



Project No

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Project

Withington Hospital CDC

Title

Flood Risk Assessment

Date

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Revision

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1. Introduction

This flood risk assessment has been prepared by CCS Consulting in support of a full planning application for a new Endoscopy & Cardiorespiratory Development building at Withington Community Hospital, Manchester, M20 2LR (hereafter referred to as the 'Site').

This flood risk assessment has been prepared in accordance with the latest National and local planning policies, regulations, and relevant design guidance, which include:

- National Planning Policy Framework (NPPF), July 2021 Paragraphs 153-158 and 159-169;
- National Planning Practice Guidance (NPPG);
- Principles of Sustainable drainage systems (SuDS) set out by DEFRA (2011);
- CIRIA (2010) Planning for SuDS;
- Ciria SuDS Manual C753 (2015);
- Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015);
- Manchester City, Salford City and Trafford Councils Level 1 SFRA (May 2010);
- Manchester City, Salford City and Trafford Councils Level 2 SFRA (March 2011);
- Manchester City Council – Local Flood Risk Management Strategy (March 2014);
- Manchester Local Development Framework – Core Strategy Development Plan (July 2012).

The Environment Agency and Manchester City Council need to be satisfied that the granting of planning permission will address the risk of flooding to the Site, and that the proposals will not in turn increase the risk of flooding to neighbouring land and property.

This flood risk assessment has therefore been prepared to identify and evaluate the various possible sources of flood risk to which the Site might be subjected to; to identify any mitigation, protection or compensation measures deemed necessary or feasible; and to manage the surface water so it is sustainable, and does not increase the probability of flooding within, or near the Site.

2. Planning Policies and Guidance

2.1. National Planning Policy Framework (NPPF) and National Planning Practice Guidance (NPPG)

NPPF 2021 sets out the Government's national policy on development and flood risk, and seeks to provide clarity on what is required at regional and local levels, to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas at highest risk.

NPPF Paragraphs 153 to 158 provide guidance for developments to take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk.

NPPF Paragraphs 159 to 169 provide guidance for planning and flood risk, where are plans should apply a sequential, risk-based approach to the location of development taking into account current and future impacts of climate change; to ensure that flood risk is not increased elsewhere due to the development; and to incorporate sustainable drainage systems.

NPPG, Paragraph 020 Reference ID: 7-020-20220825, outlines that the objectives of this FRA are to establish whether a proposed development is likely to be affected by current or future flooding from any source; whether it will increase flood risk elsewhere; whether the measures proposed to deal with these effects and risks are appropriate; whether there is evidence for the local planning authority to apply (if necessary) the Sequential Test; and whether the development will be safe and pass the Exception Test, if applicable.

2.2. Flood and Water Management Act

The Flood and Water Management Act takes forward some of the proposals from three previous strategy documents published by the UK Government - Future Water (2008), Making Space for Water (2008) and the UK Government's response to the Sir Michael Pitt's Review of the summer 2007 floods. In doing so it gives the EA a strategic overview role for flood risk, and gives local authorities responsibility for preparing and putting in place strategies for managing flood risk from groundwater, surface water and ordinary watercourses in their areas.

2.3. Manchester Local Development Framework – Core Strategy Development Plan

Relevant Policy EN 08 state:

'All new development will be expected to be adaptable to climate change in terms of the design, layout, siting and function of both buildings and associated external spaces. In achieving developments which are adaptable to climate change'

Relevant Policy EN 14 state:

'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.

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'.

3. Site Setting and Description

3.1. Site Location

The Site is part of Withington Community Hospital and is in residential area of West Didsbury, which is approximately 1.5km south-west of Mauldeth Road station, approximately 1km west of Brennage station, and is bound by existing hospital car parking and building leading to Nell Lane the north, Burton Road to the east, Fielden Road to the south, and hospital buildings leading onto Elizabeth Slinger Road to the west.

The address of the site is Withington Community Hospital, Manchester, M20 2LR, with co-ordinates for the centre of the site being, Easting: 383735, Northing: 392005.

3.2. Existing Site and Topography

As detailed on the topographical survey in Appendix A, the Site is currently undeveloped and consists of trees, shrubs and grassed areas, and therefore is deemed to be greenfield. The site has a general fall from the centre towards the Site boundary, where the levels range from approximately 34.24m AOD to approximately 32.49m AOD.

3.3. Proposed Development

The proposal is shown on the development plans in Appendix B, with a full description of the Site being stated by the Architect. In brief, and in relation to this surface water management report, the proposed development is to build a new hospital building to the centre of the Site, with an access road to the south and west, car parking to the centre / west, and soft-landscaping areas around the site boundary and adjacent to the car park.

3.4. Ground Conditions

The ground conditions can be determined by the British Geological Survey (BGS) website, where it shows the Site to have superficial deposits of Glaciofluvial deposits (sands and gravels) over bedrock consisting of Wilmslow Sandstone Formation (sandstone).

The BGS website also shows borehole log data adjacent to the Site in Burton Road (see Appendix C), which shows made ground to a depth of 2.20m, over coarse sand to a depth of 3.90m, over clay. The borehole also indicates ground water level rising in the coarse sand layers up to 3.00m bgl.

3.5. Waterbody / Rivers / Canals

There are no known waterbodies, rivers or canals near to the Site. As detailed on the OS Water Lines Network Map in Appendix D, the nearest waterbodies are the River Mersey approximately 250m to the south, and Platt Brook approximately 2.5 km to the north.

3.6. On-Site Drainage and Public Sewers

As detailed on the United Utilities asset plan in Appendix D, there is an 825 x 1200mm surface water sewer in Burton Road (west of site), a 525mm diameter combined water sewer in Burton Road (west of site), and a 300mm diameter combined water sewer in Fielden Road (south of site).

As the Site is undeveloped it is believed that there are no drainage networks within the development / site boundary. The topographical survey however identifies existing foul and surface water networks serving the existing hospital building to the north. In particular, and relevant to this report, the topographical survey shows a 225mm diameter surface water network which is believed to discharge to the surface water sewer in Burton Road.

4. Sources of Flooding

In accordance with the NPPF, flood risk must be assessed for all sources of flooding and development of the Site should be carried out in such a way as to mitigate any potential flood risk to both the Site and third parties and their property. This section identifies all possible sources of flooding.

4.1. Fluvial Flooding

Fluvial flooding results from watercourses / rivers surcharging and flooding the surrounding areas.

4.2. Coastal Flooding

Coastal flooding results from high tides from the sea.

4.3. Pluvial Flooding

'Pluvial' flooding is that which results from rainfall generated overland flow before the run-off enters any watercourse, drain or sewer. It is more often linked to high intensity rainfall events (typically in excess of 30mm per hour). However, it can also result from lower intensity rainfall or melting snow where the ground is saturated, frozen, developed or has low permeability. This results in overland flow and ponding in depressions in the topography. In urban areas 'pluvial' flows are likely to follow the routes of highways and other surface connectivity to low spots where flooding can occur. In some cases, it can deviate from this route into adjacent developments via dropped kerbs (either for access to driveways or disability access).

4.4. Groundwater Flooding

Groundwater flooding is caused by the emergence of water from sub-surface permeable strata. Fluctuations in the groundwater table can cause flooding should the table rise above the existing ground level. Groundwater flooding events tend to have long durations, lasting days, or weeks.

4.5. Flooding from Drains and Sewers

Flooding from drains and sewers is caused when the capacity of the drains and sewers is exceeded, and will result in flooding from the manholes.

4.6. Canals, Reservoirs and Other Artificial Sources

Flooding from canals, reservoirs and artificial sources is caused when the capacity of the sources are exceeded, or if there is, an infrastructure failure.

5. Sourced Data

Data from the Environment Agency; local strategic flood risk assessments; and information from other parties are to be studies to establish which sources of flooding are at the Site.

5.1. Environment Agency Flood Maps for Planning

The EA fluvial flood zone map shown in Figure 1, indicates that the Site is in Flood Zone 1 (land having a less than 1 in 1,000 annual probability of river flooding).



Figure 1 – EA Fluvial Flood Zone Map

The EA fluvial flood probability map shown in Figure 2, indicates the Site has a better than very low probability of fluvial flooding.



Extent of flooding from rivers or the sea

High Medium Low Very Low Location you selected

Figure 2 – EA Fluvial Flood Probability Map

The EA pluvial flood probability map shown in Figure 3, indicates the Site has a very low probability of pluvial flooding. There is an isolated low probability pluvial flood area to the north of the site, but this is outside the Site boundary, and is caused by ponding due to a depression in the ground.



Extent of flooding from rivers or the sea

High Medium Low Very Low Location you selected

Figure 3 – EA Pluvial Flood Probability Map

The Extents of Flooding from Reservoirs Map in Figure 4 indicates that the Site is not in a flooding area when river levels are normal, or when there is also flooding from rivers.

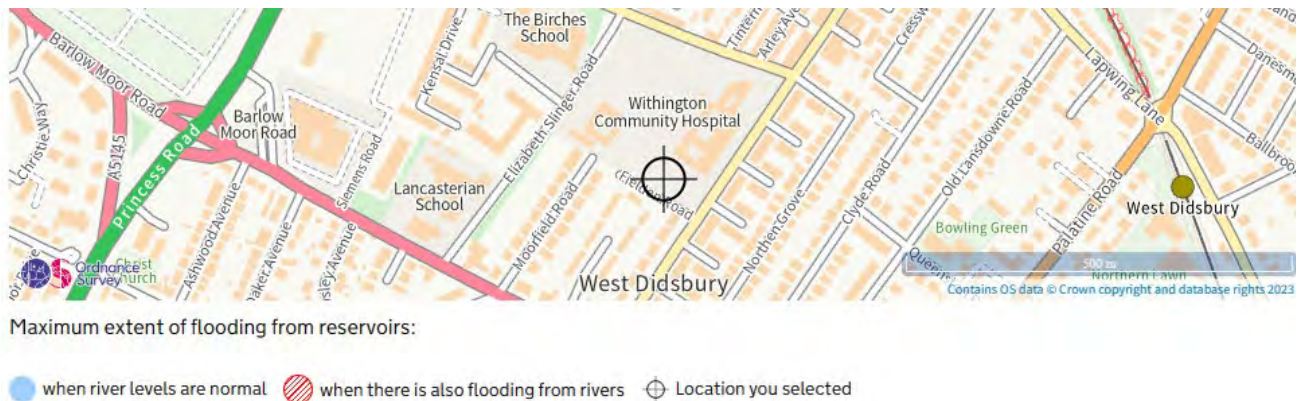


Figure 4 – EA Extents of Flooding from Reservoirs Map

5.2. Landmark Envirocheck Data Maps

Refer to Appendix F for Landmark Envirocheck flood map data. The data shown on the maps have been sourced from studies by JBA Consulting, the EA and NRW. The summary of each of the maps are as follows:

Flood Zone Map

The EA/NRW flood data map, also indicates that all the Site lies within Flood Zone 1 – low probability.

Pluvial, Fluvial and Coastal Flooding

The Envirocheck (JBA) 75-year to 1000-year return period flood map indicates that there is no pluvial, fluvial, or coastal flooding within the Site boundary.

Surface Water / Pluvial Flooding

The EA 30-year to 1000-year return period flood map indicates that there is no surface water / pluvial flooding in the Site boundary.

Ground Water

The BGS flood data map indicates that there is limited potential for groundwater flooding to occur at the Site, and the ESI groundwater flood map indicates that there is a negligible risk of ground water flooding at the Site.

Canal Failure

The Envirocheck (JBA) canal failure map indicates that the Site is in a canal flood coverage, but will not be in an area of flooding if the event of a canal failure.

