

Our Ref: 20081/LS
26th November 2020

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FAO of Mr David Lawless, Senior Planner, Development Management South

Dear David,

LAUREN HOUSE, MANCHESTER, M22 4BL
FLOOD RISK STATEMENT

This Flood Risk Statement (FRS) assesses flood risk from all sources relating to the proposed extension of an existing residential block located at Lauren House, Beechpark Avenue in Manchester.

The site is located within an area of Flood Zone 2 associated with the Baguley Brook and Brownley Brook. This statement has been prepared with due consideration of the National Planning Policy Framework¹ (NPPF), the latest Planning Practice Guidance for Flood Risk and Coastal Change² and Flood Risk Standing Advice (FRSA) for vulnerable developments in Flood Zone 2³. In addition, this letter complies to the Manchester City Council (MCC) Core Strategy⁴ Policy EN14 Flood Risk.

ASSESSMENT OF EXISTING SITE

The site is less than 1 hectare and is located on the north side of Beechpark Avenue. The site is bounded by residential areas to the east and south, with an area of woodland to the north with contains a small pond. To the west of the site is the A5103 Princess Parkway, immediately north of the transition from the M56 at Junction 3a.

The site is currently occupied by an existing block of flats, with associated gardens and car parking. There are 12 no. existing two-bedroomed flats, located on the ground, first and second floor of the purpose-built unit. This site also includes disabled access, including specific parking, bicycle storage and shared garden spaces.

Whilst there are no watercourses located within the immediate vicinity of the site, there are two small watercourses located approximately 350m from the site, on the southern side of Altrincham Road. Several small drains are identified on mapping within Gib Lane Wood, on the western side of A5103 and within Round Wood to the south-east of the site, however these appear to be land drains or small depressions and are not shown to be connected directly to the river systems. The Brownley Brook is largely in under the Wythenshawe area to the south of the site, but there are some short open channel reaches. It appears to join the Baguley Brook after passing under the M56, south of Junction 3a. The Baguley Brook then flows to the west, before later joining the Sinderland Brook.

Cont.../

¹ Communities and Local Government, Updated National Planning Policy Framework, 2019

² Communities and Local Government, Planning Practice Guidance, 2014

<http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/> Accessed 09/11/2020

³ <https://www.gov.uk/flood-risk-assessment-local-planning-authorities> Accessed 09/11/2020

⁴ Manchester City Council, Core Strategy Adopted July 2012

The location of the site, together with an indication of nearby watercourses, is shown in **Figure 1**.

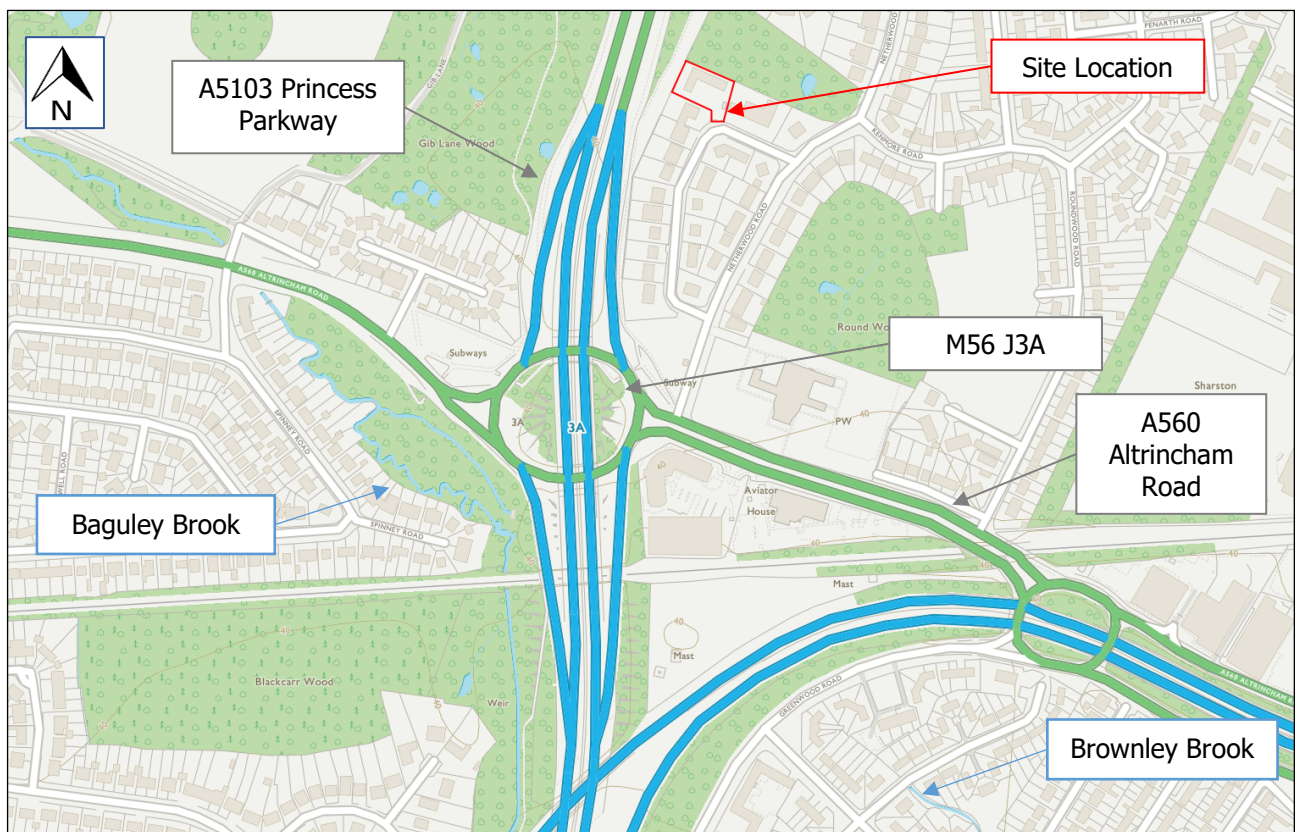


Figure 1⁵ - Site Location

GROUND LEVELS

Topographic survey for the site was undertaken in April 2006, by Survey Solutions, and was reissued in November 2020 for the purposes of this assessment. This confirms that ground levels on site range from a minimum of 36.78m AOD on the north boundary to 38.01m AOD at the site entrance. Ground levels within the centre of the site, are in the order of 37.50m AOD, with levels at the location of the proposed eastern and western extensions at 37.42m and 37.52m AOD respectively.

The site appears to fall from the entrance towards the northern boundary. As such, ground levels within the road are typically higher than those on site; ranging from 37.81m to 37.98m AOD along Beechpark Avenue. Given that Beechpark Avenue lies between the watercourses and the site, it is considered that the on-site ground level may not give a true representation of the actual risk of flooding. As such, further investigation was undertaken to investigate ground levels within the wider area.

Environment Agency LiDAR data was obtained and used to consider the site ground levels in the context of the wider topography, as shown in **Figure 2**.

