



Flood & Water Management Act 2010

Section 19 Flood Investigation Report FI0087

Location: Bretton, Flintshire
Incident Date: October 2023

Document Control Sheet

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Revision History

Date	Version Number	Summary of Changes
23/08/2024	Draft Report 1	NA
10/07/2025	Version 2	Updated to document feedback from Risk Management Authorities
01/09/2025	Final Version	Final edits made by the LLFA

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Executive Summary

This report has been prepared for the purpose of meeting the requirements of Section 19 of the Flood and Water Management Act 2010. Under Section 19 of the Flood and Water Management Act 2010, the Lead Local Flood Authority (Flintshire County Council) on becoming aware of a flood in its area, must to the extent it considers necessary or appropriate, investigate, prepare and publish a Flood Investigation Report.

As a Lead Local Flood Authority (LLFA), it is the responsibility of Flintshire County Council (FCC) to manage the local flood risk from surface water, groundwater and ordinary watercourses such as streams and ditches (including lakes and ponds).

Section 19 of the Flood and Water Management Act 2010 states:

“On becoming aware of a flood in its area, a lead local flood authority must to the extent it considers necessary or appropriate, investigate –

- (a) Which risk management authorities have relevant flood risk management functions, and*
- (b) Whether each of those risk management authorities has exercised, or is intending to exercise, those functions in response to the flood”*

The flood risk management authorities in Flintshire are:

- Flintshire County Council
- Flintshire’s Environment Department
- Natural Resources Wales
- Dŵr Cymru / Welsh Water

Internal flooding to a single residential property warrants that the incident should be investigated, and a report prepared in accordance with the Council’s Local Flood Risk Management Strategy (LFRMS):¹

In October 2023, Storm Babet brought periods of heavy rainfall across large areas of the United Kingdom. The Met Office reported that the 18th to the 21st of October saw “the third-wettest independent 3-day period for England and Wales in a series from 1891”.

Representatives of Waterco Ltd, on behalf of FCC, have carried out community engagement and communicated with relevant stakeholders to gain an understanding of the nature of the October 2023 flood event. This Report provides details of the flooding incident.

Across the entirety of Bretton, the community engagement exercise indicated that at least 7 properties experienced internal flooding, with many more experiencing external flooding. The source of flooding can be attributed to a combination of watercourses and drainage systems exceeding their capacity due to the high amounts of rainfall. The public sewer system flowing along Chester Road became overwhelmed resulting in flooding of Chester Road. Flood waters on Chester Road did not drain sufficiently due to siltation of drainage assets (gullies) on the road, and bow waves from passing cars further pushing this water onto properties which generally sit below the road level.

¹ <https://www.flintshire.gov.uk/en/PDFFiles/Flooding-and-Drainage/Flintshire-Local-Flood-Risk-Management-Strategy.pdf>.

Elsewhere, towards the southern extent of Bretton, piped drains below ground exceeding their capacity due to high amounts of rainfall were again reported to be the primary cause of the flooding experienced, due to surface water buildup in the road.

Table 1 sets out the recommended actions required to reduce the flooding, and the stakeholder required to undertake each action.

Table 1 - Recommendations to Address Flooding

Ref	Stakeholder	Action
01	FCC Highways Authority	Post event review of highway assets to ensure they are operational.
02	FCC Highways Authority	Review the maintenance schedule of highway assets in this area, ensuring regular maintenance is carried out at flooding hotspots.
03	FCC Highways Authority	Consider the implementation of traffic management plans that can be put in place when a storm event is predicted, to prevent passing vehicles creating bow waves that exacerbate flooding.
04	FCC LLFA & Highways Authority	Investigate local capacity improvements to mitigate flood risk, including the use of highways assets.
05	FCC LLFA & NRW	Communicate with local communities to raise awareness of property level flood resilience measures that can be implemented to help mitigate flood risk
06	FCC LLFA	Investigate the feasibility for a flood mitigation scheme to manage and reduce runoff entering the highways from adjacent land.
07	NRW	Ensure Main Rivers are inspected on a risk-based frequency and where appropriate and justifiable, a maintenance regime is documented and completed by an appropriate Risk Management Authority and/or Riparian Owner.
08	DCWW	Review customer complaints and investigate the associated sections of public sewer system to remove any blockage / significant debris following the October 2023 event.
09	Broughton & Bretton Flood Action Group	Continue to engage with residents to help raise awareness of local issues surrounding flooding.
10	Property Owners / Residents	Sign up to the free signing up to the NRW Flood Warning System and consider the implementation of property level flood resilience measures. These could include; the installation of non-return valves to prevent ingress of floodwater on private drainage systems and installing flood barriers or flood doors.

1.0 Introduction

- 1.1 Since the introduction of the Flood and Water Management Act 2010 (FWMA) Flintshire County Council (FCC) is the designated Lead Local Flood Authority (LLFA).
- 1.2 Under Section 19 of the FWMA, FCC as the LLFA on becoming aware of a flood in its area must to the extent that it considers necessary or appropriate investigate and prepare a report.
- 1.3 Where a LLFA carries out an investigation then the report must be published, and any relevant risk management authorities notified.
- 1.4 Waterco have been commissioned by FCC to carry out a Flood Investigation Report in relation to flooding in Bretton during Storm Babet which occurred in October 2023. Storm Babet caused internal and external flooding to residential properties in Bretton.
- 1.5 The purpose of this Section 19 (S19) Flood Investigation Report is to identify the cause of internal flooding to properties in Bretton during the October 2023 flood event. This report will provide an overview of flooding mechanisms, identify relevant Risk Management Authorities and stakeholders, and provide a list of recommendations.
- 1.6 The opinions expressed in this report and the comments and recommendations given are based on an assessment of available information.
- 1.7 The information, views and conclusions drawn are based, in part, on information supplied to Waterco by other parties. Waterco has proceeded in good faith on the assumption that this information is accurate. Waterco accepts no liability for any inaccurate conclusions, assumptions or actions taken resulting from any inaccurate information supplied to Waterco from others.
- 1.8 A photographic record showing photographs during and following the Storm Babet flooding is included in Appendix A.

2.0 Summary of Storm Babet

National Context

- 2.1 Storm Babet brought heavy and persistent rainfall across much of the UK and ‘*was the third-wettest independent 3-day period for England and Wales in a series from 1891*’ according to the Met Office². As shown in Figure 1, many parts of the UK received over 50mm of rain, with 75-100mm of rain recorded across areas of North Wales. Several areas across the UK received over 100% of the average rainfall amount for October.

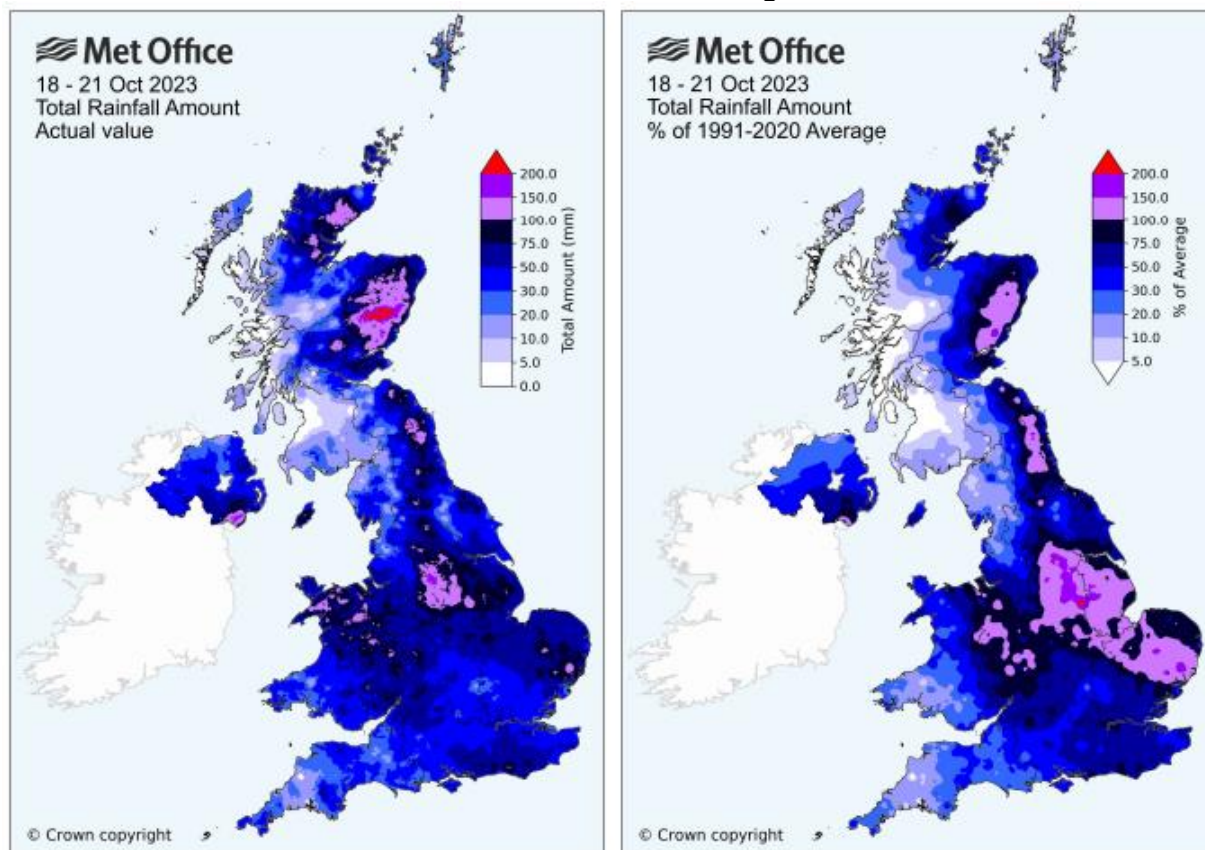


Figure 1 - Met Office Accumulated Daily Rainfall 18th-21st of October 2023

- 2.2 Storm Babet was part of a wider period of heavy rainfall across the country. According to NRW, the 9 month period ending in March 2024 was the second wettest of any 9 month period recorded in North Wales, and the wettest 9-month period ending in the month of March. Storms over this period (such as Storm Babet) were characterised more by their prolonged rainfall rather than their intensity. Between September 2023 and March 2024 NRW issued 194 Flood Warnings and 3 Severe Flood Warnings.