Historic Flood Map

The Envirocheck historic flood map indicates that there has been no history of flooding from any source at the Site.

5.3. Manchester City, Salford City and Trafford Councils Level 2 SFRA

Manchester City, Salford City and Trafford Councils Level 2 SFRA has identified the site to be in a Critical Drainage Area.

6. Probability of Flooding

Now that the extents of the sources of flooding are known from the above data, an assessment is to be made of the probability of flooding from each of the sources.

6.1. Fluvial Flooding - Probability: Low

The flood data maps indicate that the overall Site is in Flood Zone 1 (land having a less than 1 in 1,000 annual probability of river flooding).

The EA fluvial flood probability map shown in Figure 2, indicates the Site has a better than very low probability of fluvial flooding.

The JBA maps indicate that there is no fluvial or coastal flooding within Site area up to the 1000-year return period.

Therefore, as the flood maps indicate the Site to be in Flood Zone 1, and indicate no flooding up to the 1000-year return period, the probability of fluvial / coastal flooding is deemed to be low.

6.2. Pluvial Flooding - Probability: Low

The EA pluvial flood probability map shown in Figure 3, indicates the Site has a very low probability of pluvial flooding. There is an isolated low probability pluvial flood area to the north of the site, but this outside the Site boundary, and is caused by ponding due to a depression in the ground.

The Envirocheck (JBA) 75-year to 1000-year return period flood map indicates that there is no pluvial flooding within the Site boundary.

The EA 30-year to 1000-year return period flood map indicates that there is no surface water / pluvial flooding in the Site boundary.

Manchester City, Salford City and Trafford Councils Level 2 SFRA has identified the site to be in a Critical Drainage Area.

Therefore, based on the EA and JBA flood map data, there is a low probability of flooding, with the SFRA indicating the Site to be in a critical drainage area.

The probability of pluvial flooding at the Site will still be low, but with onus being on the management of the Site surface water run-off to ensure the risk of flooding to areas within the Site and near to the Site are reduced.

6.3. Ground Water Flooding - Probability: Low

The BGS flood data map indicates that there is limited potential for groundwater flooding to occur,

The ESI groundwater flood map indicates that there is a negligible risk of ground water flooding at the Site.

Therefore, based on the flood map data, the probability of groundwater flooding at the Site is deemed to be low.

6.4. Flooding from Drains and Sewers - Probability: Low

There is an 825 x 1200mm surface water sewer in Burton Road (west of site), a 525mm diameter combined water sewer in Burton Road (west of site), and a 300mm diameter combined water sewer in Fielden Road (south of site). There has been no history of flooding from the sewers, within the Site being higher than road / manhole cover levels.

Therefore, the flood water will not flow towards the Site, with the probability of flooding from drains and sewers for the Site is deemed to be low.

6.5. Canals, Reservoirs and Other Artificial Sources - Probability: Low

There are no known canals, reservoirs or artificial sources near the development Site. The Extents of Flooding from Reservoirs Map in Figure 4, indicates that the Site is not in a flooding area; The Envirocheck (JBA) canal failure map indicates that the development Site is in the canal coverage area, but is not in a canal failure area; There has also been no history of flooding from any sources, and therefore, based on the assessed data, the risk of flooding from canals, reservoirs or artificial sources is deemed to be low.

7. Flood Risk and Vulnerability

Paragraphs 077 to 078 of the NPPG are relevant to the assessment of flood vulnerability and appropriate development of the Site. These paragraphs describe the different flood zones, flood risk vulnerability classifications, as well as flood zone 'compatibility' (appropriate development in flood zone).

7.1. Flood Zones

NPPG Paragraph 078, Table 1 indicates that the flood zones are:

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 0.1% annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map for Planning – all land outside Zones 2, 3a and 3b)
Zone 2 Medium Probability	Land having between a 1% and 0.1% annual probability of river flooding; or land having between a 0.5% and 0.1% annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1% or greater annual probability of river flooding; or Land having a 0.5% or greater annual probability of sea. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: • land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or • land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding). Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

The EA flood map data has identified that the Site to be in Flood Zone 1.

7.2. Flood Risk Vulnerability Classification

NPPG Paragraph 077 refers to NPPF Annex 3. Annex 3 describes the flood risk vulnerability classifications as:

Flood Risk Vulnerability Classification
Essential Infrastructure Essential transport infrastructure (including mass evacuation routes) which should cross the area at risk; Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood; Wind turbines.
Highly Vulnerable Police and ambulance stations; fire stations and command centers; telecommunications installations required to be operational during flooding; Emergency dispersal points; Basement dwellings; Caravans, mobile homes and park homes intended for permanent residential use; Installations requiring hazardous substances consent.
More Vulnerable Hospitals; Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels; Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels; Non-residential uses for health services, nurseries and educational establishments; Landfill* and Sites used for waste management facilities for hazardous waste; Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable Police, ambulance and fire stations which are not required to be operational during flooding; Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'More Vulnerable' class; and assembly and leisure; Land and buildings used for agriculture and forestry; Waste treatment (except landfill and hazardous waste facilities); Minerals working and processing (except for sand and gravel working); Water treatment works which do not need to remain operational during times of flood; Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place; car parks.
Water-Compatible Development Flood control infrastructure; Water transmission infrastructure and pumping stations; Sewage transmission infrastructure and pumping stations; Sand and gravel working; Docks, marinas and wharves; Navigation facilities; Ministry of Defence installations; Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location; Water-based recreation (excluding sleeping accommodation); Lifeguard and coastguard stations; Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms; Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

This development is classed as a 'More Vulnerable' as the development is a used hospital purpose.

7.3. Flood Risk Vulnerability and Flood Zone 'Compatibility'

NPPG Paragraph 079 Table 2, gives guidance on flood risk vulnerability compared with flood zones, to

determine the compatibility.

Flood Risk Vulnerability and Flood Zone ‘Compatibility’					
Flood Zones	Flood Risk Vulnerability Classification				
	Essential Infra-structure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	† Exception Test required	✗	Exception Test required	✓	✓
Zone 3b*	* Exception Test required	✗	✗	✗	✓*

✓Exception test is not required.

✗ Development should not be permitted.

“†” In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

“*” In Flood Zone 3b (functional floodplain) essential infrastructure that has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.

The post development Site would be classed as ‘More Vulnerable’, but as the Site is in Flood Zone 1, Table 2 of the NPPG states that the Site is appropriate for development, as the probability of flooding is deemed to be low.

8. Flood Flows and Safe Access / Egress

To ensure that the Site is safe for its lifetime, an analysis of any flood flow displacement and safe access and egress routes are as follows:

8.1. Flood Flows and Displacement

The new building with the Site is in Flood Zone 1, and therefore, will not affect fluvial flood flows or displace fluvial flood water to neighbouring land or property.

The assed flood maps indicate that there is no pluvial flooding with no overland pluvial flood flows from outside the Site boundary. Therefore, the new building will not affect pluvial flood flows or displace pluvial flood water to neighbouring land or property.

8.2. Safe Access and Egress

The flood data maps indicates that there is no flooding in the Site, or in the roads to the east and south of the Site during the 1000-year return period.

Safe egress and access can therefore be gained to and from the Site from the surrounding road.

9. Surface Water Management

As the Site is in a critical drainage area, and to ensure the Site does not increase flood risk to areas within or near the Site boundary, the surface water run-off is to be managed.

Refer to CCS Consulting – Surface Water Management Report (January 2023) for full surface water management details.

A summary of the surface water management, as set out in the report is as follows:

9.1. Surface Water Management Principles

The surface water for the Site is to be managed so that it adheres to the current national regulations and local authority requirements.

Run-Off Destination

Surface water run-off is to discharge to one or more of the following in the order of priority shown:

- Discharge into the ground (infiltration);
- Discharge to a surface water body;
- Discharge to a surface water sewer, highway drain or other drain;
- Discharge to combined sewer.

Design Principles

The design principles for the surface water management of the development will be to:

- Ensure that people, property, and critical infrastructure are protected from flooding;
- Ensure that the development does not increase flood risk off site;
- Ensure that SuDS can be economically maintained for the development.

Peak Surface Water Flow

Non-Statutory Technical Standards for Sustainable Drainage Systems states:

S2 For greenfield developments, the peak runoff rate from the development to any highway drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100-year rainfall event should never exceed the peak greenfield runoff rate for the same event.

Volume Control

National Non-statutory technical standards for sustainable drainage systems states:

S4 Where reasonably practicable, for greenfield development, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100-year, 6-hour rainfall event should never exceed the greenfield runoff volume for the same event.

S5 Where reasonably practicable, for developments which have been previously developed, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100-year, 6-hour rainfall event must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event, but should never exceed the runoff volume from the development site prior to redevelopment for that event.

S6 Where it is not reasonably practicable to constrain the volume of runoff to any drain, sewer or surface water body in accordance with S4 or S5 above, the runoff volume must be discharged at a rate that does not adversely affect flood risk.

Flood Risk within Development

National Non-statutory technical standards for sustainable drainage systems states:

'S7 The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur on any part of the site for a 1 in 30-year rainfall event.

S8 The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur during a 1 in 100-year rainfall event in any part of: a building (including a basement); or in any utility plant susceptible to water (e.g. pumping station or electricity substation) within the development.

S9 The design of the site must ensure that, so far as is reasonably practicable, flows resulting from rainfall in excess of a 1 in 100-year rainfall event are managed in exceedance routes that minimise the risks to people and property'.

Pollution / Water Quality

The SuDS design for the development site will ensure that the quality of any receiving water body is not adversely affected and preferably enhanced in accordance with Ciria SuDS Manual C753, Chapter 4.

Designing for Exceedance

The development site design will be such that when SuDS features fail or are exceeded, exceedance flows do not cause flooding of properties on or off site. This is achieved by completely containing the surface water within the drainage system (including areas designed to hold or convey water) for all events up to a 1 in 30-year event. The design of the site ensures that flows from rainfall more than a 1 in 100-year rainfall event are managed in exceedance routes that avoid risk to people and property both on and off site.

9.2. Surface Water Management Strategy

The surface water management strategy for the Site, based on the principles stated above are as follows:

SuDS Principles and Discharge Destination

The feasible SuDS methods being permeable paving, filter drains, swale / shallow ponds, cellular units and a flow control chamber, and the surface water destination being to a surface water sewer via an existing drainage network.

Peak Flow Control

The post development run-off rates will be an increase of the 1-year greenfield rate, but the equivalent to the 30-year greenfield rate, and a 6% reduction of the 1000-year greenfield rate. Therefore, as the greenfield rates for extreme storms have not been exceeded, the discharge rates are deemed to be acceptable, as they will meet the requirements set out in the Non-Statutory Technical Standards for Sustainable Drainage Systems.

Volume Control

The post development surface water run-off volume will be a 13% reduction of the greenfield volume for the same storm event and duration. Therefore, the discharge volume is deemed to be acceptable, as it meets the requirements set out in the Non-Statutory Technical Standards for Sustainable Drainage Systems.

Flood Risk within the Development

With the SuDS methods and attenuation volumes, no flooding will occur for all storms up to and including the 100-year + 40% storm event.

Maintenance

The management and maintenance of the surface water drainage networks and SuDS features will be by estate management of the clinical site, where the maintenance of the drainage and SuDS will form part of the overall site management / landscaping / gardening.

Surface Water Design Exceedance

In the unlikely event of an extreme storm greater than 100-year + 40% climate change, or poor maintenance of the SuDS features and / or pipework, potential flooding of the drainage network could occur. Surface water flow paths to follow existing and proposed ground topography, where water will flow towards the development boundaries, and into Burton and Fielden Road.