⁵ Contains OS data © Crown copyright and database rights 2020

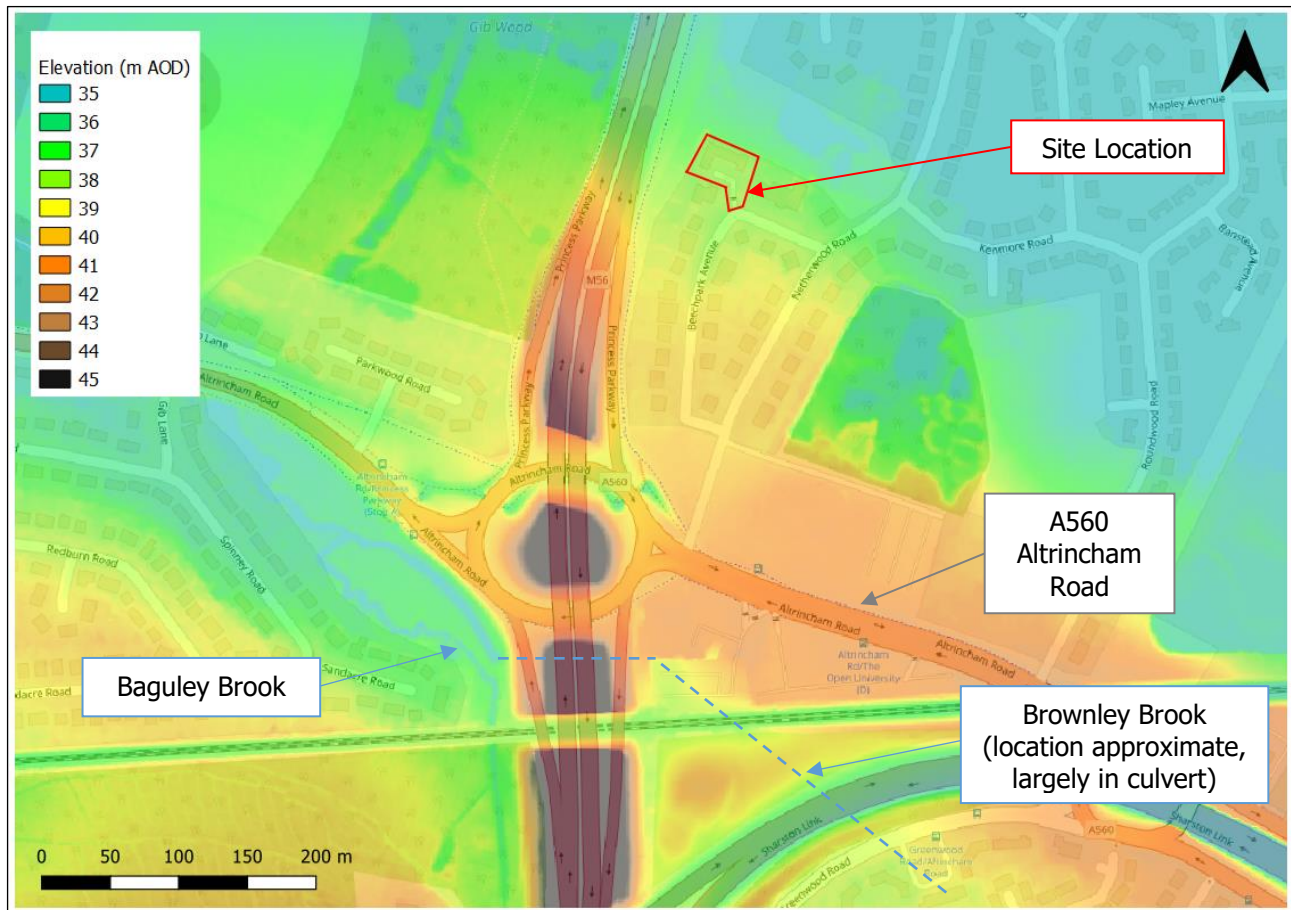


Figure 2 – LiDAR data showing ground levels to the south of the site

Whilst the site is shown to be within a low lying area (ground levels in the order of 37.0 to 38.0m AOD), the LIDAR clearly indicates that ground levels rise along Beechpark Avenue and Netherwood Road to the south towards A560 Altrincham Road, before dropping again on the southern side towards the Baguley Brook and (largely culverted) Brownley Brook. Whilst there are two underpasses clearly shown within the ground model (approximately 36.5m AOD), typical ground levels on the north side of the A560 are in the order of 40.0 to 40.9m AOD, several metres higher than ground levels on site.

PROPOSED DEVELOPMENT

Proposals for the site are for the addition of two small extensions to the existing building, at the eastern and western ends. This will provide 2 no. two-bedroom maisonettes, with kitchen / dining / living space at ground floor level, and two bedrooms with bathrooms at first floor.

The proposal will require relocation of the bicycle and bin stores, and provision of two new car parking spaces. Entrances to the new units will be from the car parking area, as per the existing properties, and access to and from the development will remain off Beechpark Avenue. The proposed ground floor layout can be seen in the attached drawings.

ASSESSMENT OF FLOOD RISK

In assessing the risk of flooding to the site, data from the Environment Agency (EA), Greater Manchester Preliminary Flood Risk Assessment⁶ (PFRA), Local Flood Risk Management Strategy⁷

⁶ JBA Consulting, January 2012, Greater Manchester Preliminary Flood Risk Assessment

⁷ Manchester City Council, March 2014, Manchester Local Flood Risk Management Strategy

(LFRMS), and Strategic Flood Risk Assessment (SFRA) Level 1⁸ and Level 2⁹ have been consulted. In addition, the area is included in the Upper Mersey Catchment Flood Management Plan (CFMP)¹⁰.

Historic Flood Records

A number of publicly available sources of flood risk were investigated to determine if the site and surrounding area have been affected by floods in the past. When requested directly, the EA did not provide any historical flooding information.

The Level 1 SFRA reports (via Upper Mersey CFMP) that there was flooding from the Baguley Brook during an extreme event in 1981, when "over 280 properties flooded in Fallowfield, Withington, Gorton, Sale, and Altrincham". However, this number represents properties flooded from the Chorlton, Sinderland, Temperley and Baguley Brooks combined, through a dense urban area.

No records of specific properties flooded were found and an investigation of flood maps shows that there are many properties at significantly greater risk of flooding than Lauren House, and it is therefore unlikely that the site would have been flooded or included within this figure. We are not currently aware of any other history of flooding at the site, or of any records of flooding from any other sources near the site.

Risk of Flooding from Rivers and the Sea

The dominant source of flood risk to the site is fluvial in nature from the Baguley and Brownley Brooks, which are located approximately 350m south of the site. The GOV.UK internet Flood Zone maps shows that the site lies partially within Flood Zone 2 as shown in **Figure 3**.



Figure 3¹¹ –Flood Map for Planning

⁸ JBA Consulting, March 2011, Manchester, Salford, Trafford Strategic Flood Risk Assessment Level One

⁹ JBA Consulting, March 2011, Manchester, Salford, Trafford Strategic Flood Risk Assessment Level Two

¹⁰ Environment Agency, December 2009, Upper Mersey Catchment Flood Management Plan Summary Report

¹¹ <https://flood-map-for-planning.service.gov.uk/confirm-location?easting=382304&northing=389414&placeOrPostcode=m22%204bl>

Retrieved 10/11/2020

Flood Zone 2 is defined as “medium risk”, which means land which has been assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding. However, the flood zones are broad scale and only used to advise on the likely extent of flooding within an area. The flood zones do not take into account the presence of any flood defences in the area, which are located downstream in the catchment. To further this assessment, detailed hydraulic model output and flood water levels were requested from the EA.

Flood water levels were provided from the Altrincham 2009 model, which represents the most recent model which the EA holds for this area. This model is also referenced by the Manchester, Salford and Trafford SFRA. A selection of model nodes were provided at the nearest point to the site, for both undefended and defended scenarios. Model Node 2 (ea013_Model_09_BAGU01_00019) is the closest listed, on the south-west side of the roundabout at Junction 3a, and results are presented in **Table 1**.

Table 1 –Nearby Flood Water Levels (from Altrincham 2009 model)

	Undefended Flood Water Levels (m AOD)			Defended Flood Water Levels (m AOD)
Floodplain Node	1% AEP (1 in 100 year)	1% AEP (1 in 100 year) + Climate Change	0.1% AEP (1 in 1000 year)	1% AEP (1 in 100 year)
BAGU01_00019	36.37	36.45	36.53	36.38

No on-site flood water levels were received from the Environment Agency, and levels provided were in-channel results from the Baguley Brook only. These results do not appear to reflect the extent of flooding shown on the published flood maps. A full copy of the EA’s hydraulic model was therefore requested and interrogated to understand the designation of Flood Zone 2 around the site. This confirmed that the Altrincham 2009 model does not include the Brownley Brook tributary, and output provided illustrates only a narrow corridor of flooding along the Baguley Brook itself. The output flood map (Figure 3, Level 2A Undefended Altrincham) is included within this letter.

The Baguley Brook is Main River, under the jurisdiction of the Environment Agency, whereas the Brownley Brook is classified as Ordinary Watercourse. It is largely culverted under the Wythenshawe area, but does appear to be represented generally on the GOV.UK flood maps. Therefore, further clarification was sought from the EA as to the origin of the flooding which appears to indicate that the site is at risk.

