

WELCOMB STREET

Flood Risk Assessment



HLEF83419
Welcomb Street
1
September 2022

REPORT

Quality Management

Version	Status	Authored by	Reviewed by	Approved by	Review date
1	Draft	Jessica Grady / Lauren Sims	Chris Rogers	Chris Rogers	September 2022

Approval for issue

Chris Rogers

30 September 2022

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Prepared by:

Prepared for:

RPS Consulting Services Ltd

Network Space

5 New York Street
Manchester, M1 4JB

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1 INTRODUCTION

- 1.1 RPS was commissioned to undertake a Flood Risk Assessment (FRA) of land at *Welcomb Street, M11 2NB* in relation to the proposed development.
- 1.2 The aim of the FRA is to outline the potential for the site to be impacted by flooding, the impacts of the proposed development on flooding in the vicinity of the site, and the proposed measures which could be incorporated into the development to mitigate the identified risk. The report has been produced in accordance with the guidance detailed in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance (PPG). Reference has also been made to the Manchester City Council Strategic Flood Risk Assessment (SFRA) and the Manchester City Council Local Flood Risk Management Strategy (LFRMS).
- 1.3 This report has been produced in consultation with the Environment Agency (EA) and the Lead Local Flood Authority (LLFA). The site is not located within an Internal Drainage Board (IDB) District.
- 1.4 This report is not intended to provide formal details of the final drainage design for the development. However, it provides information regarding the capabilities of the conceptual surface water drainage strategy to meet the requirements of the NPPF.
- 1.5 The desk study was undertaken by reference to information provided / published by the following bodies:
- EA;
 - Manchester City Council (MCC);
 - Centre for Ecology and Hydrology;
 - British Geological Survey (BGS);
 - Ordnance Survey (OS); and
 - United Utilities.

2 PLANNING POLICY CONTEXT

National Planning Policy

- 2.1 The National Planning Policy Framework (NPPF) was released in March 2012 and was updated in July 2021. The document advises of the requirements for a site-specific Flood Risk Assessment (FRA) for any of the following cases (Planning and Flood Risk paragraph 163 (footnote 50)):
- All proposals (including minor development and change of use) located within the EA designated floodplain, recognised as either Flood Zone 2 (medium probability) or Flood Zone 3 (high probability);
 - All proposals of 1 hectare (ha) or greater in an area located in Flood Zone 1 (low probability);
 - All proposals within an area which has critical drainage problems (as notified to the Local Planning Authority by the EA);
 - Land identified in a strategic flood risk assessment as being at increased flood risk in future; and
 - Where proposed development may be subject to other sources of flooding, where its development would introduce a more vulnerable use.
- 2.2 Paragraph 165 of the updated NPPF identifies that major developments (developments of 10 homes or more and to major commercial development) should incorporate Sustainable Drainage Systems unless there is clear evidence that this would be inappropriate. The systems used should:
- a. Take account of advice from the Lead Local Flood Authority;
 - b. Have appropriate proposed minimum operational standards;
 - c. Have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and
 - d. Where possible, provide multifunctional benefits.
- 2.3 Defra published their 'Non-statutory technical standards for sustainable drainage systems' in March 2015. These are supported by the revised NPPF.

Local Planning Policy

- 2.4 The Manchester City Council Local Plan was adopted in July 2012 and contains the following Policies relating to flood risk and drainage:

Policy EN14 Flood Risk

- *In line with the risk-based sequential approach contained within PPS25, development should be directed away from sites at the greatest risk of flooding, and towards sites with little or no risk of flooding; this should take account of all sources of flooding identified in the Manchester-Salford-Trafford Strategic Flood Risk Assessment (SFRA).*
- *In addition to the requirements for site-specific Flood Risk Assessments (FRAs) set out in PPS25, an appropriate FRA will also be required for all development proposals, including changes of use, on sites greater than 0.5ha within Critical Drainage Areas (CDAs) and Canal Hazard Zones identified in the SFRA.*
- *All new development should minimise surface water run-off, including through Sustainable Drainage Systems (SUDS) and the appropriate use of Green Infrastructure. Developers should have regard to the surface water run-off rates in the SFRA User Guide. In CDAs, evidence to justify the surface water run-off approach / rates will be required.*

- *The City of Manchester contains many sections of rivers which are culverted or 'hidden'; where these are indicated in the SFRA beneath the proposed development site, further investigation will be required and the development proposal should take this into account; where feasible and appropriate development should seek to open up culverted/hidden rivers to reduce the associated flood risk and danger of collapse, taking advantage of opportunities to enhance biodiversity and Green Infrastructure.*

2.5 The Manchester City Council SFRA identifies and maps flood risk from all sources at a borough-wide scale as well as providing guidance on producing site specific FRAs. Relevant information from the SFRA has been referenced throughout this FRA report.

2.6 The Manchester City Council LFRMS assesses the risk of surface water flooding within Manchester and identifies options to manage risk to acceptable level. Relevant information from the LFRMS has been reproduced throughout this FRA report.

3 CONSULTATION

Environment Agency

- 3.1 Consultation has been undertaken with the EA regarding any detailed flood modelling they have available. Their response has been summarised in Section 6 and is included as Appendix A.

United Utilities

- 3.2 The public sewer network within the vicinity of the site is operated by United Utilities. Asset location plans and sewer flooding records have been obtained and are discussed further in the report.

Lead Local Flood Authority

- 3.3 The site is within the administrative boundary of Manchester City Council. Consultation has been undertaken regarding the proposed development. Manchester City Council have identified the site is within the Conurbation Core Critical Drainage Area.

Internal Drainage Board

- 3.4 The site is not located within an IDB District.

4 SITE DESCRIPTION

Site Description

- 4.1 The site is located at National Grid Reference SJ879972, is irregular in shape and occupies an area of approximately 1.5 hectares (ha). The site location is presented in Figure 1.

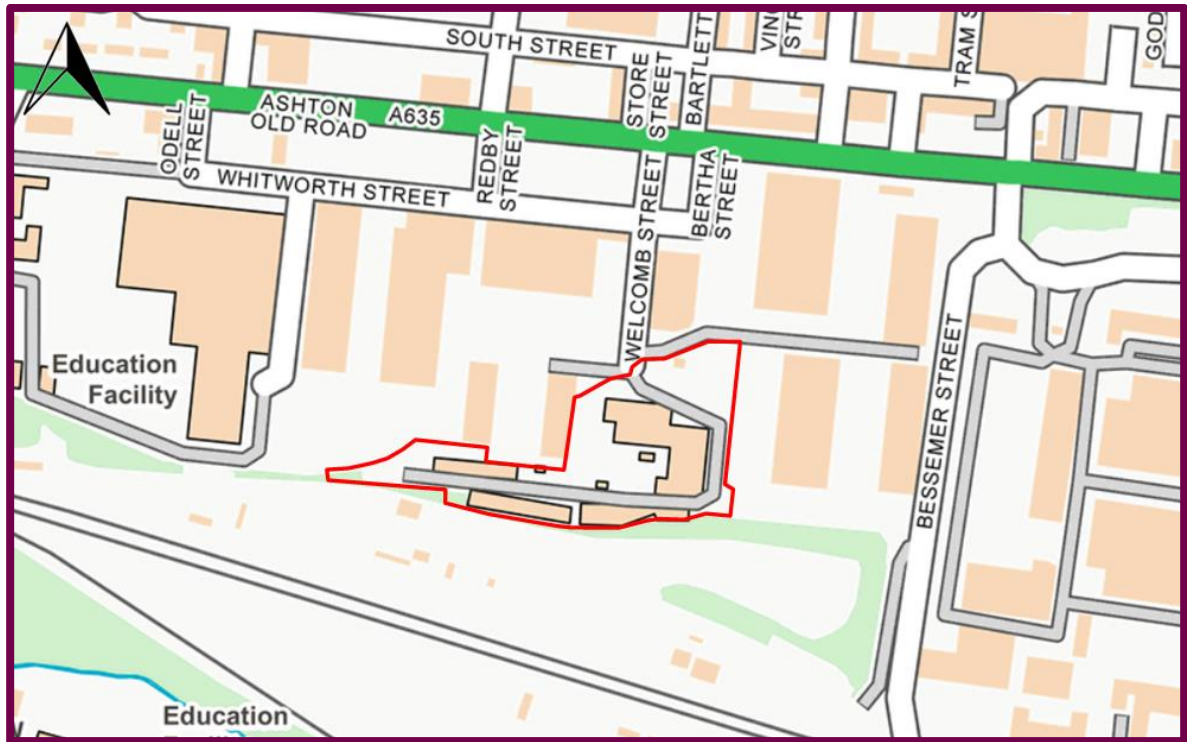


Figure 1. Site Location

- 4.2 The site is currently occupied by existing buildings associated with the Manchester School of Building. Vehicular and pedestrian access is via Welcomb Street which provides access to the buildings.

Surrounding Land Uses

- 4.3 The site is located in an area primarily surrounded by City Works Business Park and the associated units.
- 4.4 To the north of the site is Welcomb Street and beyond lies the Ashton Old Road (A635) and adjacent commercial properties.
- 4.5 To the south lies a tarmac Plant and beyond is a further industrial park. A railway line is also located adjacent to the tarmac plant.
- 4.6 There are no designated sensitive areas (e.g. Special Area of Conservation (SAC), Special Protection Area (SPA) or Site of Special Scientific Interest (SSSI)) within 1km of the site.

Topography

- 4.7 OS Spot Heights within the vicinity of the site indicate surrounding levels. Levels within Ashton Old Road are indicated to sit at 59.8 and 64m AOD. Levels along Bessemer Street, located to the east of the site, sit at between 59.7 and 64.9m AOD.
- 4.8 A topographical and underground utility survey conducted by RPS in June 2022, reference UAR3182_A, shows that the highest elevations are in the site's western corner. This area reaches

peaks of 60.3 metres above ordnance datum (mAOD). The site falls towards the site centre where elevations are around 59.4 mAOD. The survey is provided in Appendix B.

5 PROPOSED DEVELOPMENT

- 5.1 The proposed development comprised the construction of 13 industrial units in addition to associated parking. Development plans are shown in Appendix C.
- 5.2 Vehicular and pedestrian access will be obtained from Welcomb Street on the northern boundary of the site.
- 5.3 The proposed use of the site is classified as 'less vulnerable' within the PPG.

6 HYDROLOGICAL SETTING

Nearby Watercourses

- 6.1 OS Mapping indicates that the nearest surface water feature is an ordinary watercourse located approximately 250m south west of the site.
- 6.2 The nearest EA designated main river is a stretch of Gore Brook, located approximately 1.5km south east of the site within Sunny Brow Park.
- 6.3 A stretch of the Ashton Canal is located approximately 950m north of the site.
- 6.4 No other significant artificial watercourses / features (e.g. canals, reservoirs) have been identified within 1km of the site.