Flood water will flow away from the proposed building, and will not flow directly towards existing dwellings / properties outside the development boundary. The flood water within the roads will be contained due to the road having a gradient (water to flow along road) and upstand kerbs.

Water Quality

The level of water treatment is to be assessed against the details set out in Ciria SuDS Manual C753. Chapter 26 sets out the Pollution Hazard Indices for different land classifications, and how to calculate that against the SuDS mitigation indices to show suitable levels of treatment. The mitigation indices are greater than the pollution hazard index, and therefore suitable water quality is achieved.

Construction Environment Management Plan

All existing drainage networks within the development area are to be maintained during construction. The pipe network, cellular units, and flow control chamber are to be the first part of the drainage network to be built. This will ensure that the surface water discharge is suitably restricted without pollutants or flooding.

10. Residual Risk

It is difficult to completely guard against flooding since extreme events greater than the design standard event are always possible, however, there are practicable ways to minimise the risk such as by allowing a freeboard (safety margin) and by using suitable construction and management techniques.

This flood risk assessment has been prepared in accordance with the NPPF, Local Planning Policy and the NPPG. Any recommendations regarding floor levels are based on the relevant British Standards (BS8533), the standing advice provided by the EA or based on common practice.

CCS Consulting Ltd do not warrant that the advice in this report will guarantee the availability of flood insurance either now or in the future.

The owner/occupier of the buildings will be required to carry out maintenance on any SuDS devices within the Site boundary. It will be the owner's /occupier's responsibility to regular upkeep the drainage network on Site throughout the lifetime of the development to ensure that flood risk on and off Site is managed effectively.

11. Flood Risk Assessment Conclusion / Summary

Based the assessed flood data for the Site, the probability of flooding from all sources to the Site is deemed to be low.

No flood water flows will be affected, and no flood water will be displaced.

Safe access and egress can be gained to and from the proposed building up to the 1000-year return period.

The surface water will be managed using SuDS methods to control the water at source, reduce pollutants, and to reduce the risk of flooding to areas within or near the Site.

In terms flood risk the development is deemed to be acceptable.

Appendix A

Topographical Survey

Appendix B

Proposed Site Plan



Ground Floor GA Plan
1 : 200

GENERAL NOTES:

- DAY Architectural Ltd accepts no responsibility for any costs, losses or claims whatsoever arising from these drawings, specifications and related documents unless there is full compliance with the Client or any unauthorised user of the following:
1. All boundaries, dimensions and levels are to be checked on site before construction and any discrepancies reported to the Architect / Designer.
 2. Partial Service: Any discrepancy with site or other information is to be advised to the Architect / Designer and direction and / or approval is to be sought before the implementation of the detail.
 3. Works and site data are reproduced under license from the Ordnance Survey.
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 5. For the purposes of coordination, all relevant parties must check this information prior to implementation and report any discrepancies to the Architect / Designer.

P1 Issue for Information

REV DESCRIPTION

12.01.23

DATE

MA

REV BY

CLIENT
Manchester University Hospital NHS Foundation Trust

PROJECT
Endoscopy & Cardiorespiratory, Withington Community Hospital

DRAWING
Overall Hospital Site Plan

SCALE
1 : 200 @ A0

PROJECT
1342-22

CLIENT REF
MFT

DRAWN BY
MA

CHECKED BY
CB

DATE
DAY XX 00 DR A 02-0101 P1

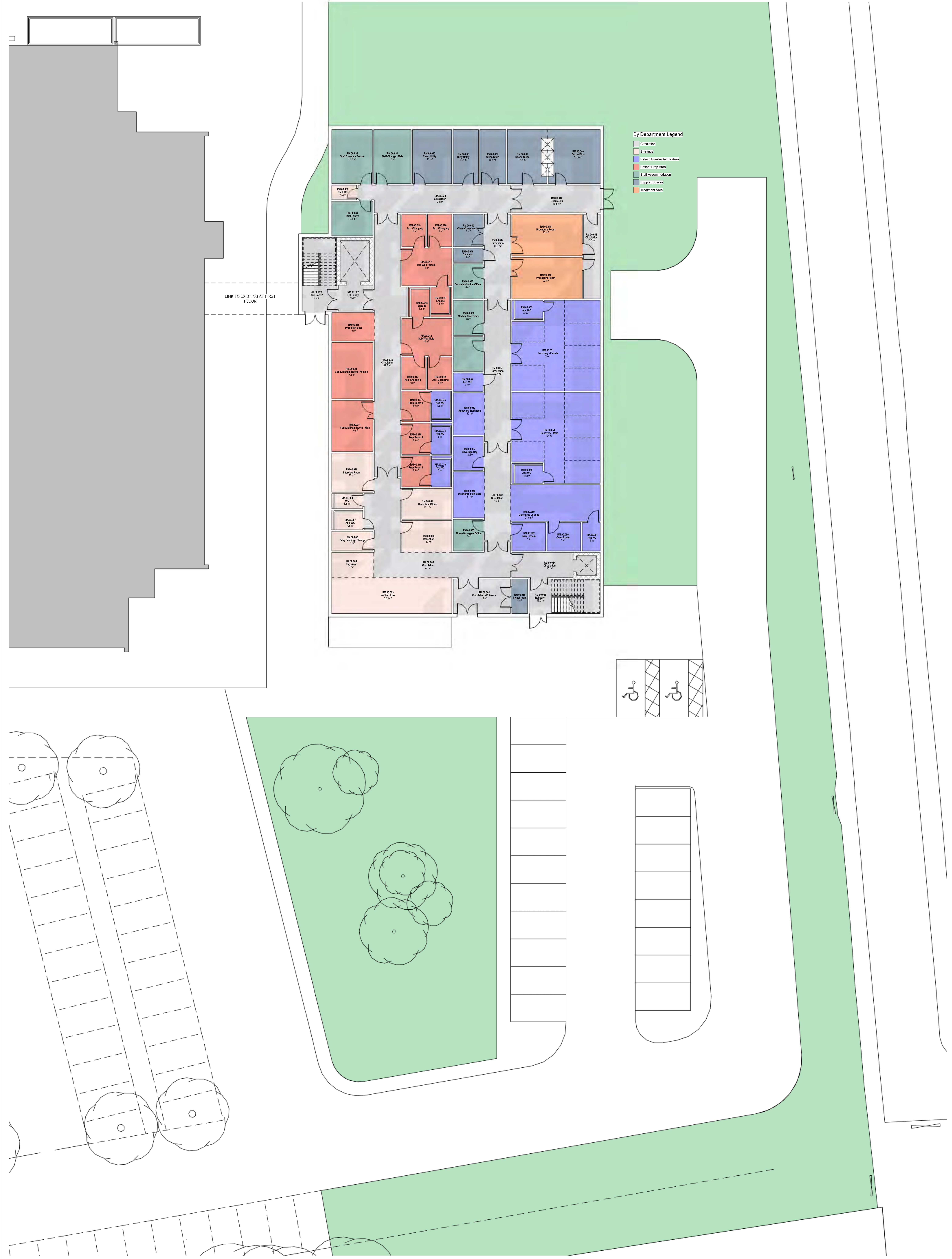
SUITABILITY
INFORMATION

DAY

DAY Architectural Ltd
Studio 1, Lancaster Buildings
17 Deansgate, Manchester, M3
2BW

T: 0161 634 9100
W: www.day-architectural.com

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Appendix C

Ground Investigation Data

578954654
8383 9203

DATE	CASING DEPTH (m)	WATER LEVEL MORNING & EVENING	DEPTH OF STRATA BELOW G.L.	Reduced Level	DESCRIPTION	No. and Type of Sample	SAMPLE DEPTH PENETRATION		No. of Blows	Legend
							From	To		
21-2-87	0.00	DRY	0.40		Bituminous surfacing onto concrete					
			0.70		Brown-black silt, sand, ash, cinders, gravel, brick, clay etc. MADEGROUND	D1	0.50			
			1.40		Very loose grey-brown very gravelly fine to coarse SAND with clay lenses	D2 P1 B1	1.00 1.55 1.80	1.85 2.20	3	
22-2-87			2.20		MADEGROUND					
			2.70		Very loose grey-brown gravelly fine to coarse SAND	P2 B2	2.35 2.70	2.65 3.20	1	
			3.90		Medium-dense brown slightly silty and very gravelly fine to coarse SAND	P3 W1	3.35 3.65	3.65	11	
					Stiff/very stiff brown silty and sandy CLAY with silt and sand laminae and lenses and fine to medium gravel becoming firm/stiff silty and slightly sandy laminated CLAY with occasional fine gravel below 5.20 m and stiff below 6.0 m	D3 U1 D4 U2 D5 U3 D6	4.00 4.30 4.85 5.20 5.75 6.00 6.55	4.75 5.65 6.45		
22-2-87	4.50	DRY	6.55		END OF BOREHOLE					

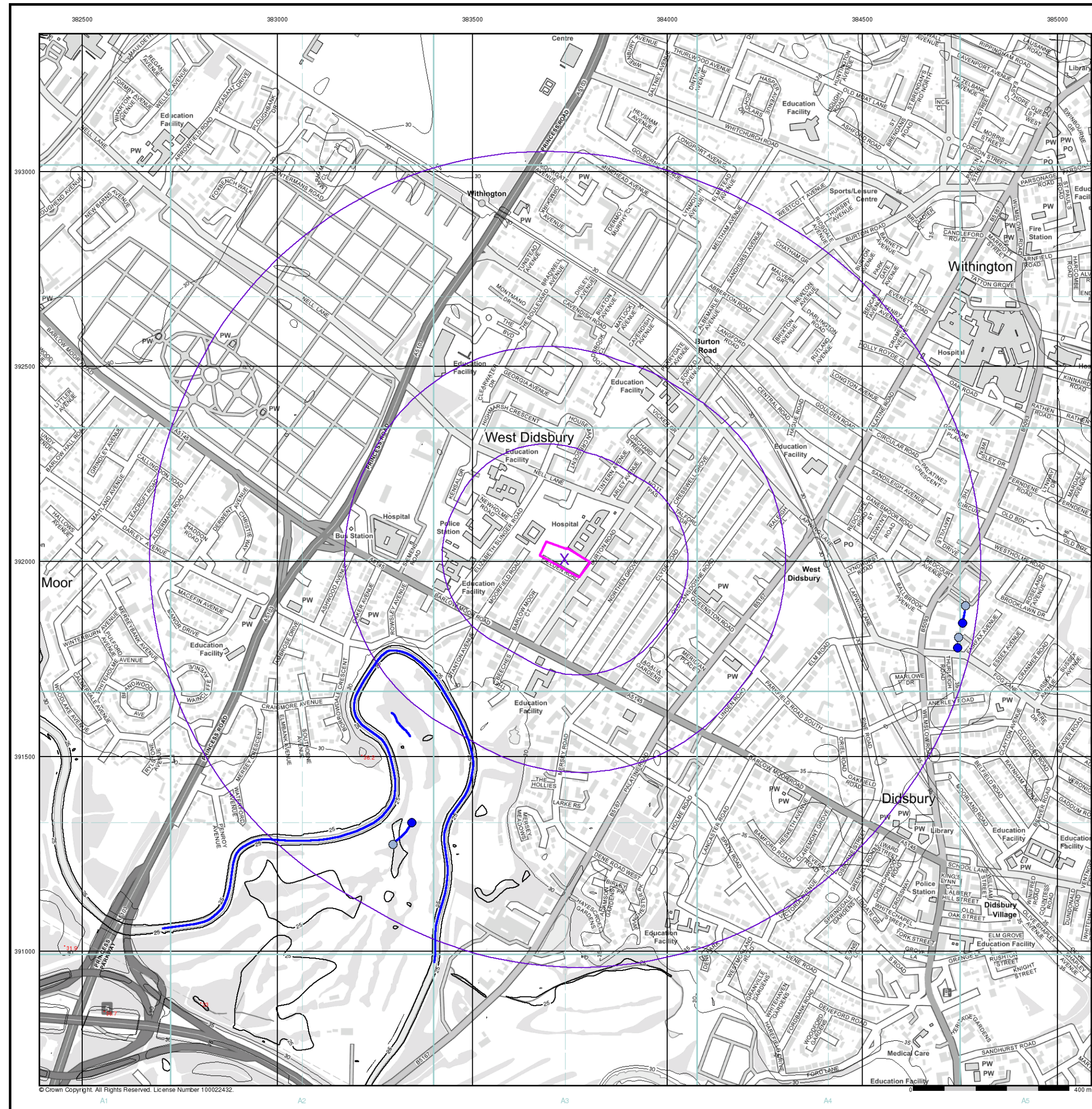
SAMPLE TEST KEY	D - DISTURBED SAMPLE	B - BULK SAMPLE	U - UNDISTURBED SAMPLE
	P - SPT SAMPLE	W - WATER SAMPLE	