Correspondence with the relevant EA team confirmed that the area of Flood Zone 2 around the site was thought to be a result from an earlier hydraulic model, the Brownley Brook 2007 model (part of the Timperley and Sinderland Model). This older model, with associated results and flood maps, was provided to Water Environment Ltd for further interrogation. The Brownley Brook is a small tributary, 4km long with heavily culverted reaches, which joins the Baguley Brook immediately downstream of a crossing under the M56. The nearest open channel node was BROW01_0135U, on the south-east side of the roundabout at Junction 3a. Results for the undefended model are shown in **Table 2**. There are no defended run results for the Brownley Brook since it is not directly affected or benefitted by flood defences.

Table 2 –Nearby Flood Water Levels (from Timperley and Sinderland 2007 model)

	Undefended Flood Water Levels (m AOD)			Defended Flood Water Levels (m AOD)
Floodplain Node	1% AEP (1 in 100 year)	1% AEP (1 in 100 year) + Climate Change	0.1% AEP (1 in 1000 year)	1% AEP (1 in 100 year)
BROW01_0135U	37.23	37.23	37.83	N/A

The Brownley Brook results show an in-channel flood water level of 37.83m AOD during the 1 in 1000 year event, higher than level in the Baguley Brook for the same event (36.53m AOD). However, the mapped Flood Envelope for the 1 in 1000 year event, as shown on the output provided with the modelling report (Figure D.1 Sheet 2 of 2, Brownley Brook - included with this letter), still does not indicate flooding north of A560 Altrincham Road.

Following all reasonable investigation of available EA model output, including out-dated modelling from 2007 and discussion with the EA directly, it has not been possible to confirm the origin of the Flood Zone 2 designation around the site. Therefore, conservative assessment should be made using the worst-case in-channel flood water level of 37.83m AOD on the Brownley Brook.

Due to the age of the hydraulic models, no up-to-date climate change levels are provided. Those presented in this report include 20% uplift for climate change, as standard at the time. As per the Environment Agency guidance on climate change, “more vulnerable” developments in Flood Zone 2 within the North West catchment should use the Higher Central and Upper End climate change allowances. This includes climate change allowance ranges from 35% to 70%.

The Environment Agency in Greater Manchester, Merseyside & Cheshire have provided guidance on application of the climate change allowances and local considerations. This document¹² confirms that for a minor development (1-9 dwellings) which is more vulnerable in Flood Zone 2 the “basic” assessment approach can be utilised. In this locality, this precautionary approach adds a standard freeboard to the peak design event (1% AEP). For the Higher Central and Upper End allowances, this adds 0.24m and 0.48m respectively. Uplifted flood water levels are shown in **Table 3**.

Table 3 – Flood Water Levels with Uplift to Account for Climate Change

	Flood Water Levels (m AOD) with Basic Assessment for Climate Change			
Floodplain Node	1% AEP (1 in 100 year)	1% AEP (1 in 100 year) + 35% Climate Change	1% AEP (1 in 100 year) + 70% Climate Change	0.1% AEP (1 in 1000 year)
BAGU01_00019	36.37	36.61	36.85	36.53
BROW01_0135U	37.23	37.47	37.71	37.83

¹² Environment Agency, March 2016, Flood Risk Assessment – Climate Change Allowances for Greater Manchester, Merseyside & Cheshire

Based on the data available, the worst-case level is still the 0.1% AEP on the Brownley Brook, which should represent the extent of Flood Zone 2. The design flood water level is therefore 37.83m AOD. However, interrogation of LiDAR ground levels within the area to the north of the Brownley Brook, shows an area of high ground on the north side of A560 Altrincham Road. This area has a minimum ground level of 40.0m AOD, before falling northwards towards the site. Any flood water would need to reach and overcome this area of high ground, before flooding Beechpark Avenue towards the site.

It is therefore not expected that a flood level of 37.83m AOD would be able to reach the site. Even taking into account the presence of low-lying underpasses beneath the road, there is no flow path from either the Baguley Brook or Brownley Brook towards the site without overcoming the high ground north of A560 Altrincham Road. Therefore, regardless of the onsite ground level, the genuine risk of flooding to the site from the watercourses is assessed to be low.

The site is not at risk of tidal flooding as the site is over 25km upstream of the Howley Wier in Warrington which is the tidal limit of the River Mersey. The site is at low risk of tidal flooding.

Risk of Flooding from Land

Flooding from surface water arises during intense rainfall events when flood waters are unable to infiltrate into the ground or discharge into local ditches or artificial drainage infrastructure. In an urban environment, the risk of flooding from surface water and from overloaded sewers is closely related, and both are included in the relevant surface water flooding datasets. Flooding events are typically of short duration (unless there is a drainage system blockage) but can be severe.

The GOV.UK Flood Long Term Flood Risk Maps cover the risks of flooding from surface water. These maps are a useful tool in assessing the extent and frequency of flooding in a general area but do come with a caveat that they should not be relied upon for site specific development or property level assessment. Engineering judgement is therefore required when considering the flood risk information presented. The GOV.UK maps showing the risk of flooding from surface water map, applicable to the site, is shown in **Figure 4**.

The dark blue shaded areas are areas of 'High' surface water flood risk which have a 1 in 30 year event chance of flooding. While the lighter blue areas are of 'Medium' risk of surface water flooding which have a 1 in 100 year event chance and the pale blue areas are of 'Low' risk of surface water flooding has between a 1 in 1000 year and 1 in 100 year event chance of occurring. Areas not highlighted in blue are classed at 'Very Low' risk of surface water flooding with less than 1 in 1000 year event chance of occurring.

Figure 4 shows that a small area of "low" risk surface water flooding is seen within the car parking area of the existing development on site. The corner of Beechpark Road, at the entrance to the site, is shown to experience a "low" and "medium" risk of flooding. Further interrogation of the GOV.UK surface water maps was undertaken to determine the flood water depth. The GOV.UK surface water flood maps do not include the 1 in 100 year plus climate change and as such, the 1 in 1000 year event is used as a surrogate. This confirmed that the small low risk area of flooding on site, and within Beechpark Road, is considered to be below 300mm depth.

Therefore, whilst some shallow surface water ponding could be seen within the car parking area to the front of the proposed maisonettes, flooding of this depth would likely be contained and controlled by the onsite surface water drainage system. In addition, thresholds to both new maisonettes will

be raised by a minimum of 150mm above external ground levels in accordance with CIRIA C635¹³ to protection against the ingress of surface water ponding on site, regardless of the source.

