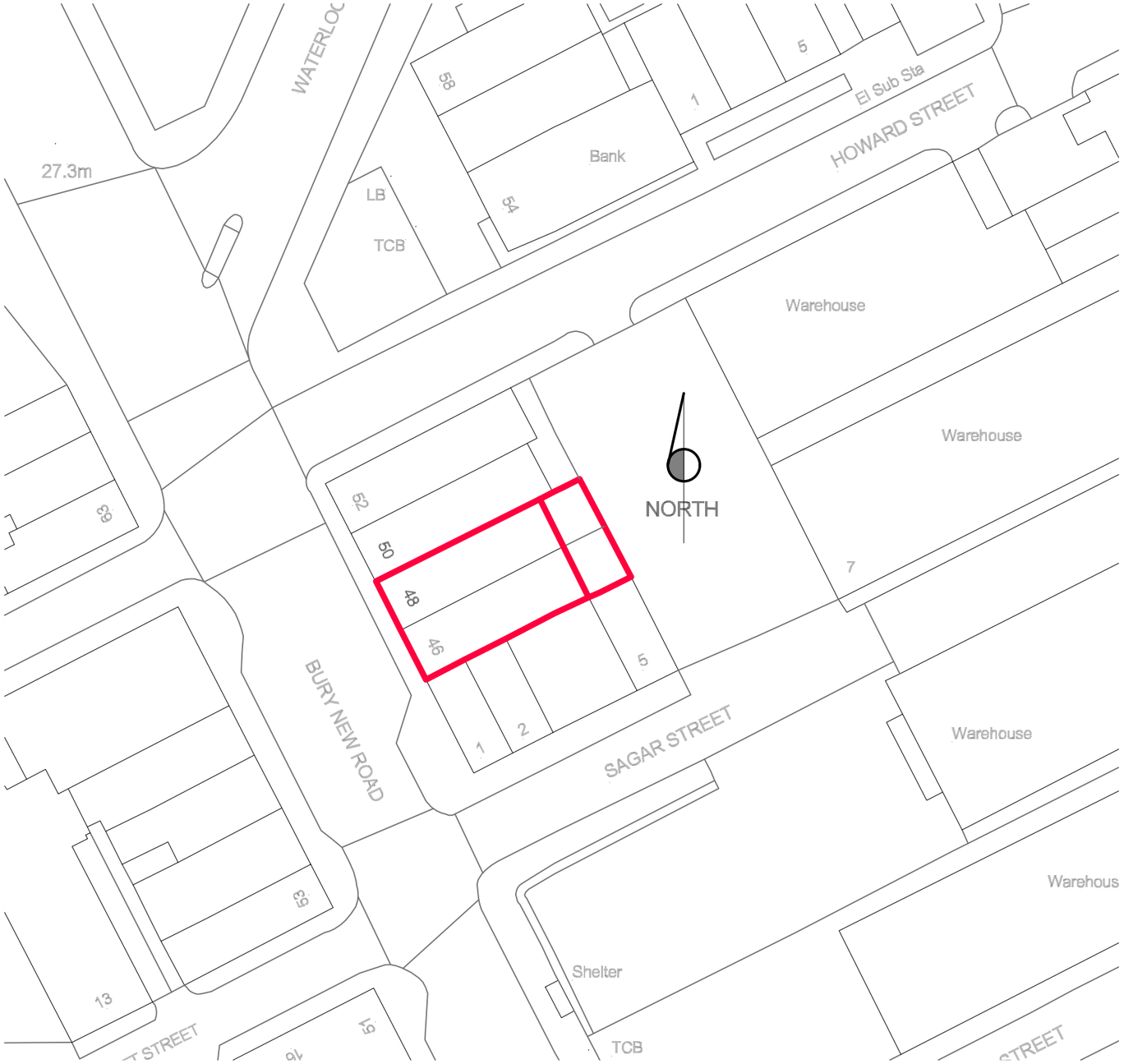

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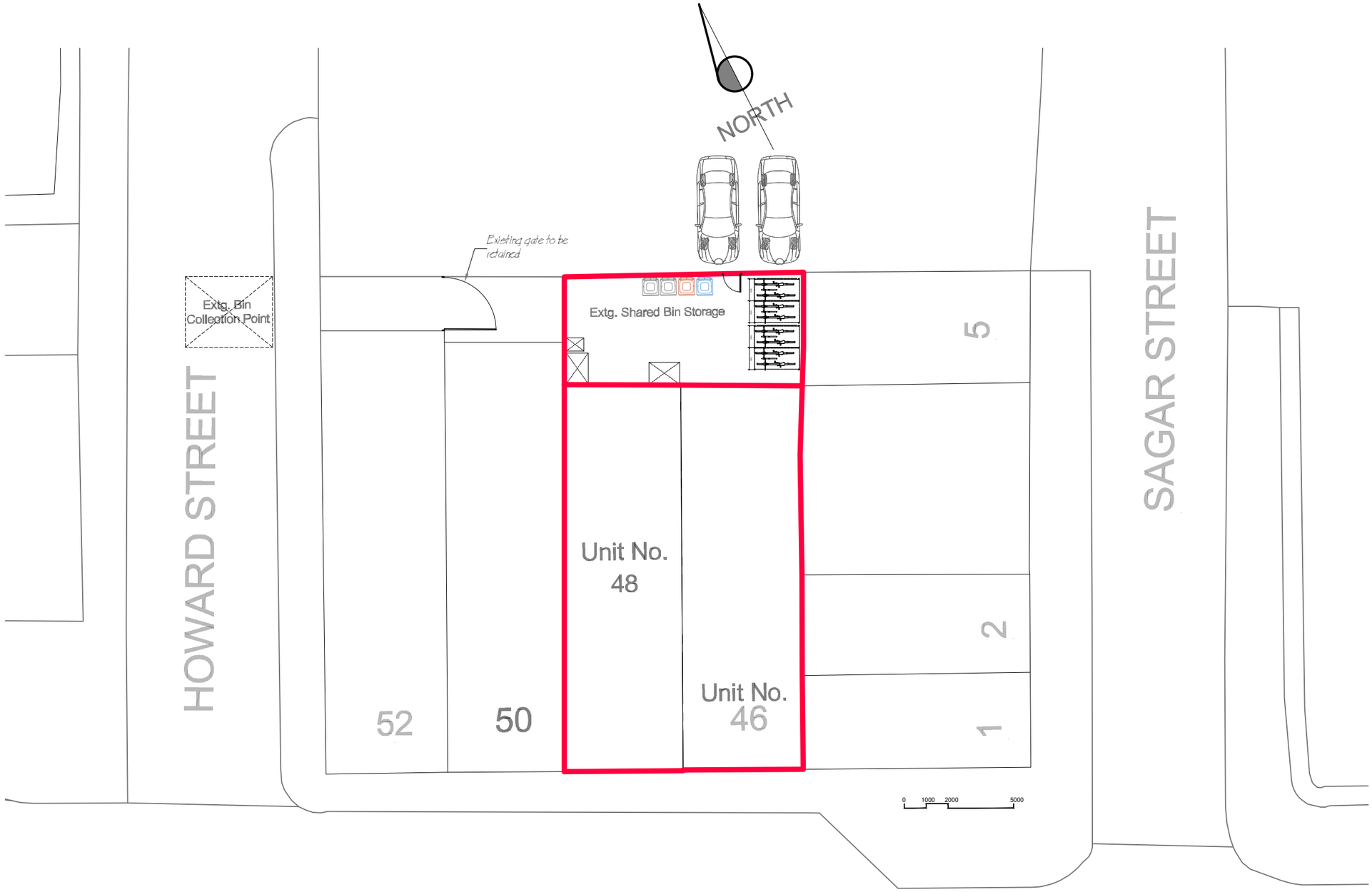

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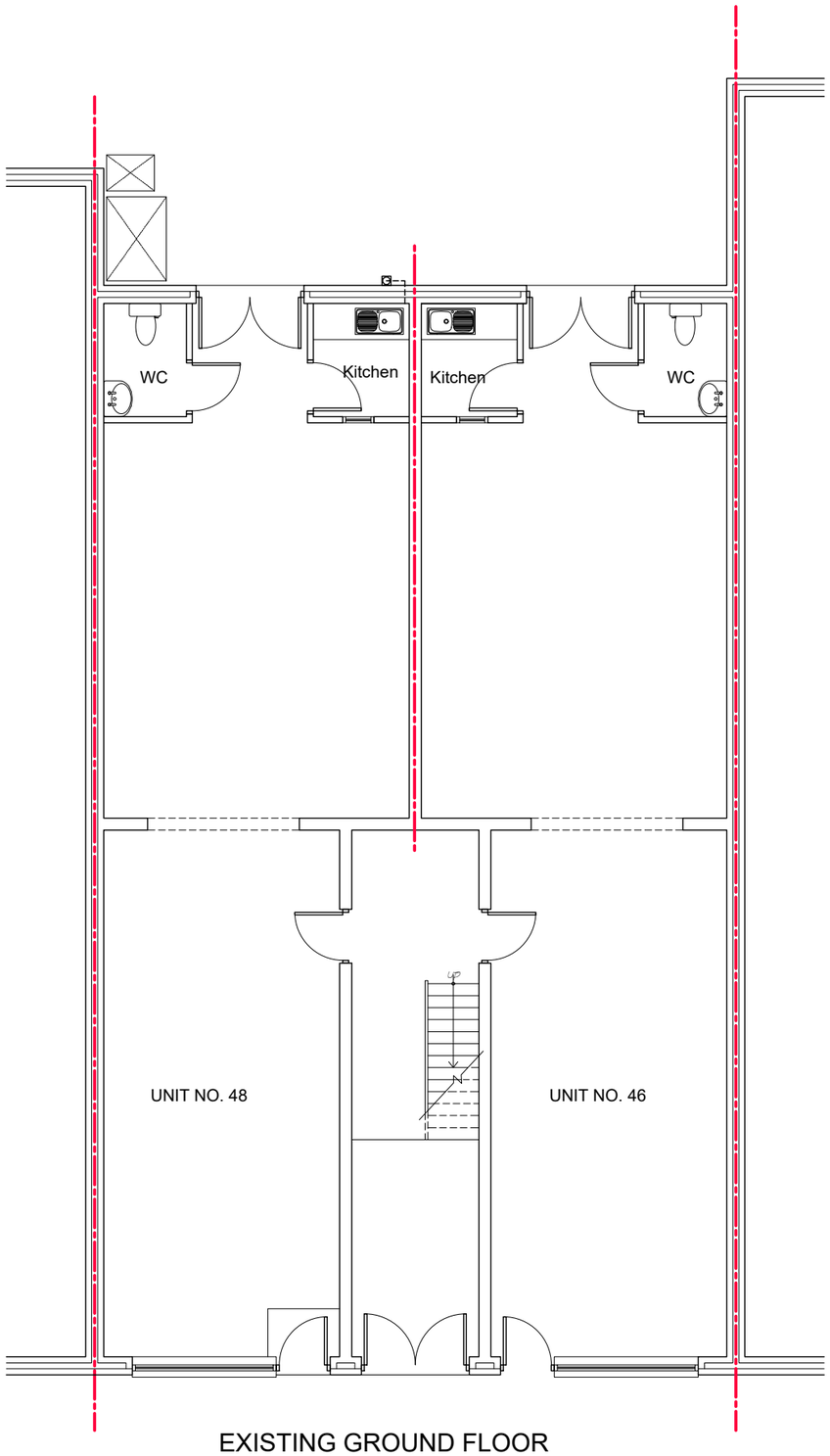

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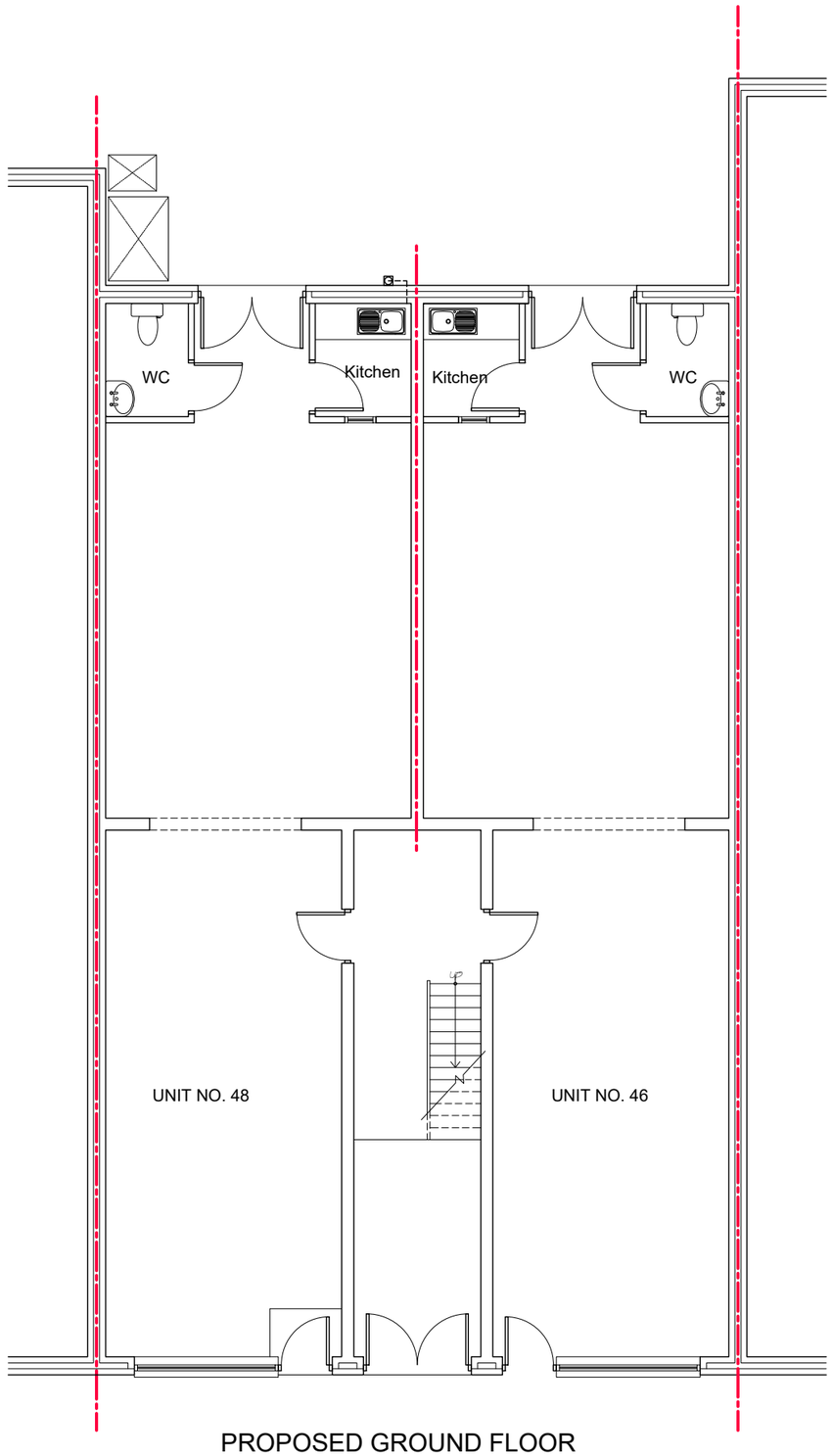