ALL DEPTHS AND REDUCED LEVELS IN (m) UNLESS OTHERWISE STATED

COMMERCIAL
IN CONFIDENCE

Appendix D

OS Water Network Map



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OS Water Network Lines Map (1:10,000)

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

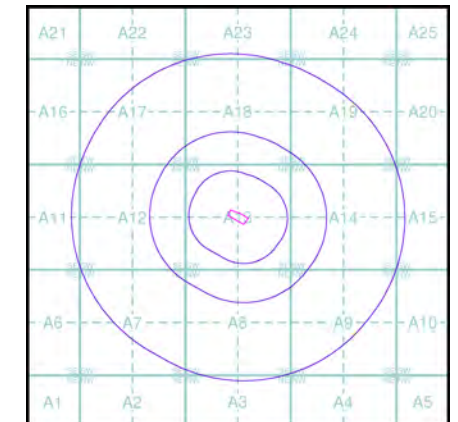
OS Water Network Data

- | | |
|--------------|-------------------------|
| Canal | Drain |
| Reservoir | Other |
| Foreshore | Lake |
| Marsh | Transfer |
| Tidal River | Lock Or Flight Of Locks |
| Inland River | Sea |
| Junction | Source |
| Outlet | Other |
| Pseudo | |

Contours (height in meters)

- Standard Contour 105 100 95
- Master Contour 105 100 95
- Spot Height 167.3
- MLW Mean Low Water
- MHW Mean High Water

OS Water Network Map - Slice A



Order Details

Order Number: 309147548_1_1
Customer Ref: 900 - Withington
National Grid Reference: 383740, 392010
Slice: A
Site Area (Ha): 0.57
Search Buffer (m): 1000

Site Details

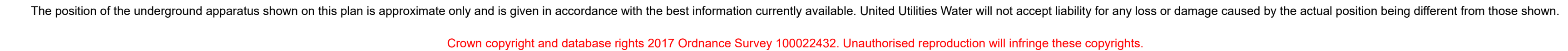
Site at 383740, 392010

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Web: www.envirocheck.co.uk

Appendix E

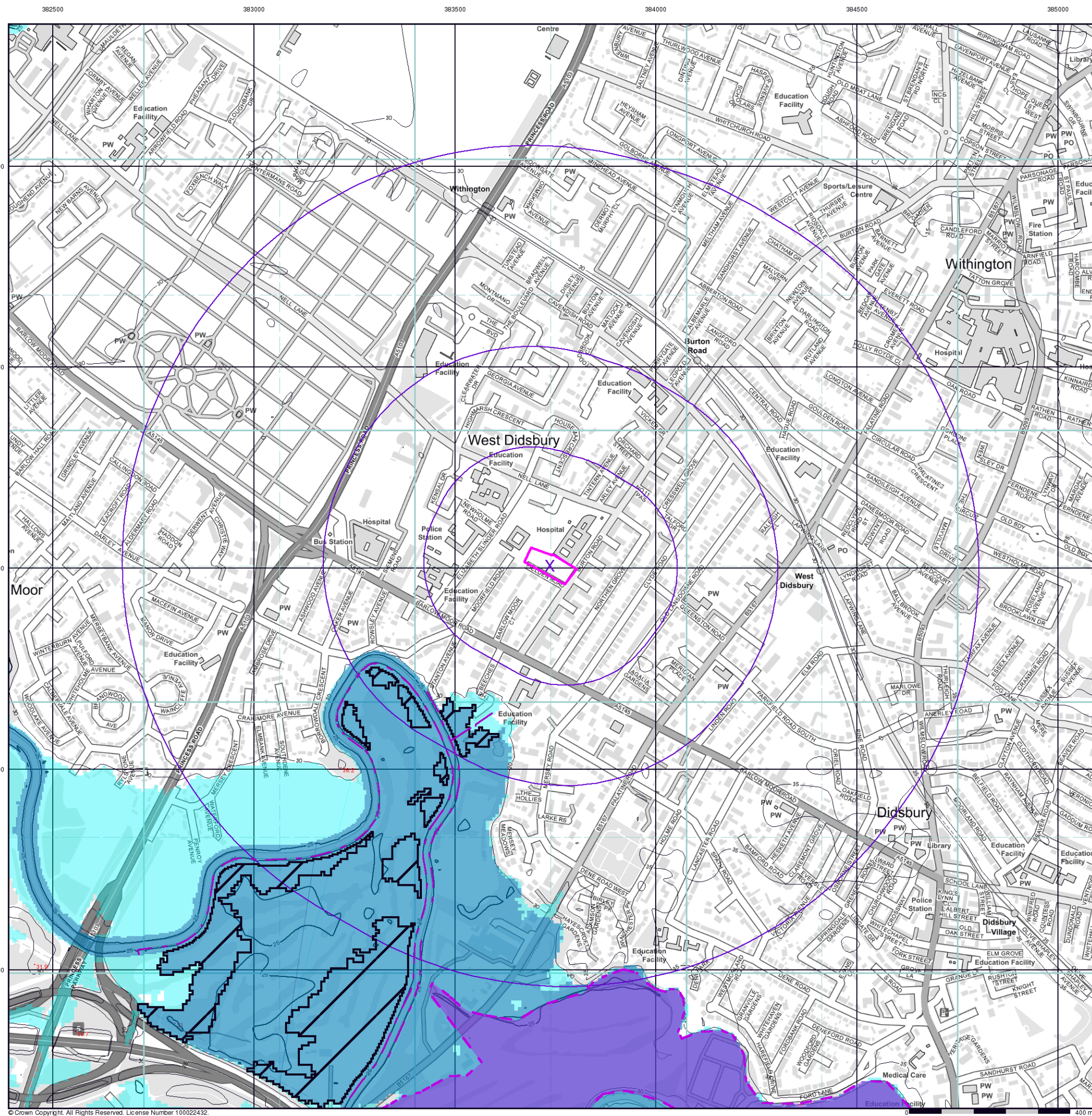
United Utilities Asset Plan

[illegible]

**SEWER
RECORDS**

Appendix F

Landmark Envirocheck Flood Map Data



EA/NRW Flood Data Map (1:10,000)

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

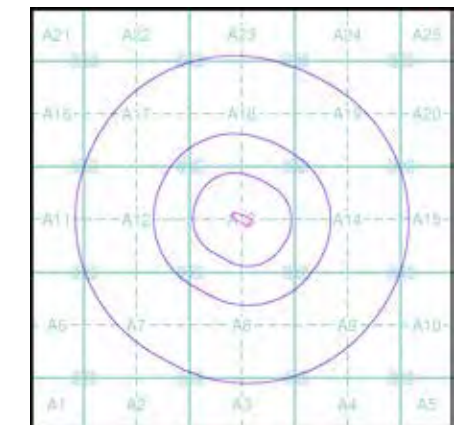
Flood Data

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Contours (height in metres)

- Standard Contour: 105, 100, 95
- Master Contour: 105, 100, 95
- Spot Height: 167.8
- MLW: Mean Low Water
- MHW: Mean High Water

EA/NRW Flood Data Map - Slice A

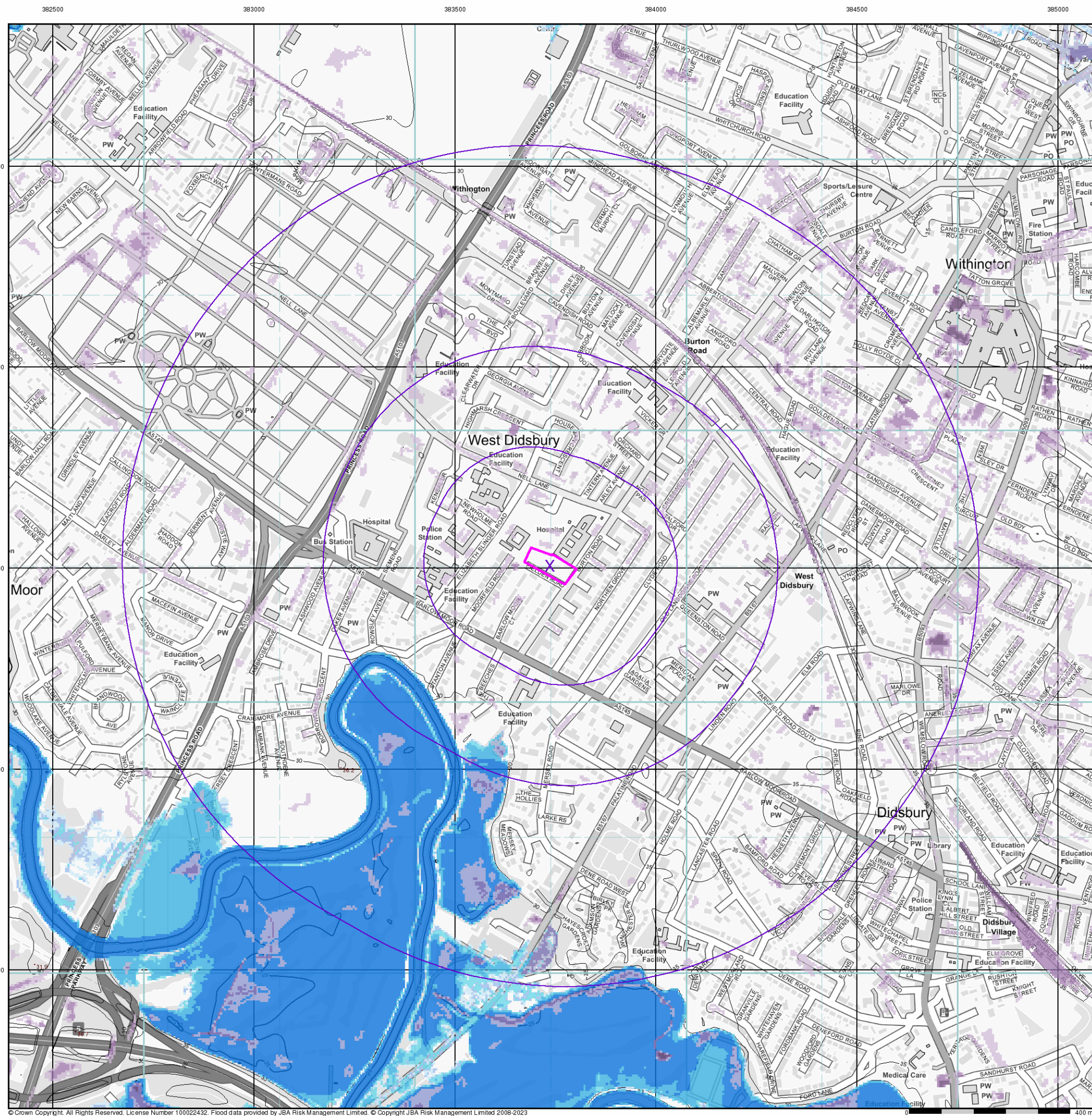


Order Details

Order Number: 309147548_1_1
Customer Ref: 900 - Withington
National Grid Reference: 383740, 392010
Slice: A
Site Area (Ha): 0.57
Search Buffer (m): 1000