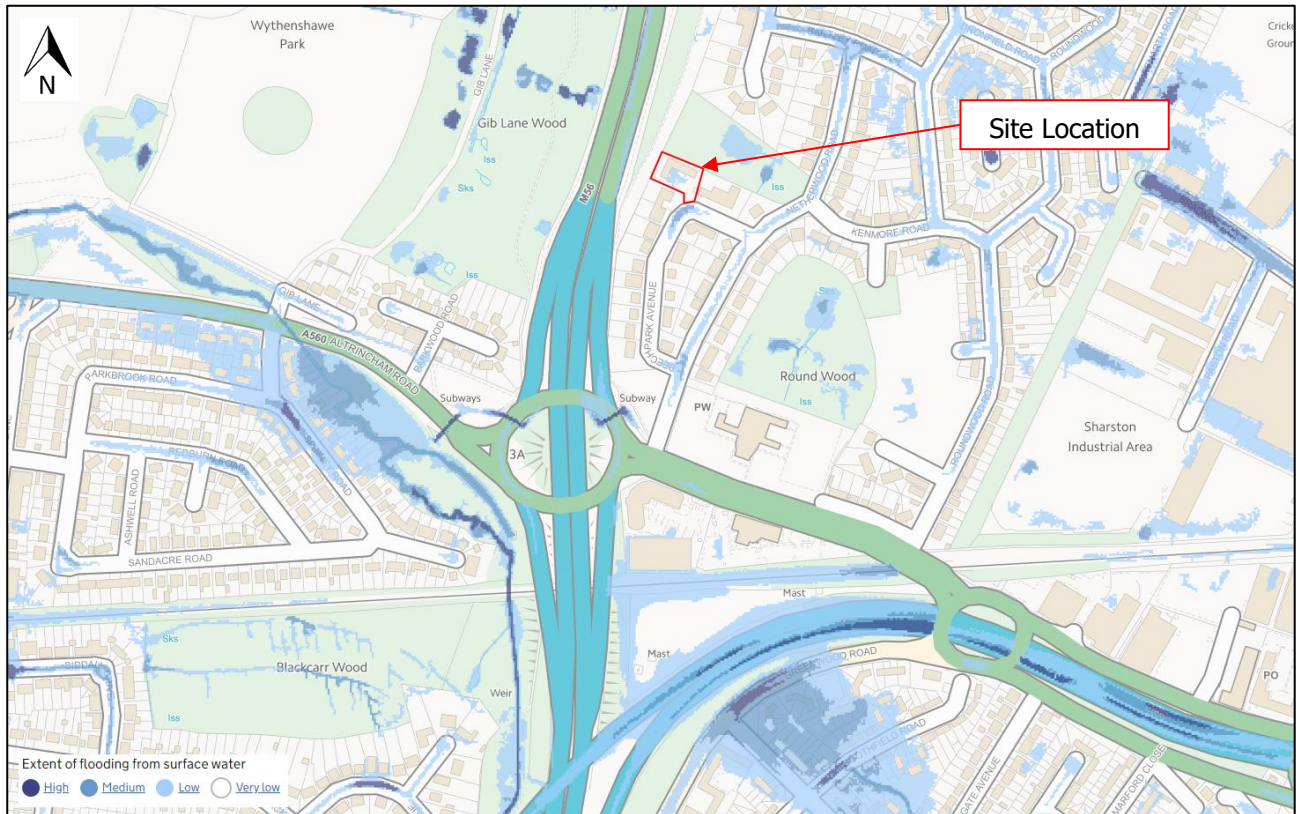


Figure 4¹⁴ - GOV.UK Long Term Flood Risk, Surface Water Extents Risk Map

Risk of Flooding from Sewers

Sewer flooding generally results in localised short-term flooding caused by intense rainfall events overloading the capacity of sewers. A Water Report provided by United Utilities (UU) indicates the presence of a 225mm diameter vitrified clay foul sewer within Beechpark Avenue. This sewer runs from the south, around past the site entrance, and east towards Netherwood Road.

There are no separate surface water sewers identified on the UU sewer records. The existing block of flats on site is shown on the survey to discharge to two 1500mm diameter soakaways within the site boundary.

There are no records of the site having experience sewer flooding. Any sewer flooding experienced as a result of failure of the public sewer in Beechpark Avenue would likely collect in low spots within the road and is unlikely to be of significant enough depth to flow onto the site and towards the proposed dwellings.

Any blockage or failure of the onsite surface water drainage system could result in areas of standing water within the car park. However, as per the risk of flooding from land addressed above, threshold levels at entrances into the new maisonettes will be raised a minimum of 150mm above external ground levels to protect against ingress of surface water flooding from any source. The risk of flooding from sewers is low.

¹³ CIRIA, May 2006, Designing for exceedance in urban drainage - good practice (C635)

¹⁴ © Crown Copyright and database right 2019 OS 100024198. Retrieved 10/11/2020

Risk of Flooding from Groundwater

The DEFRA's magic maps show that the site is not located in a groundwater source protection zone. but the superficial drift deposits were classified as a Secondary (undifferentiated) Aquifer and the bedrock is a Secondary B Aquifer. The Groundwater Vulnerability was shown to be Minor Aquifer Medium - High. This means the site could support groundwater at a local level rather than a strategic scale but still be an important source of source of water for baseflow of river.

The British Geologic Survey (BGS) 1:50,000 scale mapping classifies the superficial geology underlying the site is Devensian Till. The bedrock geology is the Tarporley Siltstone Formation, part of the Mercia Mudstone Group. The superficial till is a typically a mixture of clay, sand, gravel and boulders whilst the bedrock comprises interbedded siltstones, mudstones and sandstones in approximately equal portions. Therefore, geological conditions are mixed, but both the superficial and bedrock geology could be capable of supporting groundwater.

A small area identified as at risk of Groundwater Flooding is shown at the site within the SFRA mapping (SFRA Figure GW_2.1). Further interrogation of the source of the data revealed that this designation is based on the presence of BGS drift deposits in Flood Zone 2, rather than any local data.

The site and surrounding area of Beechpark Avenue are predominantly hard paved, which reduces the emergence of groundwater at the surface. Groundwater emergence elsewhere in the area, including in woodland areas to the north, would follow localised flow paths, therefore, any flooding would be similar to those shown on surface water risk map and flows would discharge to the local sewer system. The risk of flooding from groundwater is considered to be low.

Risk of Flooding from Artificial Sources

The GOV.UK Long Term Flood Risk from artificial sources show that the area is not at risk of flooding for either reservoirs or local flood storage areas. The Environment Agency are the enforcement authority for the Reservoirs Act 1975 in England, they ensure that reservoirs are inspected regularly, and essential safety work is carried out. All reservoirs must be inspected and supervised by reservoir panel engineers. There has been no loss of life in the UK from reservoir flooding since 1925.

The site is therefore not considered at risk of reservoir flooding and there are no further artificial waterbodies in the area that would constitute a significant risk of flooding to the site.

DESIGN RESPONSE TO FLOOD RISK

The EA standing advice for 'more vulnerable' development located in areas of flood risk should have ground floor levels set a minimum of 300mm above general ground level of the site or 600mm above the estimated flood water level, whichever is higher.

This FRS has concluded that the site is not at direct risk of flooding in even the highest (0.1% AEP) modelled flood event, due to the presence of higher ground between the watercourses and the site. As such, the application of standing advice guidance is not required.

Proposals for the site present an extension of the existing development on site, not a redevelopment. Therefore, constraints on finished floor levels and appropriate external threshold levels are dictated by the existing building. The proposed units are designed to meet full disabled access regulations, with ramps to entrances provided. It has therefore been confirmed that finished floor levels will be raised 150mm above surrounding ground levels.

In addition, the residential units proposed are maisonettes, with all sleeping accommodation at first floor level.

SUMMARY

This letter has outlined the risk of flooding from all sources. The site is shown on the GOV.UK internet Flood Zone map to lie partially within Flood Zone 2. The EA were unable to provide flood water levels for the site itself and therefore full hydraulic models were obtained and interrogated to ascertain the source of the Flood Zone 2 designated. Flood water levels from both the Baguley Brook and Brownley Brook models were considered within this FRS, to ensure a conservative assessment.

Comparison of flood water levels with local topography concluded that, whilst the onsite ground levels are below the worst-case flood water level (including considerations for climate change), there is no flow route which would allow flooding from either the Baguley Brook or Brownley Brook to reach the site. This is due to high ground levels on the north side of the A560 Altrincham Road. Based on information available, the risk of fluvial flooding to the site is low and there are no risks identified from any other source.

The proposal extensions will include threshold levels and / or finished floor levels raised 150mm above surrounding ground levels, to provide internal protection in the unlikely event of any localised flood event on the site.

Please feel free to contact me if you have any queries.

Yours sincerely,

**Laura Sleightholme**

MSc DIC BSc (Hons) Geol

MCIWEM FGS

Senior Environmental Engineer

Enclosures:

- Topographic Survey and Proposed Plans
- Environment Agency Flood Product Data Responses (provided Product 4, plus mapped output from hydraulic models)
- United Utilities Sewer Asset Plans