PROPOSED GROUND FLOOR

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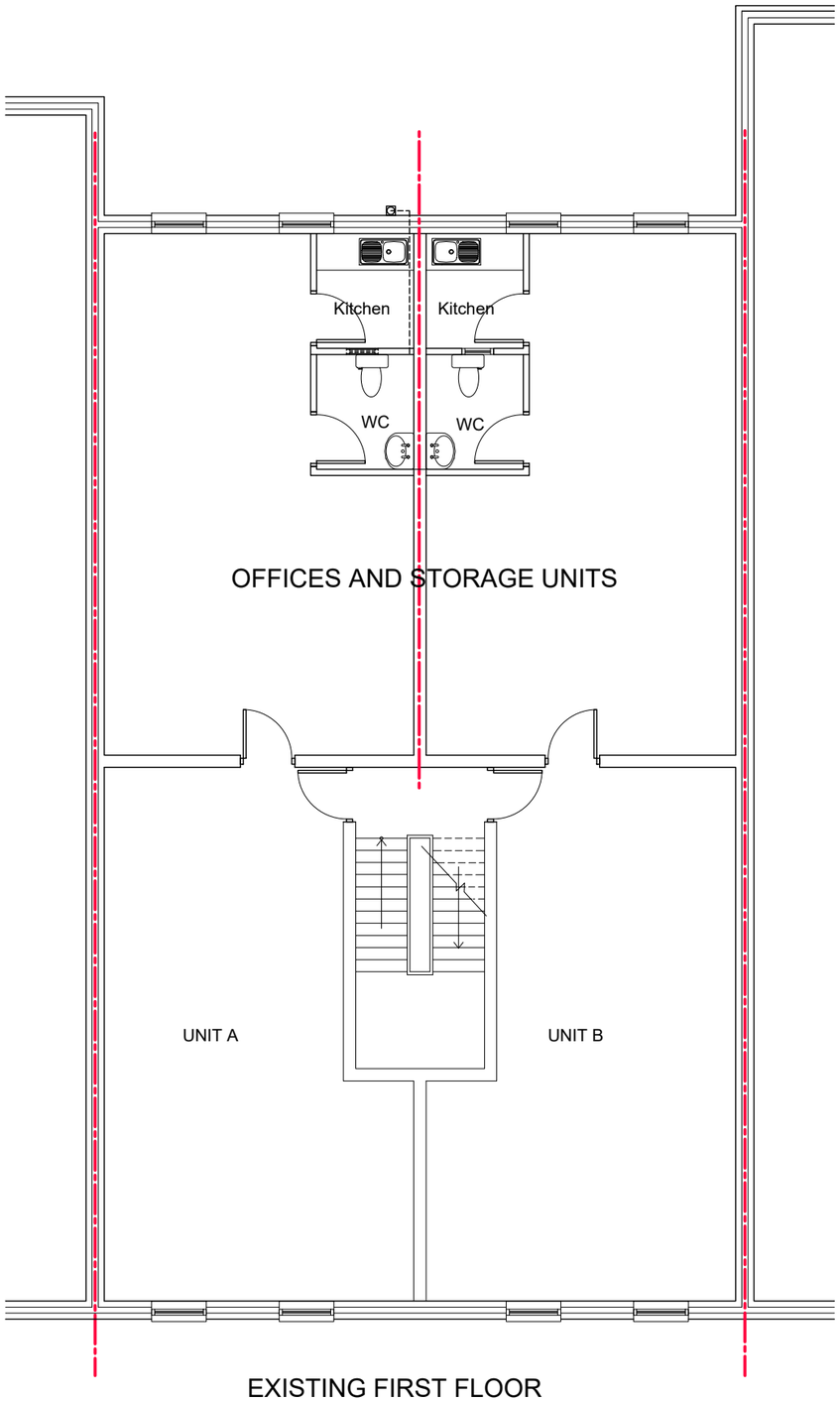

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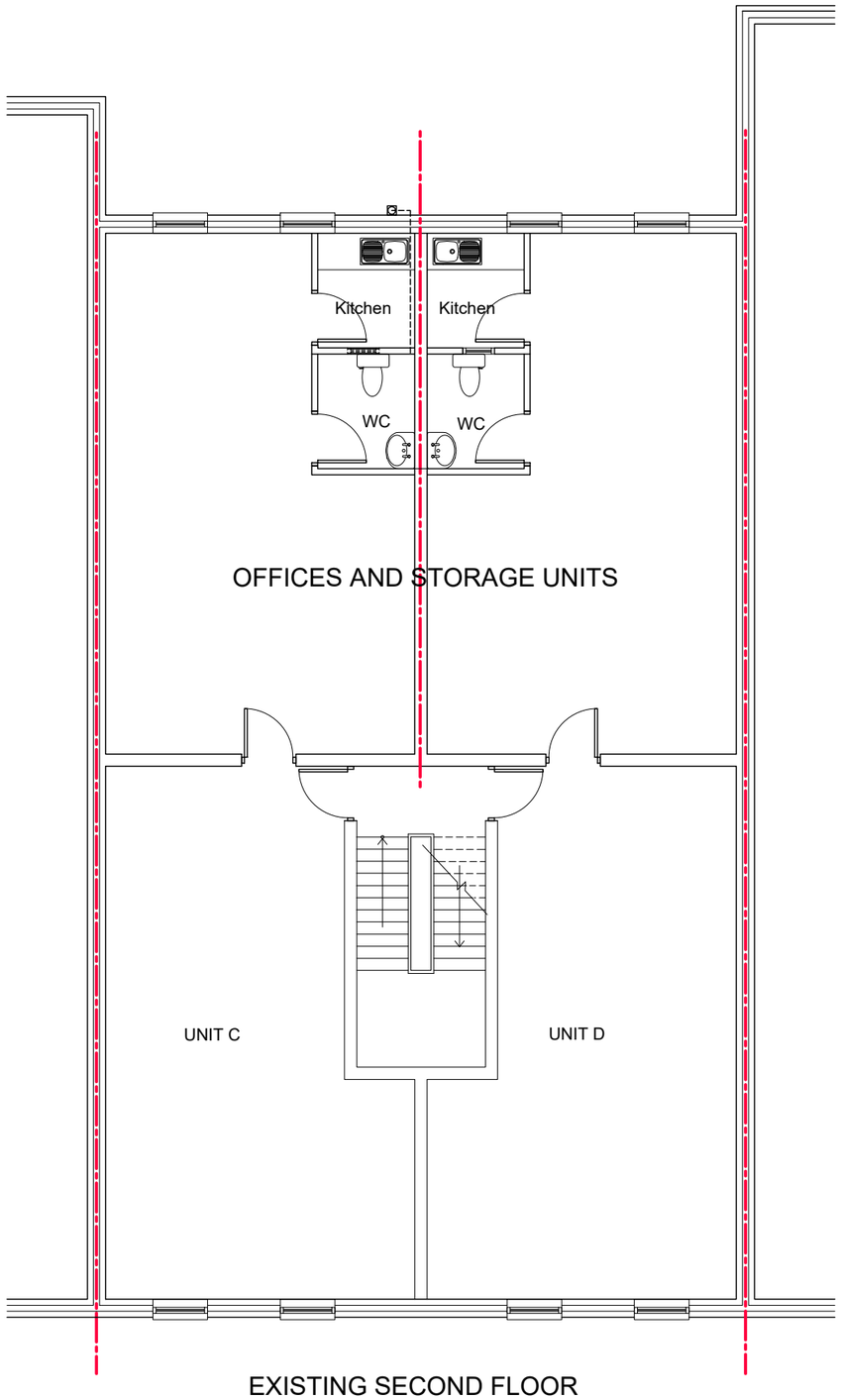

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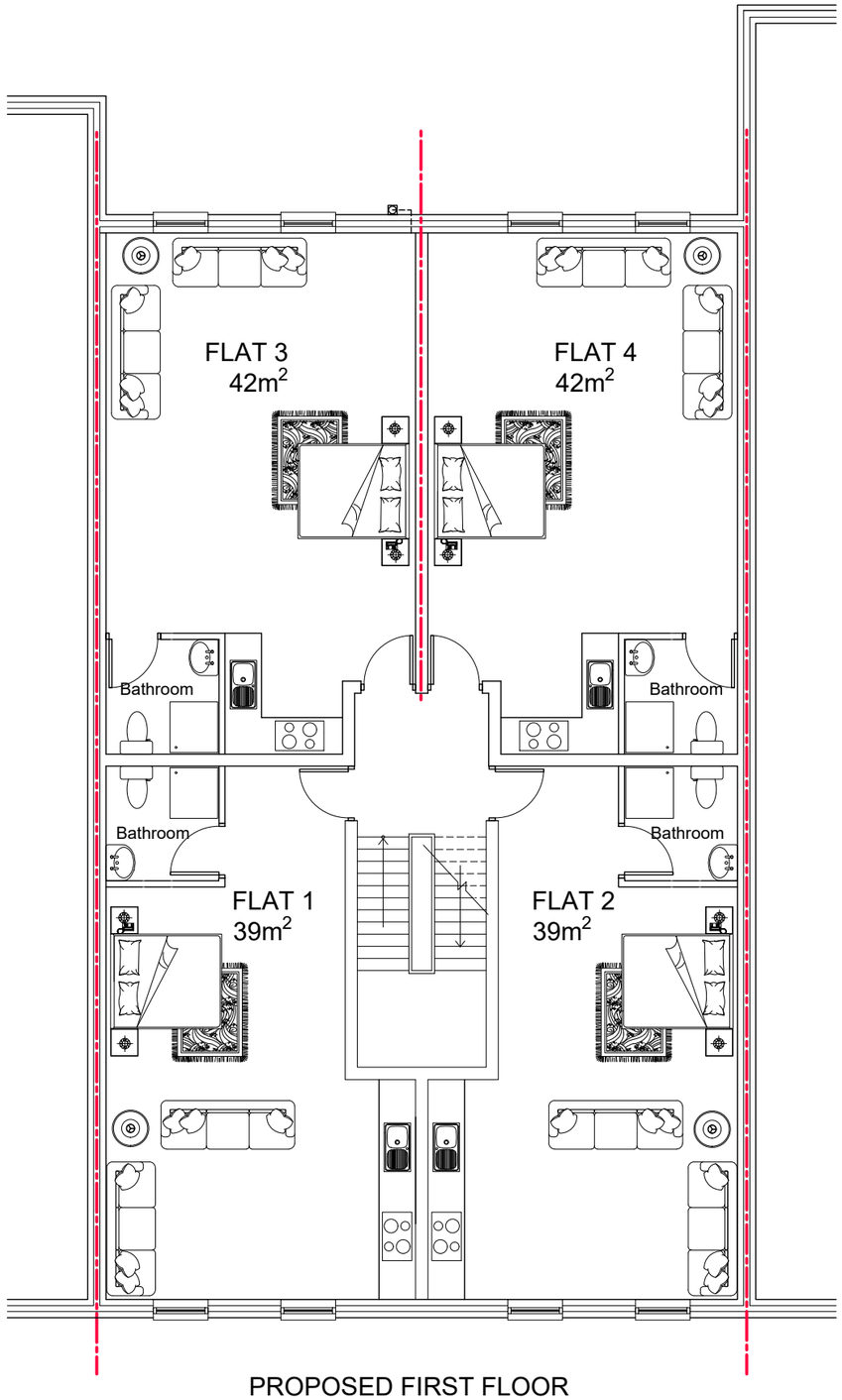

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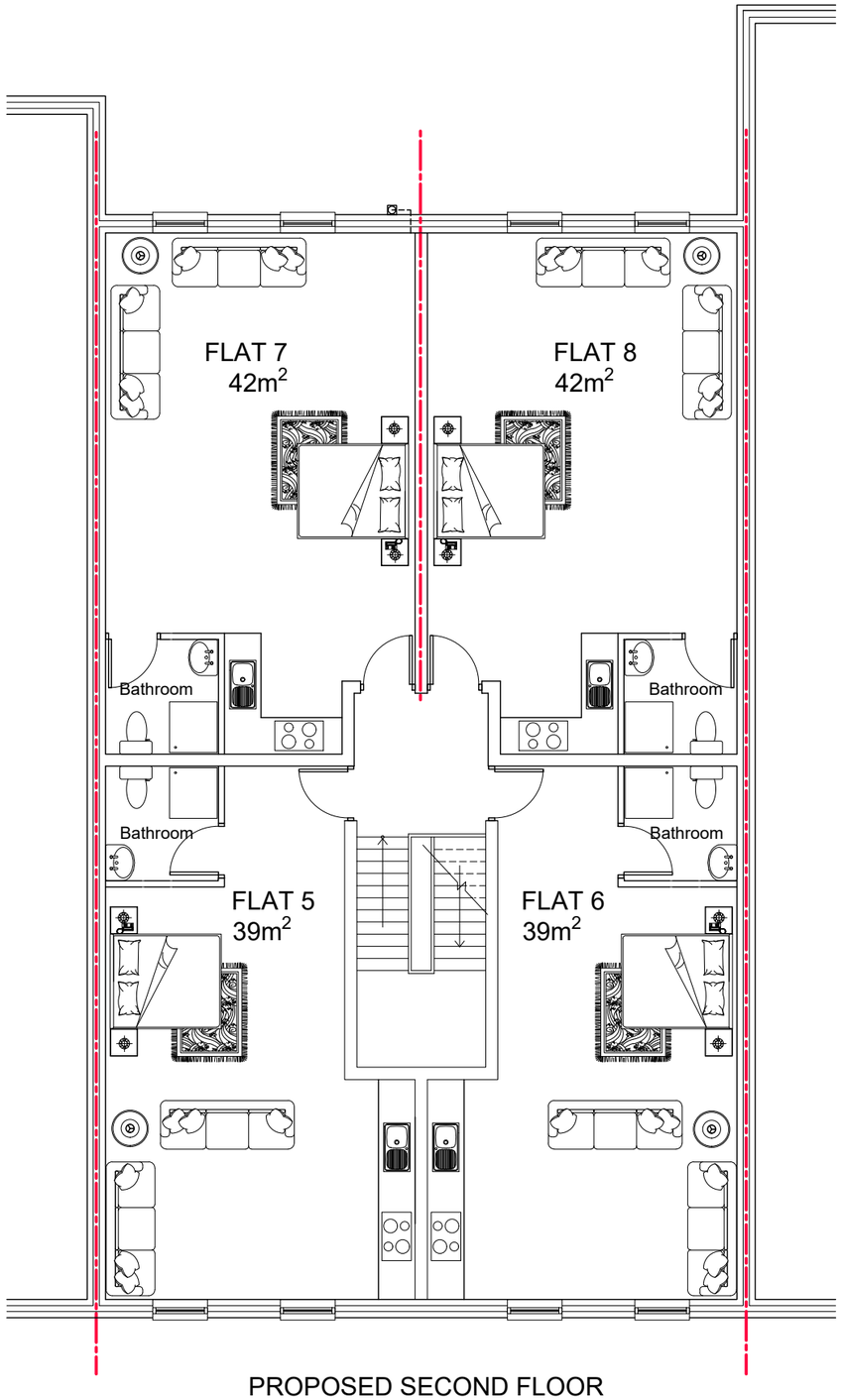

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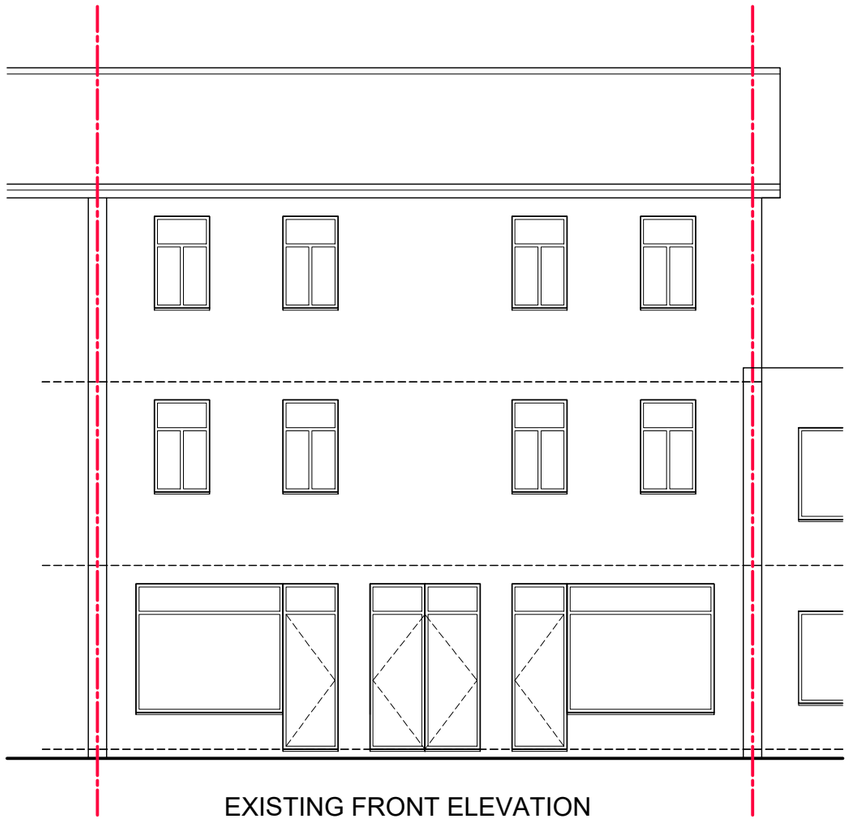