Fluvial / Tidal Flood Risk Classification

- 6.5 The EA Flood Map for Planning, which is available online, indicates that the site is located within Flood Zone 1, whereby the annual probability of flooding from fluvial or tidal sources is classified as a less than 1 in 1,000. The EA Flood Map for Planning is provided in Figure 2.

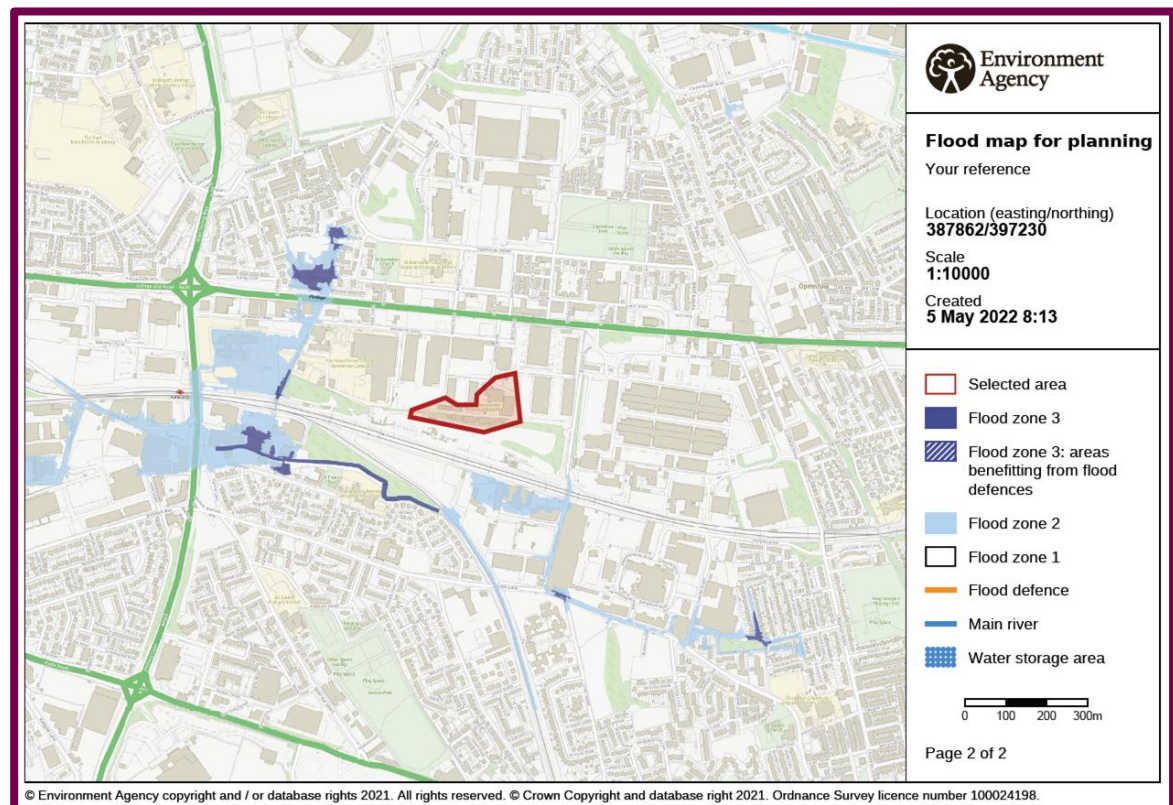


Figure 2. EA Flood Map for Planning

- 6.6 The EA were consulted regarding any site-specific flood modelling. They subsequently provided maps derived from Corn Brook 2017 flood model and the results are discussed below. Full information provided by the EA is provided in Appendix A.
 - The site is shown to be in Flood Zone 1;
 - The site remains unaffected by all fluvial flood extents in the undefended scenario, up to the 1 in 20-year event (5% AEP);
 - The site remains unaffected by all fluvial flood extents in the undefended scenario, up to the 1 in 100-year event plus 70% climate change;

EA Flood Warning Area

- 6.7 The EA defines a Flood Warning Area as “geographical areas where we expect flooding to occur and where we provide a Flood Warning Service. They generally contain properties that are expected to flood from rivers or the sea and in some areas, from groundwater.”
- 6.8 The site is not located in a Flood Warning Area.

Surface Water Flood Risk Classification

- 6.9 The EA's updated Flood Map for Surface Water indicates that the site is shown to have between a 'Very Low' (flooding occurring as a result of rainfall with a less than 1 in 1,000 annual probability) to 'High' (flooding occurring as a result of rainfall with a greater than 1 in 30 (3.3%) annual probability) risk of surface water flooding. The updated Flood Map for Surface Water is presented in Figure 3.

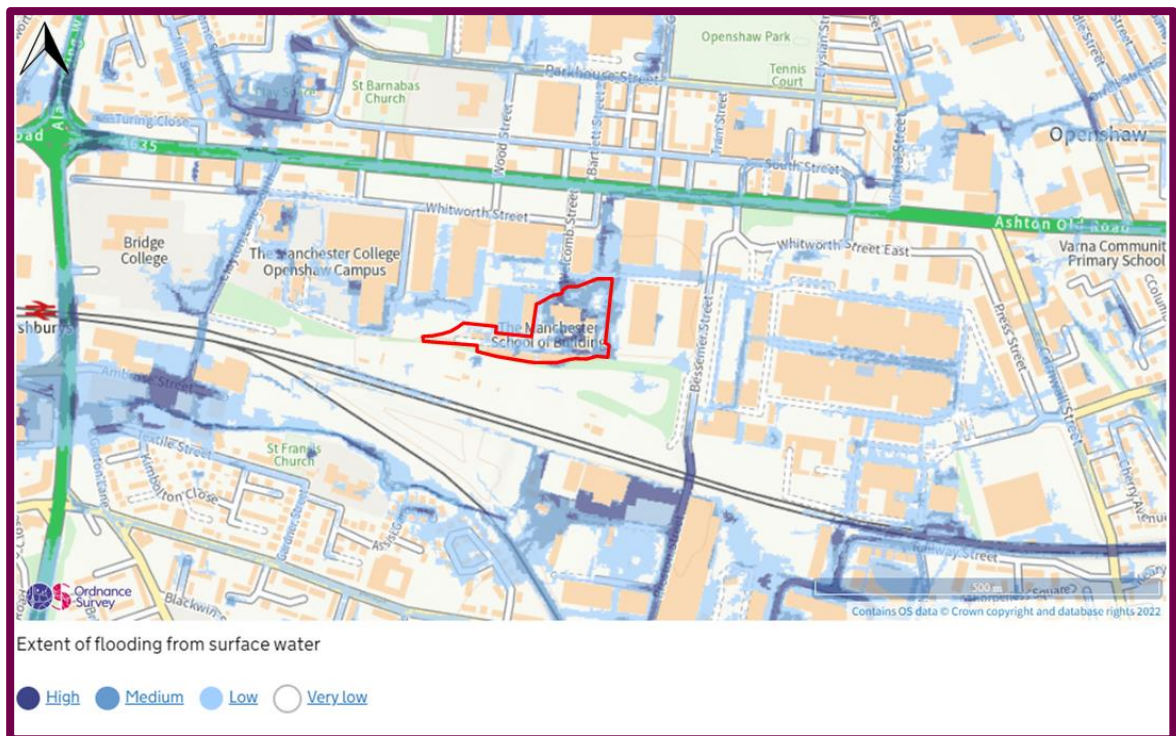


Figure 3. Updated Flood Map for Surface Water

- 6.10 The Flood Map for Surface Water Flooding Depths, shown in Figure 4, indicate that flood depths at the site will predominantly reach depths of between 300 and 900mm.

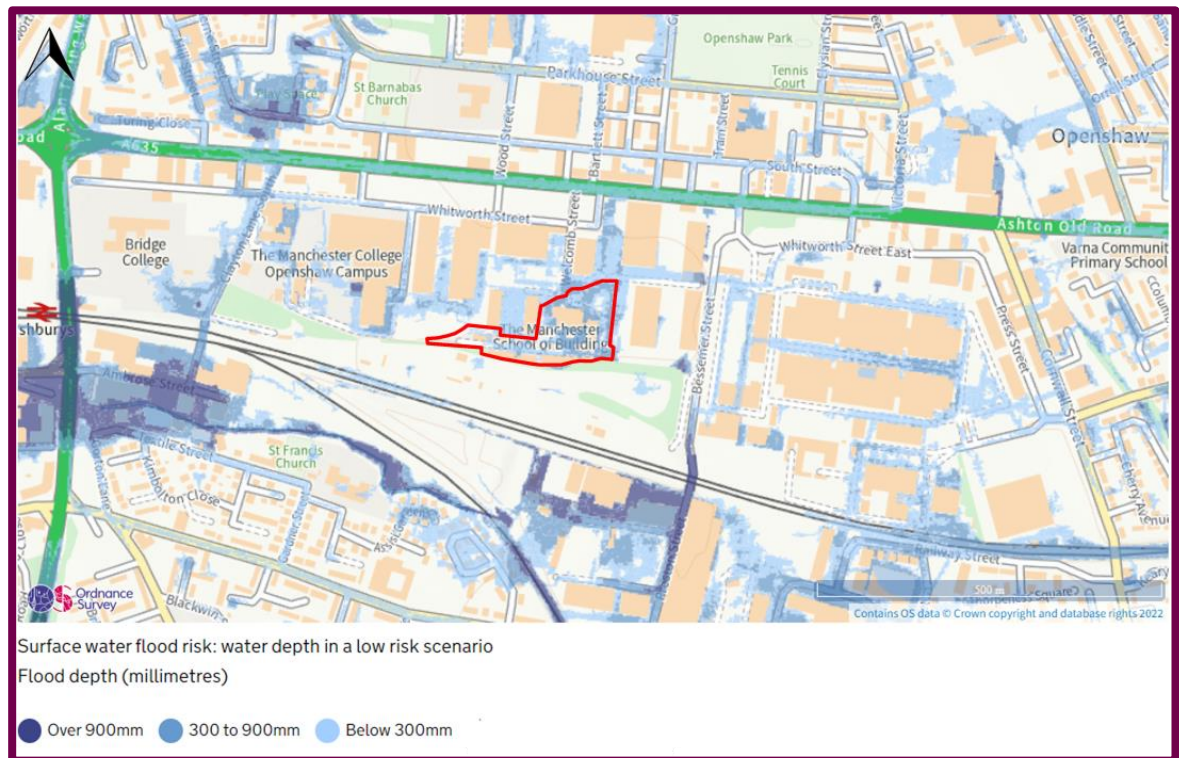


Figure 4. Flood Map for Surface Water (depth in a Low Risk Scenario)

Reservoir Flood Risk Classification

- 6.11 EA mapping also indicates that the site is located within an area potentially at risk from reservoir flooding when river levels are normal. The Flood Map for Reservoirs is presented in Figure 5.