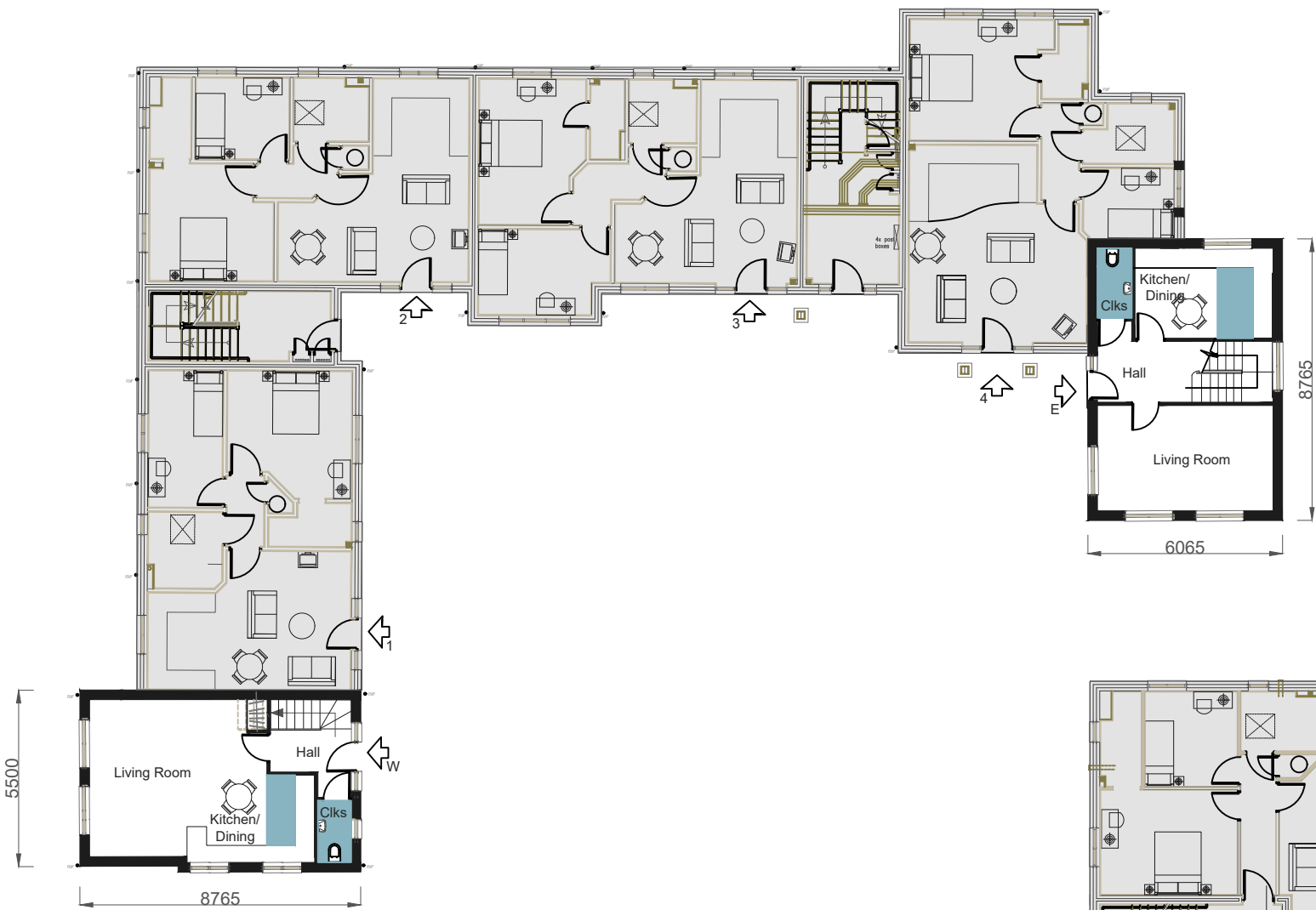
AUGUST 2020

20191 PL02
Lauren House
Proposed extensions

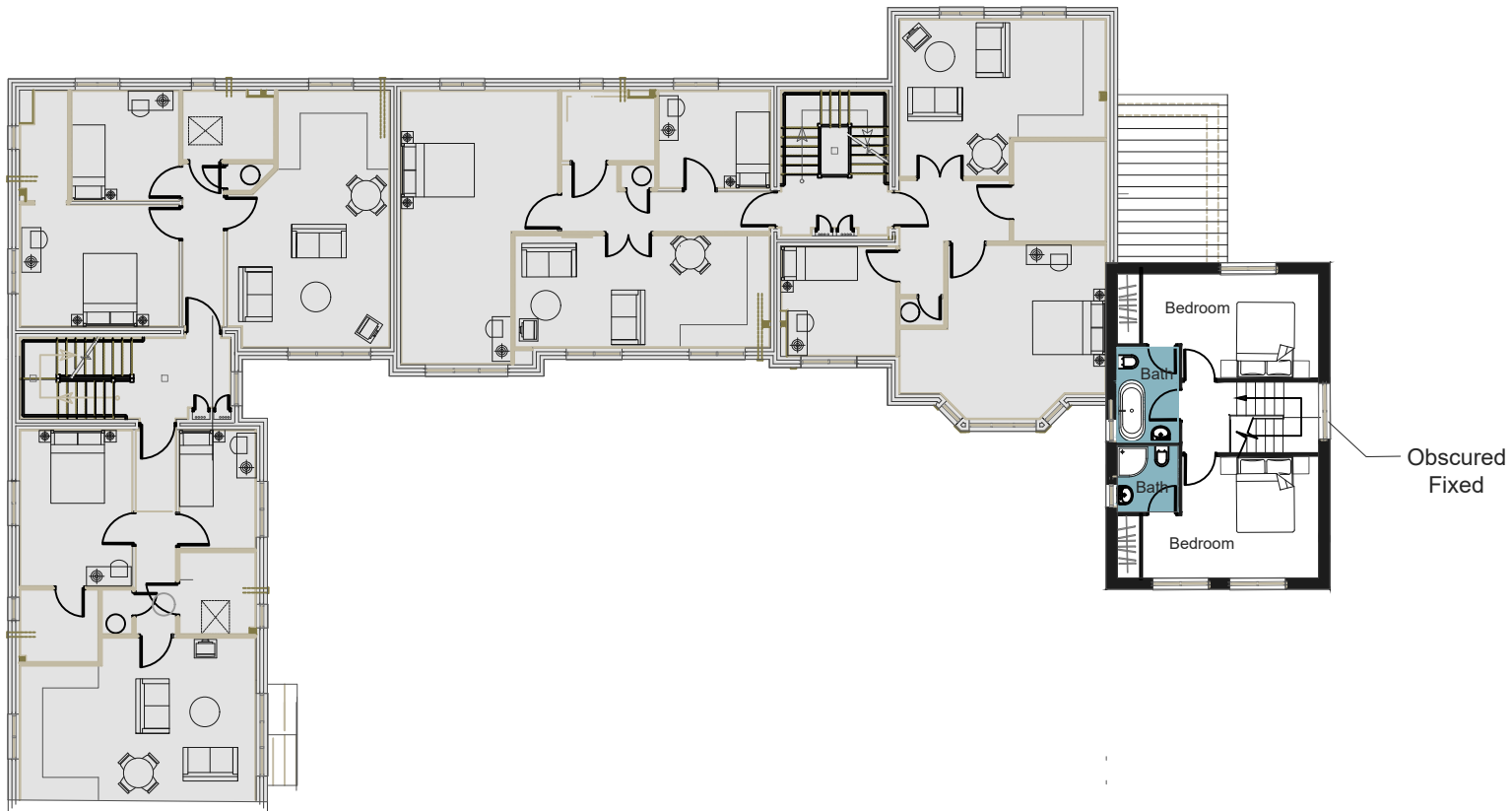
FLOOR PLANS

SCALE 1:200 @ A3

2No maisonettes
81 & 88sqm



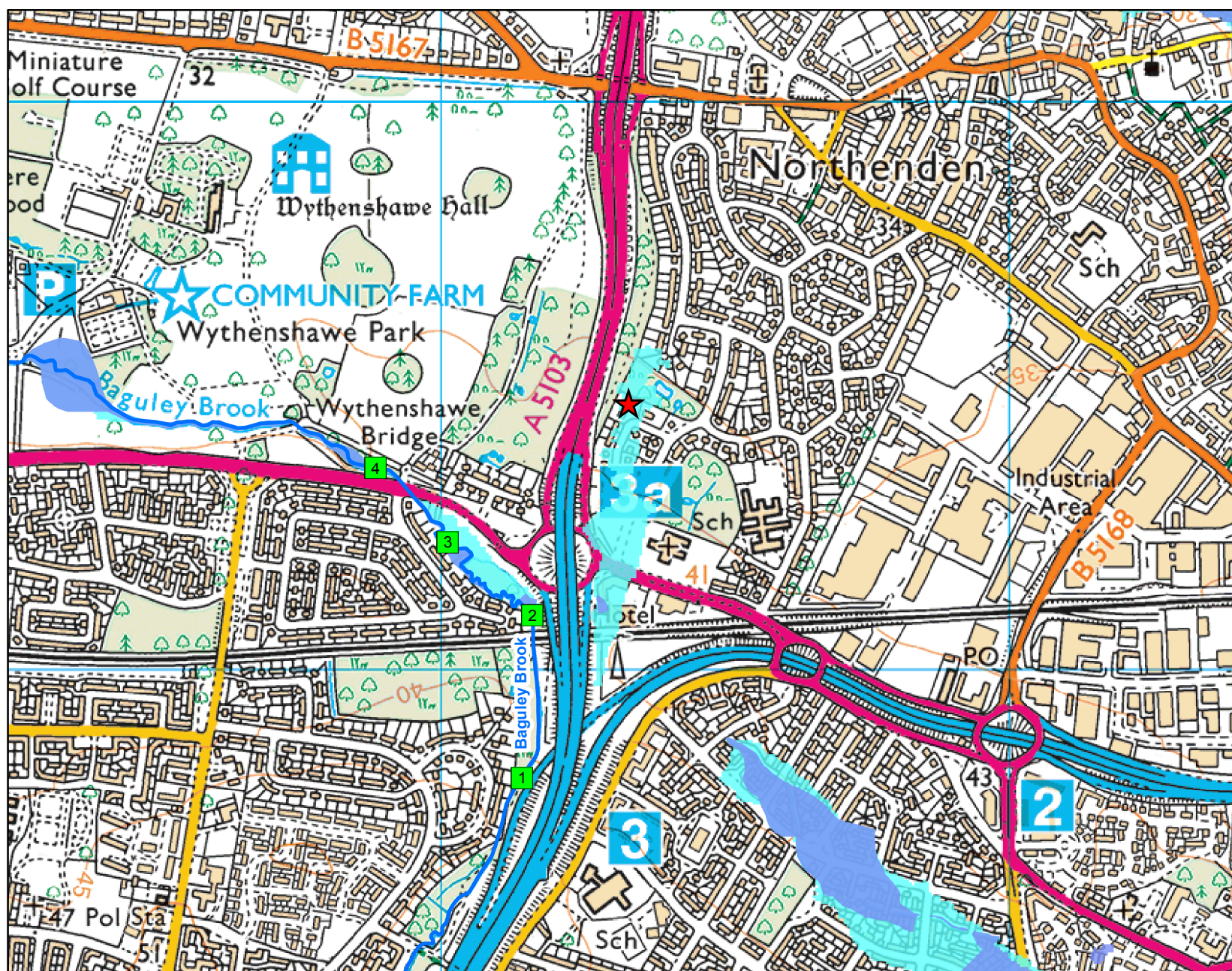
GROUND FLOOR



FIRST FLOOR

FIRST FLOOR

Detailed Flood Map centred on Beechpark Avenue, Manchester, M22 4BL. Created on 14/10/2020 [GMMC187868CC]



1:10,001



Legend

- ★ Site Location
- Model Measurements
- Main River
- Flood Zone 3
- Flood Zone 2

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Map Reference	Model Node Reference	Easting	Northing	Data	Undefended			Defended
					1 % AEP (1 in 100 year)	1 % AEP (1 in 100 year) + Climate Change*	0.1 % AEP (1 in 1000 year)	1 % AEP (1 in 100 year)
1	ea013_Model_09_BAGU02_00011	382144	388808	Modelled Water Level (m aodN)	38.34	38.41	38.47	38.34
				Modelled Flow (cumecs)	1.77	2.12	2.58	1.77
2	ea013_Model_09_BAGU01_00019	382162	389094	Modelled Water Level (m aodN)	36.37	36.45	36.53	36.38
				Modelled Flow (cumecs)	1.78	2.14	2.66	1.77
3	ea013_Model_09_BAGU01_00024	382013	389224	Modelled Water Level (m aodN)	35.20	35.26	35.32	35.21
				Modelled Flow (cumecs)	3.60	4.30	5.27	3.58
4	ea013_Model_09_BAGU01_00028	381886	389354	Modelled Water Level (m aodN)	34.18	34.25	34.42	34.18
				Modelled Flow (cumecs)	3.59	4.36	5.40	3.57

Model data taken from Altrincham 2009 Study

AEP - Annual Exceedence Probability

m aodN - metres above ordnance datum Newlyn

cumecs - cubic metres per second

Notes: *Climate Change Scenario - We only hold climate change measurements based on the previous climate change guidance (20% increase in flow). The new climate change guidance is available at <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>. The location of the site and the type (vulnerability) of development determine the climate change allowances to consider in any flood risk assessment.