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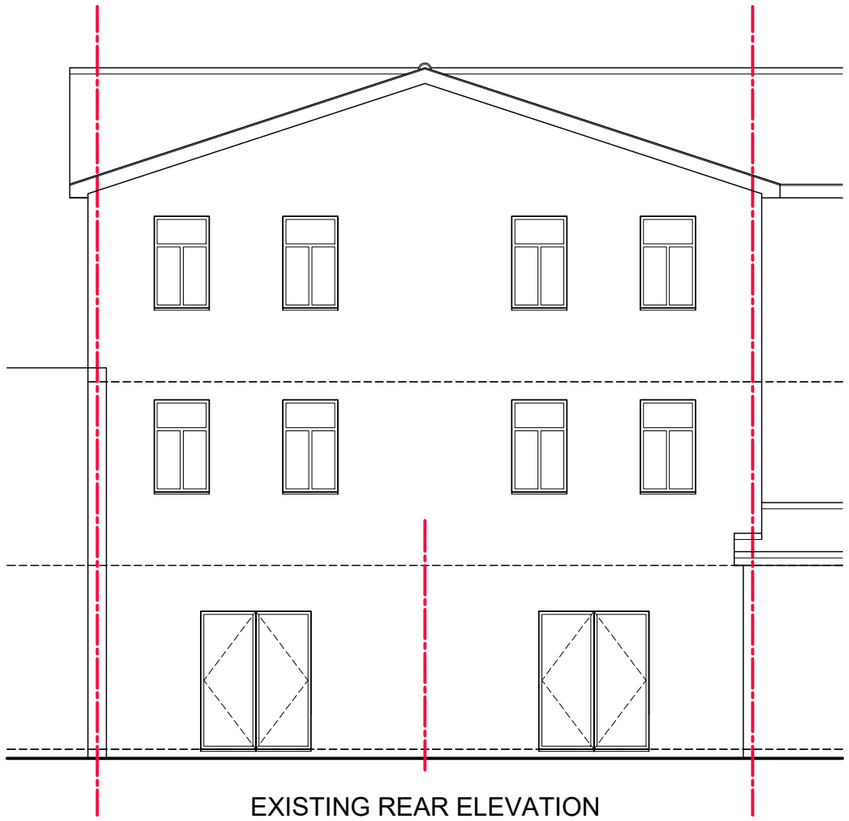

EXISTING REAR ELEVATION

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General Notes

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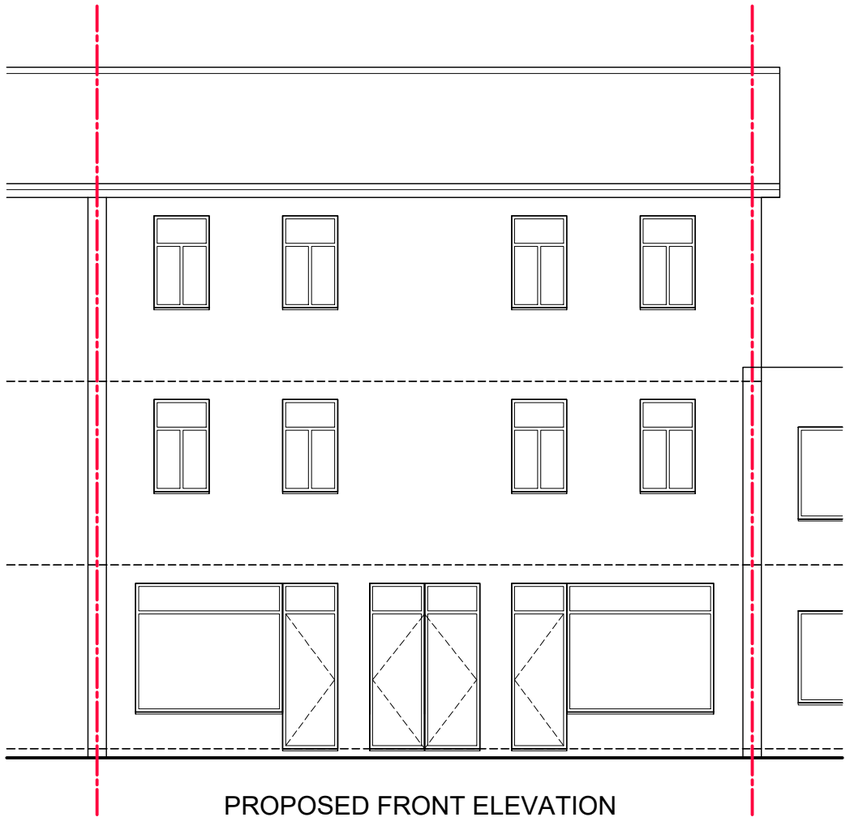
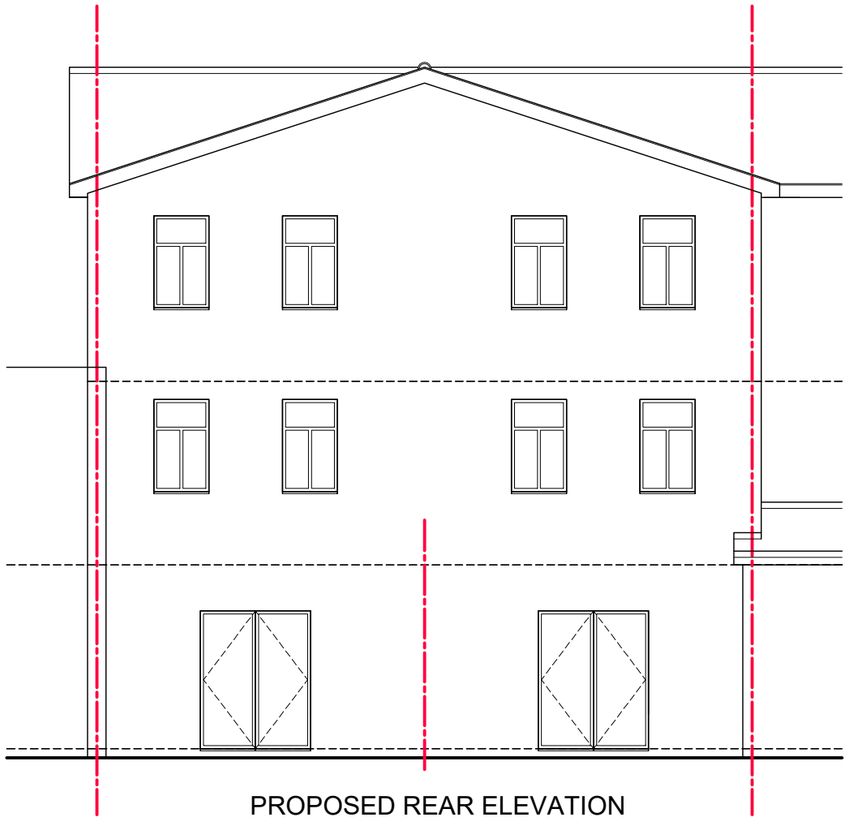
Project	Sheet
Date: 03/11/2024	A3
Scale: 1/100	



PROPOSED FRONT ELEVATION



PROPOSED REAR ELEVATION

0 1000 2000 5000

General Notes

No.	Revision/Issue	Date

Firm Name and Address

Mason and Marlowe

Mason and Marlowe Ltd.
Project Managers and Quanity Surveyors

5 Picadilly Place
Manchester, M1 3BR

Project Name and Address

46-48 Bury New Rd
Manchester, M8 8EL

Project

Sheet

A3

Date

03/11/2024

Scale

1/100

Flood risk assessment data

Location of site: 383495 / 399752 (shown as easting and northing coordinates)
Document created on: 10 December 2024
This information was previously known as a product 4.
Customer reference number: A9177KHE8TXP

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)
- past floods
- 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

Or you can contact your Lead Local Flood Authority for further information.

Your Lead Local Flood Authority is Manchester District.

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

About the models used

Model name: Lower Irwell 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

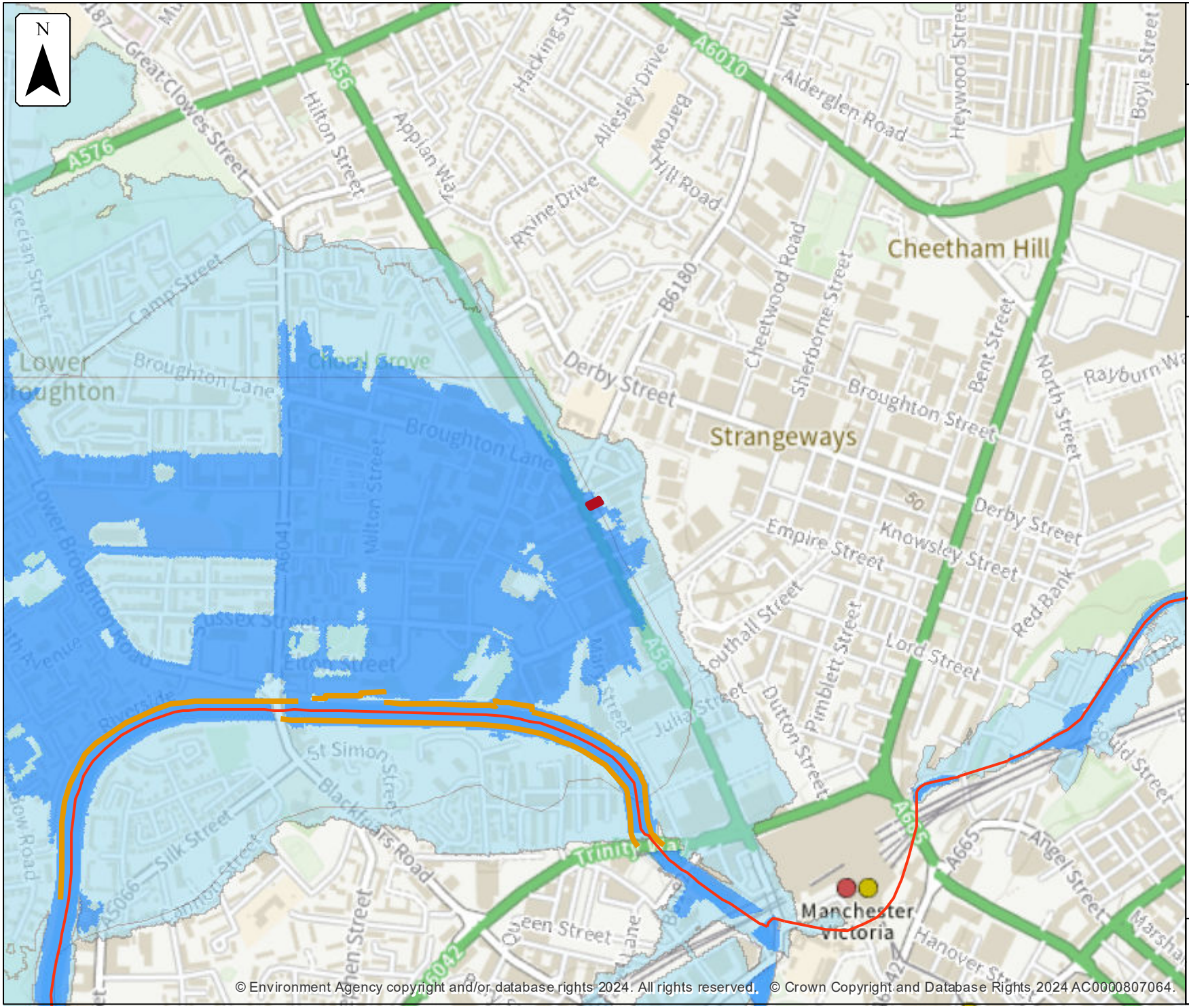
Flood zone 2 shows the area at risk of flooding for an undefended flood event with:

- 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.



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Environment Agency

Flood map for planning

Location (easting/northing)
383495/399752

Scale
1:10,000

Created
10 Dec 2024

- Selected area
- Main river
- Flood defence
- Flood zone 3
- Flood zone 2

0 100 200 300 400 500
metres

Past floods

Past flood events included in this document

The recorded flood outlines included in this document are for areas of land local to your site location that have been flooded by any of these sources:

- ephemeral water
- main rivers
- ordinary watercourses
- the sea

Data limitations

The outlines do not include flooding from:

- drainage where rainfall has led to surface water ponding or overland runoff
- artificial, water-bearing sewer, water supply and wastewater treatment pipelines

Changes to flood defences

The defences (also known as assets) that were in place may also have changed. For example, assets may have been built more recently than the last recorded flood outline.

What the recorded flood outlines dataset is

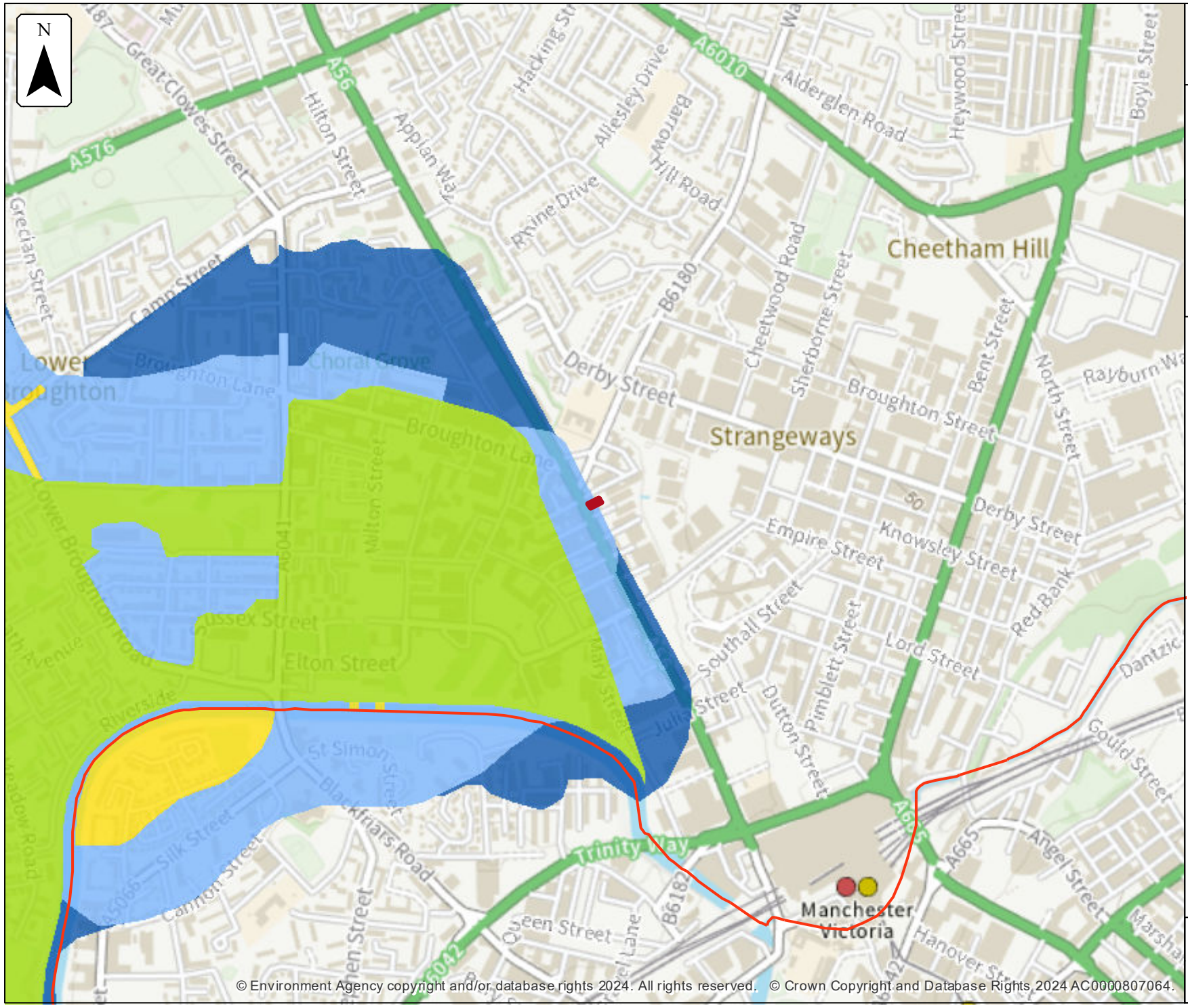
The recorded flood outlines are a geographical information system (GIS) data layer that show our verified records of areas that have flooded in the past from:

- rivers
- the sea
- groundwater
- surface water

Download the complete recorded flood outlines dataset, which includes data quality flags for outlines recorded after April 2020. This indicates the confidence we have in an outline.