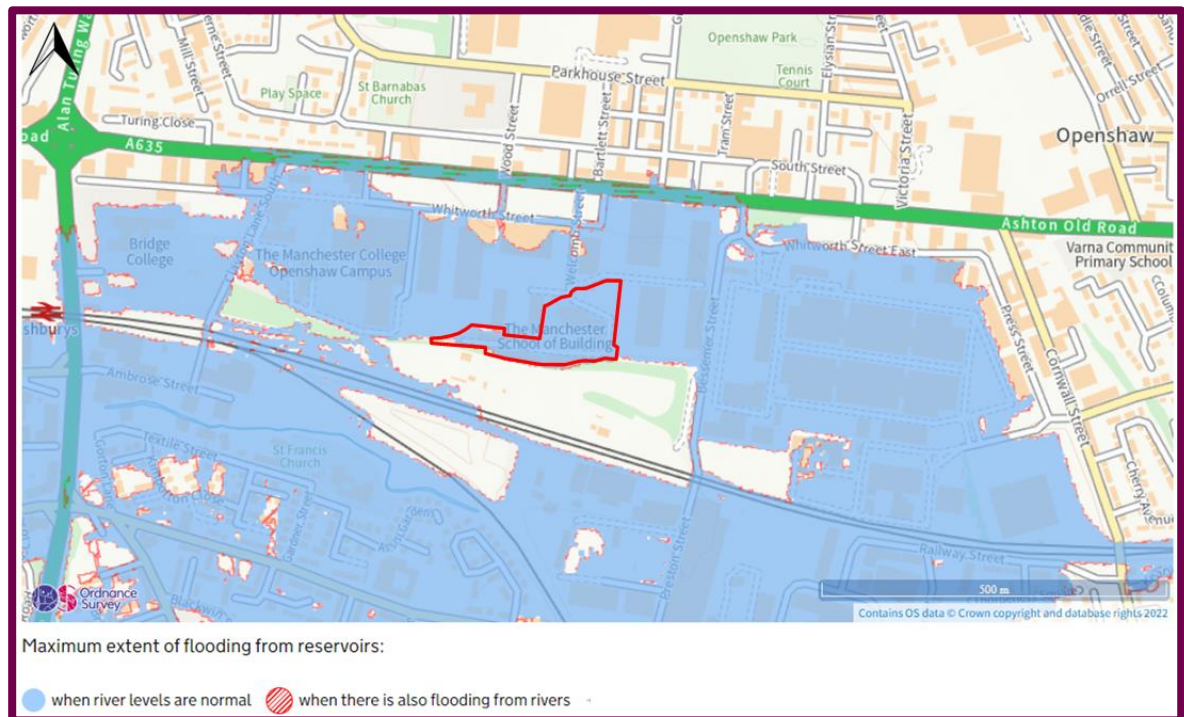


Figure 5. Risk from Reservoir Flooding

Local Authority Flood Risk Assessment

6.12 A joint SFRA for the Manchester City, Salford City and Trafford Councils was published in March 2010. It provides an overview of flood risk from various sources within the borough. Information relevant to this assessment is summarised below:

- There is a 'lost watercourse' identified to cross the south eastern corner of the site;
- No modelled fluvial flood events encroach the site boundary;
- The site is located within the Conurbation Core Critical Drainage Area;
- No Flood Storage Areas are located within the vicinity of the site;
- Surface water and sewer flooding is often interconnected;
- United Utilities sewer flood risk data was not available at the time of SFRA production;
- The site has mixed 'low' and 'intermediate' susceptibility to surface water flooding in both the 'current' and 'future' scenarios;
- The site is not located within an area identified to have groundwater flood risk;

7 HYDROGEOLOGICAL SETTING

- 7.1 British Geological Survey (BGS) online mapping (1:50,000 scale) indicates that the site is situated on 'Till Deposits', comprising diamicton. This is underlain by the 'Chester Formation', comprising sandstone.
- 7.2 Reference to BGS borehole records indicates there are no boreholes within the boundary of the site.
- 7.3 The soils are described as 'Naturally wet very acid sandy and loamy soils' by the National Soils Research Institute.
- 7.4 According to MAGIC's Aquifer Designation Mapping, the superficial 'Till Deposits' are classified as a 'Secondary (undifferentiated) Aquifer'. These formations have varying characteristics in different locations. The underlying 'Chester Formation' is classified as a 'Principal Aquifer'. These formations provide a high level of water storage and may support water supply and / or river base flow on a strategic scale.
- 7.5 MAGIC's Source Protection Zone (SPZ) mapping indicates that the site is not located within a groundwater SPZ.

8 EXISTING DRAINAGE / WATER MAINS

- 8.1 United Utilities plans of public sewers, included as Appendix D, indicates that the site is served by a 63 mm diameter surface water sewer (SW) just north of the site between Medlock Court. Additionally, there is a western flowing combined sewer with a diameter of 900 mm just north of the site boundary. Manhole cover levels and invert levels were not provided.
- 8.2 The development plans provide a 30 ft easement around the combined sewer so no built units are over the top this sewer.

9 FLOOD RISK AND MITIGATION

- 9.1 The key sources of flooding that could potentially impact the site are discussed below:

Fluvial / Tidal Flooding

- 9.2 Fluvial flooding (flooding from rivers) occurs when water levels in water courses rise higher than bank levels, causing floodwater to spill across the adjacent land.
- 9.3 The site is entirely located in Flood Zone 1, whereby the annual probability of flooding from fluvial or tidal sources is classified as a less than 1 in 1,000. However, there is a lost watercourse identified across the south eastern corner of the site.
- 9.4 EA Flood data shows the site remains unaffected by all modelled fluvial flood events. SFRA mapping similarly shows that no modelled fluvial flood events encroach the site boundary.
- 9.5 Therefore, the site can be considered a low risk of flooding from fluvial and tidal sources.
- 9.6 The PPG details the suitability of different land uses within each flood zone. The proposed development is classified as 'less vulnerable'.

Flooding from Sewers

- 9.7 Sewer flooding can occur during periods of heavy rainfall when a sewer becomes blocked or is of inadequate capacity.
- 9.8 Limited information was available from United Utilities and the SFRA regarding sewer flood risk to the site.
- 9.9 The drainage strategy proposes the use of non-return valves to ensure surcharging of the public sewer does not enter the site.

Surface Water Flooding (Overland Flow)

- 9.10 This can occur during intense rainfall events, when water cannot soak into the ground or enter drainage systems.
- 9.11 The site is shown to have between a 'Very Low' (flooding occurring as a result of rainfall with a less than 1 in 1,000 annual probability) to 'High' (flooding occurring as a result of rainfall with a greater than 1 in 30 (3.3%) annual probability) risk of surface water flooding.
- 9.12 The SFRA states that the site has mixed 'low' and 'intermediate' susceptibility to surface water flooding in current and future scenarios.
- 9.13 A separate drainage strategy has been prepared by Hydrock which has been briefly summarised in Section 10.

Groundwater Flooding

- 9.14 This can occur in low-lying areas when groundwater levels rise above surface levels, or within underground structures. BGS mapping indicates that the site is situated on 'Till Deposits', classified as a 'Secondary (undifferentiated) Aquifer'. This is underlain by the 'Chester Formation', classified as a 'Principal Aquifer'.
- 9.15 SFRA Mapping shows the site is not located within an area identified to have groundwater flood risk.
- 9.16 As no basement level is a part of the proposed development, the risk of groundwater flooding can be considered significantly reduced.

Other Sources

- 9.17 There is a limited risk of flooding occurring as a result of a break in a water main.
- 9.18 Although the EA mapping indicates that the site is located within an area potentially at risk from reservoir flooding, due to the operational and maintenance standards of Reservoirs in the UK, the risk of reservoir flooding can be considered low.
- 9.19 The risk of flooding associated with canals and other artificial structures is considered to be low given the absence of any such structures in the site vicinity.

10 DRAINAGE STRATEGY

- 10.1 A drainage strategy has been prepared for the site by Hydrock in September 2022 (Document reference: 22975-HYD-XX-XX-RP-C-0500).
- 10.2 The drainage strategy states that separate surface water and foul systems are proposed on site. Surface water will split into 4 networks due to site constraints. Surface water will be collected via rainwater pipes, channel drains and road gullies before being attenuated within below ground cellular structures to store proposed run off from the impermeable catchment area during the 1 in 100-year plus 40% climate change event. A northern network will serve Units 3, 6 and part of 4 – this runoff will be restricted to 19.7 l/s. A south-eastern network will serve Units 5 and portions of Units 2 and 4 and will restrict runoff to 14.4 l/s. Two further networks will serve the remainder of Unit 2 and Unit 1 and runoff will be restricted to 6.5 l/s and 5 l/s respectively. Each network will discharge to a private manhole before ultimately discharging into United Utilities combined sewer. A total of 483m³ of attenuation will be provided on site.
- 10.3 Foul water is proposed to discharge into two existing combined manholes before subsequent discharge into the United Utilities combined sewer.

11 SEQUENTIAL TEST AND EXCEPTION TEST

Sequential Test

- 11.1 The NPPF requires the Local Authority to apply the Sequential Test in consideration of new development. The aim of the Test is to steer new development to areas at the lowest probability of flooding. Given that the subject site has not been allocated as one of the Council's proposed future development sites, it has not been specifically assessed within the SFRA. Therefore, the Sequential Test is based on the EA flood zones and information contained within the SFRA.
- 11.2 According to the EA online Flood Map for Planning, the site is shown to be located within Flood Zone 1. As the development is a change of use and the site is considered to have a low risk of flooding from all sources, application of the Sequential Test is not required.

The Exception Test

- 11.3 According to Table 3 of the PPG to the NPPF, 'Less Vulnerable' developments are considered appropriate within Flood Zone 1 without the requirement to apply the Exception Test.

12 SUMMARY AND CONCLUSIONS

- 12.1 The aim of the FRA is to outline the potential for the site to be impacted by flooding, the potential impacts of the development on flooding both onsite and in the vicinity, and the proposed measures which can be incorporated into the development to mitigate the identified risks. The report has been produced in accordance with the guidance detailed in the NPPF. Reference has also been made to the SFRA.
- 12.2 The potential flood risks to the site, and the measures proposed to mitigate the identified risks, are summarised in Table 1.