Figure 3

Notes

This plan has been produced in accordance with Planning Policy Statement 25 - Development and Flood Risk.

Because the information is indicative rather than specific, local planning authorities will nevertheless need to consult the Environment Agency on individual applications.

Amendment will be required in future to account for information gathered subsequently e.g. changes in hydrological river responses or following flood events.

When in doubt the Environment Agency should be consulted.

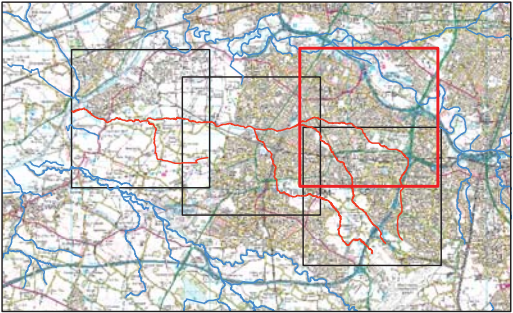
Channel roughness used in the model represents average conditions without any blockages and would not reflect the position if any heavy weed growth or debris were allowed to build up in the river channel.

It is assumed that embankments remain intact during flood events and act as an impermeable barrier. Were embankments to fail this could result in greater inundation.

Users should not that the floodplain extents were mapped at 1:10,000 scale as appropriate to the level of investigation and are based on information available at the time of survey.

The mapped outlines have been produced from a combined iSIS-TuFlow model. The base iSIS model was not constructed as part of this study and instead relates to the Environment Agency 'Timperley and Sinderland Flood Mapping Study', May 2007.

It must be noted that the model nodes displayed on these maps relate to the original 2007 iSIS model. Due to the scale of the mapping, not all the nodes are displayed on this image.



Key

- Node Point
- Main River
- Main River Excluded From Study
- 1.0% Annual Probability (100 Yr Flood Extent)
- 1.0 % Annual Probability (100 Yr Climate Change Flood Extent)
- 0.1% Annual Probability (1000 Yr Flood Extent)
- 45.98 Modelled Water Level for 100 year Simulation