Get flood information from other organisations

Contact Manchester District Lead Local Flood Authority (LLFA) and your drainage board to get information about past flooding caused by surface water or drainage systems.



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Environment Agency

Past floods

Location (easting/northing)
383495/399752

Scale
1:10,000

Created
10 Dec 2024

Selected area
Main river

Date of flood event
December, 2015
January, 2008
January, 1954
September, 1946
November, 1866

0 100 200 300 400 500
metres

Data on past flood events

Start date	End date	Source of flood	Cause of flood	Affects location
26 December 2015	26 December 2015	main river	overtopping of defences	No
21 January 2008	22 January 2008	main river	unknown	No
21 January 1954	22 January 1954	main river	channel capacity exceeded (no raised defences)	No
20 September 1946	21 September 1946	main river	channel capacity exceeded (no raised defences)	Yes
01 November 1866	02 November 1866	main river	channel capacity exceeded (no raised defences)	Yes

Flood defences and attributes

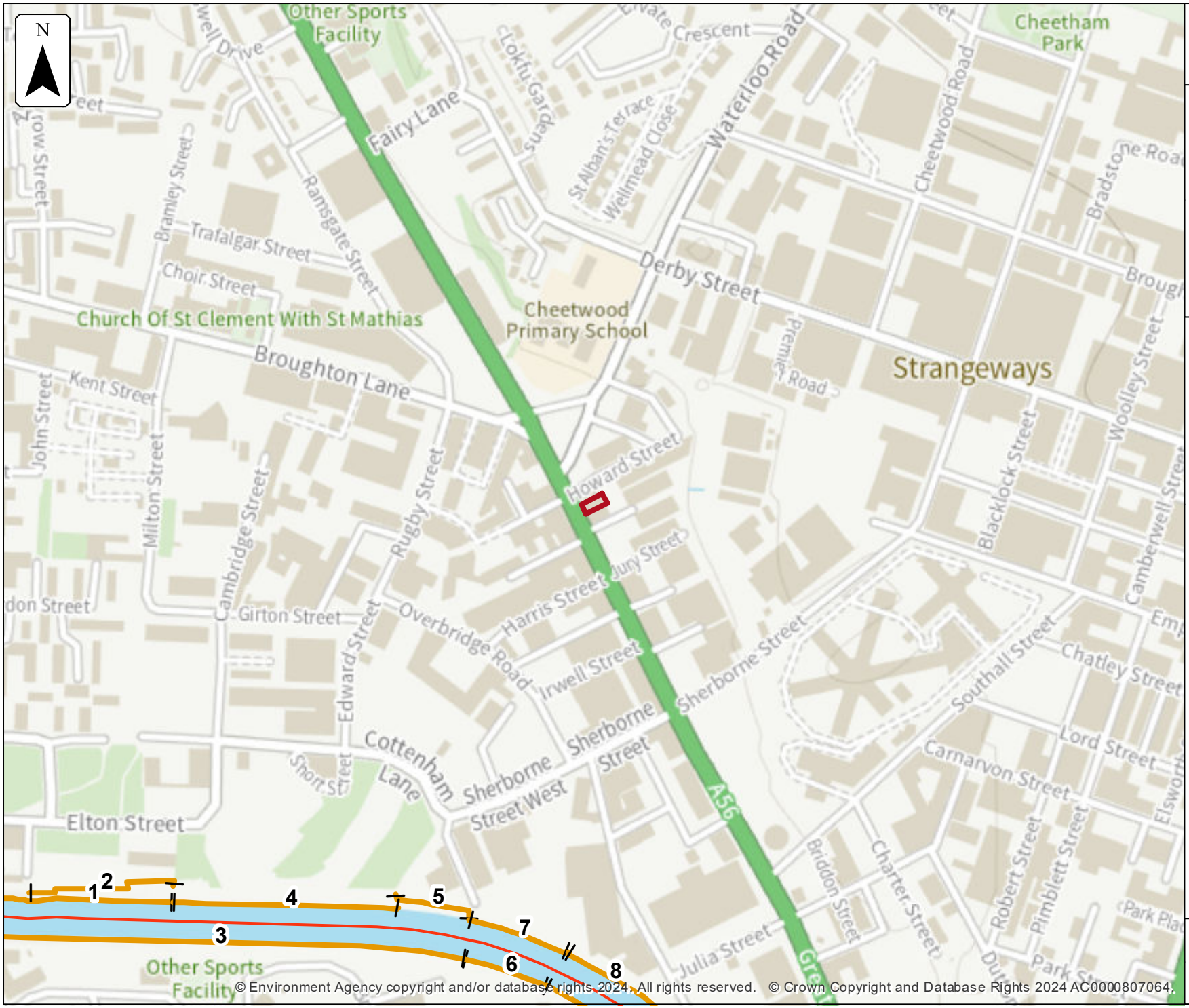
The flood defences map shows the location of the flood defences present.

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



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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	452369	Engineered High Ground	5				
2	452918	Wall			28.30	27.10	
3	89057	Embankment	75		28.58	27.01	
4	452758	Embankment	75		27.10	27.10	27.10
5	181081	Wall	75		27.07	27.10	
6	384247	Engineered High Ground			27.10	27.01	
7	88893	Engineered High Ground	75		27.20	27.44	
8	88831	Engineered High Ground	75		27.44	27.66	

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

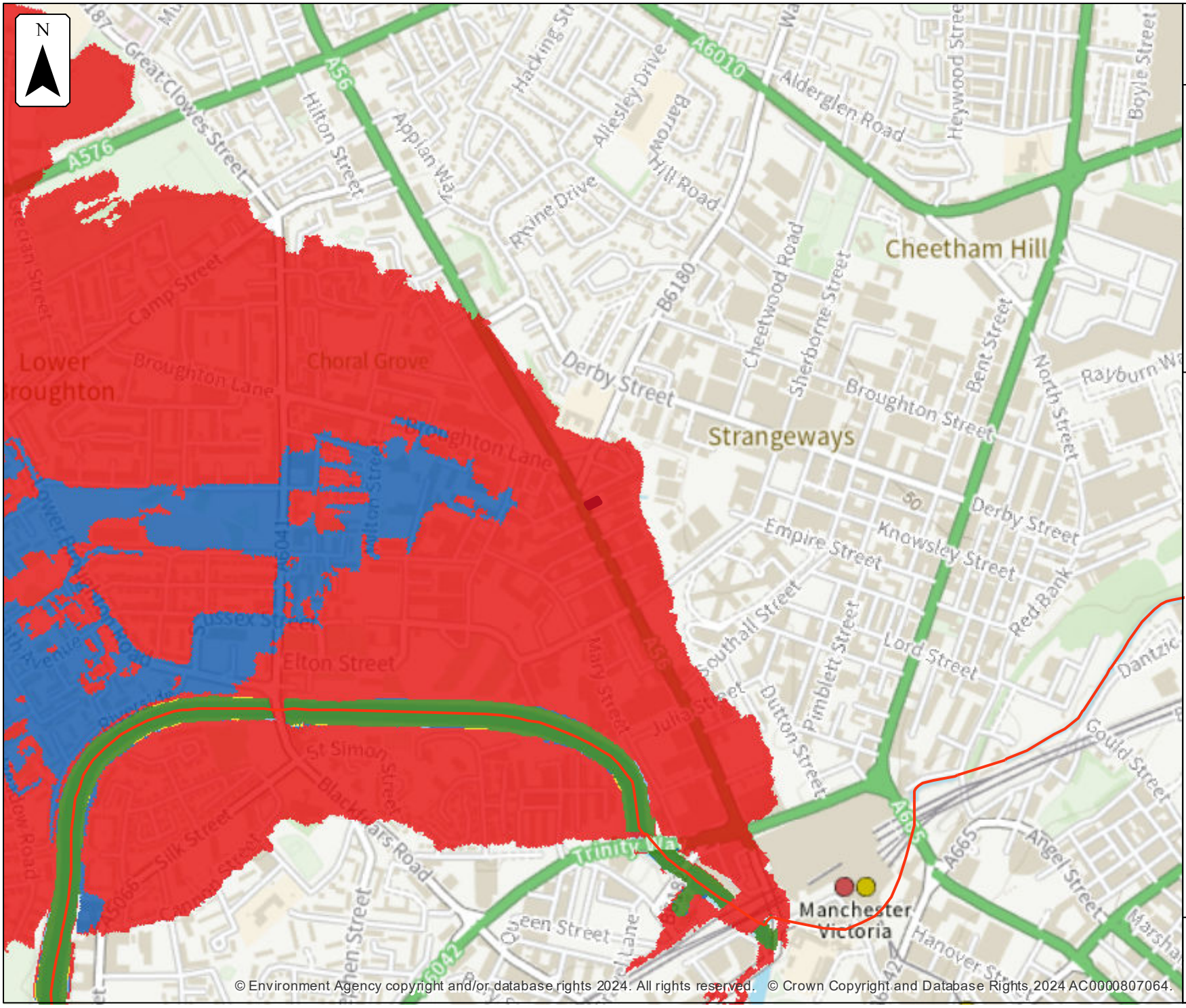
The climate change data included in the models may not include the latest flood risk assessment climate change allowances. Where the new allowances are not available you will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding.

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
- No defences exist modelled fluvial: risk of flooding from rivers where there are no flood defences
- 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
- No defences exist climate change modelled fluvial: risk of flooding from rivers where there are no flood defences, including estimated impact of climate change