Regional Context

- 2.3 Unlike most storms, Storm Babet did not pass over rapidly. This allowed multiple fronts to add more rainfall over a prolonged period of time. The evapotranspiration rate in October was low and rainfalls were frequent throughout the month, with high levels of antecedent rainfall on October 13th / 14th (27mm in Mold) leading to soils being close to saturation.
- 2.4 Rainfall records have been obtained from NRW's Mold rain gauge³.

² Storm Babet Report https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/interesting/2023/2023_08_storm_babet.pdf

³ <https://rivers-and-seas.naturalresources.wales/Station/1011?parameterType=2>

- 2.5 Figure 2 shows the rainfall in the days leading up to the flooding on the 20th October. Flintshire experienced rainfall two days prior to the 20th October, with 15.2mm of rainfall on the 18th and 11.8mm on the 19th. On 20th October, Mold rain gauge recorded 61.8mm of rainfall.

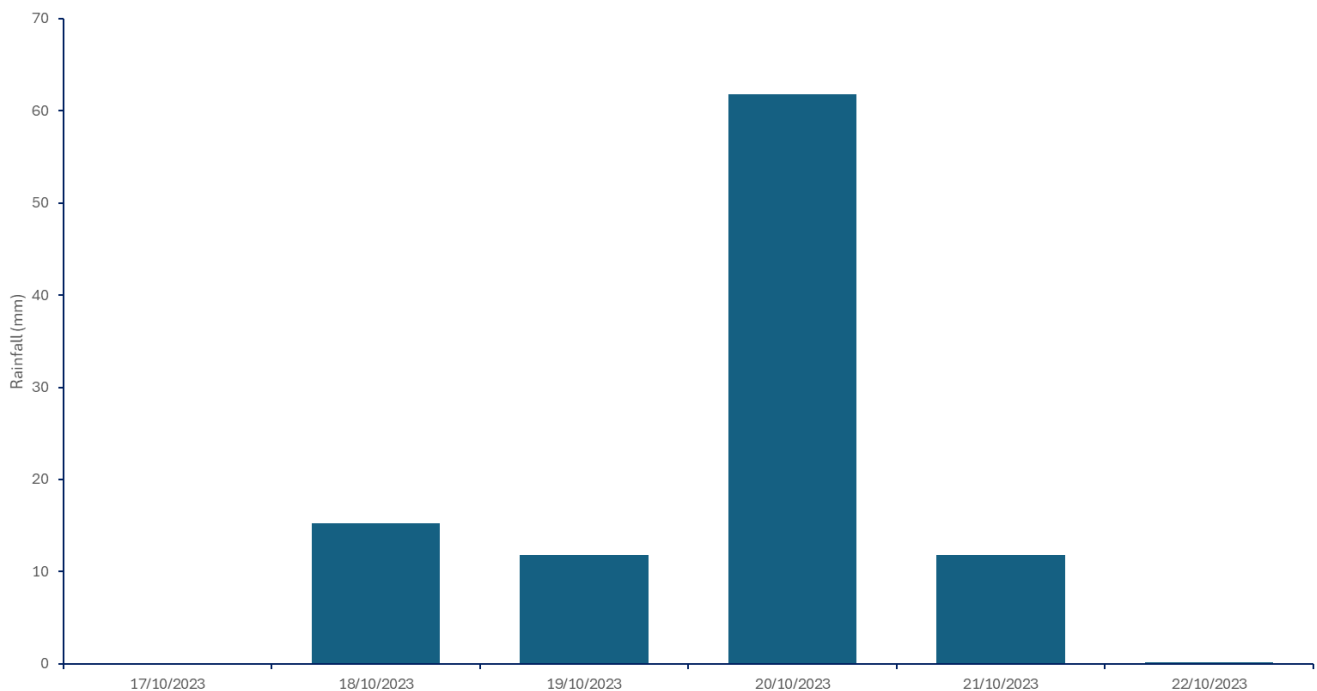


Figure 2 - NRW Mold Rain Gauge- Daily Rainfall From 18th-21st October

- 2.6 Figure 3 shows that there was a period of intense rainfall on Wednesday the 18th October which began at 19:00pm and peaked between 21:00-22:00 with 5mm of rainfall per hour. There was some additional rainfall on Thursday the 19th October peaking at approximately 1mm per hour. During 20th October, rainfall was prolonged with peak rainfall intensities at approximately 4.2mm per hour.

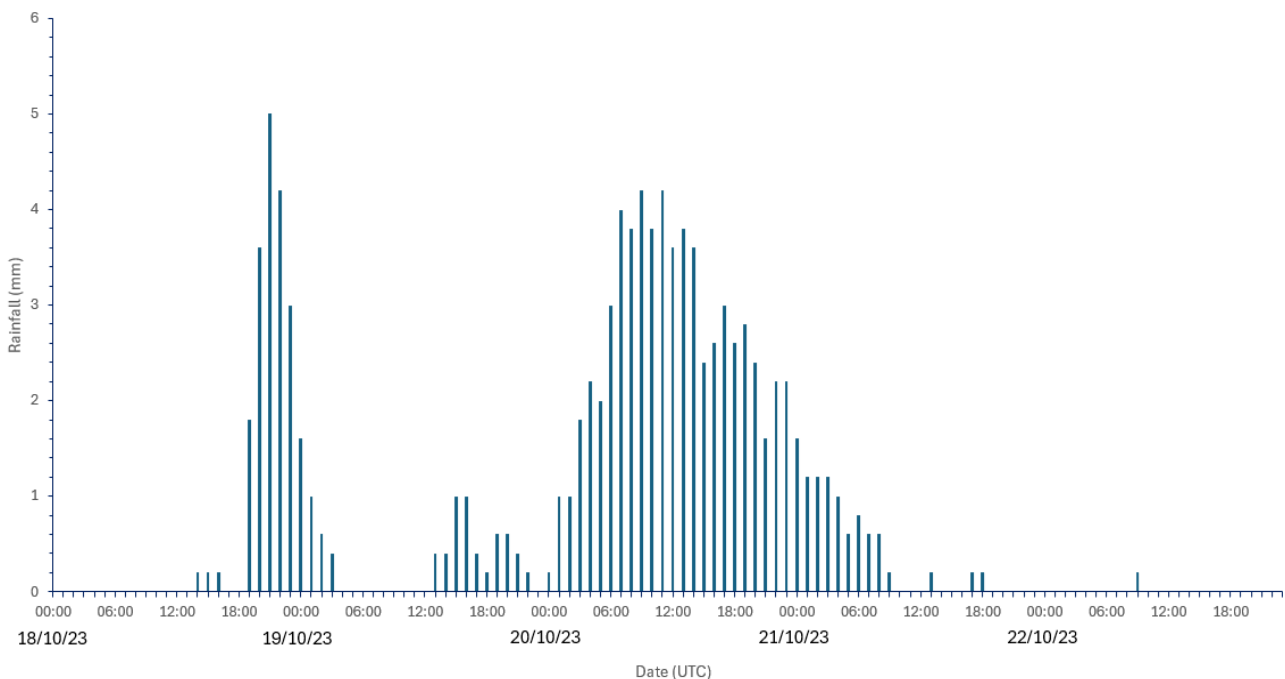
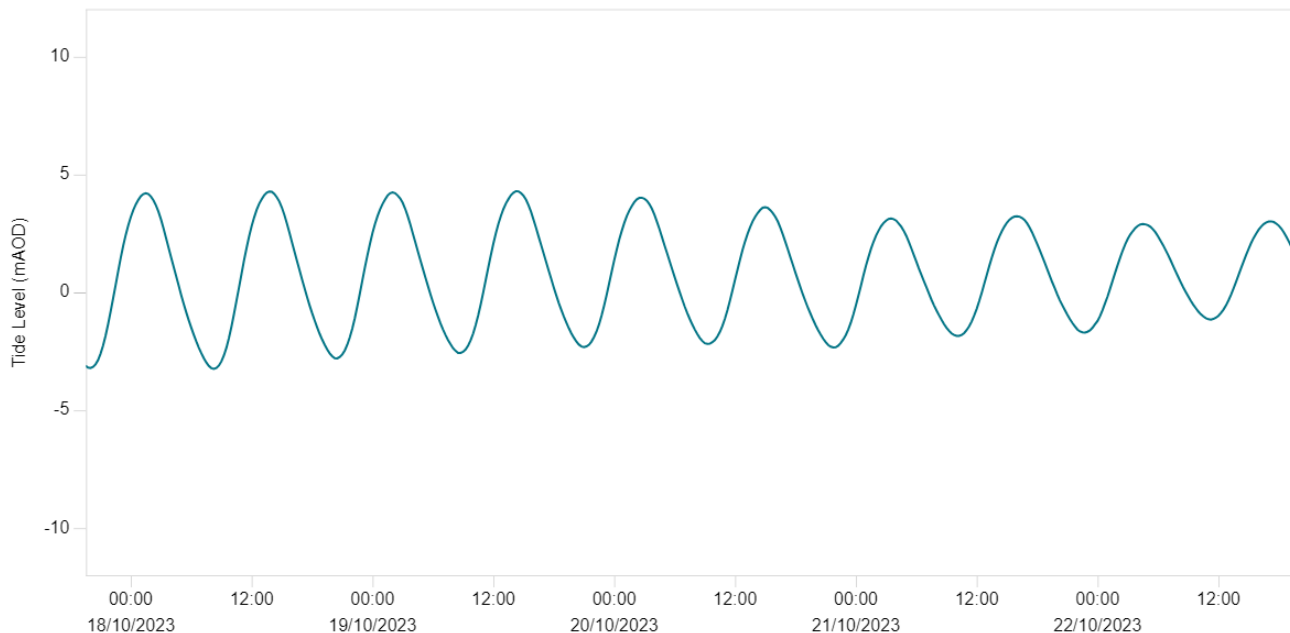


Figure 3 - Hourly Rainfall Between the 18th and 22nd of October

- 2.7 Flood Estimation Handbook (FEH) analysis estimates that a total rainfall of 61.8mm of rainfall over 24 hours (on the 20th October), as recorded at the NRW Mold rain gauge, equates to a return period of 1 in 20 years.
- 2.8 The 73.6mm of rainfall over a 48-hour period between the 19th and 20th of October (recorded at the NRW Mold rain gauge) equates to a return period of approximately 1 in 23 years. The 88.8mm of rainfall over a 72-hour period between the 18th and 20th of October equates to an approximate return period of 1 in 38 years.
- 2.9 Due to high amounts of rainfall throughout October, there would have been a lack of soil water storage and in consequence, higher and quicker runoff resulting in flooding.
- 2.10 Tide levels have been obtained from NRW's Liverpool tide gauge⁴ (closest to Bretton). Rainfall during Storm Babet was at its heaviest between 10am and 2pm on the 20th of October, whilst high tide on the 20th of October was at 3pm. The high tide immediately following the heavy rainfall will have restricted water from the watercourses within and adjacent to the study area freely discharging into the River Dee.