FINAL	date	
DRAFT	Nov 2009	
REV	DATE	REMARKS

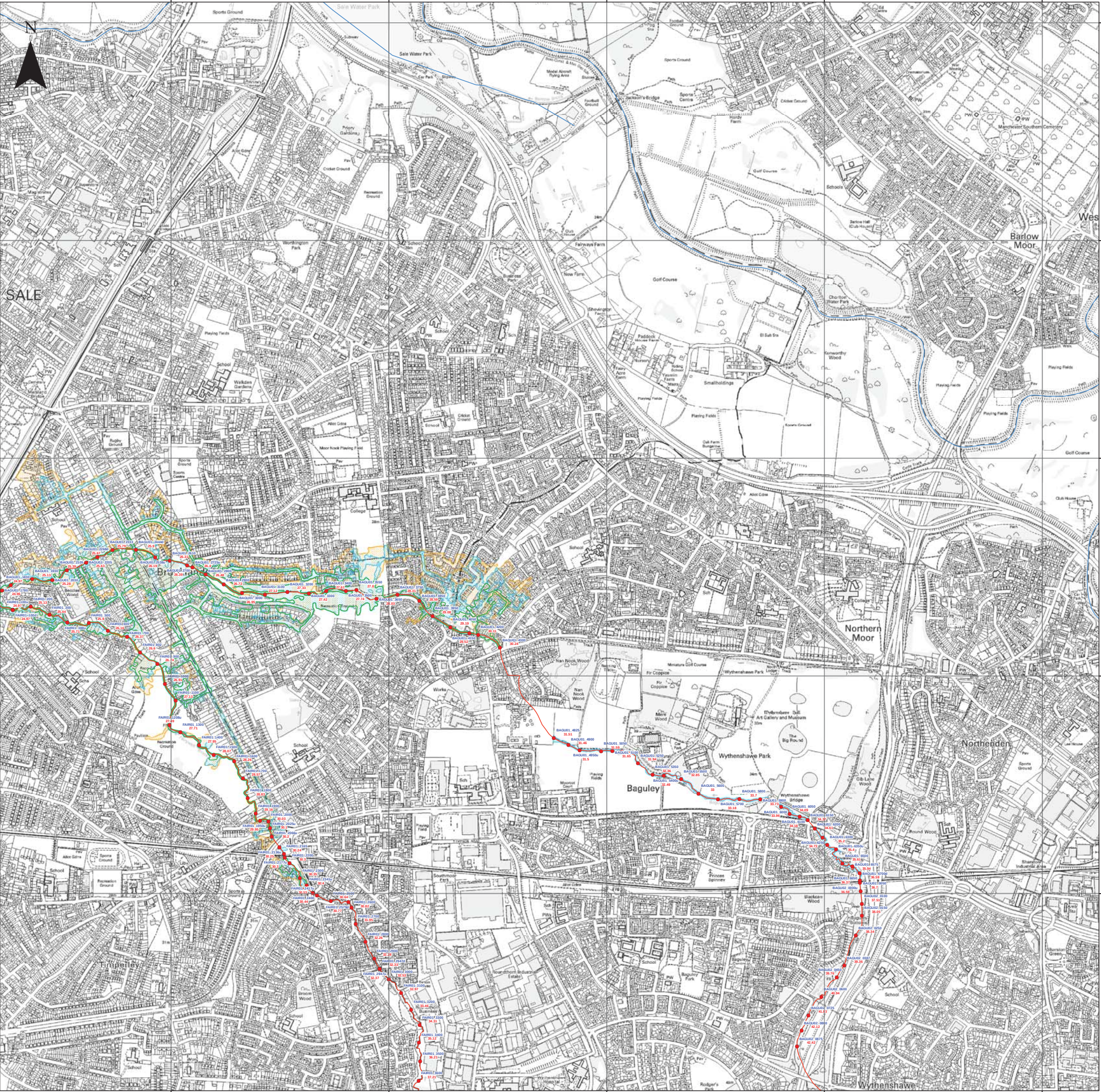
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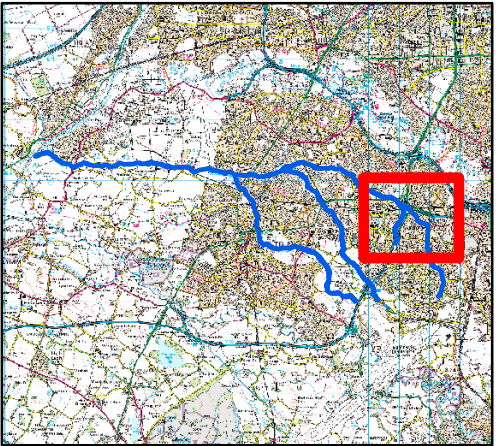
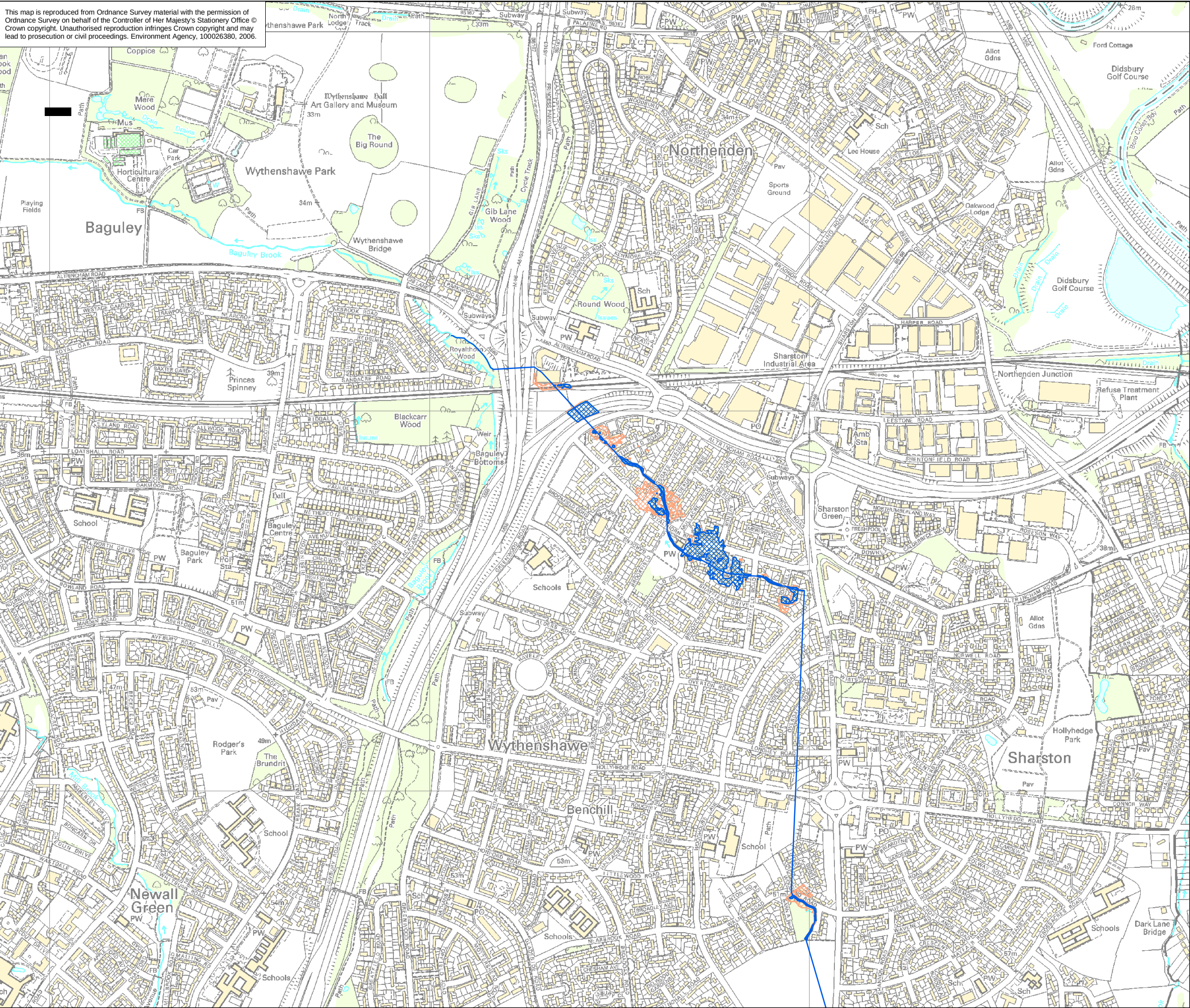
Flood Mapping

Level 2A Undefended
Altrincham
Figure 3

DATE OF ISSUE:		FIGURE NO:
SCALE: 1:9,000 @ A1		FIGURE NUMBER



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User Note
This plan has been produced in accordance with Planning Policy Guidance note 25 - development and flood risk. Because the information is indicative rather than specific, local planning authorities will nevertheless need to consult the Environment Agency on individual applications. Users should note that the flood plan extents were mapped at 1:10,000 (or as appropriate to the commission) scale, as appropriate to the level of investigation and are based on information available at the time of survey. Amendment will be required in future to account for information gathered subsequently e.g. changes in hydrological river response or observations following flood events. When in doubt the Environment Agency should be consulted.

Technical Note
It should be noted that certain locations not shown may be at risk of flooding from other sources (piped drain systems, water mains etc.) and from other watercourses not shown in this study.