Table 1. Proposed mitigation

Source of Flooding	Identified Risk			Comment
	L	M	H	
Fluvial	✓			Not considered to be at significant risk
Tidal	✓			
Sewers	✓			
Surface Water	✓			
Groundwater	✓			
Other Sources (e.g. reservoirs, water mains)	✓			

- 12.3 In conclusion, the site is located in Flood Zone 1 and can be considered at 'low' risk from all sources assessed.
- 12.4 It has been demonstrated that the development meets the Sequential and Exception Tests imposed under the NPPF.
- 12.5 A separate drainage strategy has been undertaken by Hydrock which ensures that the site is sufficiently drained for the 1 in 100-year plus 40% climate change event.

APPENDICES

Appendix A

EA Detailed Flood Data

Flood risk assessment data

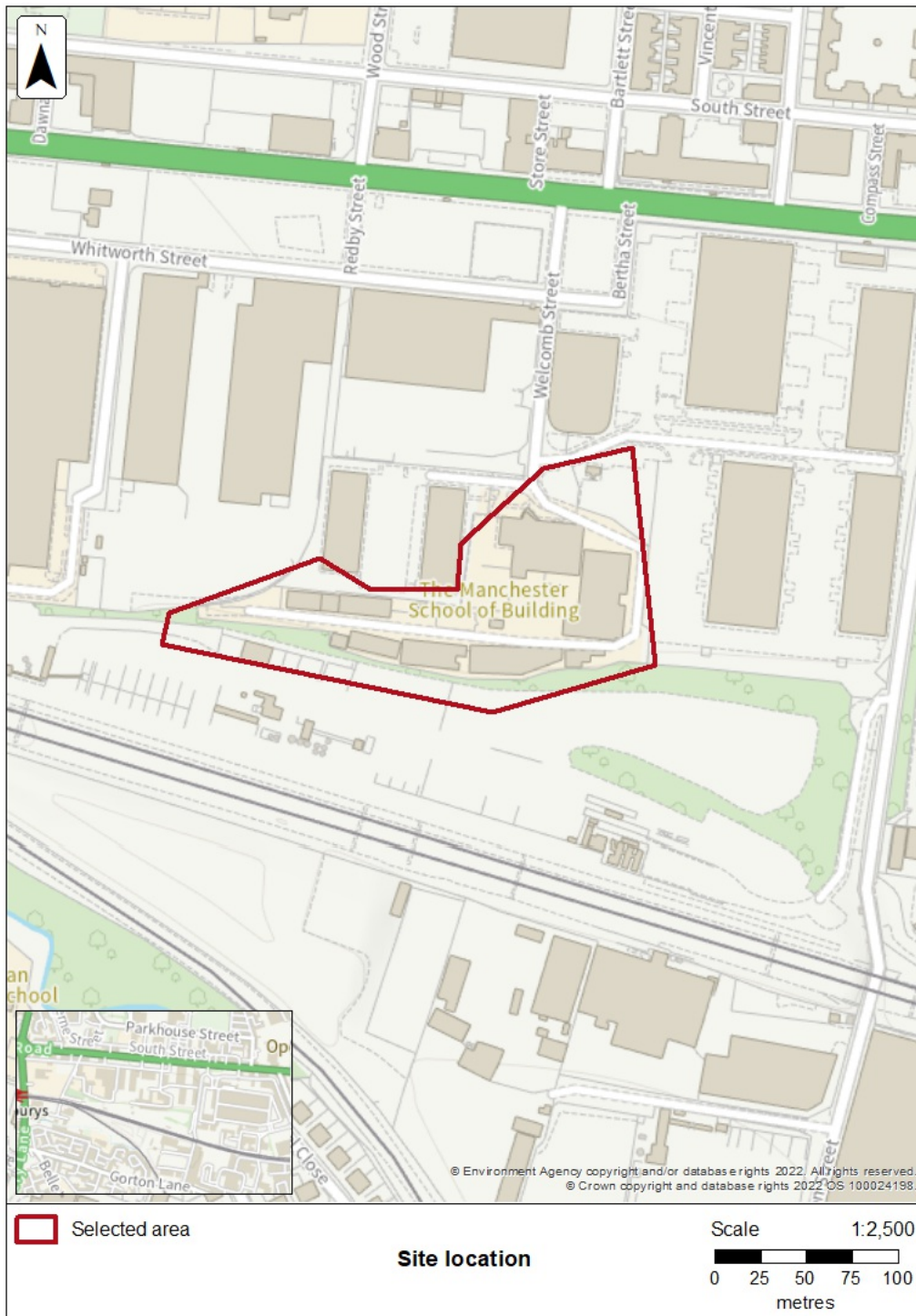
Location of site: 387892 / 397216 (shown as easting and northing coordinates)

Document created on: 13 June 2022

This information was previously known as a product 4.

Customer reference number: GMMC262465AB

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)
- 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

Information that's unavailable

This document **does not** contain:

- historic flooding
- flood defences and attributes

We do not have historic flooding data for this location. You can contact your Lead Local Flood Authority or Internal Drainage Board to see if they have other relevant local flood information. Please note that some areas do not have an Internal Drainage Board.

We aren't able to display flood defence locations and attributes as there are no formal flood defences in the area of interest.

Surface water and other sources of flooding

Use the [long term flood risk service](#) to find out about the risk of flooding from:

- surface water
- ordinary watercourses
- reservoirs

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

About the models used

Model name: Corn Brook 2017

Scenario(s): No defences exist fluvial, no defences exist climate change fluvial

Date: 31 December 2017

This model contains 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 occurring 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 development is in flood zone 1.

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

This data is updated on a quarterly basis as better data becomes available.



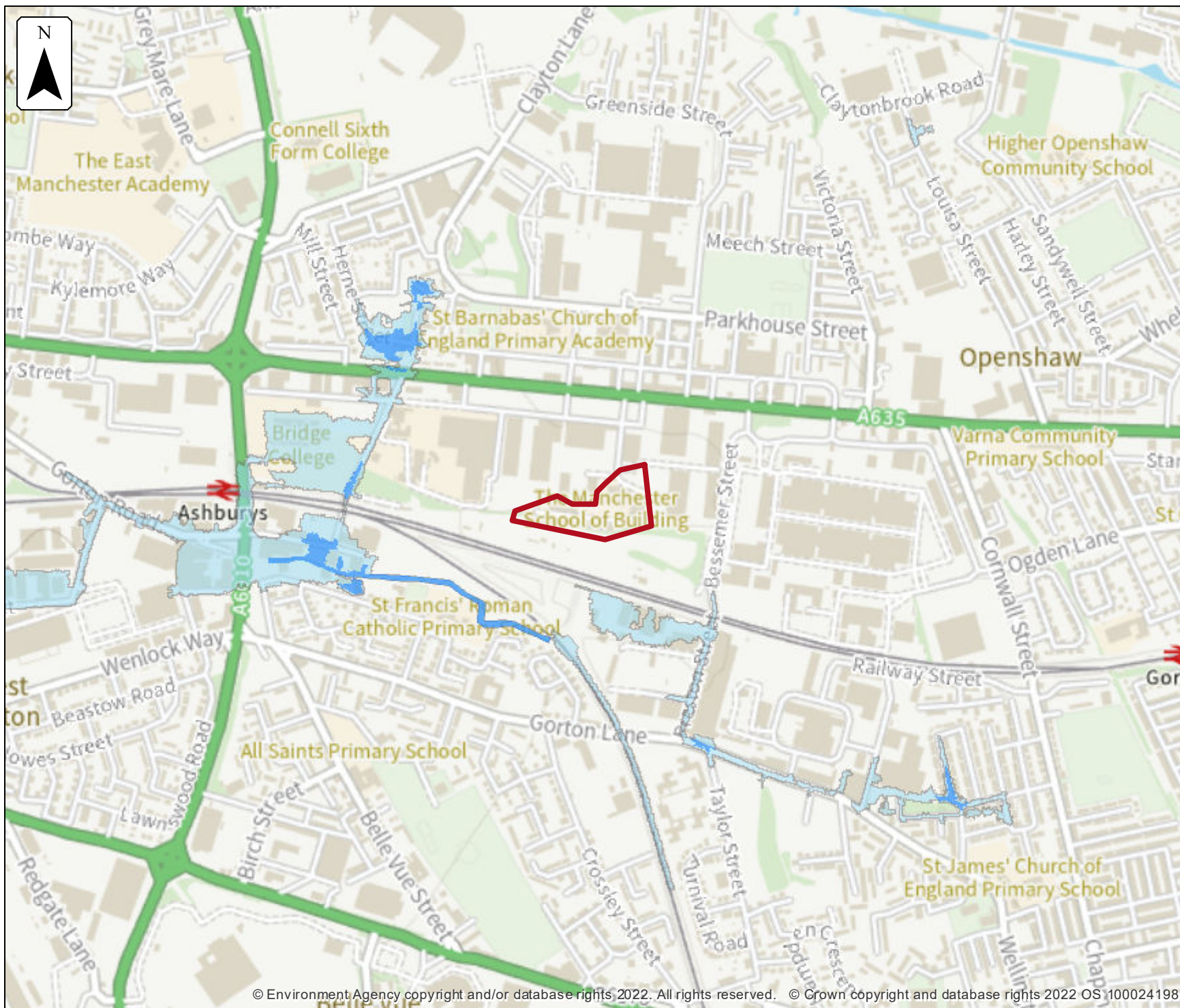
Flood map for planning

Location (easting/northing)
387892/397216

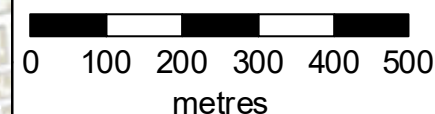
Scale
1:10,000

Created
13 May 2022

-  Selected area
-  Flood zone 3
-  Flood zone 2



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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:

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

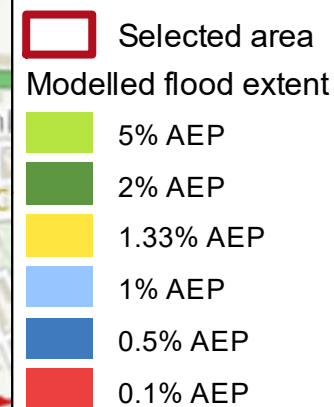


No defences exist modelled fluvial extent

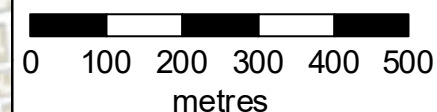
Location (easting/northing)
387892/397216

Scale Created
1:10,000 13 May 2022

Model name
Corn Brook 2017



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





No defences exist climate change modelled fluvial extent

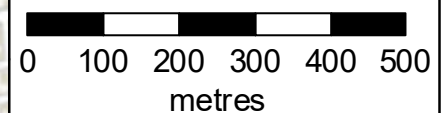
Location (easting/northing)
387892/397216