Site Details

Site at 383740, 392010



JBA 75 Year Return Flood Map (Undefended) (1:10,000)

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

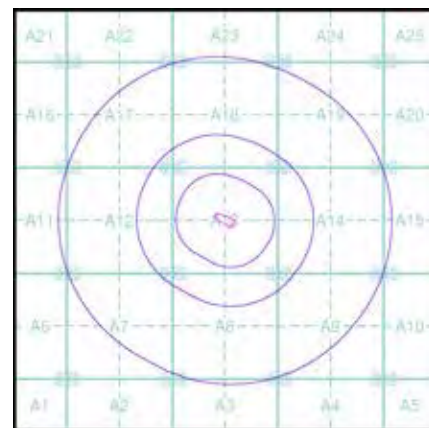
Modelled Flood Depth

Pluvial Depth	Fluvial Depth	Coastal Depth
0.1m	0.01m - 0.05m	0.01m - 0.05m
0.1m - 0.3m	0.05m - 0.1m	0.05m - 0.1m
0.3m - 1m	0.1m - 0.3m	0.1m - 0.3m
>1m	0.3m - 1m	0.3m - 1m
	>1m	>1m

Contours (height in metres)

- Standard Contour 105 100 95
- Master Contour
- Spot Height 167.8
- MLW Mean Low Water
- MHW Mean High Water

JBA 75 Year Return Flood Map (Undefended) - Slice A

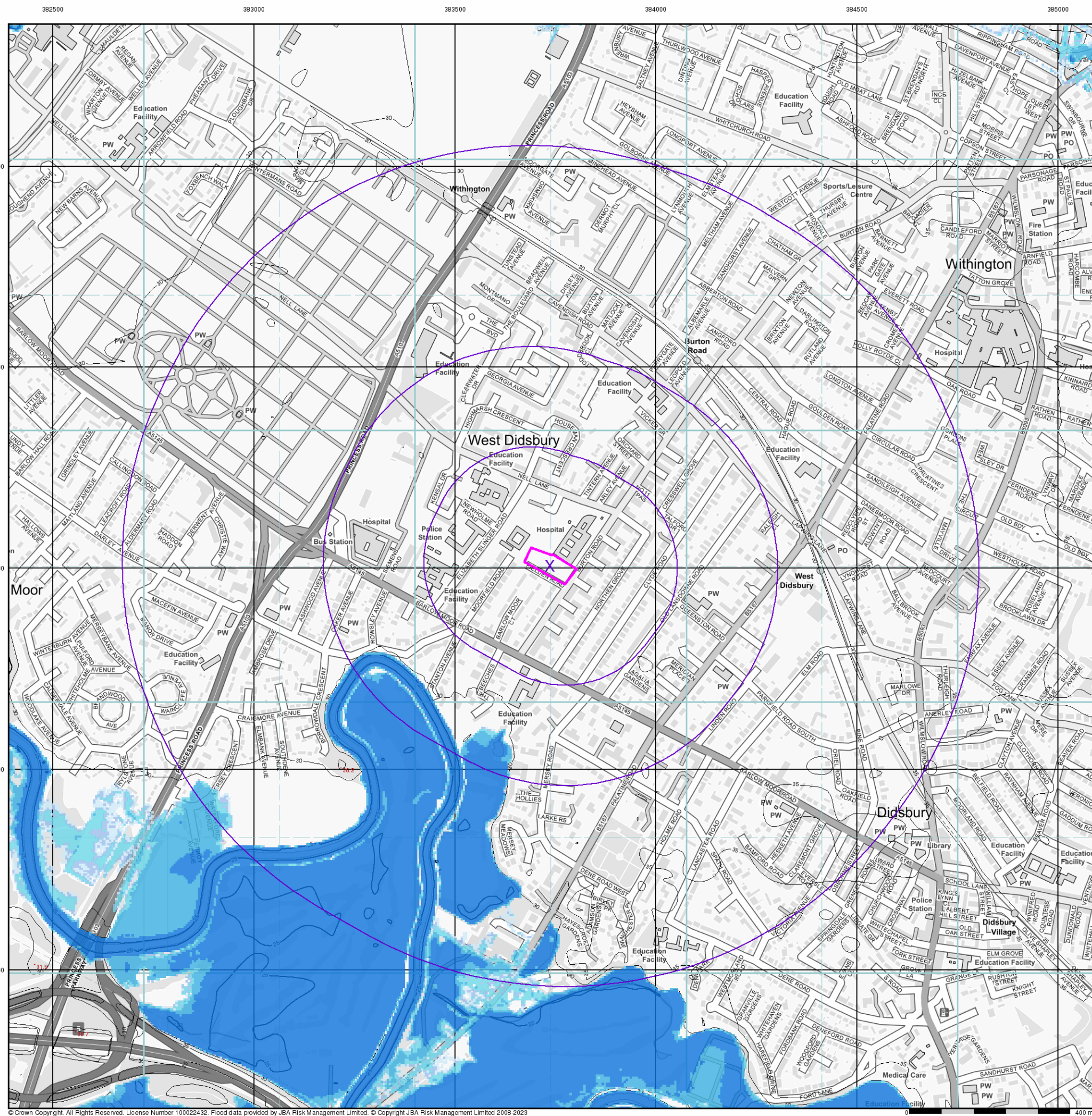


Order Details

Order Number: 309147548_1_1
Customer Ref: 900 - Withington
National Grid Reference: 383740, 392010
Slice: A
Site Area (Ha): 0.57
Search Buffer (m): 1000

Site Details

Site at 383740, 392010



JBA 100 Year Return Flood Map (Undefended) (1:10,000)

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

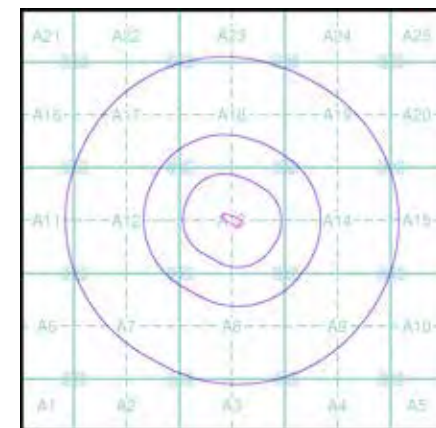
Modelled Flood Depth

Fluvial Depth	Coastal Depth
0.01m - 0.05m	0.01m - 0.05m
0.05m - 0.1m	0.05m - 0.1m
0.1m - 0.3m	0.1m - 0.3m
0.3m - 1m	0.3m - 1m
>1m	>1m

Contours (height in metres)

- Standard Contour 105 100 95
- Master Contour 100 95
- Spot Height 167.8
- MLW Mean Low Water
- MHW Mean High Water

JBA 100 Year Return Flood Map (Undefended) - Slice A

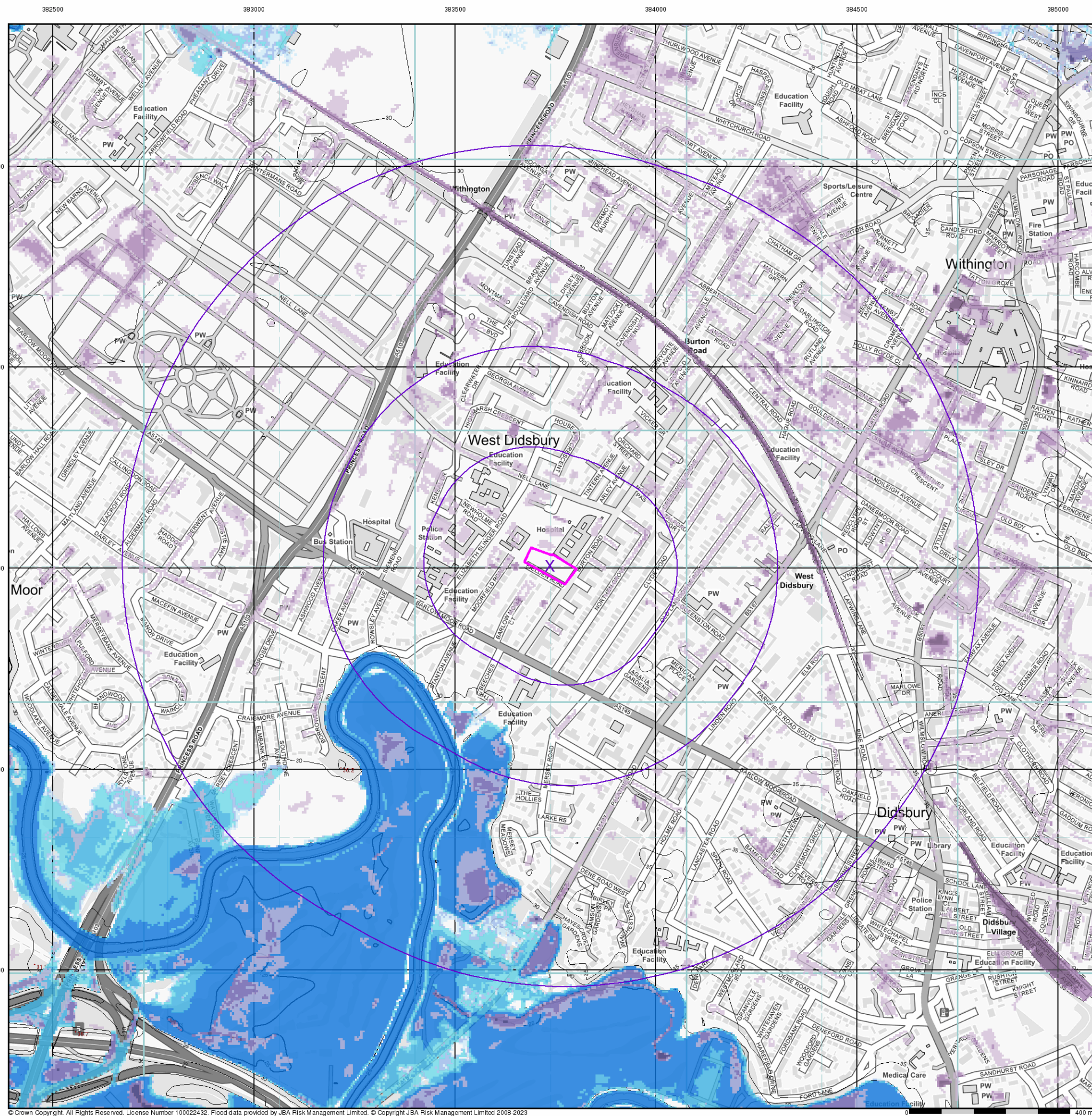


Order Details

Order Number: 309147548_1_1
Customer Ref: 900 - Withington
National Grid Reference: 383740, 392010
Slice: A
Site Area (Ha): 0.57
Search Buffer (m): 1000

Site Details

Site at 383740, 392010



JBA 200 Year Return Flood Map (Undefended) (1:10,000)