- Key**
- Study Reach
 - 1% AEP Flood Envelope
 - 1% AEP + 20% Flood Envelope
 - 0.1% AEP Flood Envelope



North West Region - South Area
Appleton House, 430 Birchwood Boulevard, Birchwood
Warrington, Cheshire, WA3 7WD

**Flood Risk Mapping
and Data Management**

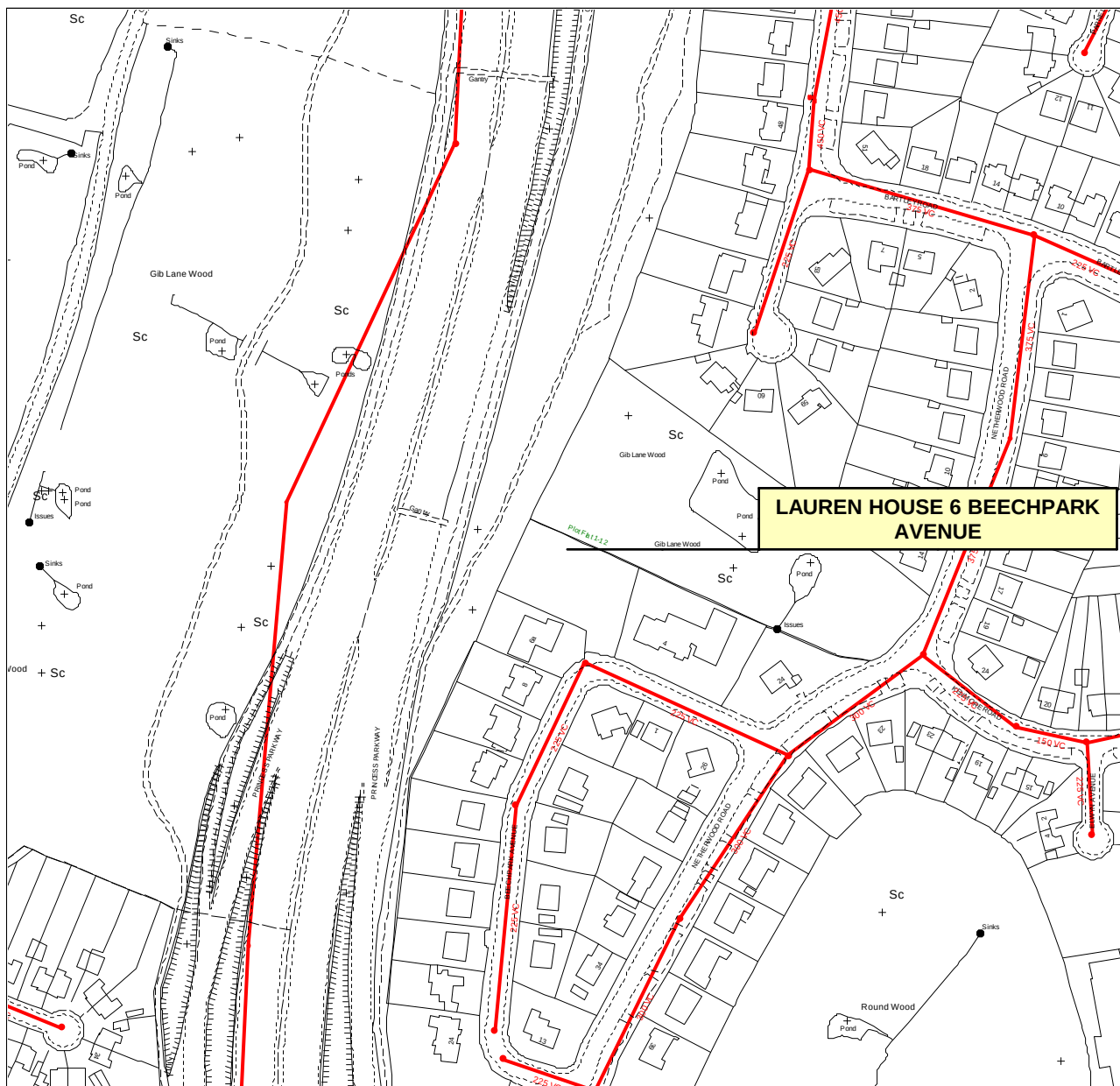
**Refine Existing S105 and FRM
Studies for Flood Zone 2**

**Timperley and Sinderland Study
Brownley Brook**

Produced	TC	DATE	May-07
Checked	ATL	DATE	May-07
Approved	AJT	DATE	May-07

Scale: 1:10,000 @ A1

FIGURE NO.
D.1 (Sheet 2 of 2)

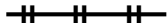


Extract from the Map of Public Sewers



Legend

Red or Brown - Foul Sewers
 Blue - Surface Water Sewers

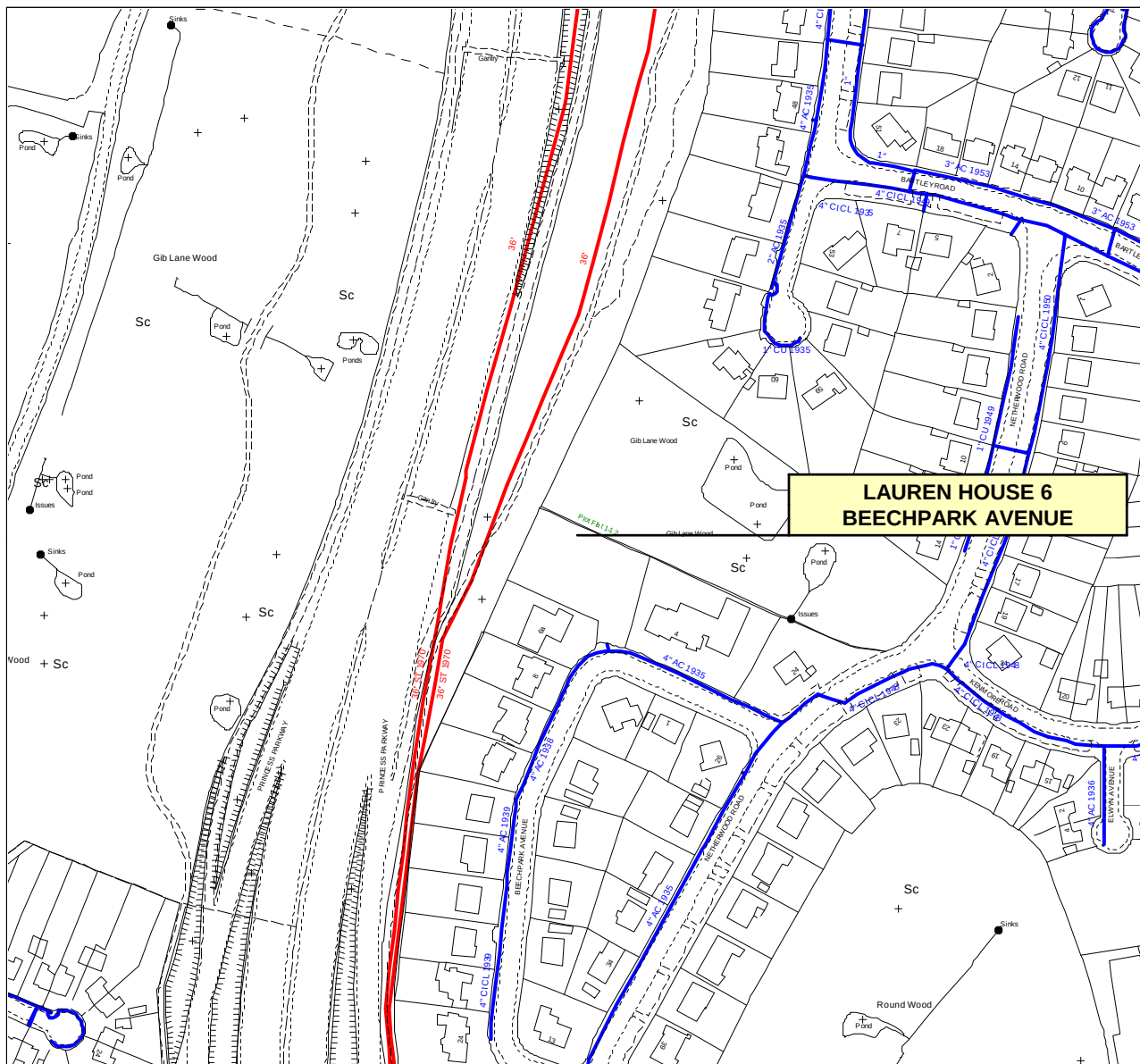
	Abandoned Sewer
	Public Sewers
	Mersey Valley Sludge main
	Highway Drain
	Private Sewers
	Pumping Main
	Section 104 Sewers
	District or Parish Boundary
	Development Outline

Mapping By Clair Sanderson

The position of underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. The actual positions may be different from those shown on the plan and private pipes sewers or drains may not be recorded. United Utilities will not accept any liability for any damage caused by the actual positions being different from those shown.

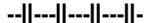
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Received Date 15/05/2008 Response Date 15/05/2008



Extract From the Map of Water Mains

Legend

	Distribution Mains
	Trunk Mains
	Non Potable Mains
	Proposed Mains
	Disused Mains (these may still be live)
	District or Parish Boundary
	Development Outline

Mapping By Clair Sanderson

The position of underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. The actual positions may be different from those shown on the plan and private service pipes may be shown by a broken blue line. United Utilities will not accept any liability for any damage caused by the actual positions being different from those shown.

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