Environment Agency

Defended modelled fluvial extent

Location (easting/northing)
383495/399752

Scale
1:10,000

Created
10 Dec 2024

Model name
Lower Irwell 2017

Selected area

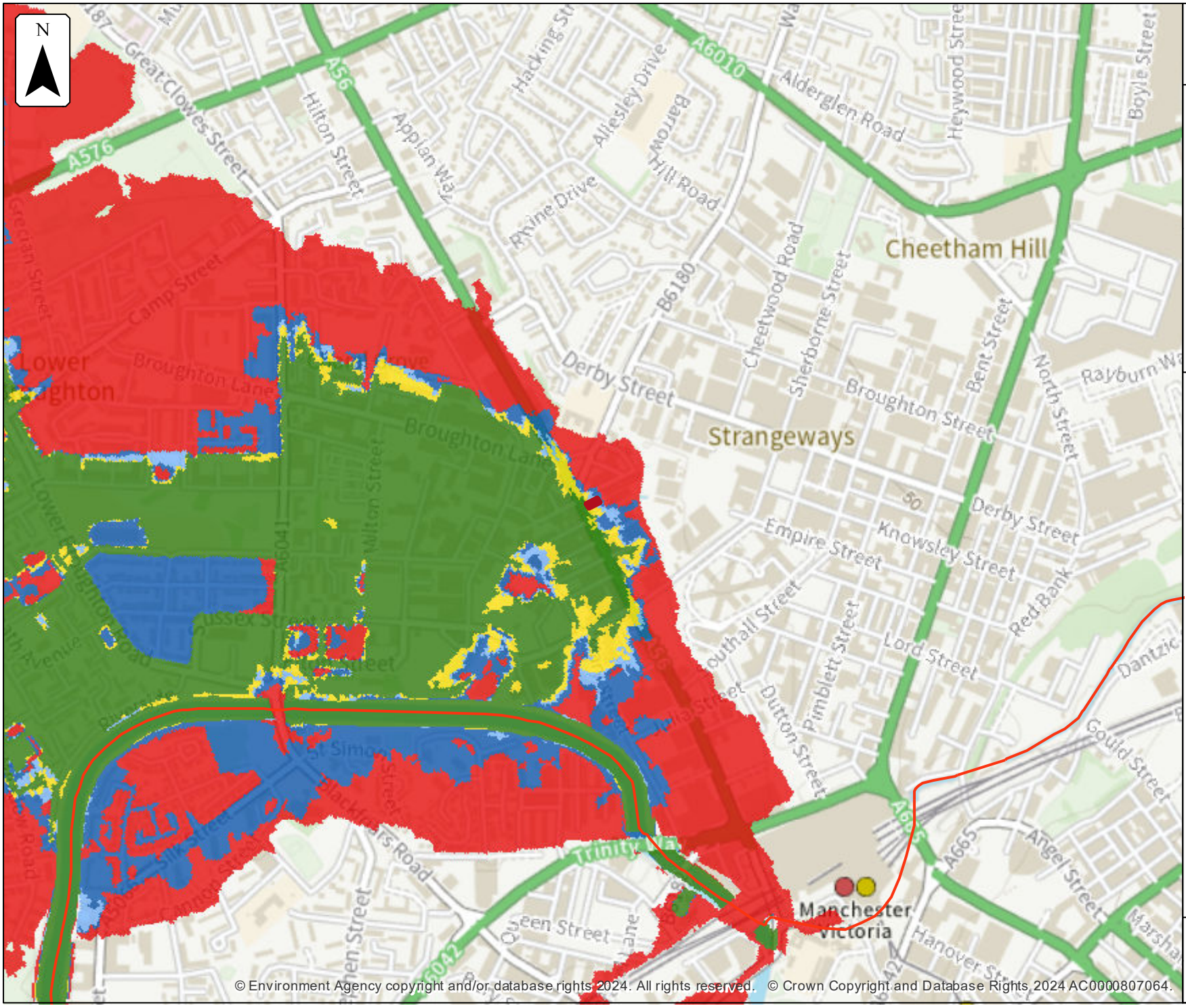
Main river

Modelled flood extent

- 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



Environment Agency

Defences removed modelled fluvial extent

Location (easting/northing)
383495/399752

Scale
1:10,000

Created
10 Dec 2024

Model name
Lower Irwell 2017

Selected area

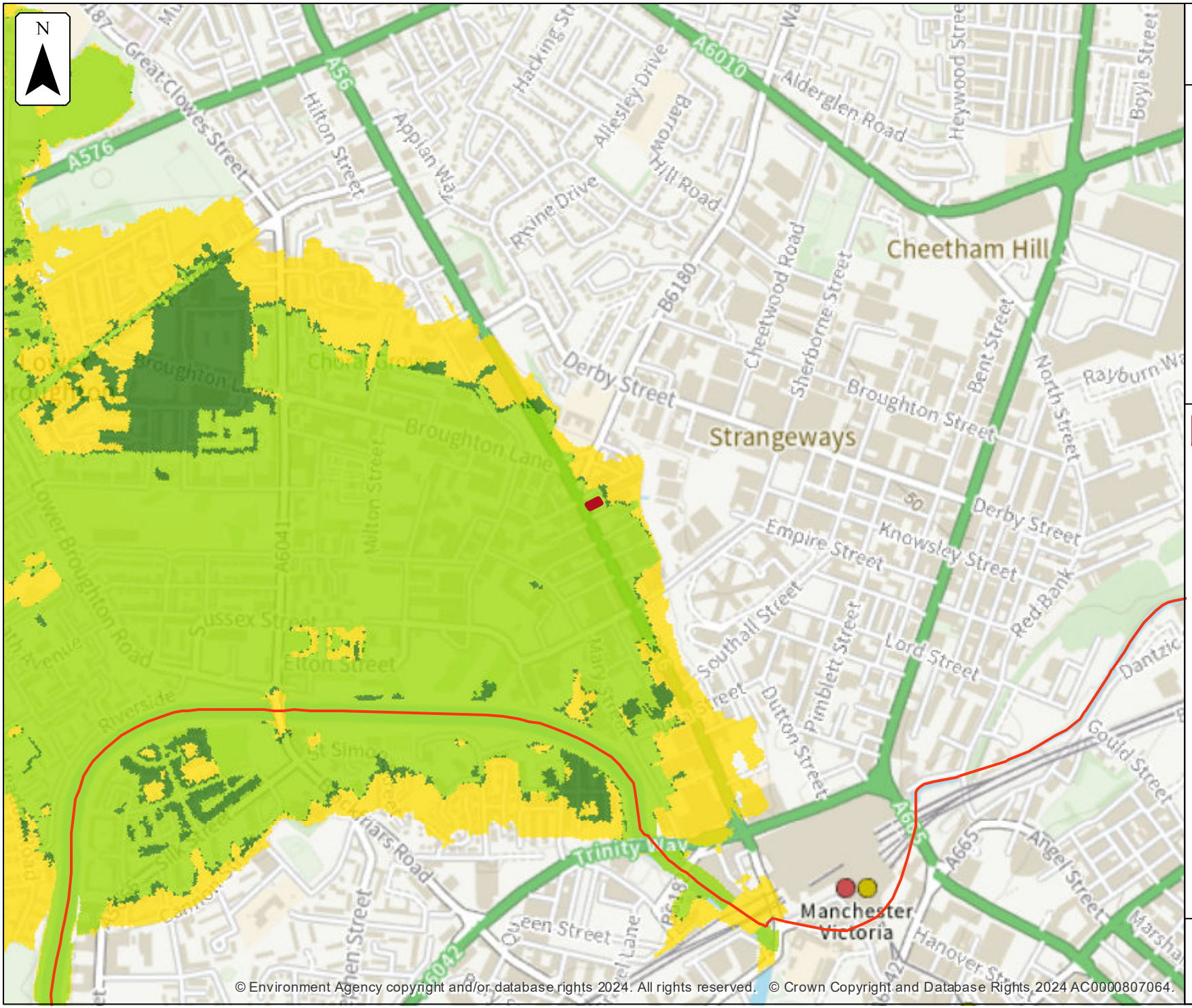
Main river

Modelled flood extent

- 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
A576
A56
A6010
B6180
A665
A6042
Great Clowes Street
Hilton Street
Applan Way
Hacking St
Allesley Drive
Barrow Hill Road
Rhyne Drive
Alderglen Road
Heywood Street
Boyle Street
Cheetham Hill
Cheetwood Road
Sherborne Street
Bent Street
North Street
Rayburn Wa
Derby Street
Broughton Street
Strangeways
Broughton Lane
Lower Broughton Road
Wilton Street
Sussex Street
Elton Street
Riverside
Empire Street
Knowsley Street
Southall Street
Pimblett Street
Red Bank
Lord Street
Dutton Street
Dantzic
Gould Street
Trinity Way
Angel Street
Hanover Street
Queen Street
Manchester Victoria
Environment Agency
Defended climate change modelled fluvial extent
Location (easting/northing)
383495/399752
Scale
1:10,000
Created
10 Dec 2024
Model name
Lower Irwell 2017
Selected area
Main river
Modelled flood extent
1.0% AEP (+30%)
1.0% AEP (+35%)
1.0% AEP (+70%)
Flood extents may not be visible where they overlap other return periods
0 100 200 300 400 500
metres
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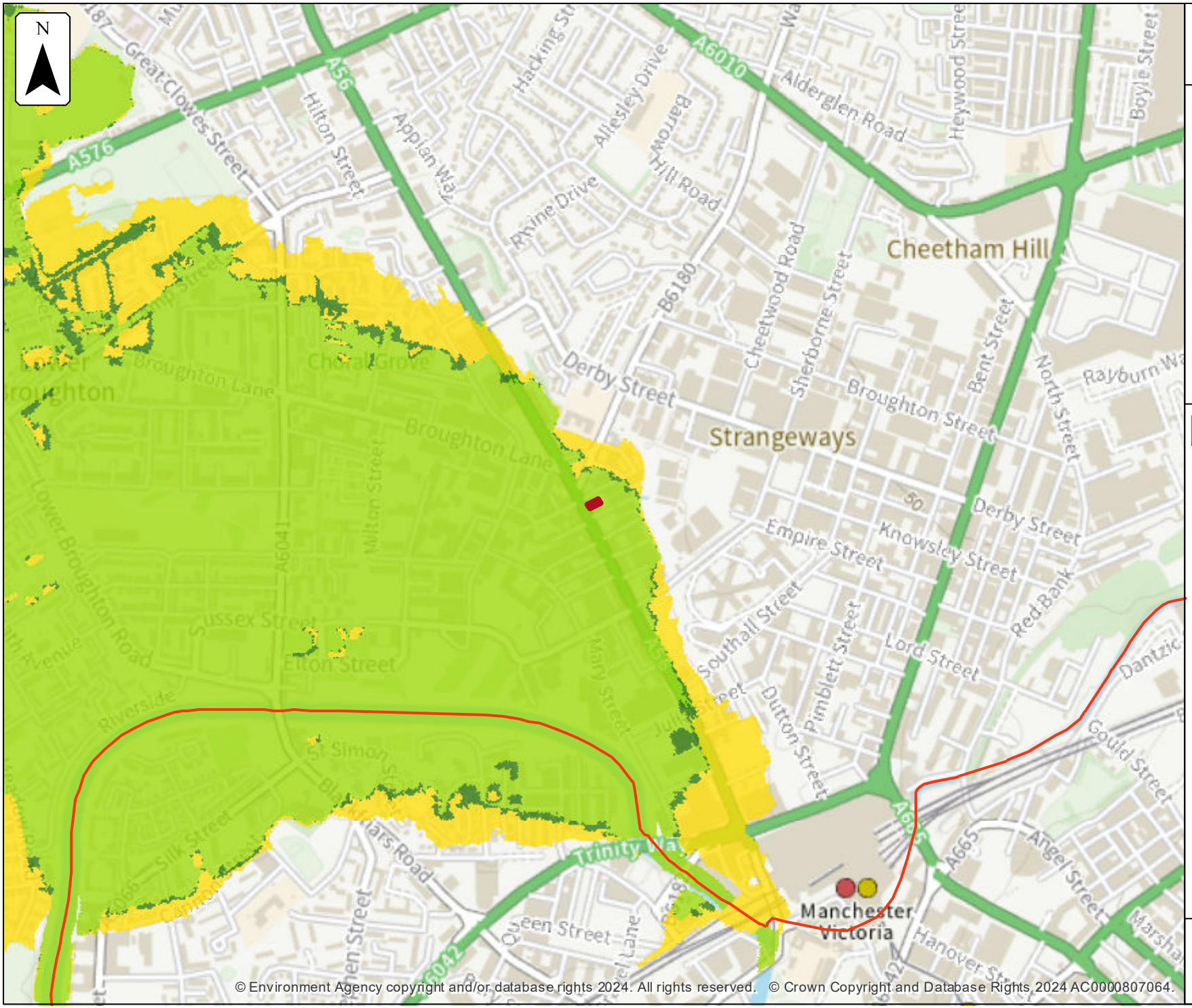

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Environment Agency

Defences removed climate change modelled fluvial extent

Location (easting/northing)
383495/399752

Scale
1:10,000

Created
10 Dec 2024

Model name
Lower Irwell 2017

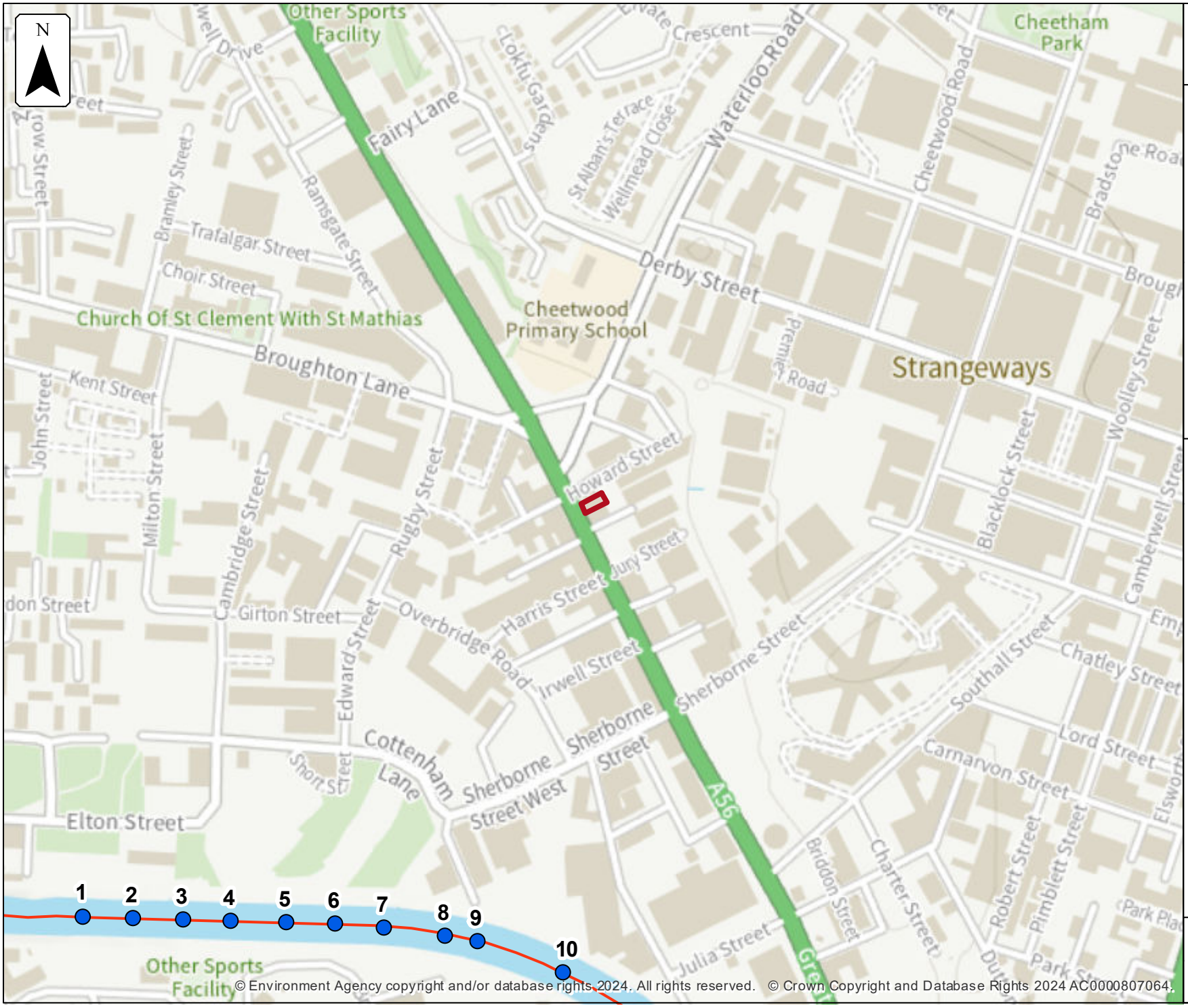
- Selected area
- Main river

Modelled flood extent

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

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

0 100 200 300 400 500
metres



Environment Agency

Defended modelled fluvial node locations

Location (easting/northing)
383495/399752

Scale
1:5,000

Created
10 Dec 2024

Model name
Lower Irwell 2017

- Selected area
- Modelled location
- Main river

0 50 100 150 200 250
metres

Modelled node locations data

Defended

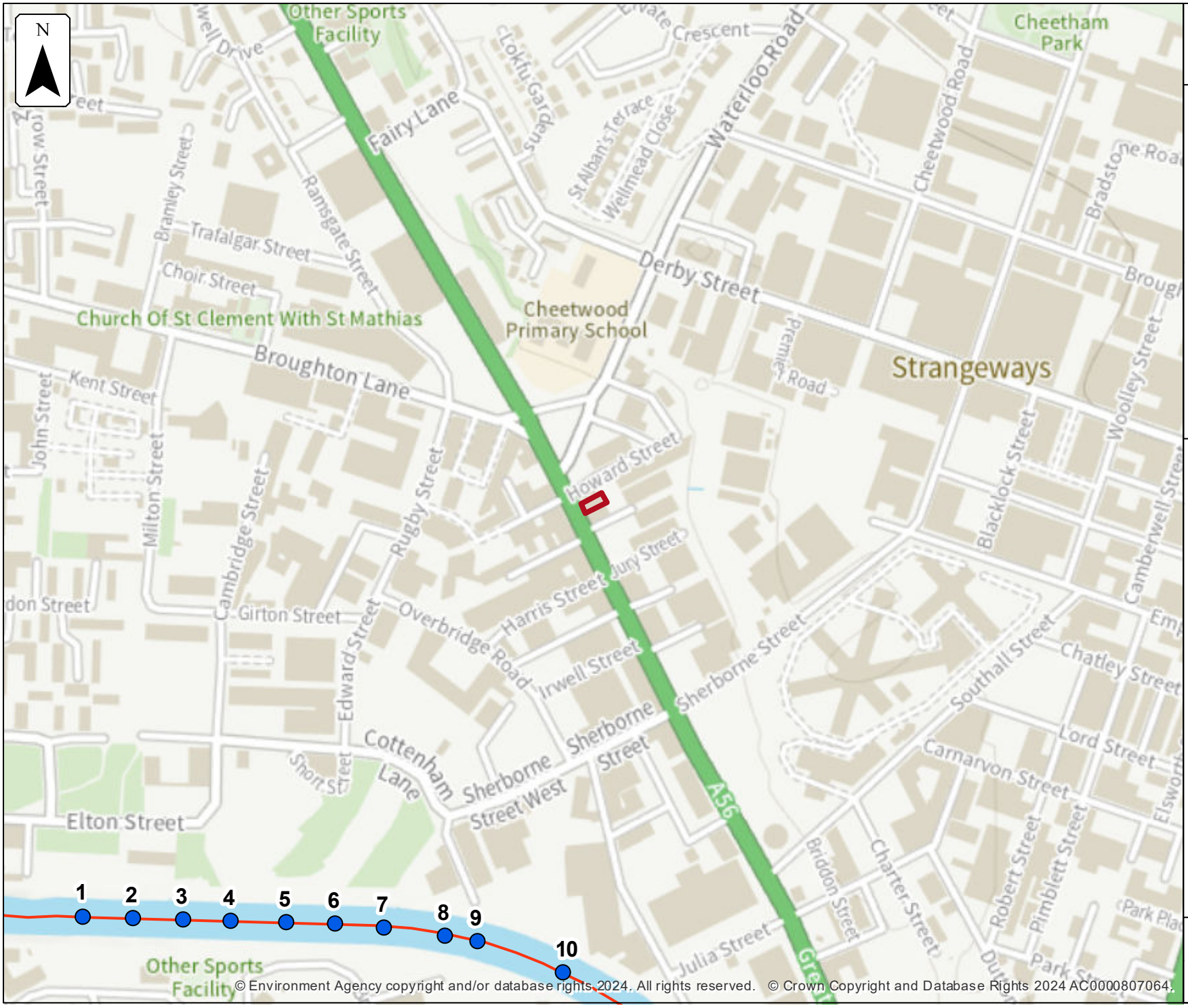
Label	Modelled location ID	Easting	Northing	20% AEP	10% AEP	4% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
				Level	Level	Level	Level	Level	Level	Level	Level
1	1545264	382997	399348	25.73	26.09	26.41	26.62	26.74	26.82	27.11	30.31
2	1545344	383046	399347	25.70	26.06	26.39	26.61	26.73	26.80	27.10	30.30
3	1545220	383096	399345	25.67	26.04	26.37	26.58	26.71	26.78	27.08	30.30
4	1545295	383142	399344	25.65	26.02	26.35	26.57	26.69	26.76	27.06	30.29
5	1545266	383196	399342	25.62	25.99	26.32	26.55	26.67	26.74	27.04	30.29
6	1545219	383243	399341	25.59	25.97	26.30	26.52	26.65	26.72	27.02	30.28
7	1545210	383291	399337	25.57	25.94	26.28	26.51	26.63	26.70	27.0	30.27
8	1545342	383351	399330	25.54	25.92	26.26	26.48	26.61	26.68	26.98	30.24
9	1545294	383383	399325	25.52	25.90	26.24	26.46	26.59	26.66	26.96	30.24
10	1545231	383466	399294	25.39	25.77	26.11	26.34	26.47	26.54	26.83	30.19

Data in this table comes from the Lower Irwell 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.
If no level or flow data is available for a scenario, no table will be shown.

Defended

Label	Modelled location ID	Easting	Northing	20% AEP	10% AEP	4% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
				Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow
1	1545264	382997	399348	318.26	356.55	387.02	406.52	417.24	424.93	472.34	437.04
2	1545344	383046	399347	318.28	356.57	387.05	406.56	417.28	424.98	472.36	437.53
3	1545220	383096	399345	318.30	356.60	387.08	406.60	417.34	425.03	472.38	436.74
4	1545295	383142	399344	318.32	356.63	387.12	406.65	417.38	425.09	472.40	435.80
5	1545266	383196	399342	318.35	356.66	387.16	406.70	417.44	425.15	472.42	433.58
6	1545219	383243	399341	318.37	356.69	387.20	406.74	417.49	425.20	472.45	437.52
7	1545210	383291	399337	318.39	356.72	387.25	406.80	417.55	425.26	472.48	449.06
8	1545342	383351	399330	318.42	356.75	387.29	406.85	417.61	425.33	472.52	474.40
9	1545294	383383	399325	318.43	356.77	387.32	406.88	417.65	425.36	472.53	494.47
10	1545231	383466	399294	318.47	356.83	387.40	406.98	417.76	425.47	472.59	519.73

Data in this table comes from the Lower Irwell 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.
If no level or flow data is available for a scenario, no table will be shown.