**Figure 4 - Tide Level (m AOD) between 18th and 22nd of October:
NRW-Liverpool Tidal Gauge**

Local Context

- 2.11 Community engagement was undertaken by Waterco in Bretton on the 30th and 31st July 2024. The purpose of the community engagement exercise was to gather information on the number of properties affected and the flooding mechanisms / source(s). A questionnaire was also posted to residents to seek additional feedback. Table 2 shows a summary of the number of responses received.

⁴ <https://rivers-and-seas.naturalresources.wales/Station/70139?parameterType=3>

Table 2 - Summary of Community Engagement Undertaken in Bretton

Location	Verbal responses received (properties)	Number of postal / email responses
Chester Road	7	0
Bretton Lane	21	3
Bretton Road	4	0
Total	32	3

2.12 In addition to the community engagement exercise, a number of stakeholders were consulted regarding any information on flooding in Bretton:

- **Natural Resources Wales** – provided information on calls received during Storm Babet; a record of properties known to have flooded; and correspondence with North Wales Fire & Rescue Service.
- **FCC Highways Authority** – provided a call log showing where members of public had reporting flooding.
- **Dŵr Cymru Welsh Water** – held a post-Storm Babet meeting with FCC and Waterco to share details of asset performance and flooding records during Storm Babet.

2.13 Table 3 provides a summary of the locations and reported effects of flooding following responses from the community engagement exercise and stakeholder engagement.

Table 3 - Summary of Flooding in Bretton During Storm Babet

Location	Internal Flooding	External Flooding	Impact
Chester Road	4	3	Internal flooding confirmed at 4 properties, causing some residents to move out for an extended period of time, external flooding at a minimum of 3 additional properties, reported as near misses (water reached just below the threshold level of the property)
Bretton Lane	3	10	Mainly external flooding to driveways and outbuildings, internal flooding includes one property that is uninhabited but floods regularly during a period of heavy rainfall.
Bretton Road	0	3	No internal flooding reported, some flooding to outbuildings reported plus driveways / gardens.
Total Internal Flooding	7	16	Number of internal / external flooding incidents based on community engagement exercises and stakeholder engagement. Flooding to additional properties may have occurred but not recorded during community engagement.

3.0 Study Area Overview

Location

- 3.1 The area affected by flooding during Storm Babet in Bretton encompasses properties on Chester Road, Bretton Lane, and Bretton Road. Flooding to properties in Broughton is subject of further investigation and will be detailed in a separate S19 Flood Investigation Report.
- 3.2 A location and aerial plan identifying the Study Area is included in Appendix B. Figure 5 shows the approximate outline of areas impacted by flooding during Storm Babet. A plan showing the approximate flooding locations is included as Appendix C.

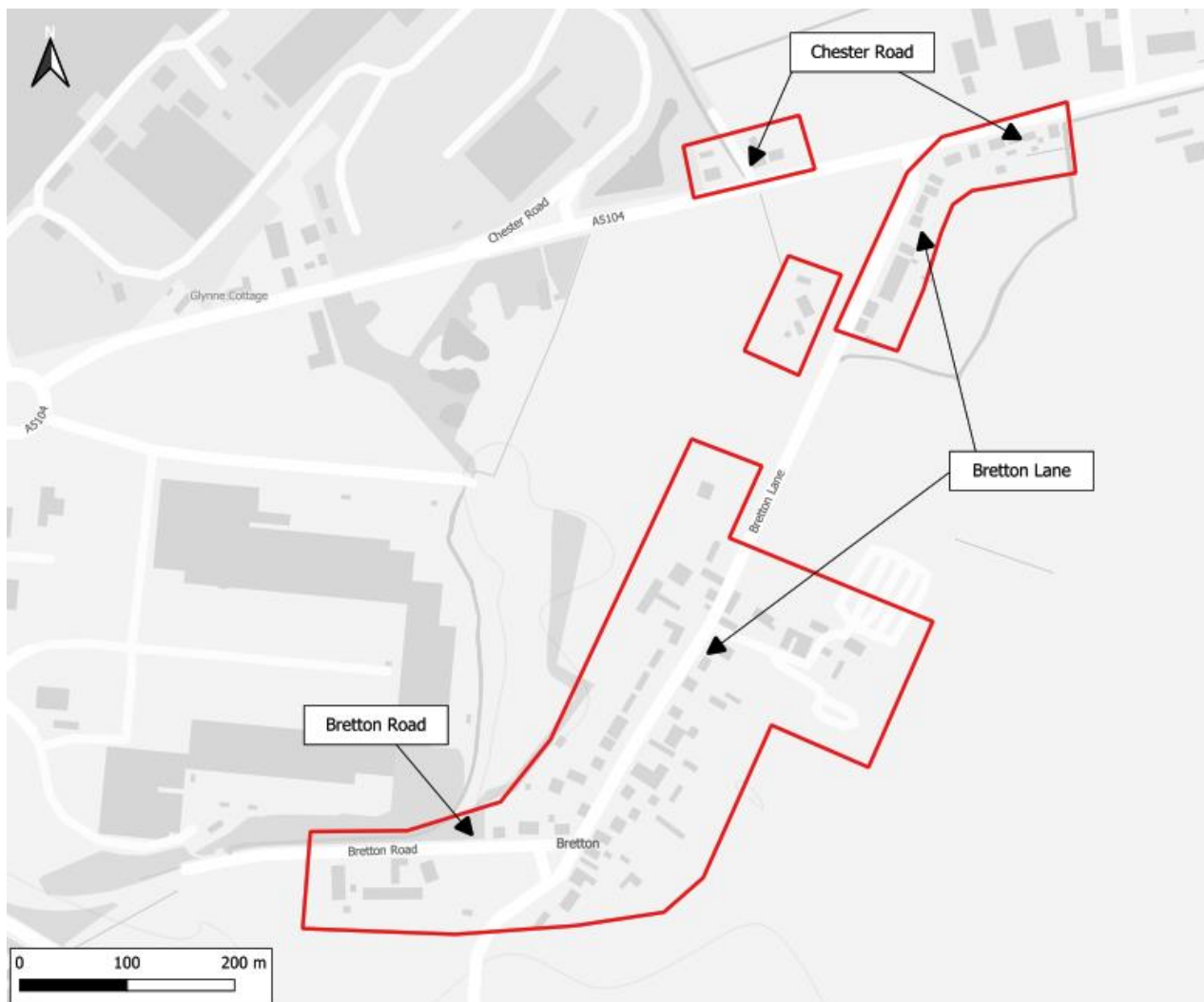


Figure 5 - Location Plan of Reported Flooding Areas

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Geology

- 3.3 The British Geological Survey (BGS) online mapping (1:50,000 scale) indicates that the northern extent of Bretton, inclusive of Chester Road is underlain by superficial tidal flat deposits generally comprising clay, silt, and sand. The superficial deposits are identified as being underlain by interbedded mudstone, siltstone and sandstone. The southern extent of Bretton is underlain by sedimentary superficial deposits.

Hydrological Setting

- 3.4 As shown by the LiDAR extract in Appendix D, ground levels in the Study area vary from approximately 9.7metres Above Ordnance Datum (m AOD) in the south to 4.5m AOD in the north. The LiDAR extract shows that properties off Chester Road and east of Bretton Lane (in the northern extent of the Study Area) are situated within isolated topographical low points below adjacent road levels.

Drainage

- 3.5 Public sewer records have been obtained from Dŵr Cymru Welsh Water⁵ (DCWW). Bretton is served by a combined sewer network.
- 3.6 A 225mm, upsizing to 300mm, public combined sewer flows north within Bretton Lane. The public combined sewer in Bretton Lane joins a 600mm public combined sewer flowing east within Chester Road. A combined sewer overflow (with an outfall into a watercourse) is located in the north-eastern extent of the Study Area. The DCWW sewer plans are included in Appendix E.

NRW Flood Maps

- 3.7 The NRW 'Flood Map for Planning – Rivers and Sea' (shown in Figure 6) shows that a number of the properties in Bretton are located in Flood Zone 3 – defined as having a 1% or greater annual probability of flooding, including the effects of climate change.
- 3.8 The NRW 'Flood Map for Planning – Surface Water and Small Watercourses' identifies areas where surface water may flow or pool during heavy rainfall. The NRW map (shown in Figure 6) shows that a number of properties in Bretton are located in Flood Zone 3. Further maps are contained within Appendix F.