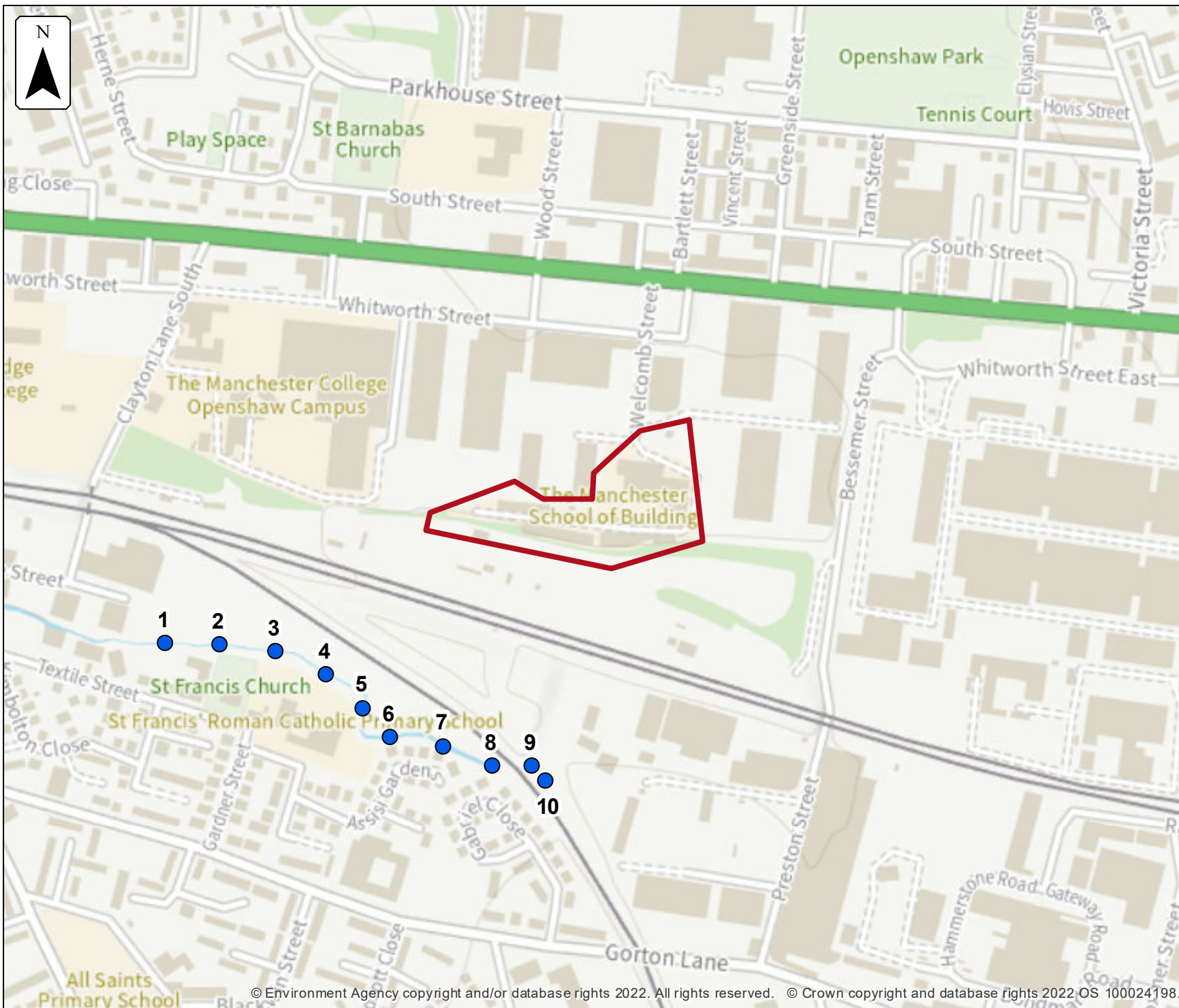
Scale Created
1:10,000 13 May 2022

Model name
Corn Brook 2017

-  Selected area
-  Main river
- Modelled flood extent
 -  1.0% AEP (+30%)
 -  1.0% AEP (+35%)
 -  1.0% AEP (+70%)
 -  0.1% AEP (+30%)

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





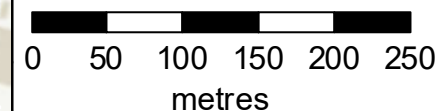
No defences exist modelled fluvial node locations

Location (easting/northing)
387892/397216

Scale Created
1:5,000 13 May 2022

Model name
Corn Brook 2017

-  Selected area
-  Modelled location



Modelled node locations data

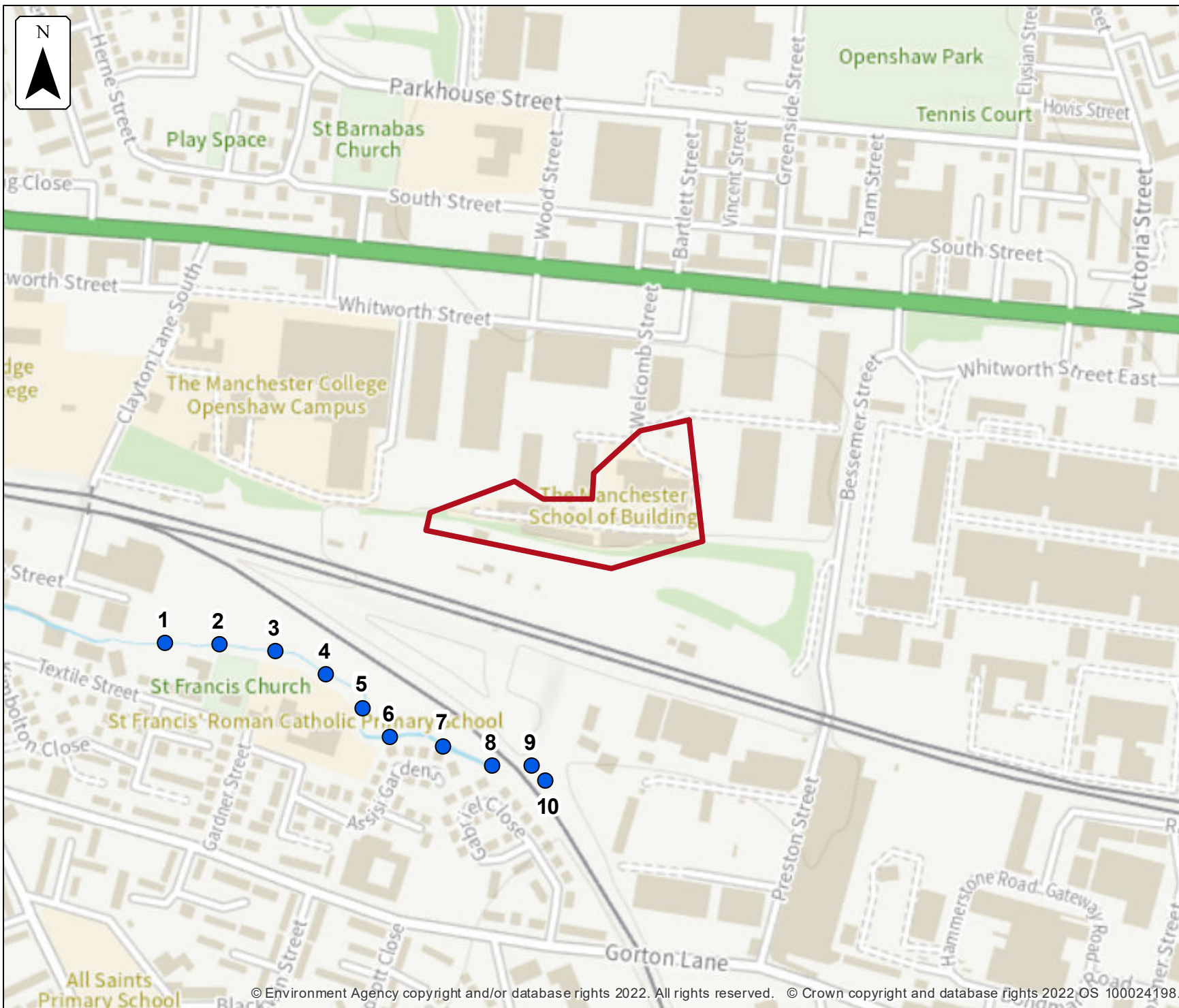
No defences exist

Label	Modelled location ID	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
				Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow
1	952455	387474	397085	51.74	1.44	51.90	2.42	51.96	2.96	52.01	3.40	52.17	5.08	52.49	10.36
2	952466	387528	397084	52.04	1.43	52.21	2.38	52.28	2.93	52.34	3.38	52.51	4.90	52.95	10.12
3	952442	387582	397077	52.36	1.43	52.52	2.37	52.59	2.92	52.65	3.38	52.81	4.89	53.25	10.11
4	952463	387631	397055	52.65	1.43	52.79	2.37	52.85	2.92	52.90	3.38	53.05	4.88	53.48	10.14
5	952456	387666	397022	52.98	1.43	53.10	2.37	53.15	2.92	53.19	3.38	53.32	4.89	53.66	10.23
6	952454	387693	396994	53.31	1.43	53.44	2.37	53.50	2.92	53.55	3.38	53.68	4.89	53.97	10.34
7	952441	387745	396985	53.79	1.43	53.94	2.37	54.0	2.92	54.06	3.38	54.19	4.89	54.54	10.79
8	952462	387792	396966	54.24	1.43	54.41	2.37	54.49	2.91	54.55	3.38	54.72	4.89	55.18	6.97
9	952449	387831	396966	54.40	1.43	54.81	2.37	55.08	2.91	55.35	3.38	56.41	4.89	58.54	7.02
10	952458	387843	396951	54.62	1.05	54.90	1.97	55.13	2.51	55.38	2.94	56.11	4.18	58.53	8.56

Data in this table comes from the Corn Brook 2017 model.

Level values are shown in mAOD, and flow values are shown in cubic metres per second.

Any blank cells show where a particular scenario has not been modelled for this location.