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

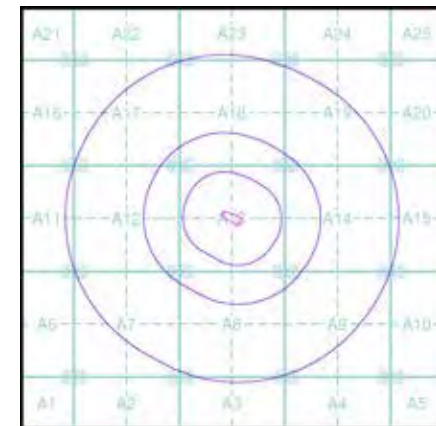
Modelled Flood Depth

Pluvial Depth	Fluvial Depth	Coastal Depth
0.1m	0.01m - 0.05m	0.01m - 0.05m
0.1m - 0.3m	0.05m - 0.1m	0.05m - 0.1m
0.3m - 1m	0.1m - 0.3m	0.1m - 0.3m
>1m	0.3m - 1m	0.3m - 1m
	>1m	>1m

Contours (height in metres)

- Standard Contour 105 100 95
- Master Contour
- Spot Height 167.8
- MLW Mean Low Water
- MHW Mean High Water

JBA 200 Year Return Flood Map (Undefended) - Slice A

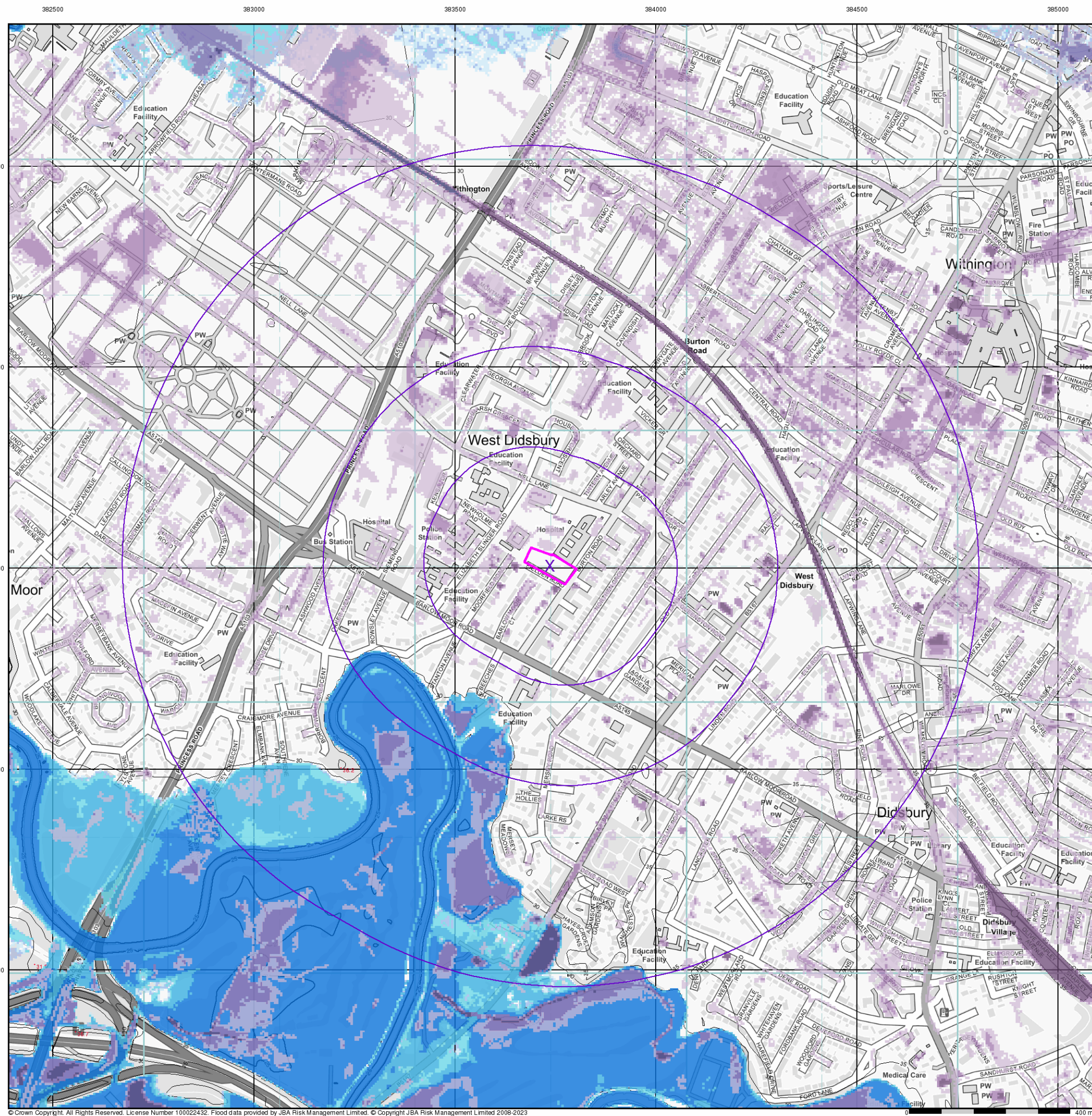


Order Details

Order Number: 309147548_1_1
Customer Ref: 900 - Withington
National Grid Reference: 383740, 392010
Slice: A
Site Area (Ha): 0.57
Search Buffer (m): 1000

Site Details

Site at 383740, 392010



JBA 1000 Year Return Flood Map (Undefended) (1:10,000)

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

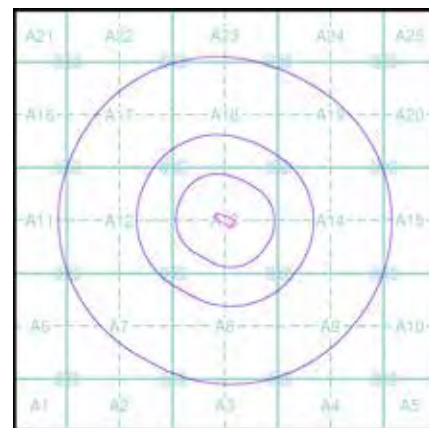
Modelled Flood Depth

Pluvial Depth	Fluvial Depth	Coastal Depth
0.1m	0.01m - 0.05m	0.01m - 0.05m
0.1m - 0.3m	0.05m - 0.1m	0.05m - 0.1m
0.3m - 1m	0.1m - 0.3m	0.1m - 0.3m
>1m	0.3m - 1m	0.3m - 1m
	>1m	>1m

Contours (height in metres)

- Standard Contour 105
- Master Contour 100
- Spot Height 167.8
- MLW Mean Low Water
- MHW Mean High Water

JBA 1000 Year Return Flood Map (Undefended) - Slice A

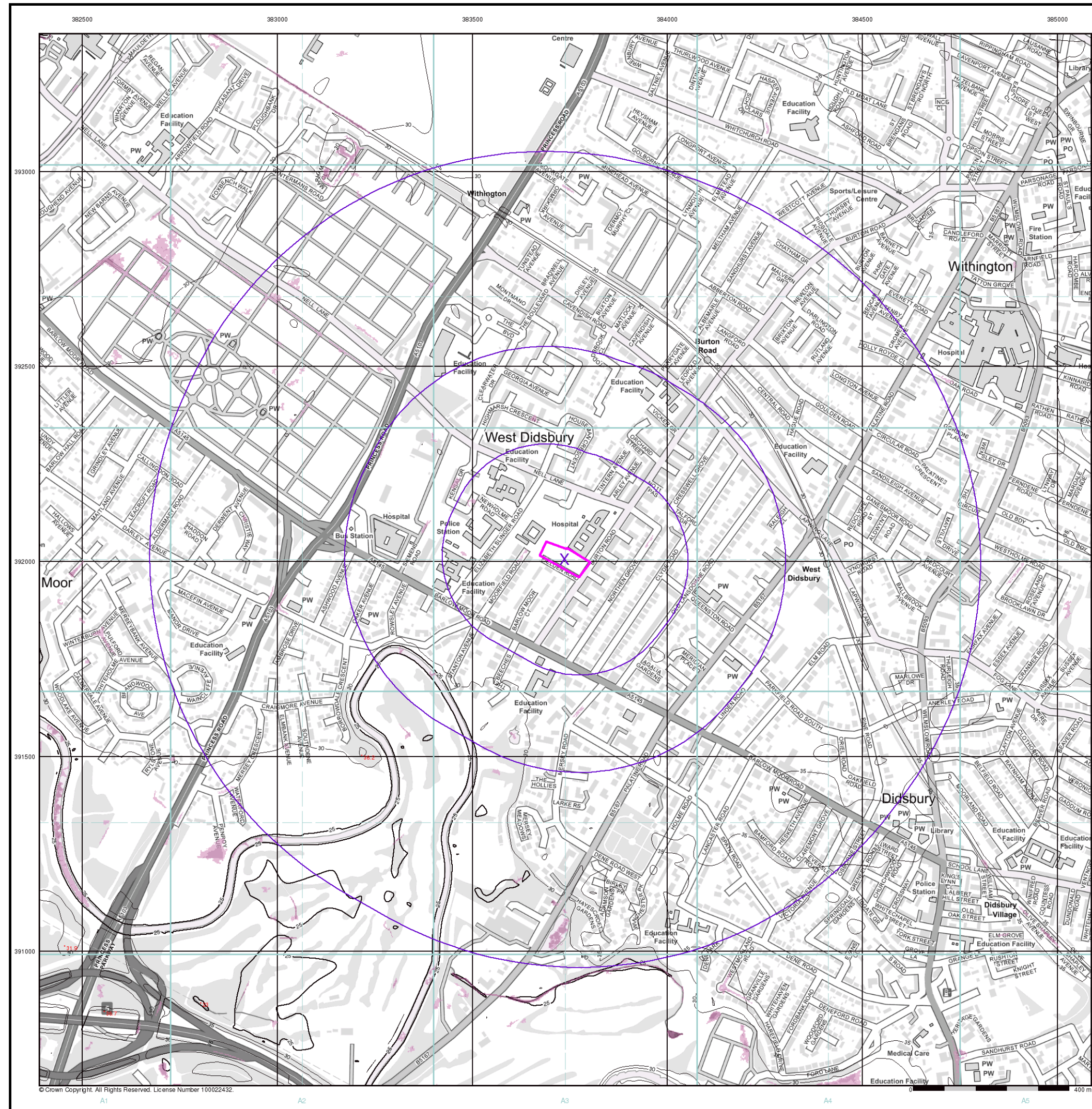


Order Details

Order Number: 309147548_1_1
Customer Ref: 900 - Withington
National Grid Reference: 383740, 392010
Slice: A
Site Area (Ha): 0.57
Search Buffer (m): 1000

Site Details

Site at 383740, 392010



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EA/NRW Surface Water 30 Year Return Depth Map (1:10,000)

General
Specified Site Specified Buffer(s) Bearing Reference Point

Surface Water Depth

0 - 0.15m
0.15 - 0.30m
0.30 - 0.60m
0.60 - 0.90m
0.90 - 1.20m
> 1.20m

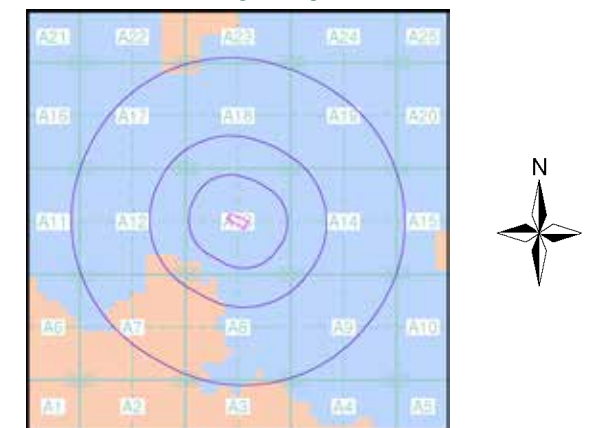
Contours (height in metres)