⁵ DCWW sewer plans - <https://developers.dwrcymru.com/en/applications/planning/locating-our-water-pipes-and-sewers>



Figure 6 - NRW Flood Map for Planning – Rivers, Sea, Surface Water and Small Watercourses Map

Contains OS Data © Crown Copyright (2024) Contains Natural Resources Wales Information © Natural Resources Wales and Database Right. All Rights Reserved.4.0 Flood Locations, Descriptions and Mechanisms

Chester Road - East

- 4.1 The locations of flooding on the eastern end of Chester Road are shown in Figure 7. Based on the findings of the community engagement exercise and stakeholder engagement, the flooding to Chester Road in this area is primarily attributed to surface water runoff from the carriageway causing water to flow into the properties which are situated at a topographically lower level than the road. The highway drainage exceeded its capacity resulting in flooding to the carriageway. There were reports of highway gullies being blocked / heavily silted.
- 4.2 Bow waves caused by vehicles further contributed to directing flood water on Chester Road into nearby properties, in some cases worsening the internal flooding. No traffic management measures were reported to have been put in place to prevent vehicle movements on Chester Road during Storm Babet.
- 4.3 It was reported by local residents that flooding also came from the watercourse (designated Main River) located immediately east and south-east of properties south of Chester Road. This report is anecdotal and there is no other evidence that this is the case, and it is not obvious that this is the source of flooding on inspection. Although vegetation clearance has now taken place, it was reported that at the time of Storm Babet, the watercourse channel was overgrown and was therefore unable to cope with the increased volume of water.

- 4.4 Additional reports state that the Welsh Water outfall structure into the watercourse (identified in Figure 7), understood to be a combined sewer overflow, discharges in periods of heavy rain (as it may be overwhelmed by inflow from highway drainage). This leads to additional flooding of the watercourse.

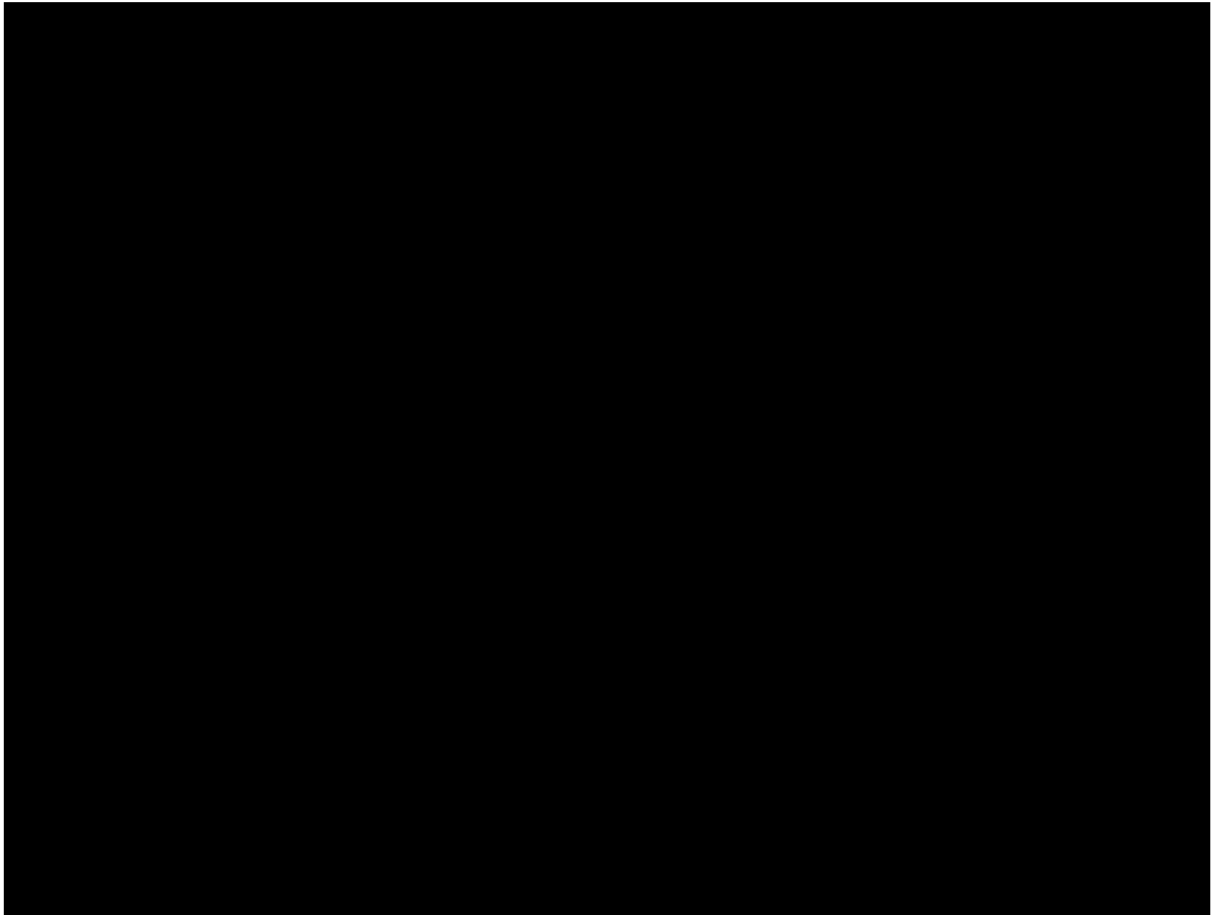


Figure 7 – Chester Road – East Area
Contains OS Data © Crown Copyright (2024)

Chester Road - West

- 4.5 The locations of flooding on the western end of Chester Road are shown in Figure 8. Based on the findings of the community engagement and stakeholder engagement, the flooding in this area is primarily attributed to drainage systems in Chester Road exceeding their capacity. There are reports that the public combined sewer system became overwhelmed following heavy rainfall. Flooding on the road was directed towards properties. Passing cars caused bow waves, directing floodwater towards properties.

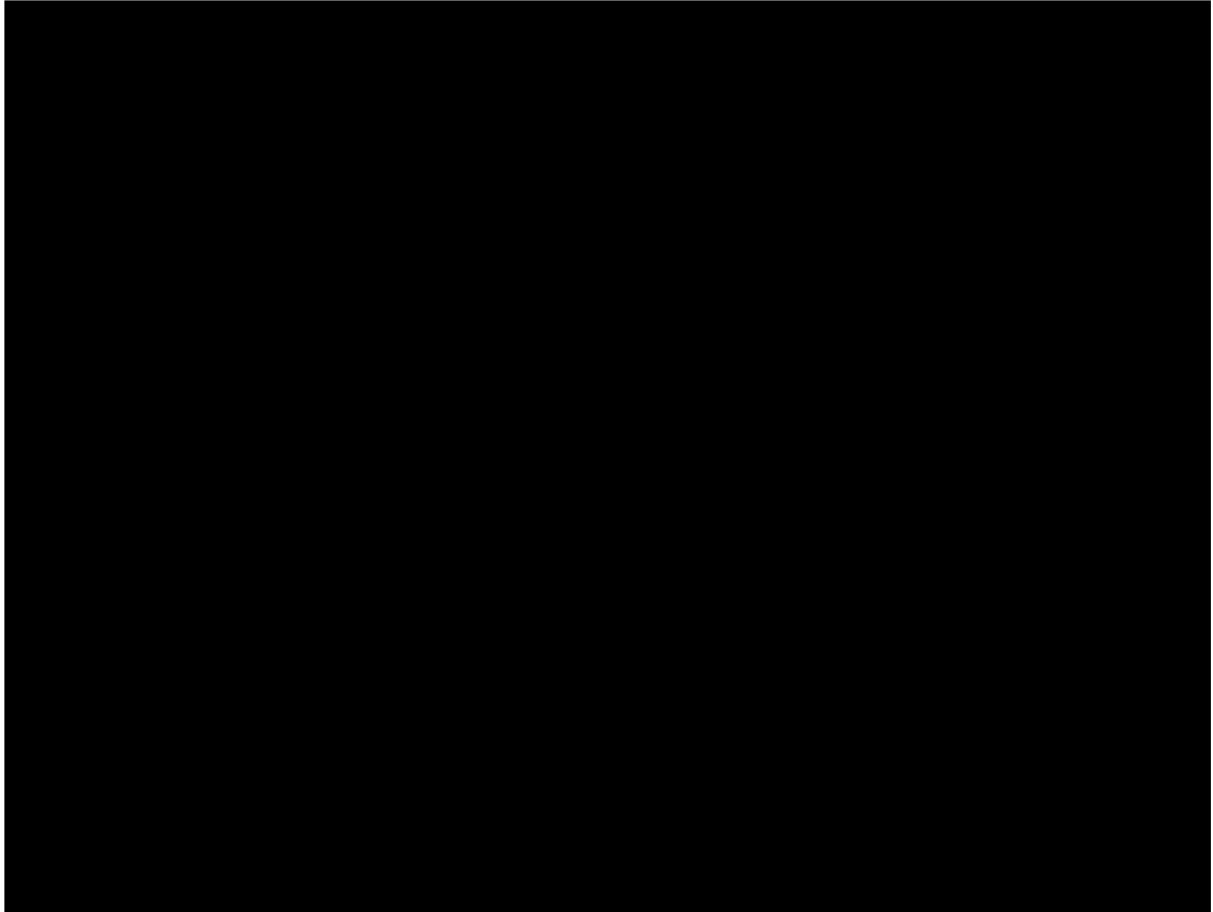


Figure 8 – Chester Road – West Area

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Bretton Lane – North

- 4.6 The locations of flooding on the northern end of Bretton Lane are shown in Figure 9. Based on the findings of the community engagement and stakeholder engagement, the flooding at the northern extent of Bretton Lane was a result of surface water build up on Chester Road and Bretton Lane, where drainage infrastructure was unable to sufficiently cope with the increased volume of water. Residents reported flood water entering their property boundaries from the front and continuing to flow round to the rear of the properties. Multiple close calls were reported, where the water level was very close to the threshold level of the property.
- 4.7 During the community engagement, one case of internal flooding was reported along this stretch of Bretton Lane, but multiple cases of external flooding including flooding to outbuildings were reported. Some residents reported flooding coming from the fields to the west of Bretton Lane. During the community engagement exercise, it was observed that this field was still inundated with water. During Storm Babet, water built up in this field and spilled over Bretton Lane causing flooding to properties.