Environment Agency

Defences removed modelled fluvial node locations

Location (easting/northing)
383495/399752

Scale
1:5,000

Created
10 Dec 2024

Model name
Lower Irwell 2017

Selected area
Modelled location
Main river

0 50 100 150 200 250
metres

Modelled node locations data

Defences removed

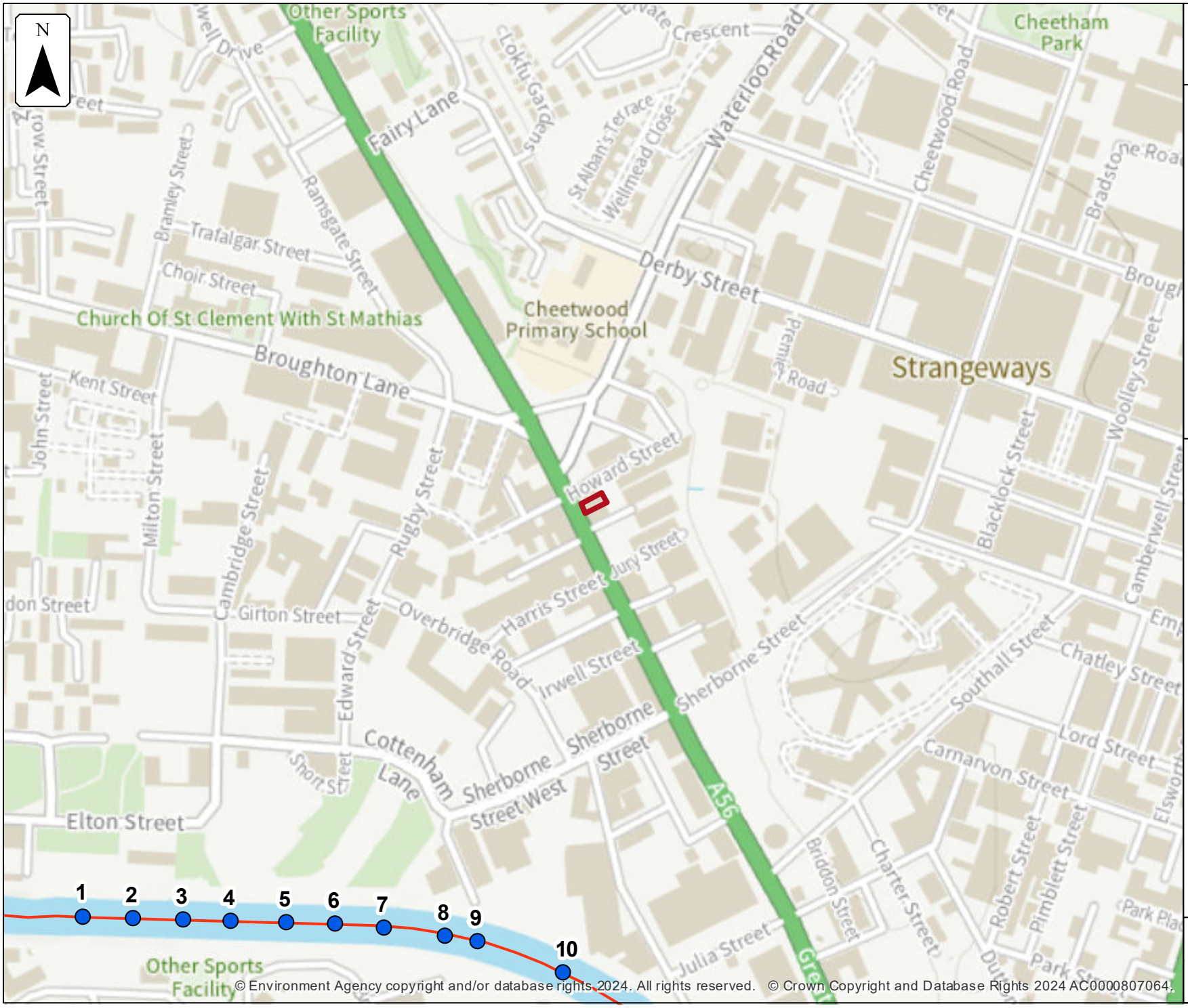
Label	Modelled location ID	Easting	Northing	20% AEP	10% AEP	4% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
				Level	Level	Level	Level	Level	Level	Level	Level
1	1545264	382997	399348	25.52	25.83	26.34	26.63	26.76	27.0	27.54	30.65
2	1545344	383046	399347	25.48	25.80	26.32	26.61	26.74	26.99	27.54	30.65
3	1545220	383096	399345	25.45	25.77	26.29	26.59	26.72	26.96	27.51	30.64
4	1545295	383142	399344	25.43	25.75	26.27	26.57	26.70	26.94	27.48	30.64
5	1545266	383196	399342	25.40	25.72	26.25	26.55	26.67	26.90	27.43	30.63
6	1545219	383243	399341	25.37	25.70	26.22	26.52	26.65	26.87	27.40	30.63
7	1545210	383291	399337	25.35	25.67	26.20	26.50	26.63	26.86	27.38	30.62
8	1545342	383351	399330	25.32	25.64	26.18	26.48	26.61	26.83	27.35	30.60
9	1545294	383383	399325	25.30	25.62	26.15	26.46	26.59	26.80	27.32	30.59
10	1545231	383466	399294	25.17	25.48	26.02	26.33	26.46	26.67	27.18	30.55

Data in this table comes from the Lower Irwell 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.
If no level or flow data is available for a scenario, no table will be shown.

Defences removed

Label	Modelled location ID	Easting	Northing	20% AEP	10% AEP	4% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
				Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow
1	1545264	382997	399348	294.36	332.94	387.89	416.45	427.71	436.85	454.23	451.03
2	1545344	383046	399347	294.38	332.95	387.91	416.48	427.75	436.84	454.02	450.20
3	1545220	383096	399345	294.41	332.96	387.92	416.52	427.78	440.39	459.66	444.25
4	1545295	383142	399344	294.43	332.97	387.94	416.54	427.80	443.18	464.63	440.40
5	1545266	383196	399342	294.46	332.98	387.96	416.56	432.01	451.54	478.80	434.91
6	1545219	383243	399341	294.48	332.99	387.97	416.62	432.83	453.49	485.19	438.68
7	1545210	383291	399337	294.51	333.0	387.99	416.66	432.81	453.95	487.55	443.73
8	1545342	383351	399330	294.54	333.01	388.01	416.70	433.33	457.32	498.71	466.21
9	1545294	383383	399325	294.55	333.02	388.03	416.72	434.26	460.26	507.94	489.16
10	1545231	383466	399294	294.60	333.04	388.06	416.74	434.28	460.28	509.27	517.98

Data in this table comes from the Lower Irwell 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.
If no level or flow data is available for a scenario, no table will be shown.



Environment Agency

Defended climate change modelled fluvial node locations

Location (easting/northing)
383495/399752

Scale
1:5,000

Created
10 Dec 2024

Model name
Lower Irwell 2017

- Selected area
- Modelled location
- Main river

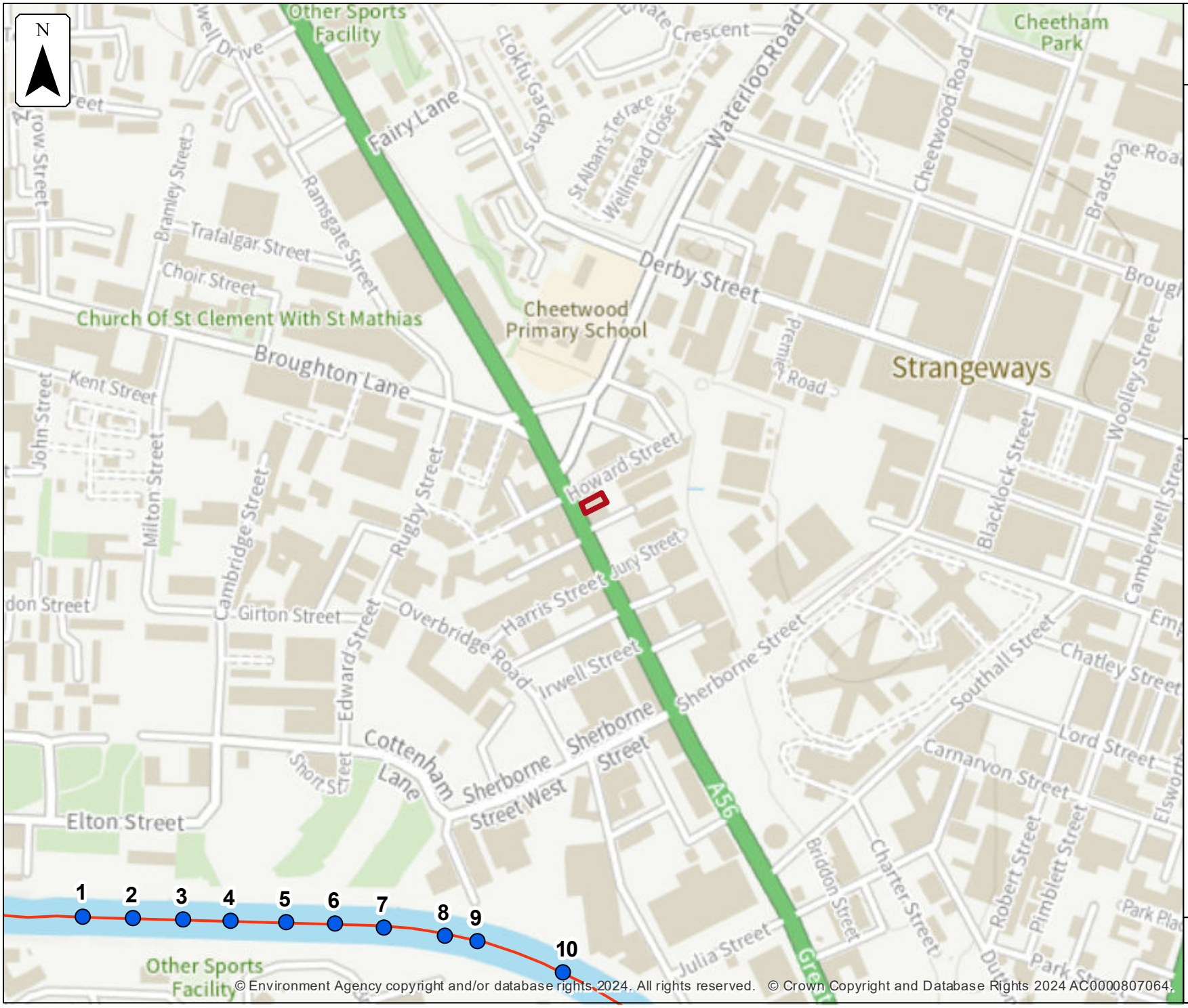
0 50 100 150 200 250
metres

Modelled node locations data

Defended climate change

Label	Modelled location ID	Easting	Northing	1% AEP (+30%)	1% AEP (+35%)	1% AEP (+70%)	1% AEP (+30%)	1% AEP (+35%)	1% AEP (+70%)
				Level	Level	Level	Flow	Flow	Flow
1	1545264	382997	399348	27.72	27.89	29.63	482.70	480.78	463.17
2	1545344	383046	399347	27.71	27.88	29.62	482.70	480.75	463.0
3	1545220	383096	399345	27.69	27.86	29.61	482.71	480.79	462.24
4	1545295	383142	399344	27.66	27.84	29.60	482.72	481.0	461.07
5	1545266	383196	399342	27.62	27.79	29.59	492.54	490.72	470.83
6	1545219	383243	399341	27.58	27.75	29.58	497.49	497.68	483.80
7	1545210	383291	399337	27.56	27.73	29.56	501.37	502.26	490.74
8	1545342	383351	399330	27.52	27.69	29.53	516.71	518.61	509.23
9	1545294	383383	399325	27.50	27.66	29.52	526.40	532.84	523.36
10	1545231	383466	399294	27.36	27.52	29.45	528.87	539.41	541.44

Data in this table comes from the Lower Irwell 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.
If no level or flow data is available for a scenario, no table will be shown.



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Environment Agency

Defences removed climate change modelled fluvial node locations

Location (easting/northing)
383495/399752

Scale
1:5,000

Created
10 Dec 2024

Model name
Lower Irwell 2017

- Selected area
- Modelled location
- Main river

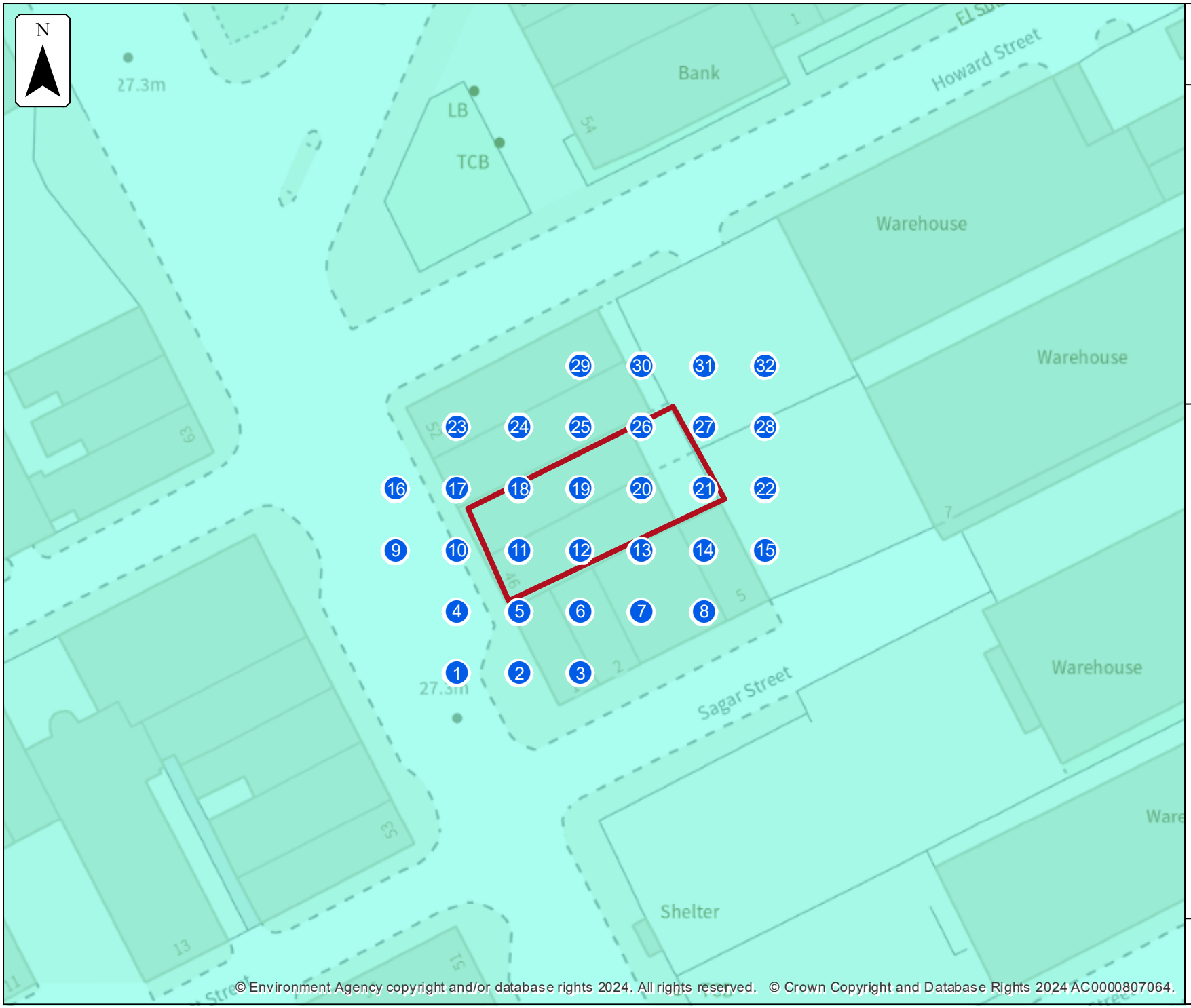
0 50 100 150 200 250
metres

Modelled node locations data

Defences removed climate change

Label	Modelled location ID	Easting	Northing	1% AEP (+30%)	1% AEP (+35%)	1% AEP (+70%)	1% AEP (+30%)	1% AEP (+35%)	1% AEP (+70%)
				Level	Level	Level	Flow	Flow	Flow
1	1545264	382997	399348	28.38	28.61	30.04	457.56	457.53	464.22
2	1545344	383046	399347	28.36	28.60	30.03	457.37	457.26	463.98
3	1545220	383096	399345	28.34	28.58	30.02	460.20	458.67	459.68
4	1545295	383142	399344	28.33	28.57	30.01	463.96	461.90	457.02
5	1545266	383196	399342	28.30	28.55	30.01	474.76	472.64	461.79
6	1545219	383243	399341	28.26	28.52	30.0	484.19	481.16	467.52
7	1545210	383291	399337	28.22	28.48	29.98	492.24	489.0	469.35
8	1545342	383351	399330	28.18	28.44	29.95	508.89	506.19	480.96
9	1545294	383383	399325	28.16	28.42	29.95	525.61	522.09	502.07
10	1545231	383466	399294	28.02	28.30	29.89	548.53	545.82	530.36

Data in this table comes from the Lower Irwell 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.
If no level or flow data is available for a scenario, no table will be shown.