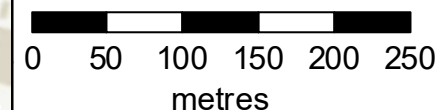
No defences exist climate change modelled fluvial node locations

Location (easting/northing)
387892/397216

Scale Created
1:5,000 13 May 2022

Model name
Corn Brook 2017

-  Selected area
-  Modelled location



Modelled node locations data

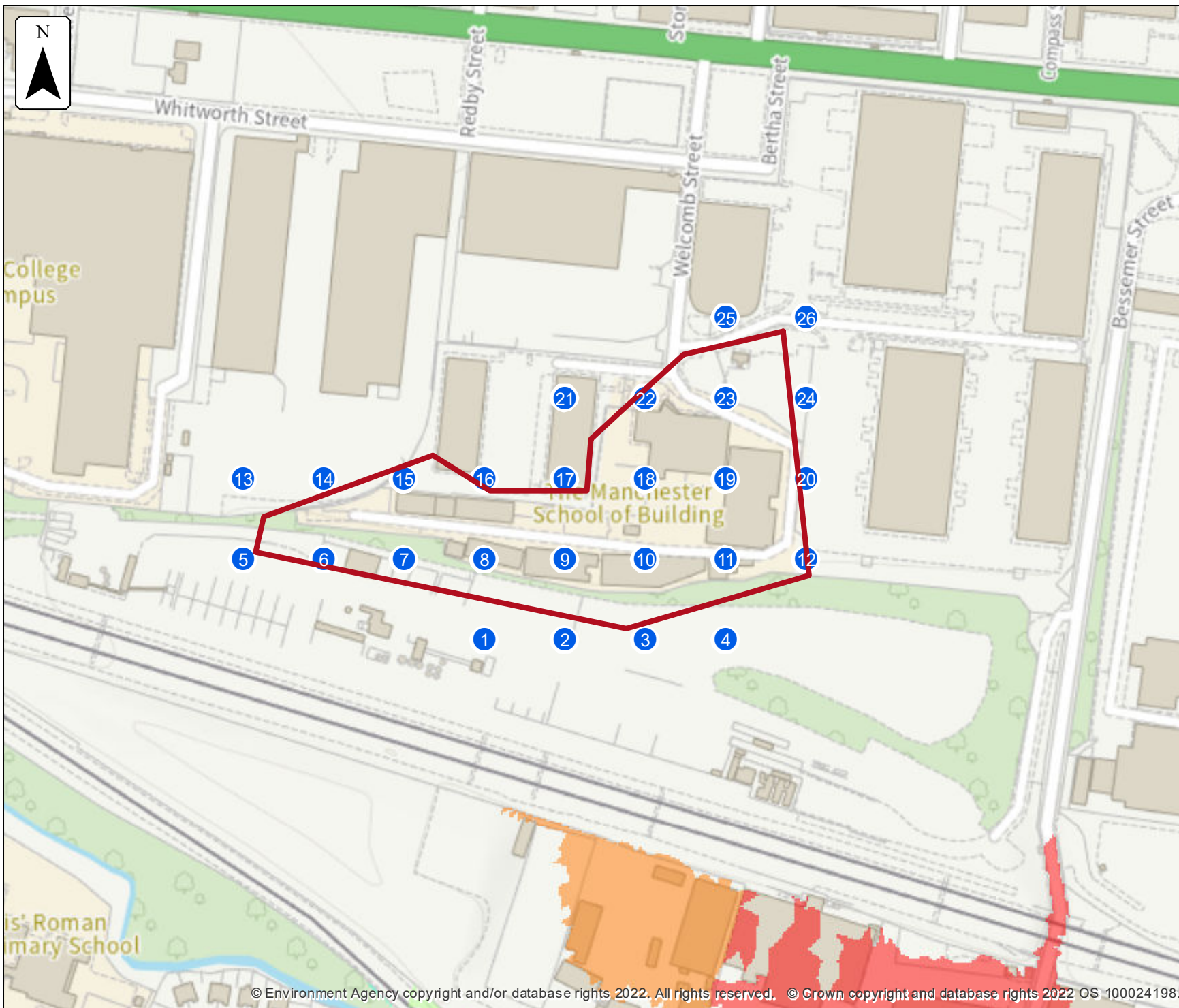
No defences exist climate change

Label	Modelled location ID	Easting	Northing	1.0% AEP (+30%)		1.0% AEP (+35%)		1.0% AEP (+70%)		0.1% AEP (+30%)	
				Level	Flow	Level	Flow	Level	Flow	Level	Flow
1	952455	387474	397085	52.14	4.66	52.15	4.85	52.32	6.64	52.57	12.56
2	952466	387528	397084	52.47	4.50	52.49	4.68	52.68	6.51	53.03	12.37
3	952442	387582	397077	52.77	4.49	52.79	4.68	52.95	6.52	53.35	12.29
4	952463	387631	397055	53.01	4.49	53.03	4.67	53.21	6.49	53.59	12.20
5	952456	387666	397022	53.29	4.49	53.30	4.67	53.45	6.52	53.76	12.33
6	952454	387693	396994	53.64	4.49	53.66	4.67	53.80	6.55	54.04	12.61
7	952441	387745	396985	54.16	4.49	54.18	4.67	54.31	6.59	54.65	13.93
8	952462	387792	396966	54.68	4.49	54.70	4.67	54.87	6.66	55.29	7.0
9	952449	387831	396966	56.10	4.49	56.24	4.67	58.06	6.74	58.66	7.05
10	952458	387843	396951	56.11	3.83	56.25	3.97	58.09	5.0	56.68	11.13

Data in this table comes from the Corn Brook 2017 model.

Level values are shown in mAOD, and flow values are shown in cubic metres per second.

Any blank cells show where a particular scenario has not been modelled for this location.



No defences exist modelled fluvial extent and height

Location (easting/northing)
387892/397216

Scale Created
1:2,500 13 May 2022

Model name
Corn Brook 2017

Selected area

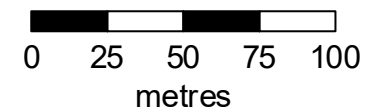
Main river

Modelled 2D grid

Water level in mAOD

- 0 - 57.0
- 57.0 - 57.375
- 57.375 - 57.75
- 57.75 - 58.125
- 58.125 - 58.5
- 58.5 - 58.875
- 58.875 - 59.25
- 59.25 - 59.625
- 59.625 - 60.0

This map shows the
0.1% AEP height data



Sample point data

No defences exist

Label	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
			Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height
1	387838	397152	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
2	387877	397152	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
3	387916	397152	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
4	387955	397152	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
5	387721	397191	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
6	387760	397191	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
7	387799	397191	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
8	387838	397191	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
9	387877	397191	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
10	387916	397191	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
11	387955	397191	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
12	387994	397191	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
13	387721	397230	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
14	387760	397230	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
15	387799	397230	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
16	387838	397230	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData

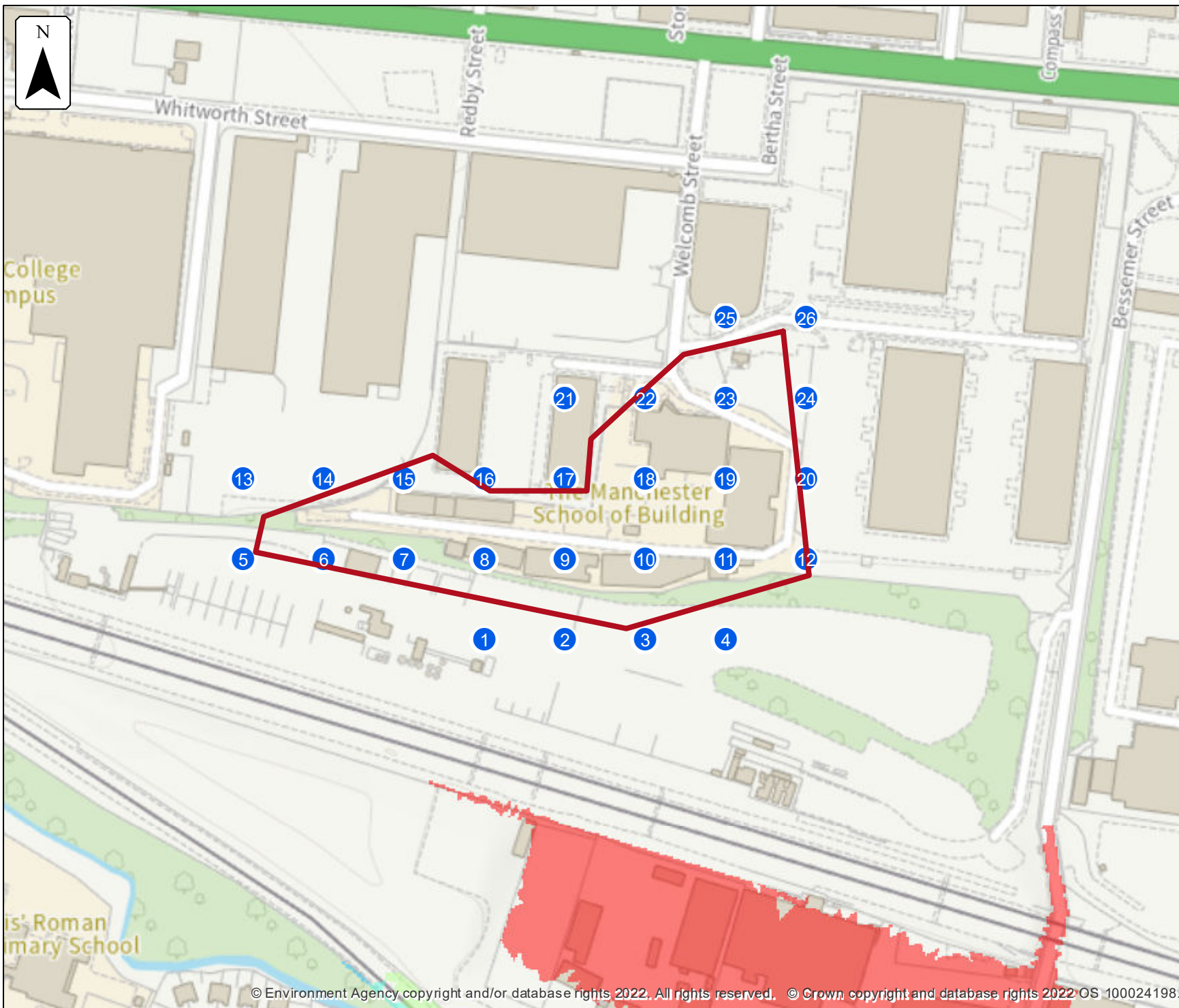
Label	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
			Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height
17	387877	397230	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
18	387916	397230	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
19	387955	397230	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
20	387994	397230	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
21	387877	397269	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
22	387916	397269	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
23	387955	397269	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
24	387994	397269	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
25	387955	397308	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
26	387994	397308	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData

Data in this table comes from the Corn Brook 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.