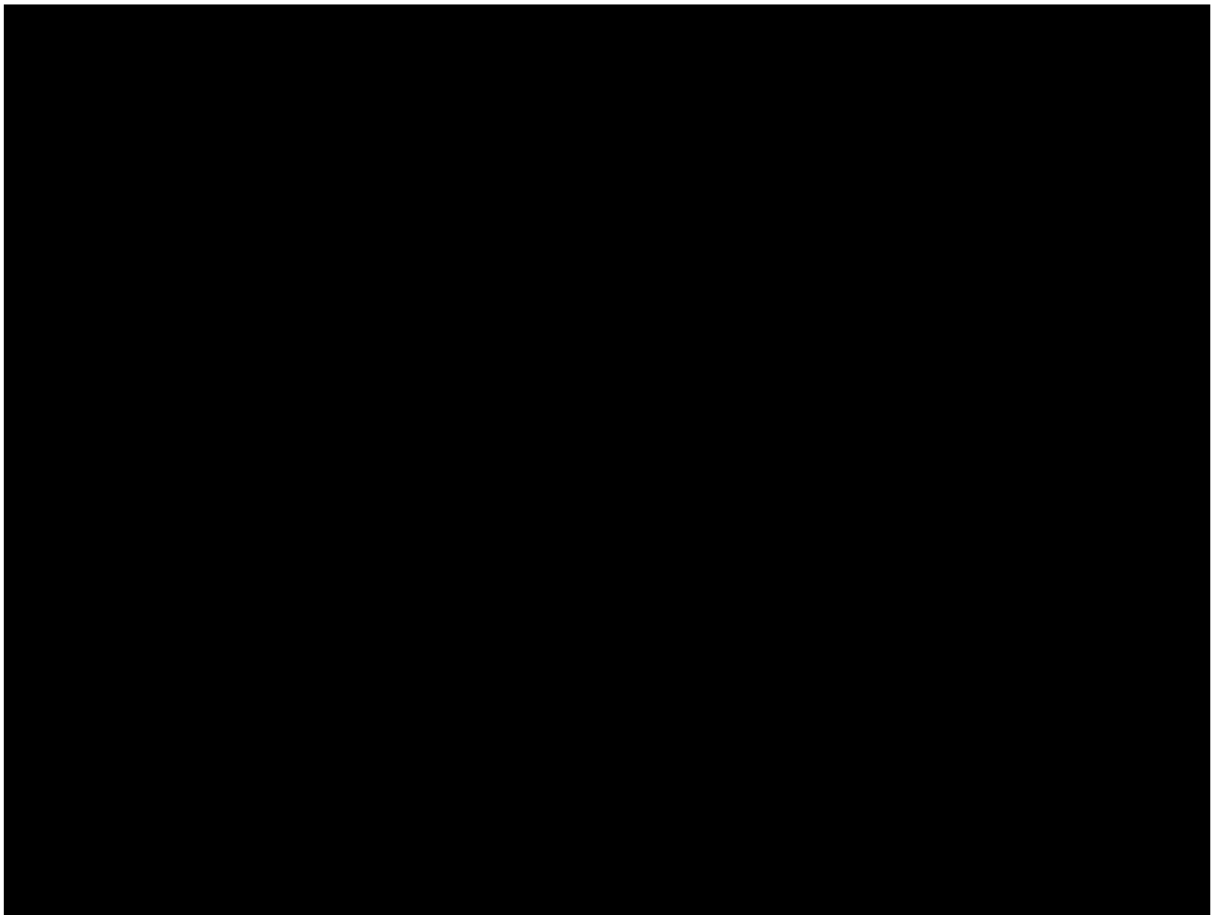


Figure 9 – Bretton Lane – North Area
Contains OS Data © Crown Copyright (2024)

Bretton Lane South / Bretton Road

- 4.8 The locations of flooding on the southern end of Bretton Lane and Bretton Road are shown in Figure 10. Based on the findings of the community engagement and stakeholder engagement, flooding towards the southern end of Bretton Lane is primarily a result of highway drains along Bretton Lane being unable to cope with the significant amount of rainfall experienced during Storm Babet. Flooding from the highway entered properties situated at a lower level than the road. During the community engagement, it was apparent that at least two properties suffered internal flooding.
- 4.9 Furthermore, residents along Bretton Road reported that during this event, flood water burst out of manholes in the rear gardens of properties. It was reported that the watercourse (ordinary watercourse) that runs between the rear of properties on Bretton Lane and the Broughton Retail Park is overgrown and contributes to local flood risk.

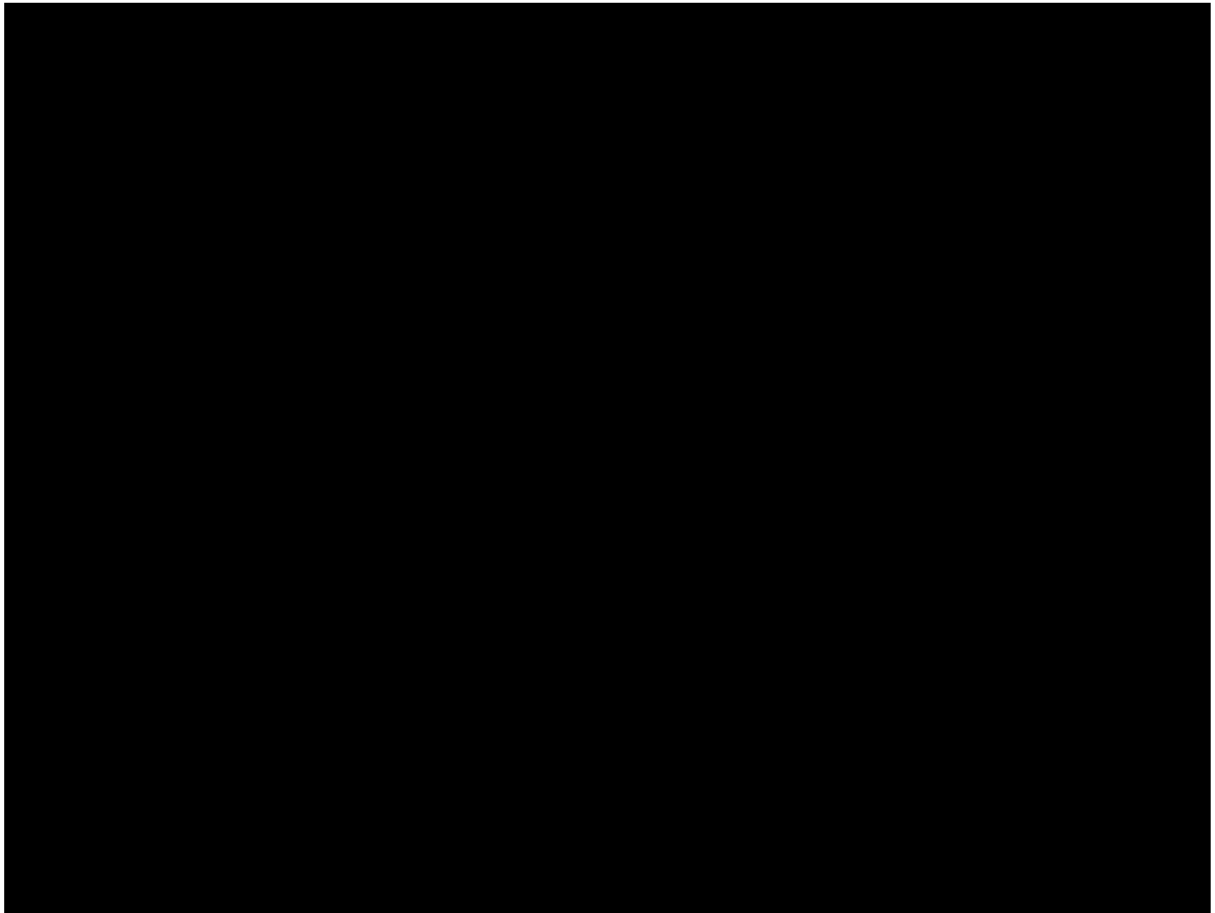


Figure 10 – Bretton Lane South / Bretton Road Area

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5 Relevant Parties Communication Register

- 5.1 The table below provides the details of communications that have taken place with relevant parties up to the time of writing this report. Relevant parties are considered to be all authorities and stakeholders directly involved and responsible for the flood risk management, all property owners affected by the flood event and affecting the flood event, and all parties who may be able to provide information salient to the flood investigation.

Table 4 - Relevant Parties Communications Register

Contact	Communications
Local Residents	Community engagement undertaken on 30 th and 31st July 2024. Questionnaires and photographs shared on the day or sent to Waterco at a later date.
Broughton, Bretton & Sandycroft Flood Action Group	Approached by Waterco to share information regarding the issues in Bretton. Meeting and Site Walkover between Waterco and three members of the Flood Action Group on 30 th July 2024.
Flintshire County Council (FCC)	Shared details of call logs and confirmed flooding locations.
Natural Resources Wales (NRW)	Email consultation from NRW with information on flood locations and sources. NRW also shared data from North Wales Fire and Rescue (on callouts / flood locations).
North Wales Fire & Rescue	

6 Conclusions

- 6.1 Waterco Ltd were appointed by FCC to prepare a Flood Investigation Report for Bretton following flooding from Storm Babet on the 20th of October 2023. The investigation focused on the following areas which were initially identified by FCC: Chester Road, Bretton Lane and Bretton Road.
- 6.2 Internal flooding was confirmed along Chester Road and Bretton Lane during Storm Babet. During the community engagement exercise, it was confirmed that at least 7 properties suffered internal flooding, while multiple more suffered external flooding including flooding to outbuildings. Numerous close calls for internal flooding were reported.
- 6.3 Rainfall experienced during Storm Babet was prolonged and steady, and high levels of rainfall throughout October meant soils were already saturated which led to faster runoff rates.
- 6.4 High levels of rainfall on October 20th resulted in highway drains exceeding their capacity along Chester Road and Bretton Lane. Flooding on the road entered lower lying properties. The flooding was exacerbated by passing cars creating bow waves.
- 6.5 Flooding was also reported from watercourses and from runoff from agricultural land.