Environment Agency

Defended modelled fluvial extent and height

Location (easting/northing)
383495/399752

Scale
1:500

Created
10 Dec 2024

Model name
Lower Irwell 2017

Selected area

Main river

Modelled 2D grid
Water level in mAOD

- 0 - 30.0
- 30.0 - 30.125
- 30.125 - 30.25
- 30.25 - 30.375
- 30.375 - 30.5
- 30.5 - 30.625
- 30.625 - 30.75
- 30.75 - 30.875
- 30.875 - 31.0

This map shows the 0.1% AEP height data

0 5 10 15 20
metres

Sample point data

Defended

Label	Easting	Northing	20% AEP	4% AEP	2% AEP	1.33% AEP	1% AEP
			Depth	Depth	Depth	Depth	Depth
1	383482	399736	NoData	NoData	NoData	NoData	NoData
2	383488	399736	NoData	NoData	NoData	NoData	NoData
3	383494	399736	NoData	NoData	NoData	NoData	NoData
4	383482	399742	NoData	NoData	NoData	NoData	NoData
5	383488	399742	NoData	NoData	NoData	NoData	NoData
6	383494	399742	NoData	NoData	NoData	NoData	NoData
7	383500	399742	NoData	NoData	NoData	NoData	NoData
8	383506	399742	NoData	NoData	NoData	NoData	NoData
9	383476	399748	NoData	NoData	NoData	NoData	NoData
10	383482	399748	NoData	NoData	NoData	NoData	NoData
11	383488	399748	NoData	NoData	NoData	NoData	NoData
12	383494	399748	NoData	NoData	NoData	NoData	NoData
13	383500	399748	NoData	NoData	NoData	NoData	NoData
14	383506	399748	NoData	NoData	NoData	NoData	NoData
15	383512	399748	NoData	NoData	NoData	NoData	NoData
16	383476	399754	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	20% AEP	4% AEP	2% AEP	1.33% AEP	1% AEP
			Depth	Depth	Depth	Depth	Depth
17	383482	399754	NoData	NoData	NoData	NoData	NoData
18	383488	399754	NoData	NoData	NoData	NoData	NoData
19	383494	399754	NoData	NoData	NoData	NoData	NoData
20	383500	399754	NoData	NoData	NoData	NoData	NoData
21	383506	399754	NoData	NoData	NoData	NoData	NoData
22	383512	399754	NoData	NoData	NoData	NoData	NoData
23	383482	399760	NoData	NoData	NoData	NoData	NoData
24	383488	399760	NoData	NoData	NoData	NoData	NoData
25	383494	399760	NoData	NoData	NoData	NoData	NoData
26	383500	399760	NoData	NoData	NoData	NoData	NoData
27	383506	399760	NoData	NoData	NoData	NoData	NoData
28	383512	399760	NoData	NoData	NoData	NoData	NoData
29	383494	399766	NoData	NoData	NoData	NoData	NoData
30	383500	399766	NoData	NoData	NoData	NoData	NoData
31	383506	399766	NoData	NoData	NoData	NoData	NoData
32	383512	399766	NoData	NoData	NoData	NoData	NoData
Max value in selected area:			Could not determine	Could not determine	Could not determine	Could not determine	Could not determine

Data in this table comes from the Lower Irwell 2017 model.

Height values are shown in mAOD, and depth values are shown in metres.
Any blank cells show where a particular scenario has not been modelled for this location.
Cells which contain text 'NoData' for a scenario show that return period has been modelled but there is no flood risk for that return period for that location.
If no height or depth data is available for a scenario, no table will be shown.
'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.

Defended

Label	Easting	Northing	20% AEP	10% AEP	4% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Height	Height	Height	Height	Height	Height	Height	Height
1	383482	399736	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
2	383488	399736	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.29
3	383494	399736	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.29
4	383482	399742	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
5	383488	399742	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
6	383494	399742	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
7	383500	399742	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
8	383506	399742	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.29
9	383476	399748	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
10	383482	399748	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
11	383488	399748	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
12	383494	399748	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
13	383500	399748	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
14	383506	399748	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
15	383512	399748	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
16	383476	399754	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
17	383482	399754	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
18	383488	399754	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30

Label	Easting	Northing	20% AEP	10% AEP	4% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Height	Height	Height	Height	Height	Height	Height	Height
19	383494	399754	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
20	383500	399754	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
21	383506	399754	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
22	383512	399754	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
23	383482	399760	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.31
24	383488	399760	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
25	383494	399760	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
26	383500	399760	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
27	383506	399760	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
28	383512	399760	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
29	383494	399766	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
30	383500	399766	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
31	383506	399766	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
32	383512	399766	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.30
Max value in selected area:			Could not determine	Could not determine	Could not determine	Could not determine	Could not determine	Could not determine	Could not determine	30.30

Data in this table comes from the Lower Irwell 2017 model.
Height values are shown in mAOD, and depth values are shown in metres.
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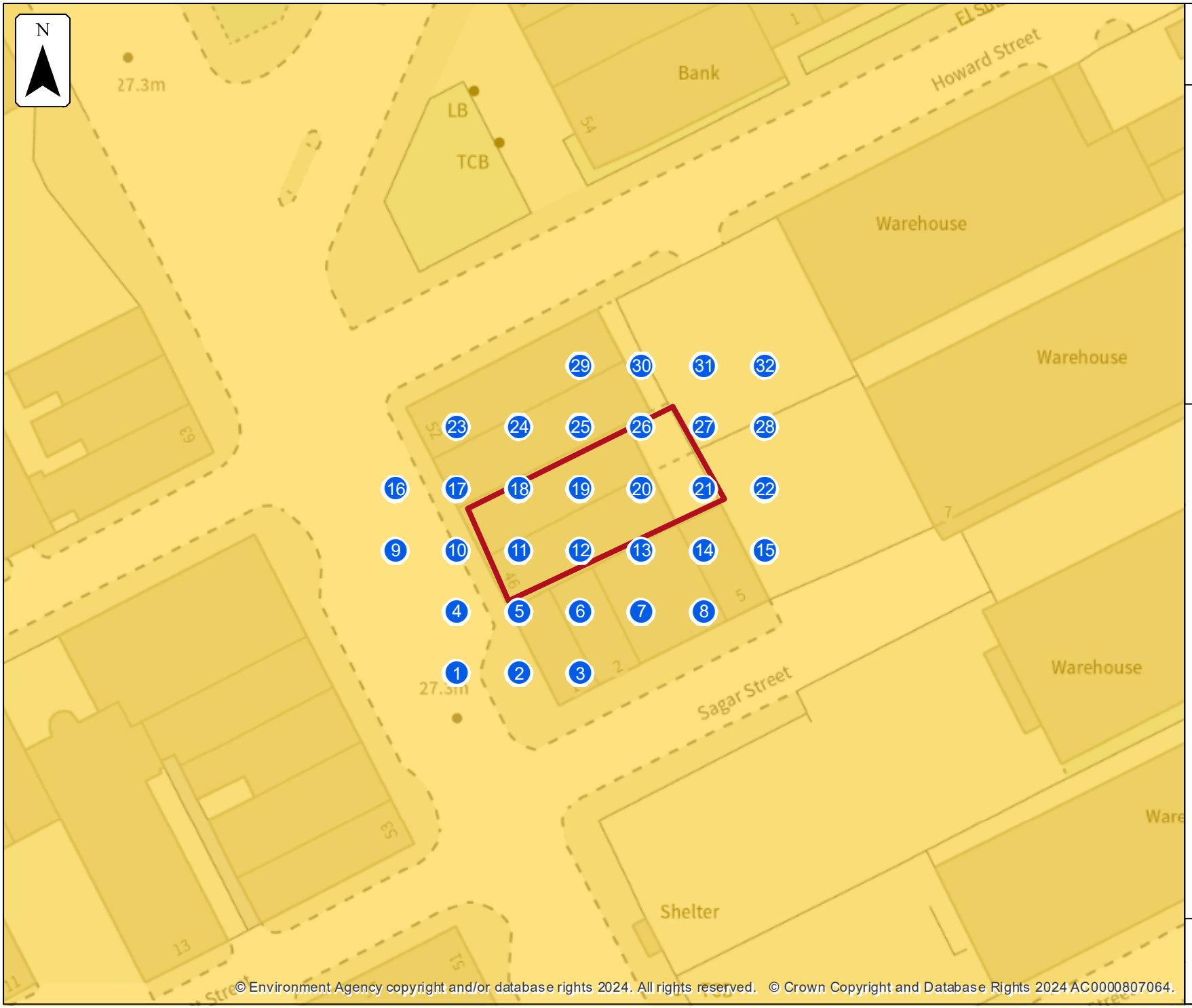
If no height or depth data is available for a scenario, no table will be shown.

'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.



Environment Agency

Defences removed modelled fluvial extent and height

Location (easting/northing)
383495/399752

Scale
1:500

Created
10 Dec 2024

Model name
Lower Irwell 2017

Selected area

Main river

Modelled 2D grid
Water level in mAOD

- 0 - 30.0
- 30.0 - 30.125
- 30.125 - 30.25
- 30.25 - 30.375
- 30.375 - 30.5
- 30.5 - 30.625
- 30.625 - 30.75
- 30.75 - 30.875
- 30.875 - 31.0

This map shows the 0.1% AEP height data

0 5 10 15 20
metres

Sample point data

Defences removed

Label	Easting	Northing	20% AEP	10% AEP	4% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
1	383482	399736	NoData	NoData	NoData	0.04	0.27	0.36	0.62	3.48
2	383488	399736	NoData	NoData	NoData	NoData	0.21	0.31	0.56	3.42
3	383494	399736	NoData	NoData	NoData	NoData	0.15	0.25	0.51	3.36
4	383482	399742	NoData	NoData	NoData	NoData	0.26	0.36	0.62	3.48
5	383488	399742	NoData	NoData	NoData	NoData	0.13	0.23	0.49	3.34
6	383494	399742	NoData	NoData	NoData	NoData	0.07	0.17	0.43	3.28
7	383500	399742	NoData	NoData	NoData	NoData	0.08	0.18	0.44	3.30
8	383506	399742	NoData	NoData	NoData	NoData	0.01	0.11	0.37	3.23
9	383476	399748	NoData	NoData	NoData	0.08	0.31	0.41	0.67	3.52
10	383482	399748	NoData	NoData	NoData	NoData	0.20	0.30	0.56	3.42
11	383488	399748	NoData	NoData	NoData	NoData	0.04	0.14	0.40	3.26
12	383494	399748	NoData	NoData	NoData	NoData	0.01	0.09	0.36	3.21
13	383500	399748	NoData	NoData	NoData	NoData	NoData	0.14	0.40	3.26
14	383506	399748	NoData	NoData	NoData	NoData	NoData	0.05	0.31	3.16
15	383512	399748	NoData	NoData	NoData	NoData	NoData	NoData	0.30	3.16
16	383476	399754	NoData	NoData	NoData	0.05	0.27	0.37	0.64	3.49

Label	Easting	Northing	20% AEP	10% AEP	4% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
17	383482	399754	NoData	NoData	NoData	NoData	0.05	0.15	0.41	3.27
18	383488	399754	NoData	NoData	NoData	NoData	NoData	0.08	0.34	3.19
19	383494	399754	NoData	NoData	NoData	NoData	NoData	0.09	0.36	3.21
20	383500	399754	NoData	NoData	NoData	NoData	NoData	0.11	0.38	3.23
21	383506	399754	NoData	NoData	NoData	NoData	NoData	NoData	0.32	3.17
22	383512	399754	NoData	NoData	NoData	NoData	NoData	0.00	0.23	3.09
23	383482	399760	NoData	NoData	NoData	NoData	0.10	0.20	0.46	3.32
24	383488	399760	NoData	NoData	NoData	NoData	0.11	0.20	0.47	3.32
25	383494	399760	NoData	NoData	NoData	NoData	0.06	0.15	0.41	3.27
26	383500	399760	NoData	NoData	NoData	NoData	NoData	0.08	0.34	3.19
27	383506	399760	NoData	NoData	NoData	NoData	NoData	0.06	0.29	3.14
28	383512	399760	NoData	NoData	NoData	NoData	NoData	NoData	0.02	2.85
29	383494	399766	NoData	NoData	NoData	NoData	NoData	0.05	0.32	3.17
30	383500	399766	NoData	NoData	NoData	NoData	NoData	NoData	0.28	3.13
31	383506	399766	NoData	NoData	NoData	NoData	NoData	NoData	0.05	2.90
32	383512	399766	NoData	NoData	NoData	NoData	NoData	NoData	NoData	2.77
Max value in selected area:			Could not determine	Could not determine	Could not determine	Could not determine	0.09	0.19	0.45	3.31

Data in this table comes from the Lower Irwell 2017 model.

Height values are shown in mAOD, and depth values are shown in metres.
Any blank cells show where a particular scenario has not been modelled for this location.
Cells which contain text 'NoData' for a scenario show that return period has been modelled but there is no flood risk for that return period for that location.
If no height or depth data is available for a scenario, no table will be shown.
'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.