Standard Contour 105 100 95
Master Contour 105 100 95
Spot Height *167.8
MLW Mean Low Water
MHW Mean High Water

Suitability

See the suitability map below
National to county
County to town
Town to street
Street to parcels of land
Property

EA/NRW Suitability Map - Slice A



Order Details

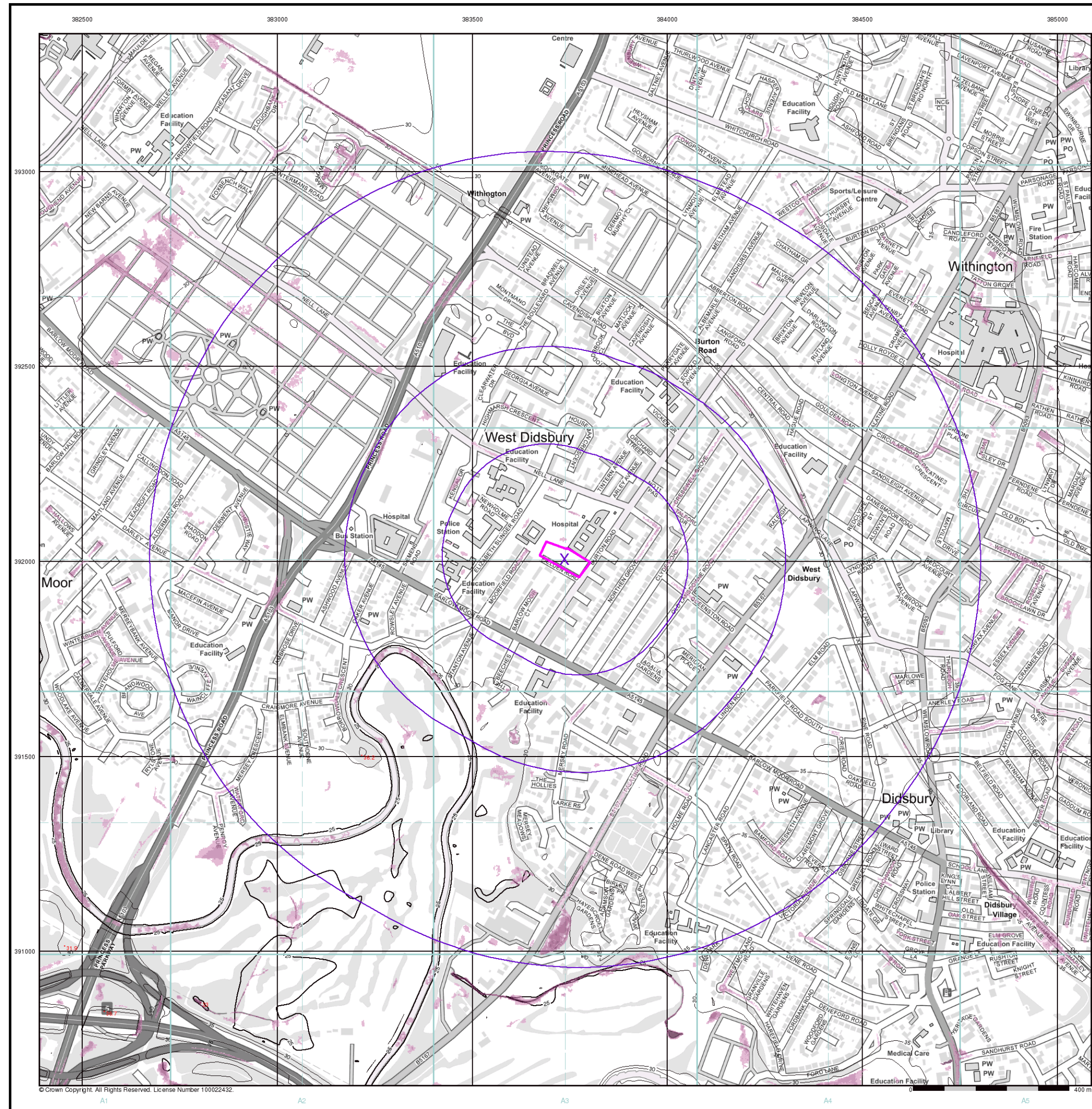
Order Number: 309147548_1_1
Customer Ref: 900 - Withington
National Grid Reference: 383740, 392010
Slice: A
Site Area (Ha): 0.57
Search Buffer (m): 1000

Site Details

Site at 383740, 392010

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EA/NRW Surface Water 100 Year Return Depth Map

General
Specified Site Specified Buffer(s) Bearing Reference Point

Surface Water Depth

0 - 0.15m
0.15 - 0.30m
0.30 - 0.60m
0.60 - 0.90m
0.90 - 1.20m
> 1.20m

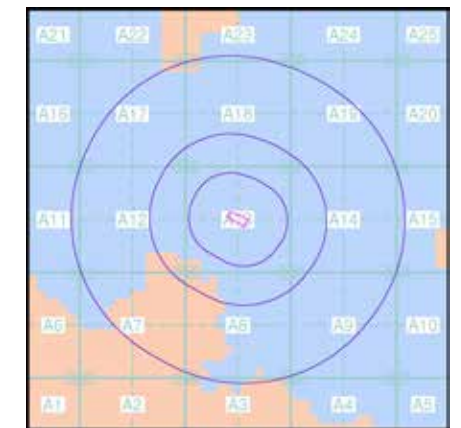
Contours (height in metres)

Standard Contour
Master Contour
Spot Height
MLW Mean Low Water
MHW Mean High Water

Suitability

See the suitability map below
National to county
County to town
Town to street
Street to parcels of land
Property

EA/NRW Suitability Map - Slice A



Order Details

Order Number: 309147548_1_1
Customer Ref: 900 - Withington
National Grid Reference: 383740, 392010
Slice: A
Site Area (Ha): 0.57
Search Buffer (m): 1000

Site Details

Site at 383740, 392010



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EANRW Surface Water 1000 Year Return Depth Map (1:10,000)

General
Specified Site Specified Buffer(s) Bearing Reference Point

Surface Water Depth

0 - 0.15m
0.15 - 0.30m
0.30 - 0.60m
0.60 - 0.90m
0.90 - 1.20m
> 1.20m

Contours (height in metres)

Standard Contour 105 100 95

Master Contour 100 95

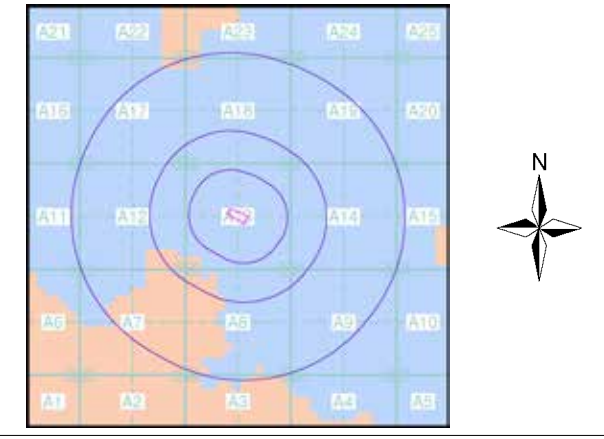
Spot Height *167.8

MLW Mean Low Water
MHW Mean High Water

Suitability
See the suitability map below

National to county	Street to parcels of land
County to town	Property
Town to street	

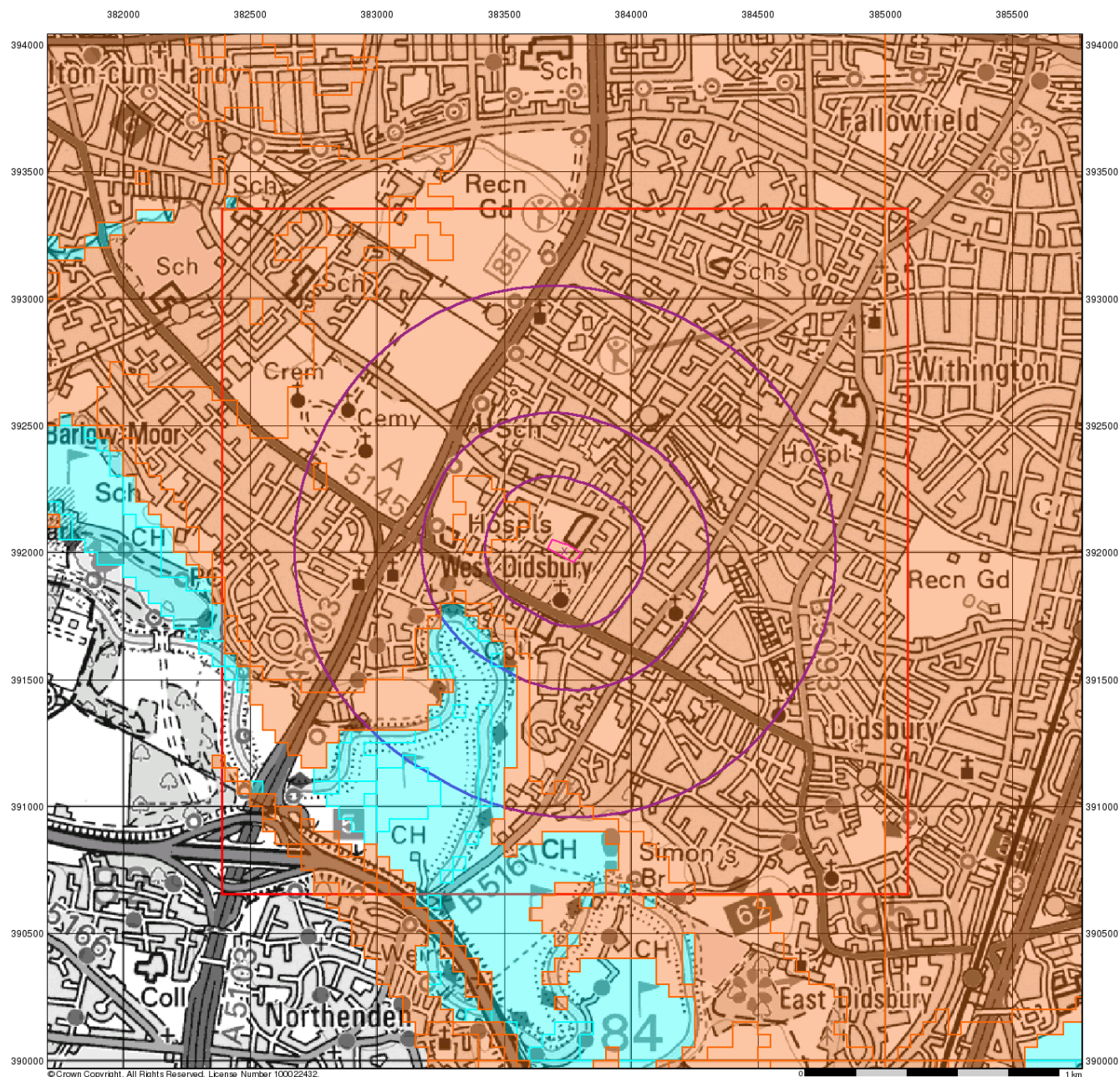
EANRW Suitability Map - Slice A



Order Details

Order Number:	309147548_1_1
Customer Ref:	900 - Withington
National Grid Reference:	383740, 392010
Slice:	A
Site Area (Ha):	0.57
Search Buffer (m):	1000

Site Details
Site at 383740, 392010



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BGS Flood Data (1:50,000)

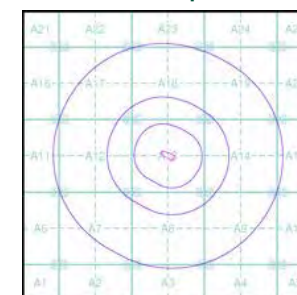
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