7 Recommendations

- 7.1 Table 5 sets out the recommended actions required to reduce the flooding, and the stakeholder required to undertake each action.

Table 5 - Recommendations to Address Flooding

Ref	Stakeholder	Action
01	FCC Highways Authority	Post event review of highway assets to ensure they are operational.
02	FCC Highways Authority	Review the maintenance schedule of highway assets in this area, ensuring regular maintenance is carried out at flooding hotspots.
03	FCC Highways Authority	Consider the implementation of traffic management plans that can be put in place when a storm event is predicted, to prevent passing vehicles creating bow waves that exacerbate flooding.
04	FCC LLFA & Highways Authority	Investigate local capacity improvements to mitigate flood risk, including the use of highways assets.
05	FCC LLFA & NRW	Communicate with local communities to raise awareness of property level flood resilience measures that can be implemented to help mitigate flood risk
06	FCC LLFA	Investigate the feasibility for a flood mitigation scheme to manage and reduce runoff entering the highways from adjacent land.
07	NRW	Ensure Main Rivers are inspected on a risk-based frequency and where appropriate and justifiable, a maintenance regime is documented and completed by an appropriate Risk Management Authority and/or Riparian Owner.
08	DCWW	Review customer complaints and investigate the associated sections of public sewer system to remove any blockage / significant debris following the October 2023 event.
09	Broughton & Bretton Flood Action Group	Continue to engage with residents to help raise awareness of local issues surrounding flooding.
10	Property Owners / Residents	Sign up to the free signing up to the NRW Flood Warning System and consider the implementation of property level flood resilience measures. These could include; the installation of non-return valves to prevent ingress of floodwater on private drainage systems and installing flood barriers or flood doors.

APPENDIX A

Photographic Record

Photo No.1	
Date: 20 st October 2023	
Description: Flooding to fields adjacent to Bretton Lane Source: Local Resident	

Photo No. 2	
Date: 20 st October 2023	
Description: External Flooding to a property along Chester Road Source: Local Resident	

Photo No.3	
Date: 20st October 2023 Description: Internal Flooding to a property along Chester Road Source: Local Resident	

Photo No. 4	
Date: 20st October 2023 Description: External flooding to a property along Chester Road Source: Local Resident	

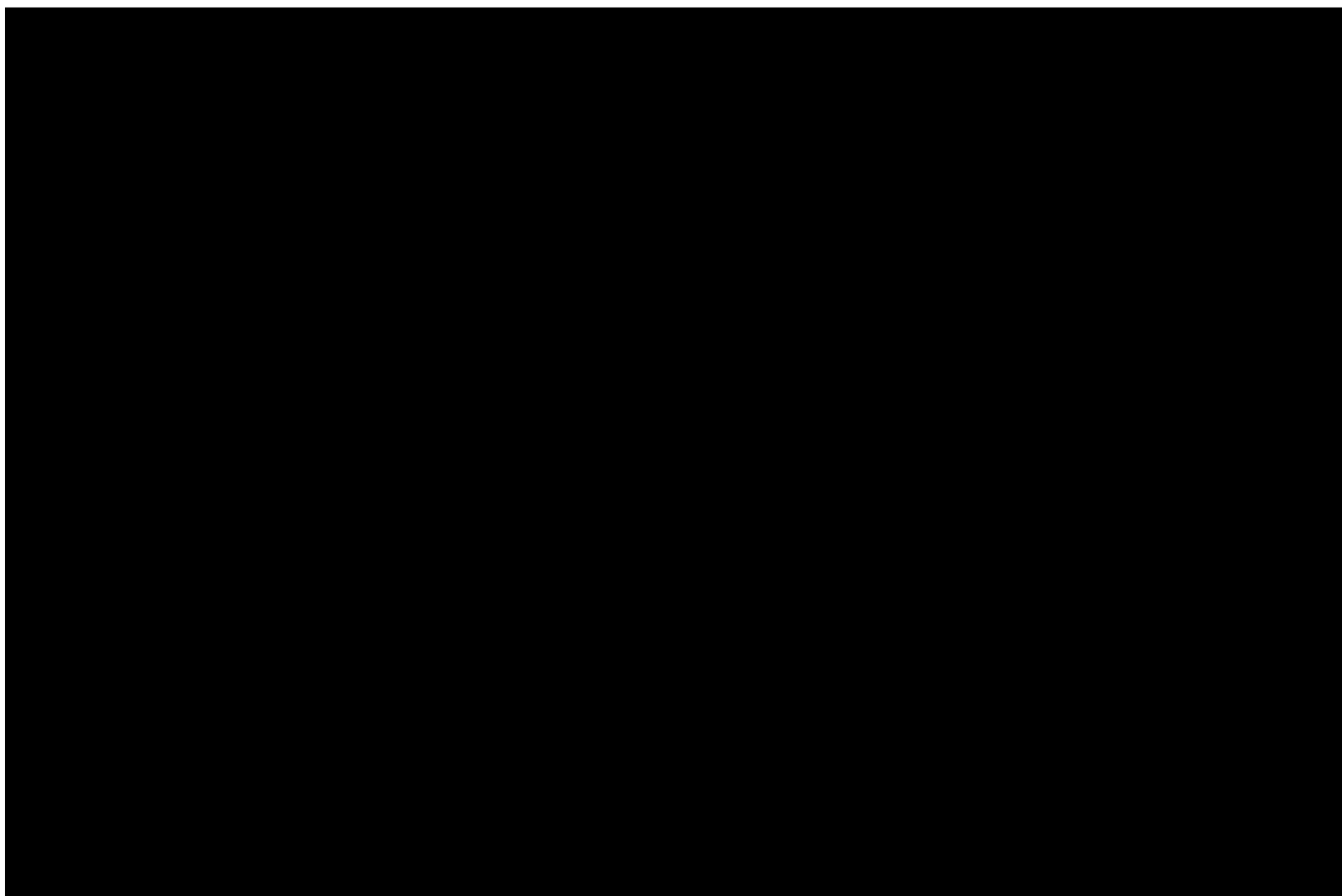
Photo No. 5	
Date: 20 th October 2023	
Description: Internal flooding at a property along Chester Road Source: Local Resident	

Photo No. 6	
Date: none given	
Description: Overgrown vegetation along the watercourse adjacent to properties on Chester Road. Source: Local Resident	

Photo No. 7	
Date: 30 th July 2024	
Description: The same watercourse as Photo 6, but after channel clearance had taken place. Source: Waterco Site Visit	

Photo No. 8	
Date: 20 th October 2023	
Description: Flood water flowing from Bretton Lane to the rear gardens of multiple properties during Storm Babet. Source: Local resident	

Photo No. 9	
Date: 20 th October 2023	
Description: Surface water build up along Bretton Lane during Storm Babet. Source: Local resident	



APPENDIX B

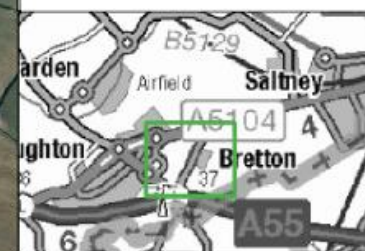
Location Plan and Aerial Image



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

 Site Boundary



Flintshire County Council



SCHEME:
15972-Bretton S19 Flood Investigation Report

PLOT TITLE:
Aerial Plan

PLOT STATUS: FINAL **DATE:** 20-08-2024

DRAWN: BT	CHECKED: AW	APPROVED: MW	PLOT SCALE/LAT A2: 1:4500
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PLOT NAME: 15972_Bretton FIR_Aerial_Plan	REVISION: 01
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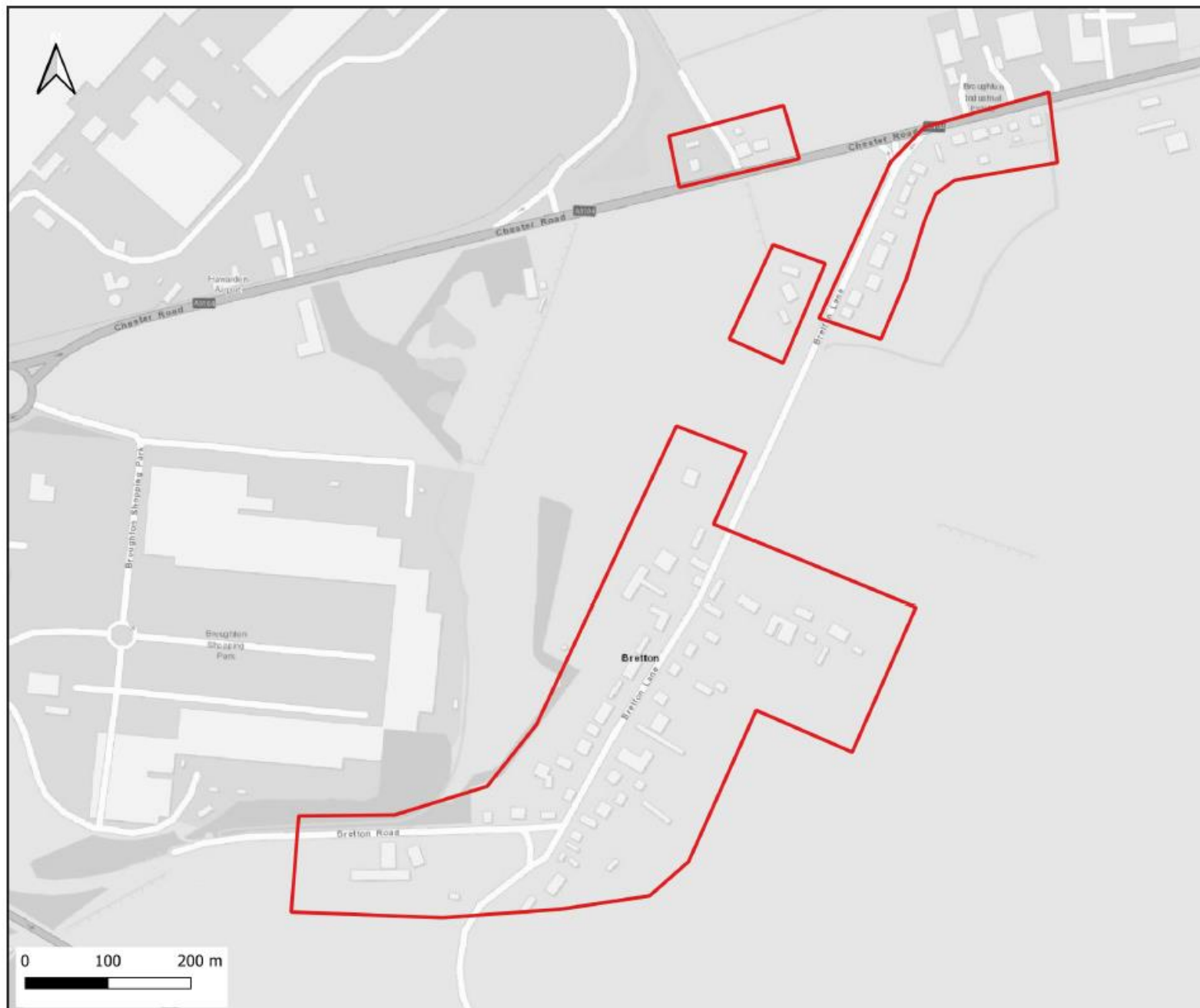
CONTAINS OS DATA © CROWN COPYRIGHT (2022)