No defences exist climate change modelled fluvial extent and height

Location (easting/northing)
387892/397216

Scale Created
1:2,500 13 May 2022

Model name
Corn Brook 2017

Selected area

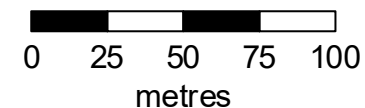
Main river

Modelled 2D grid

Water level in mAOD

- 0 - 57.0
- 57.0 - 57.375
- 57.375 - 57.75
- 57.75 - 58.125
- 58.125 - 58.5
- 58.5 - 58.875
- 58.875 - 59.25
- 59.25 - 59.625
- 59.625 - 60.0

This map shows the
0.1% AEP +30% height data



Sample point data

No defences exist climate change

Label	Easting	Northing	1% AEP (+30%)		1% AEP (+35%)		1% AEP (+70%)		0.1% AEP (+30%)	
			Depth	Height	Depth	Height	Depth	Height	Depth	Height
1	387838	397152	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
2	387877	397152	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
3	387916	397152	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
4	387955	397152	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
5	387721	397191	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
6	387760	397191	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
7	387799	397191	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
8	387838	397191	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
9	387877	397191	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
10	387916	397191	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
11	387955	397191	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
12	387994	397191	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
13	387721	397230	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
14	387760	397230	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
15	387799	397230	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
16	387838	397230	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	1% AEP (+30%)		1% AEP (+35%)		1% AEP (+70%)		0.1% AEP (+30%)	
			Depth	Height	Depth	Height	Depth	Height	Depth	Height
17	387877	397230	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
18	387916	397230	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
19	387955	397230	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
20	387994	397230	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
21	387877	397269	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
22	387916	397269	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
23	387955	397269	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
24	387994	397269	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
25	387955	397308	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
26	387994	397308	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData

Data in this table comes from the Corn Brook 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.

Strategic flood risk assessments

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

This should give you information about:

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

About this data

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

Flood risk activity permits

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

[Find out more about flood risk activity permits](#)

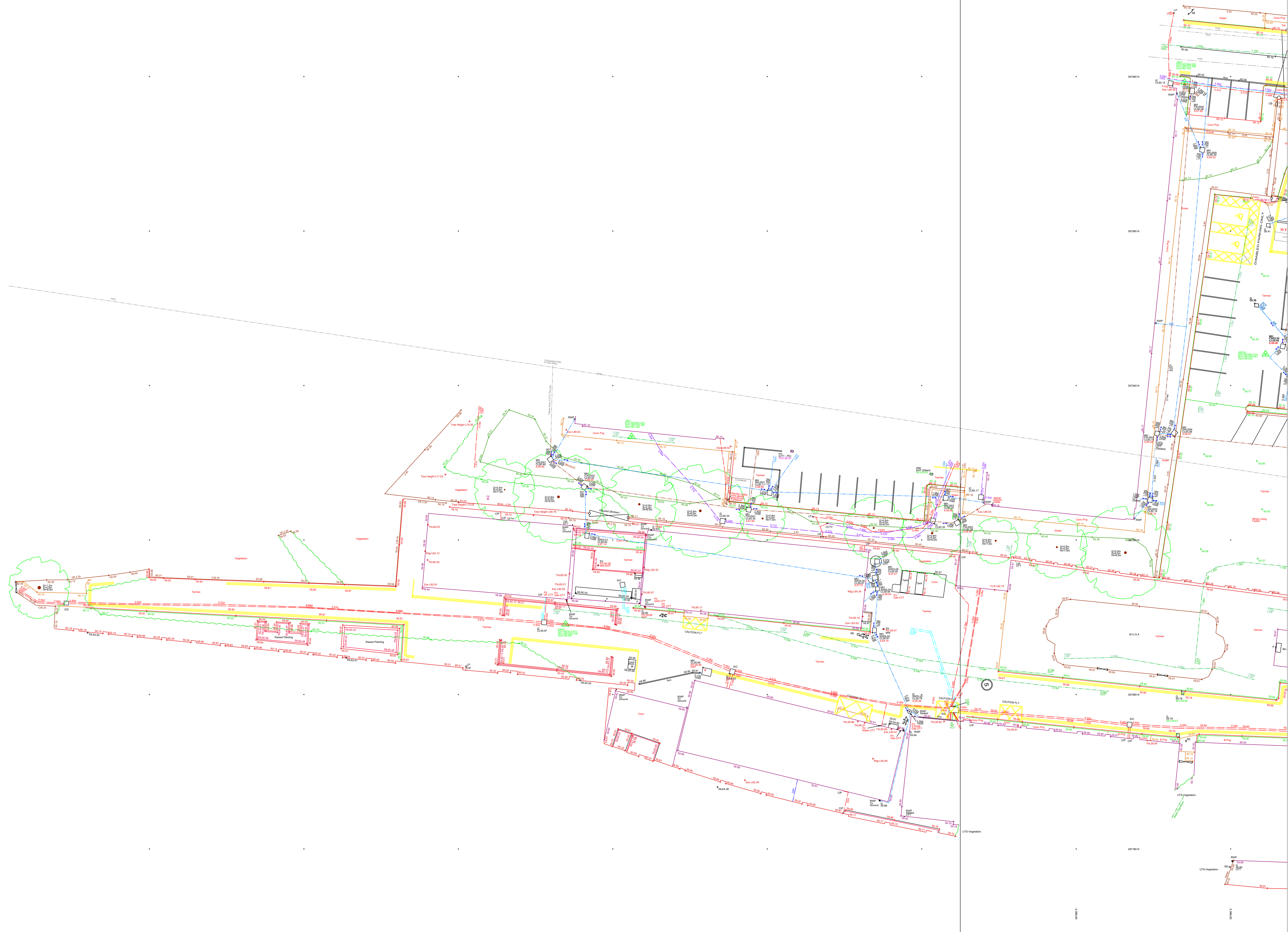
Help and advice

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

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

Appendix B

Topographic Survey

[illegible]

Utility Services Location Note:
This survey has been carried out using a combination of observation and direction using electrolocation, and ground probing radar equipment. Connections between reference points such as manholes are represented by lines. The lines are not necessarily correct and are indicated. The accuracy is limited to the tolerances normally expected from this equipment.

The following Indications of completeness and accuracy are for guidance only:

- in areas where there is a large concentration of services, the completeness will be between 80% and 90%. This will be reduced where there are obstructions or ground level.
- Profound accuracy will vary with depth and type of duct material; an accuracy of ± 150 mm is achievable in normal circumstances but will be reduced for plastic pipes.
- Existing information from historical plans is likely to be verifiable and is shown for guidance only.
- Excavations in the area should be carried out with care and in accordance with HSE, etc. No absolute guarantee of accuracy should be relied on from these plans.

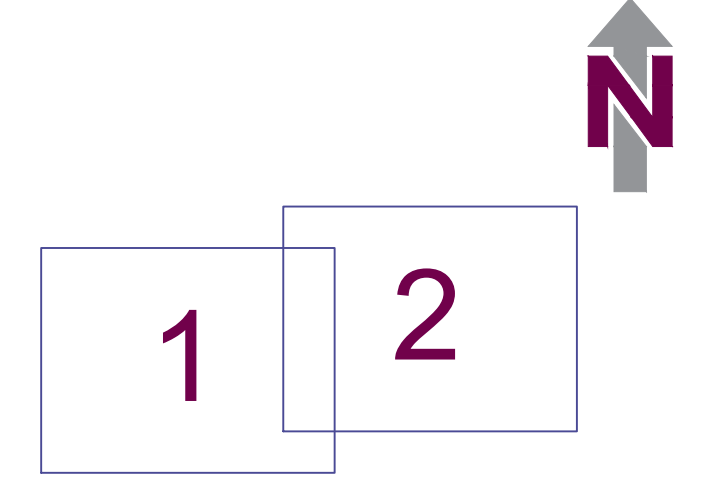
The following text is an extract from Survey of Land, Buildings and Utility Services of class 1:500 and

"Electronic tracing is a reliable method of locating buried services. On heavy, built up sites 85% completeness is probably all that can be expected. Plan accuracies of +/- 150mm may be achieved but this figure will depend on the depth of the service below ground level. Where similar services run in close proximity, separation may be impossible. Successful tracing of non-metallic pipes may be limited. Existing record information showing underground services is often incomplete and of doubtful

Standard Abbreviations

[illegible][illegible]

Sheet Layouts



<p>Grid: Local Grid by GPS Observations to the OS Active Network (OSTN15)</p>	<p>Datum: Ordnance Datum by GPS Observations to the OS Active Network (OSGM15)</p>
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Revision:	Amendments:	Date:	Author:
"	"	"	"
"	"	"	"
"	"	"	"
A	ORIGINAL ISSUE	Jun'22	JE

rps MAKING COMPLEX EASY

THE SURVIVAL ASSOCIATION

Stafford - Clevedon - Milton Keynes - Warrington - Edinburgh

T: 0800 917 8227 E: rps.survey@rpsgroup.com www.rpsgroup.com

Red Deer House, Dunston Business Village, Stafford Road, Dunston, Staffordshire, ST15 9AB

CLIENT:

RPS Consulting

PROJECT: Welcomb Street

TITLE: Topographical & Underground
Utility Survey

Drawn: DLJ/SUB/DW	Checked: CA
-------------------	-------------

Date: June 2022	Scale: 1:200 @ A0
Dwg No: UAR316Q_A	Sheet 1 of 2

MAKING



MAKING
COMPLEX

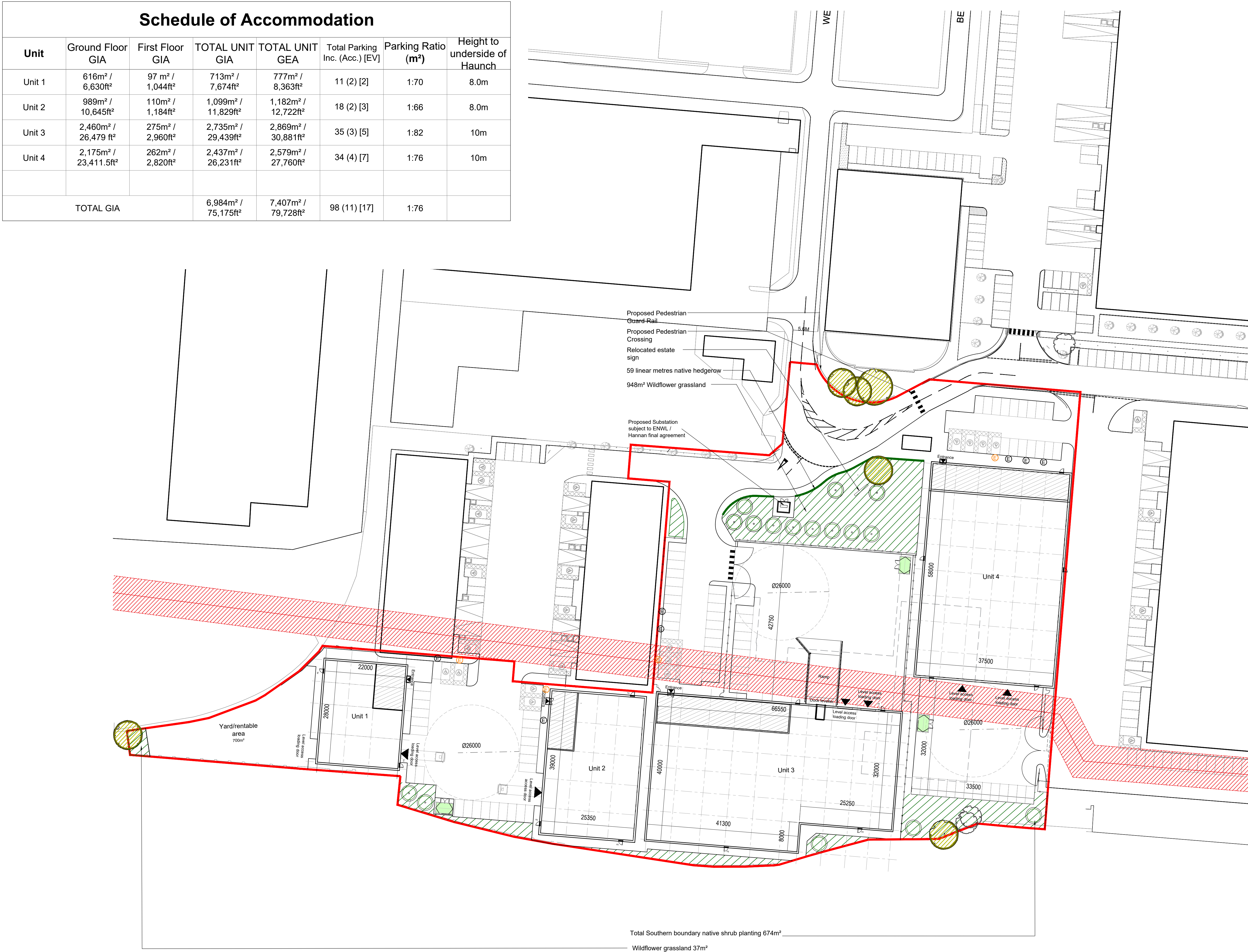
EASY

1. *Journal of the American Medical Association*, 2000; 283: 2689-2696.

Appendix C

Development Plans

Schedule of Accommodation							
Unit	Ground Floor GIA	First Floor GIA	TOTAL UNIT GIA	TOTAL UNIT GEA	Total Parking Inc. (Acc.) [EV]	Parking Ratio (m²)	Height to underside of Haunch
Unit 1	616m² / 6,630ft²	97 m² / 1,044ft²	713m² / 7,674ft²	777m² / 8,363ft²	11 (2) [2]	1:70	8.0m
Unit 2	989m² / 10,645ft²	110m² / 1,184ft²	1,099m² / 11,829ft²	1,182m² / 12,722ft²	18 (2) [3]	1:66	8.0m
Unit 3	2,460m² / 26,479 ft²	275m² / 2,960ft²	2,735m² / 29,439ft²	2,869m² / 30,881ft²	35 (3) [5]	1:82	10m
Unit 4	2,175m² / 23,411.5ft²	262m² / 2,820ft²	2,437m² / 26,231ft²	2,579m² / 27,760ft²	34 (4) [7]	1:76	10m
TOTAL GIA			6,984m² / 75,175ft²	7,407m² / 79,728ft²	98 (11) [17]	1:76	

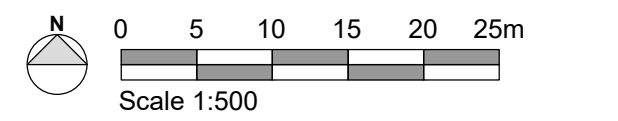


NOTES AEWTP026C

- All dimensions and levels are to be checked on site.
- Any discrepancies are to be reported to the architect before any work commences
- This drawing shall not be scaled to ascertain any dimensions. Work to figured dimensions only.
- This drawing shall not be reproduced without express written permission from AEW.
- Title overlay drawings and ownership boundaries are produced using all reasonable endeavours. AEW cannot be responsible for the accuracy or scale discrepancy of base plans supplied to them.
- All works are to be undertaken in accordance with Building Regulations and the latest British Standards.
- All proprietary materials and products are to be used strictly in accordance with the manufacturers' recommendations.

CDM 2015

Client notified of duties: **07/04/21**
Principal Designer: **Client**
Unless noted below, all known hazards have been highlighted on the drawing:



-  Site Boundary 4.54ac / 1.80ha
-  Mezzanine Extents
-  30" combined sewer with 30ft easement.
Exact alignment TBC by survey
-  Footprint of existing Zone A + B
-  Landscape Planting to Landscape Architect Specification. Existing trees and shrubs to be retained where possible.
-  Existing trees to be retained
-  Proposed tree planting
- Manchester City Council Maximum parking standards:
- B2 = 1:45 sq.m
B8 = 1:100 sq.m
-  Proposed Bin store
-  Pedestrian gate with panic hardware
-  Future provision Electrical Vehicle Charging spaces with cable routes

NOTES

HGV circulation subject to tracking analysis

P12	16/04/24	MW	DRS
Planning Issue			
REV	Date	Drawn by: -	Checked by: -

Status	Purpose of Issue
S4	For Planning

drawing stage **Stage 3**

client

Network Space

project

**Welcomb Street
Openshaw**

drawing title

Proposed Site Plan

date	Apr 2024	drawn	MW
scale@A1	1:500	checked	DRS

Appendix D

United Utilities Sewer Plans

CHECKED

Atkins - Utility Solutions

The Hub
500 Park Avenue,, Aztec West, Almondsbury
Bristol,
BS32 4RZ

FAO:

How to contact us:

**United Utilities Water Limited
Property Searches
Haweswater House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP**

Telephone: 0370 7510101

E-mail: propertysearches@uuplc.co.uk

**Your Ref: 107548
Our Ref: UUPS-ORD-390525
Date: 03/05/2022**

Dear Sirs

Location: Site off Welcomb Street Manchester

I acknowledge with thanks your request dated 02/05/2022 for information on the location of our services.

Please find enclosed plans showing the approximate position of United Utilities' apparatus known to be in the vicinity of this site.

The enclosed plans are being provided to you subject to the United Utilities terms and conditions for both the wastewater and water distribution plans which are shown attached.

If you are planning works anywhere in the North West, please read United Utilities' access statement before you start work to check how it will affect our network. <http://www.unitedutilities.com/work-near-asset.aspx>.

I trust the above meets with your requirements and look forward to hearing from you should you need anything further.

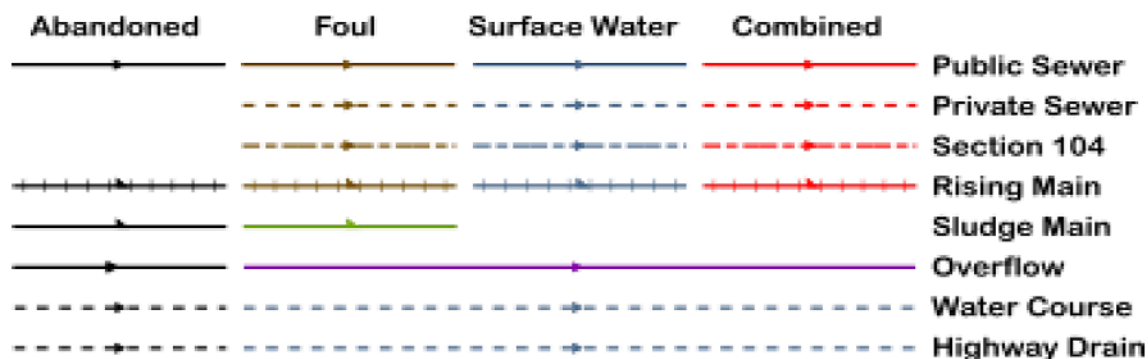
If you have any queries regarding this matter please [contact us](#).

Yours Faithfully,



Karen McCormack
Property Searches Manager

Wastewater Symbolology



All point assets follow the standard colour convention: **red** – combined **brown** - foul
blue – surface water **purple** - overflow

Manhole	Side Entry Manhole
Head of System	Outfall
Extent of Survey	Screen Chamber
Rodding Eye	Inspection Chamber
Inlet	Bifurcation Chamber
Discharge Point	Lamp Hole
Vortex	T Junction / Saddle
Penstock	Catchpit
Washout Chamber	Valve Chamber
Valve	Vent Column
Air Valve	Vortex Chamber
Non Return Valve	Penstock Chamber
Soakaway	Network Storage Tank
Gully	Sewer Overflow
Cascade	Ww Treatment Works
Flow Meter	Ww Pumping Station
Hatch Box	Septic Tank
Oil Interceptor	Control Kiosk
Summit	
Drop Shaft	Change of Characteristic
Orifice Plate	

Clean Water Symbolology

Proposed	Abandoned	Live	
			Distribution Main
			Trunk Main
			Comms Pipe
			Private Pipe
			Concessionary Service
			Raw Water
			LDTM Raw Water
			LDTM Treated Water
			Air Valve
			AC Valve, open
			AC Valve, closed
			CC Valve, open
			CC Valve, closed
			Non Return Valve
			Pressure Management Valve
			OMS Valve
			Stop Tap
			Flow Meter
			Domestic Meter
			Commercial Meter
			Pump
			Hydrant
			Fire Hydrant
			Anode
			Chlorination Point
			De-chlorination Point
			Strainer Point
			Access Point
			Hatch Box
			IP Point
			Sampling Station
			Logger Box
			Bore Hole
			Inlet Point
			Bulk Supply Point
			End Cap
			Site Termination
			Change of Characteristic
			Condition Report
			<u>Property Types</u>
			Water Tower
			Valve House
			Booster Pumping Station
			Intake Pumping Station
			Water Treatment Works
			Supply Reservoir
			Service Reservoir
			Impounding Reservoir
			Pipe Bridge

Symbology for proposed assets is the same as above, but shown in **green**
Symbology for abandoned assets is the same as above, but shown in **black**

TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self construction of water mains) (UUWL apparatus) of United Utilities Water Limited "(UUWL)".

TERMS AND CONDITIONS:

- This Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
- This Map and any information supplied with it is provided for general guidance only and no representation, undertaking or warranty as to its accuracy, completeness or being up to date is given or implied.
- In particular, the position and depth of any UUWL apparatus shown on the Map are approximate only. UUWL strongly recommends that a comprehensive survey is undertaken in addition to reviewing this Map to determine and ensure the precise location of any UUWL apparatus. The exact location, positions and depths should be obtained by excavation trial holes.
- The location and position of private drains, private sewers and service pipes to properties are not normally shown on this Map but their presence must be anticipated and accounted for and you are strongly advised to carry out your own further enquiries and investigations in order to locate the same.
- The position and depth of UUWL apparatus is subject to change and therefore this Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the Map have been made subsequent to issue and prior to any works being carried out.
- This Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) in the vicinity of UUWL apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUWL apparatus by reason of the actual position and/or depths of UUWL apparatus being different from those shown on the Map and any information supplied with it.
- If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
- This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent UUWL from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.