BGS Groundwater Flooding Susceptibility

- Potential for Groundwater Flooding to Occur at Surface
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Limited Potential for Groundwater Flooding to Occur

BGS Flood Data Map - Slice A

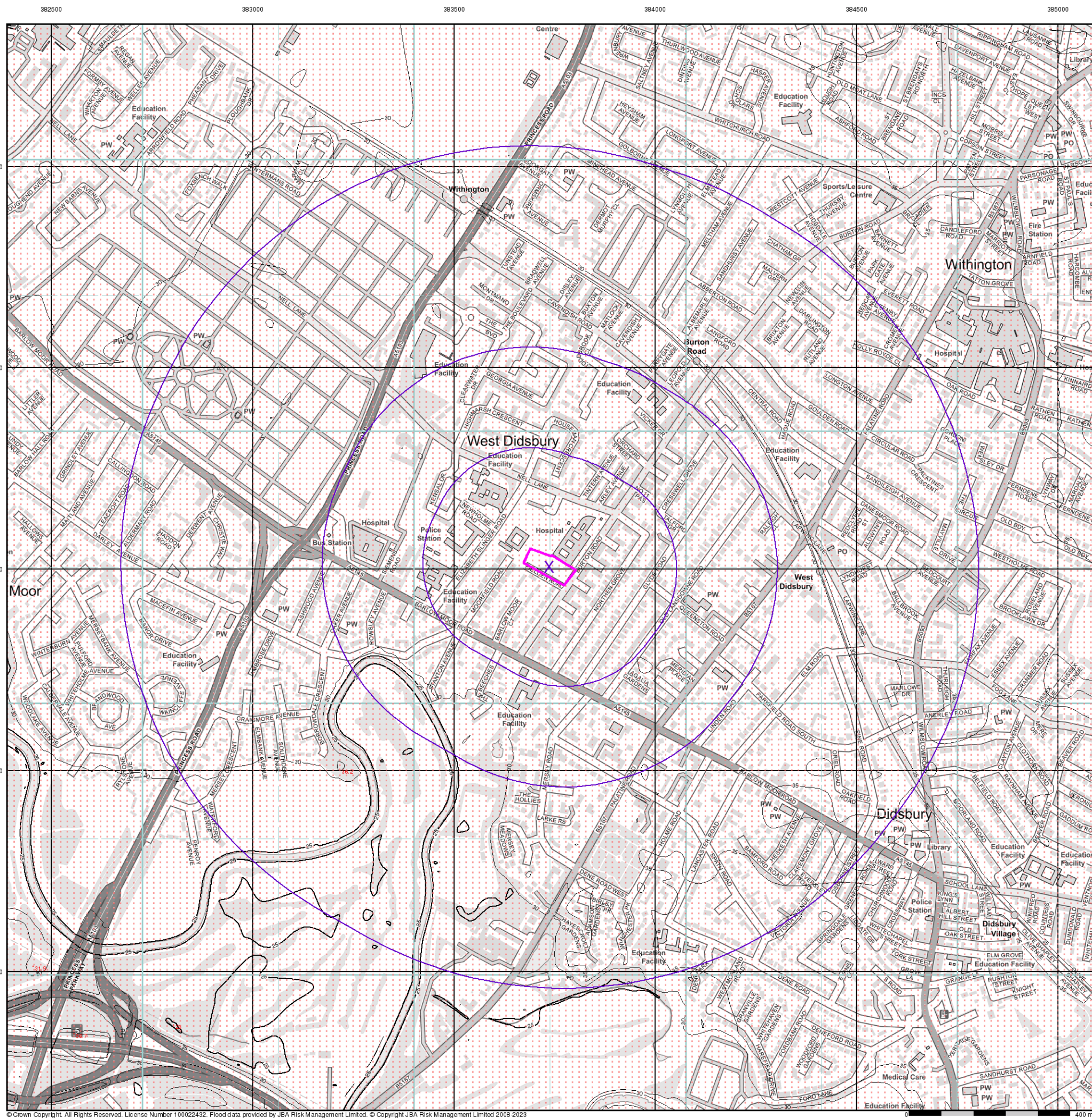


Order Details

Order Number: 309147548_1_1
 Customer Ref: 900 - Withington
 National Grid Reference: 383740, 392010
 Slice: A
 Site Area (Ha): 0.57
 Search Buffer (m): 1000

Site Details

Site at 383740, 392010



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JBA Canal Failure Map (1:10,000)

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

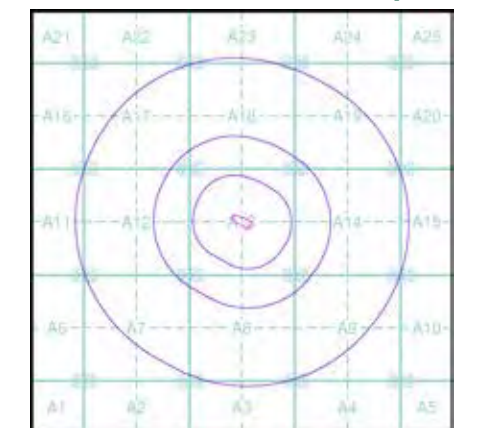
Flood Data

- Canal Failure
- Coverage

Contours (height in metres)

- Standard Contour
- Master Contour
- Spot Height
- MLW Mean Low Water
- MHW Mean High Water

JBA Canal Failure Flood Map - Slice A



Order Details

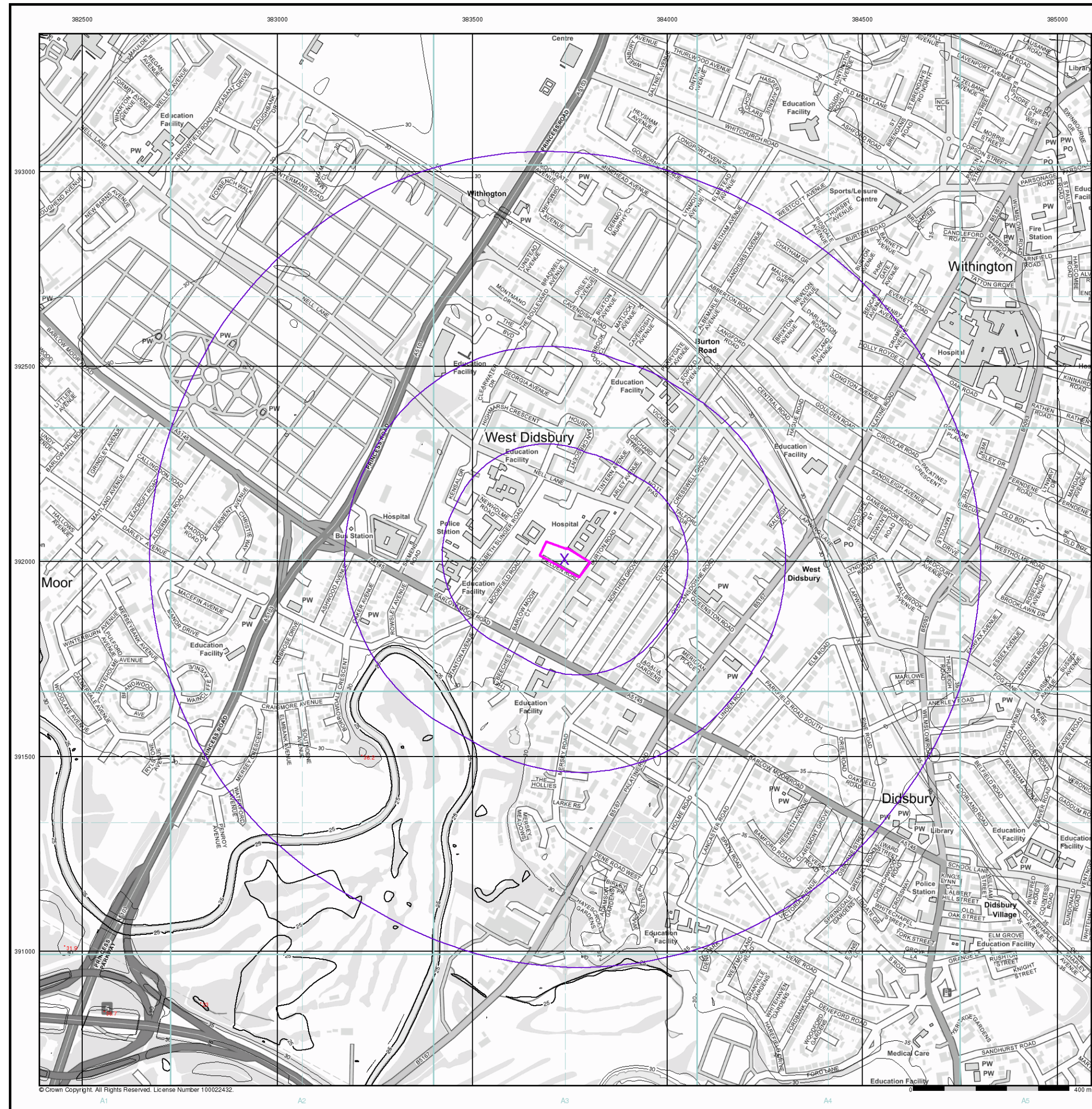
Order Number: 309147548_1_1
Customer Ref: 900 - Withington
National Grid Reference: 383740, 392010
Slice: A
Site Area (Ha): 0.57
Search Buffer (m): 1000

Site Details

Site at 383740, 392010

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EA/NRW Historic Flood Map (1:10,000)

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID

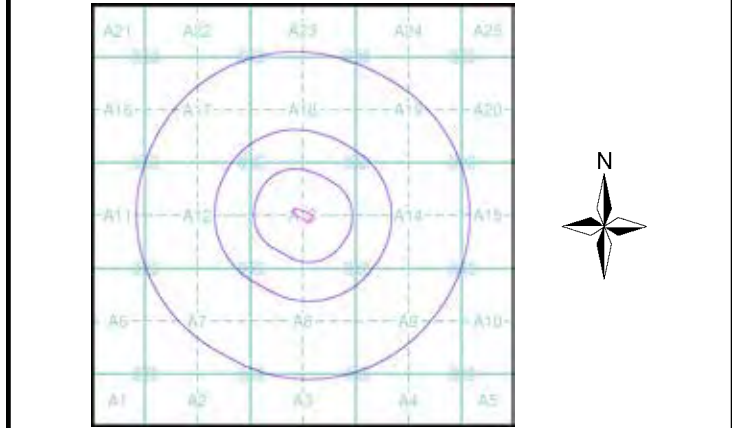
Historic Flood Events Data

- | | |
|--|---------------------------------------|
| Channel Capacity Exceeded (no raised defences) | Obstruction/Blockage - Culvert |
| Channel Capacity Exceeded / Surface Water | Obstruction/Blockage - Debris Screen |
| Groundwater/High Water Table | Operational Failure/Breach of Defence |
| Local Drainage/Surface Water | Other |
| Mechanical Failure | Overtopping of Defences |
| Obstruction/Blockage - Bridge | Surface Water |
| Obstruction/Blockage - Channel | Unknown |
| Historical Flood Liabilities | |

Contours (height in metres)

- Standard Contour 105
- Master Contour 100
- Spot Height 167.8
- MLW Mean Low Water
- MHW Mean High Water

EA/NRW Historic Flood Map - Slice A



Order Details

- Order Number: 309147548_1_1
- Customer Ref: 900 - Withington
- National Grid Reference: 383740, 392010
- Slice: A
- Site Area (Ha): 0.57
- Search Buffer (m): 1000

Site Details

Site at 383740, 392010