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APPENDIX C

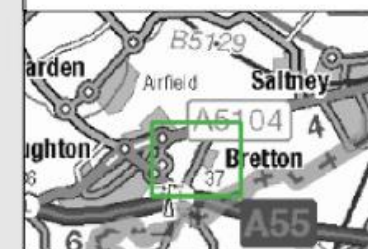
Reported Flooding Location



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

Bretton Reported Flooding Areas



CLIENT:

Flintshire County Council



SCHEME:

15972-Bretton S19 Flood Investigation Report

PLOT TITLE:

Reported Flooded Property Locations

PLOT STATUS:

FINAL

DATE:

20-08-2024

DRAWN:

BT

CHECKED:

AW

APPROVED:

MW

PLOT SCALE AT A1:

1:3500

REVISIONS

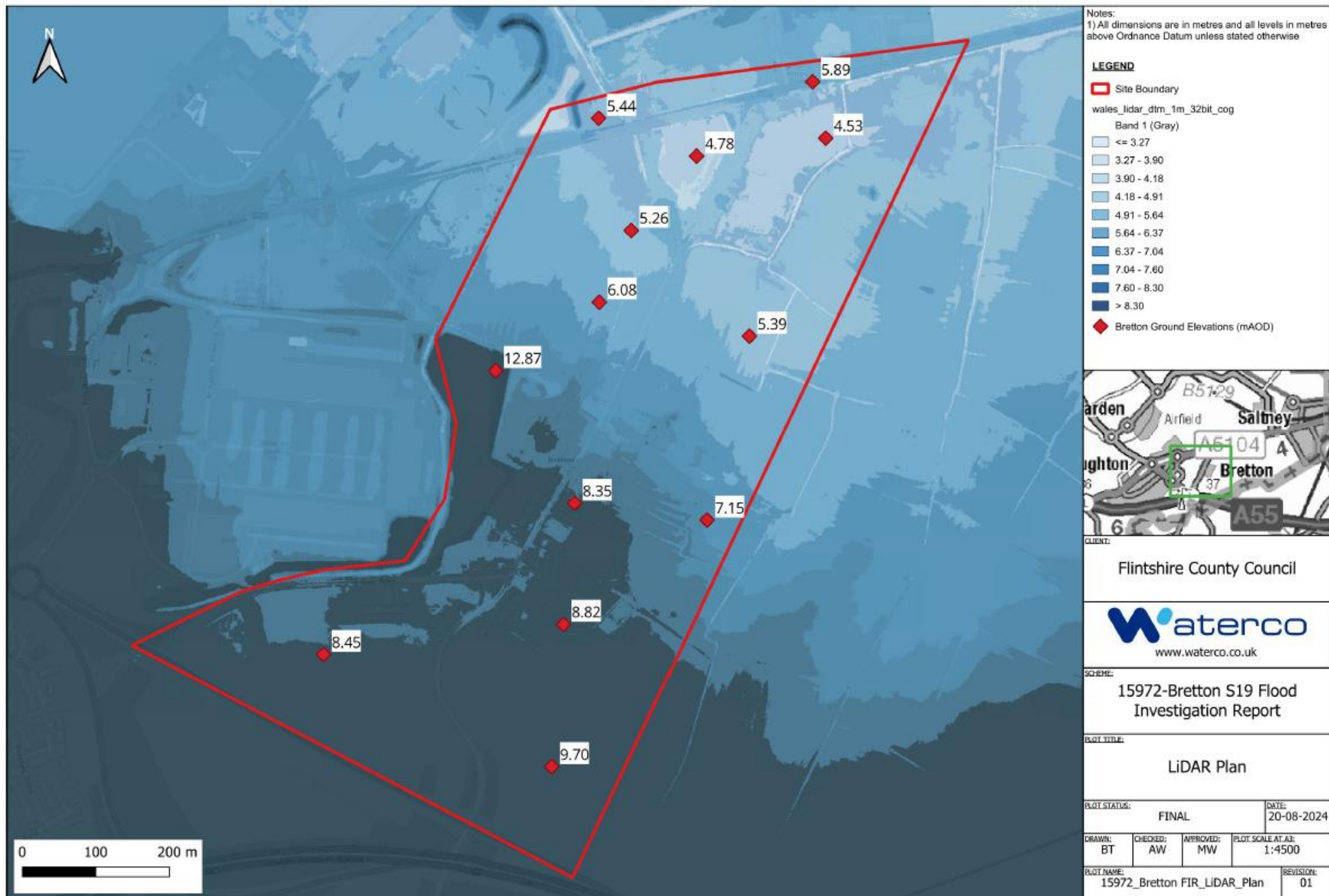
15972_Bretton FIR_Flood Property Locations

REVISION:

01

APPENDIX D

LiDAR Plan

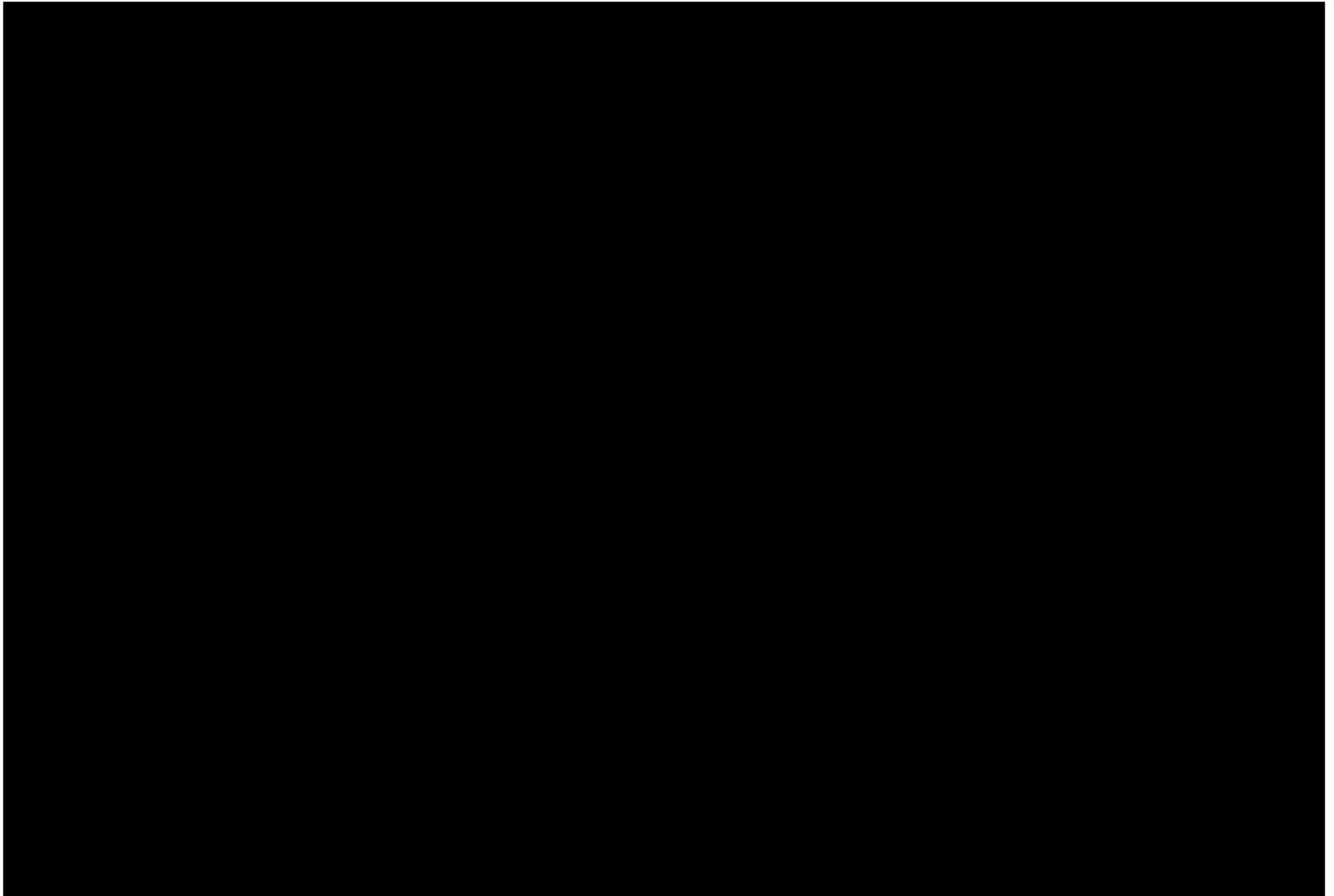


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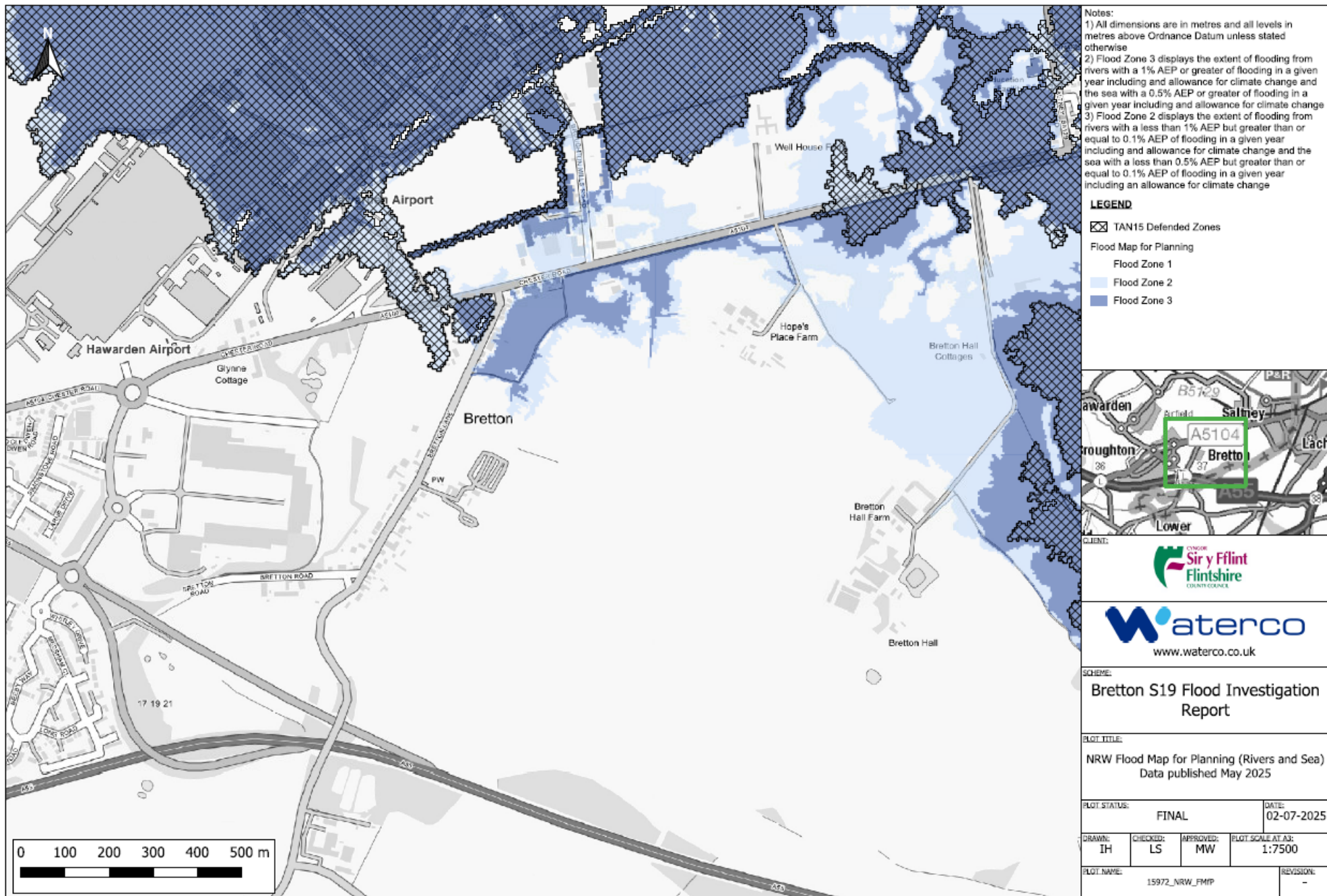
APPENDIX E

DCWW Sewer Plans



APPENDIX F

NRW Flood Maps



Notes:
 1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise
 2) Flood Zone 3 displays the extent of flooding from rivers with a 1% AEP or greater of flooding in a given year including and allowance for climate change and the sea with a 0.5% AEP or greater of flooding in a given year including and allowance for climate change
 3) Flood Zone 2 displays the extent of flooding from rivers with a less than 1% AEP but greater than or equal to 0.1% AEP of flooding in a given year including and allowance for climate change and the sea with a less than 0.5% AEP but greater than or equal to 0.1% AEP of flooding in a given year including an allowance for climate change

LEGEND

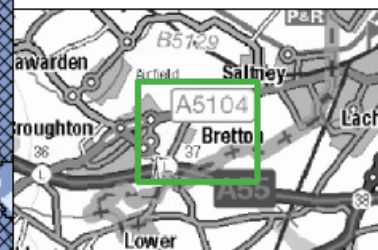
[Cross-hatch symbol] TAN15 Defended Zones

Flood Map for Planning

Flood Zone 1

Flood Zone 2

Flood Zone 3



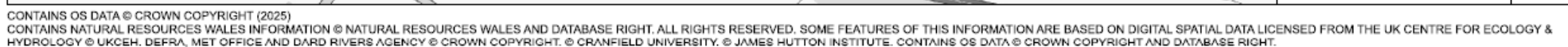
SCHEME:
 Bretton S19 Flood Investigation Report

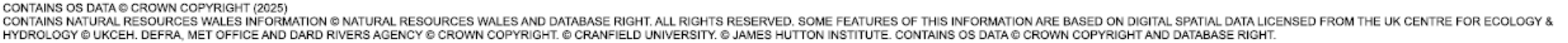
PLOT TITLE:
 NRW Flood Map for Planning (Rivers and Sea)
 Data published May 2025

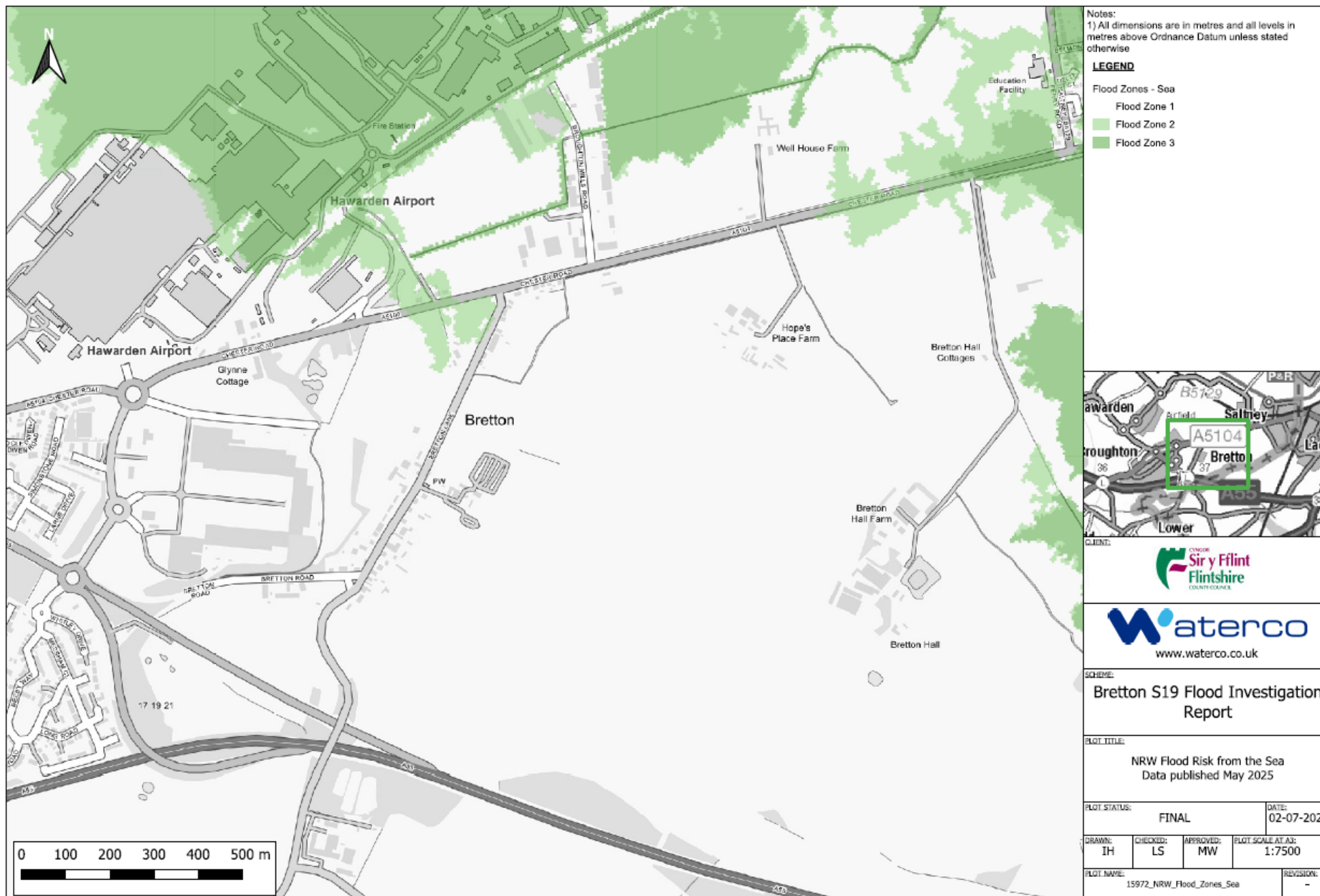
PLOT STATUS: FINAL **DATE:** 02-07-2025

DRAWN: IH **CHECKED:** LS **APPROVED:** MW **PLOT SCALE AT A3:** 1:7500

PLOT NAME: 15972_NRW_FMP **REVISION:** -







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