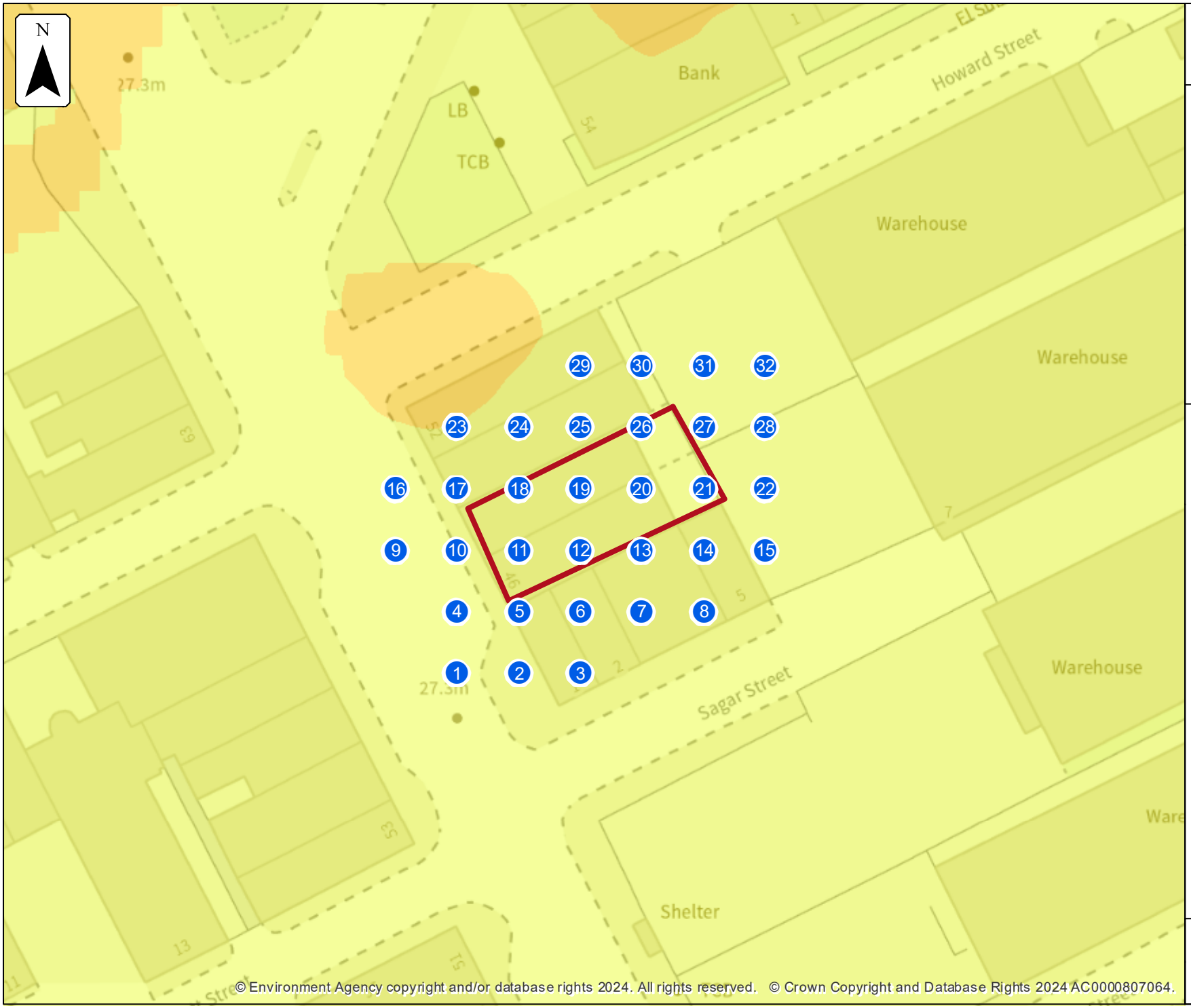
Defences removed

Label	Easting	Northing	20% AEP	10% AEP	4% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Height	Height	Height	Height	Height	Height	Height	Height
1	383482	399736	NoData	NoData	NoData	27.20	27.43	27.52	27.78	30.64
2	383488	399736	NoData	NoData	NoData	NoData	27.42	27.52	27.78	30.64
3	383494	399736	NoData	NoData	NoData	NoData	27.42	27.52	27.78	30.64
4	383482	399742	NoData	NoData	NoData	NoData	27.43	27.52	27.79	30.64
5	383488	399742	NoData	NoData	NoData	NoData	27.43	27.52	27.78	30.64
6	383494	399742	NoData	NoData	NoData	NoData	27.42	27.52	27.78	30.64
7	383500	399742	NoData	NoData	NoData	NoData	27.42	27.52	27.78	30.64
8	383506	399742	NoData	NoData	NoData	NoData	27.42	27.52	27.78	30.64
9	383476	399748	NoData	NoData	NoData	27.20	27.43	27.53	27.79	30.65
10	383482	399748	NoData	NoData	NoData	NoData	27.43	27.53	27.79	30.64
11	383488	399748	NoData	NoData	NoData	NoData	27.42	27.52	27.79	30.64
12	383494	399748	NoData	NoData	NoData	NoData	27.42	27.52	27.79	30.64
13	383500	399748	NoData	NoData	NoData	NoData	NoData	27.52	27.79	30.64
14	383506	399748	NoData	NoData	NoData	NoData	NoData	27.52	27.78	30.64
15	383512	399748	NoData	NoData	NoData	NoData	NoData	NoData	27.78	30.64
16	383476	399754	NoData	NoData	NoData	27.20	27.43	27.53	27.80	30.65
17	383482	399754	NoData	NoData	NoData	NoData	27.43	27.53	27.80	30.65
18	383488	399754	NoData	NoData	NoData	NoData	NoData	27.53	27.79	30.65

Label	Easting	Northing	20% AEP	10% AEP	4% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Height	Height	Height	Height	Height	Height	Height	Height
19	383494	399754	NoData	NoData	NoData	NoData	NoData	27.53	27.79	30.64
20	383500	399754	NoData	NoData	NoData	NoData	NoData	27.52	27.79	30.64
21	383506	399754	NoData	NoData	NoData	NoData	NoData	NoData	27.79	30.64
22	383512	399754	NoData	NoData	NoData	NoData	NoData	27.53	27.79	30.64
23	383482	399760	NoData	NoData	NoData	NoData	27.43	27.53	27.80	30.65
24	383488	399760	NoData	NoData	NoData	NoData	27.43	27.53	27.80	30.65
25	383494	399760	NoData	NoData	NoData	NoData	27.43	27.53	27.79	30.65
26	383500	399760	NoData	NoData	NoData	NoData	NoData	27.53	27.79	30.65
27	383506	399760	NoData	NoData	NoData	NoData	NoData	27.53	27.79	30.64
28	383512	399760	NoData	NoData	NoData	NoData	NoData	NoData	27.79	30.64
29	383494	399766	NoData	NoData	NoData	NoData	NoData	27.53	27.79	30.65
30	383500	399766	NoData	NoData	NoData	NoData	NoData	NoData	27.80	30.65
31	383506	399766	NoData	NoData	NoData	NoData	NoData	NoData	27.80	30.65
32	383512	399766	NoData	NoData	NoData	NoData	NoData	NoData	NoData	30.65
Max value in selected area:			Could not determine	Could not determine	Could not determine	Could not determine	27.43	27.53	27.79	30.65

Data in this table comes from the Lower Irwell 2017 model.
Height values are shown in mAOD, and depth values are shown in metres.
Any blank cells show where a particular scenario has not been modelled for this location.
Cells which contain text 'NoData' for a scenario show that return period has been modelled but there is no flood risk for that return period for that location.
If no height or depth data is available for a scenario, no table will be shown.

'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.



Environment Agency

Defended climate change modelled fluvial extent and height

Location (easting/northing)
383495/399752

Scale
1:500

Created
10 Dec 2024

Model name
Lower Irwell 2017

Selected area

Main river

Modelled 2D grid
Water level in mAOD

- 0 - 29.0
- 29.0 - 29.125
- 29.125 - 29.25
- 29.25 - 29.375
- 29.375 - 29.5
- 29.5 - 29.625
- 29.625 - 29.75
- 29.75 - 29.875
- 29.875 - 30.0

This map shows the 1.0% AEP +70% height data

0 5 10 15 20
metres

Sample point data

Defended climate change

Label	Easting	Northing	1% AEP (+35%)	1% AEP (+70%)	1% AEP (+30%)	1% AEP (+35%)	1% AEP (+70%)
			Depth	Depth	Height	Height	Height
1	383482	399736	0.83	2.45	27.87	27.99	29.61
2	383488	399736	0.77	2.39	27.87	27.99	29.61
3	383494	399736	0.71	2.33	27.87	27.98	29.60
4	383482	399742	0.82	2.44	27.87	27.99	29.61
5	383488	399742	0.69	2.31	27.87	27.99	29.61
6	383494	399742	0.63	2.25	27.87	27.99	29.61
7	383500	399742	0.64	2.26	27.87	27.99	29.61
8	383506	399742	0.57	2.19	27.87	27.99	29.61
9	383476	399748	0.88	2.49	27.88	28.00	29.61
10	383482	399748	0.76	2.38	27.87	27.99	29.61
11	383488	399748	0.60	2.22	27.87	27.99	29.61
12	383494	399748	0.56	2.18	27.87	27.99	29.61
13	383500	399748	0.60	2.22	27.87	27.99	29.61
14	383506	399748	0.51	2.13	27.87	27.99	29.61
15	383512	399748	0.50	2.12	27.87	27.99	29.61
16	383476	399754	0.84	2.46	27.88	28.00	29.62

Label	Easting	Northing	1% AEP (+35%)	1% AEP (+70%)	1% AEP (+30%)	1% AEP (+35%)	1% AEP (+70%)
			Depth	Depth	Height	Height	Height
17	383482	399754	0.62	2.24	27.88	28.00	29.62
18	383488	399754	0.55	2.16	27.88	28.00	29.61
19	383494	399754	0.57	2.18	27.88	28.00	29.61
20	383500	399754	0.58	2.20	27.88	28.00	29.61
21	383506	399754	0.53	2.14	27.88	28.00	29.61
22	383512	399754	0.44	2.06	27.87	27.99	29.61
23	383482	399760	0.67	2.29	27.88	28.00	29.62
24	383488	399760	0.68	2.29	27.88	28.00	29.62
25	383494	399760	0.62	2.23	27.88	28	29.61
26	383500	399760	0.55	2.16	27.88	28.00	29.61
27	383506	399760	0.49	2.11	27.88	28.00	29.61
28	383512	399760	0.20	1.81	27.88	28.00	29.61
29	383494	399766	0.52	2.14	27.88	28.00	29.61
30	383500	399766	0.49	2.10	27.88	28.00	29.61
31	383506	399766	0.26	1.87	27.88	28	29.61
32	383512	399766	0.12	1.74	27.88	28.00	29.61
Max value in selected area:			0.65	2.27	27.88	28.00	29.61

Data in this table comes from the Lower Irwell 2017 model.

Height values are shown in mAOD, and depth values are shown in metres.
Any blank cells show where a particular scenario has not been modelled for this location.
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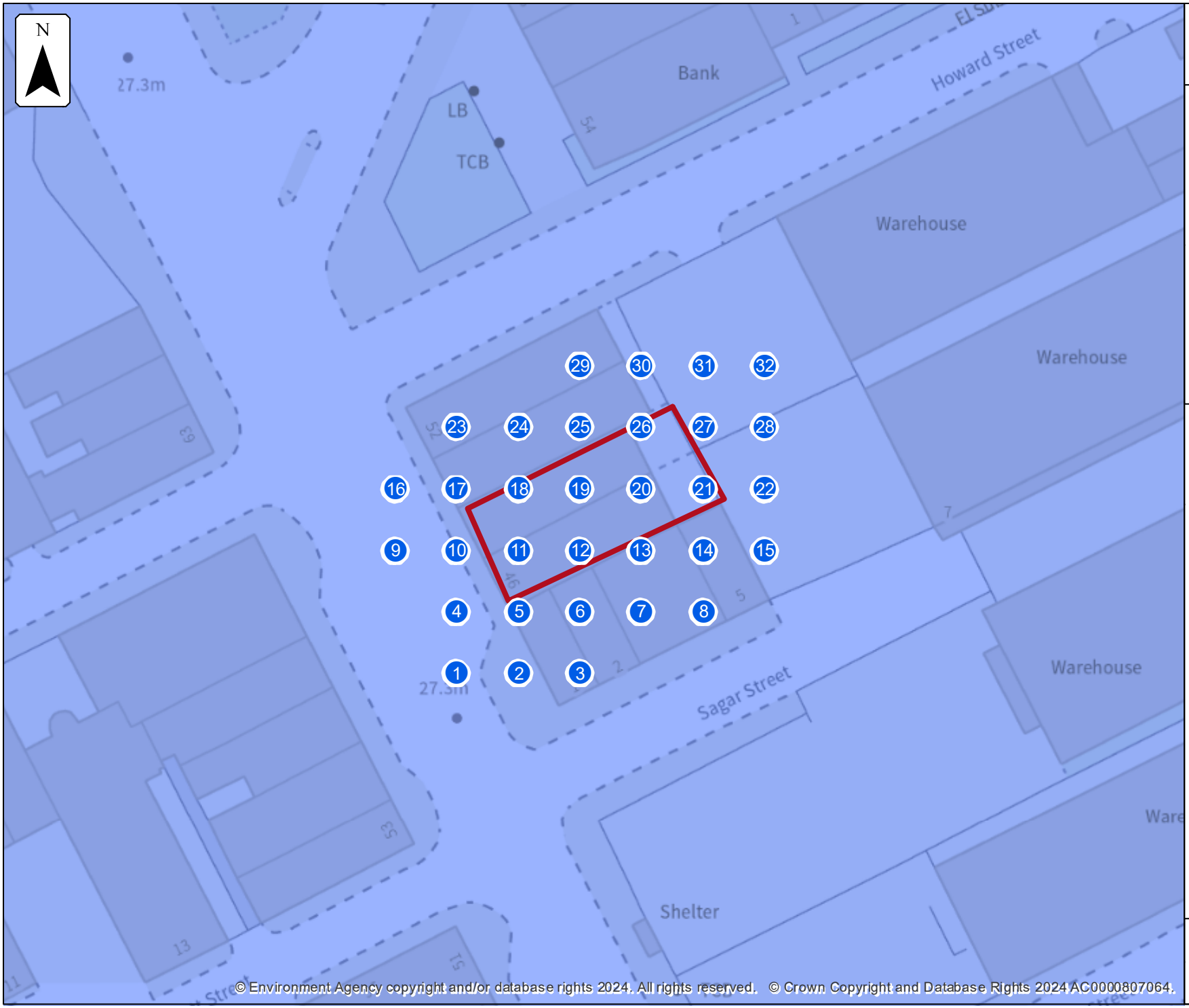
If no height or depth data is available for a scenario, no table will be shown.
'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.



Environment Agency

Defences removed climate change modelled fluvial extent and height

Location (easting/northing)
383495/399752

Scale
1:500

Created
10 Dec 2024

Model name
Lower Irwell 2017

Selected area

Main river

Modelled 2D grid
Water level in mAOD

- 0 - 30.0
- 30.0 - 30.125
- 30.125 - 30.25
- 30.25 - 30.375
- 30.375 - 30.5
- 30.5 - 30.625
- 30.625 - 30.75
- 30.75 - 30.875
- 30.875 - 31.0

This map shows the
1.0% AEP +70% height data

0 5 10 15 20
metres

Sample point data

Defences removed climate change

Label	Easting	Northing	1% AEP (+30%)	1% AEP (+35%)	1% AEP (+70%)	1% AEP (+30%)	1% AEP (+35%)	1% AEP (+70%)
			Depth	Depth	Depth	Height	Height	Height
1	383482	399736	1.24	1.45	2.86	28.39	28.61	30.02
2	383488	399736	1.17	1.39	2.80	28.39	28.61	30.02
3	383494	399736	1.11	1.33	2.74	28.39	28.61	30.02
4	383482	399742	1.23	1.45	2.85	28.39	28.61	30.02
5	383488	399742	1.09	1.31	2.72	28.39	28.61	30.02
6	383494	399742	1.03	1.25	2.66	28.39	28.61	30.02
7	383500	399742	1.05	1.27	2.67	28.39	28.61	30.02
8	383506	399742	0.98	1.20	2.60	28.39	28.61	30.02
9	383476	399748	1.28	1.50	2.90	28.41	28.63	30.02
10	383482	399748	1.17	1.39	2.79	28.40	28.62	30.02
11	383488	399748	1.01	1.23	2.63	28.40	28.62	30.02
12	383494	399748	0.97	1.19	2.59	28.40	28.62	30.02
13	383500	399748	1.01	1.23	2.63	28.40	28.61	30.02
14	383506	399748	0.92	1.14	2.54	28.39	28.61	30.02
15	383512	399748	0.91	1.13	2.53	28.39	28.61	30.02
16	383476	399754	1.25	1.47	2.87	28.41	28.63	30.03

Label	Easting	Northing	1% AEP (+30%)	1% AEP (+35%)	1% AEP (+70%)	1% AEP (+30%)	1% AEP (+35%)	1% AEP (+70%)
			Depth	Depth	Depth	Height	Height	Height
17	383482	399754	1.03	1.25	2.65	28.41	28.63	30.03
18	383488	399754	0.95	1.17	2.57	28.40	28.62	30.02
19	383494	399754	0.97	1.19	2.59	28.40	28.62	30.02
20	383500	399754	0.99	1.21	2.61	28.40	28.62	30.02
21	383506	399754	0.93	1.15	2.55	28.40	28.62	30.02
22	383512	399754	0.84	1.06	2.47	28.40	28.61	30.02
23	383482	399760	1.08	1.30	2.70	28.42	28.63	30.03
24	383488	399760	1.08	1.30	2.70	28.41	28.63	30.03
25	383494	399760	1.02	1.25	2.65	28.40	28.62	30.02
26	383500	399760	0.95	1.17	2.57	28.40	28.62	30.02
27	383506	399760	0.90	1.12	2.52	28.40	28.62	30.02
28	383512	399760	0.60	0.82	2.22	28.40	28.62	30.02
29	383494	399766	0.93	1.15	2.55	28.41	28.63	30.02
30	383500	399766	0.89	1.11	2.51	28.40	28.62	30.02
31	383506	399766	0.66	0.88	2.28	28.40	28.62	30.02
32	383512	399766	0.53	0.75	2.15	28.40	28.62	30.02
Max value in selected area:			1.06	1.28	2.68	28.41	28.63	30.02

Data in this table comes from the Lower Irwell 2017 model.

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