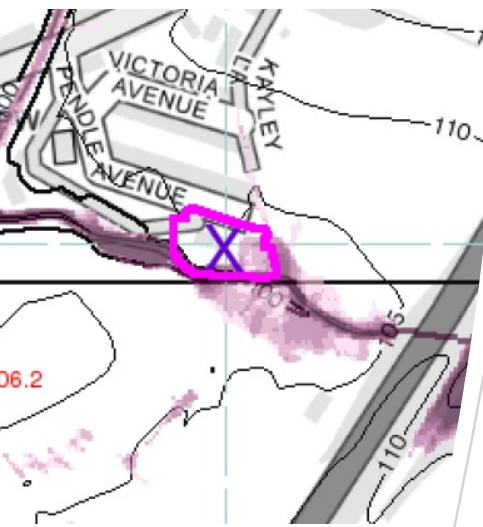


Earth Environmental & Geotechnical

Residential Development
Glencroft, Pendle Avenue,
Chatburn, Clitheroe,
Lancashire, BB7 4AX

Flood Risk Assessment

September 2019
Revision B



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Report Title:	Residential Development, Glencroft, Pendle Avenue, Chatburn, Clitheroe, Lancashire, BB7 4AX
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1. Introduction

Earth Environmental and Geotechnical Ltd have prepared a Flood Risk Assessment (FRA) for the conversion and extension of an existing dwelling and construction of a new dwelling at Glencroft, Pendle Avenue, Chatburn, Clitheroe, Lancashire, BB7 4AX.

The Environment Agency (EA), Lancashire County Council (LCC) and Ribble Valley Borough Council (RVBC) need to be satisfied that the granting of planning permission will address the risk of flooding to the residential development, and that the proposals will not in turn increase the risk of flooding to neighbouring land and property.

This Flood Risk Assessment (FRA) has been prepared to the national guidance and requirements set out in the National Planning Policy Framework, 2019 (NPPF), National Planning Practice Guidance (NPPG), which sets out the guidance for preparation of site specific FRA's and reducing flood risk in general by using Sustainable drainage systems (SuDS).

The FRA has also been prepared to the local guidance and requirements set out in the Ribble Valley Borough Council Strategic Flood Risk Assessment (May 2010); Ribble Valley Local Development Scheme (October 2017); Ribble Valley District Flood Report (February 2017); and Environment Agency Ribble Catchment Flood Management Plan (December 2009).

The report will look at a surface water management strategy for the proposed new development to establish constraints and design requirements and to promote the use of Sustainable Drainage Systems (SuDS) as per the requirements set out in Principles of Sustainable drainage systems (SuDS) set out by DEFRA (2011); Ciria SuDS Manual C753 (2015); Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015);

This flood risk assessment has therefore been prepared to identify and evaluate the various possible sources of flood risk to which the proposed 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 sustainable, and does not increase the probability of flooding within, or near the site.

2. Site Setting and Description

2.1. Site Location

The development site is in a residential / rural area of Chatburn; is located to the south east of the centre of Chatburn; and is bound by Pendle Avenue leading to residential buildings to the north; Kayley Lane leading onto agricultural fields to the west; garden areas to the east; and Heys Brook directly to the south.

The address of the site being Glencroft, Pendle Avenue, Chatburn, Clitheroe, Lancashire, BB7 4AX, and the co-ordinates of the centre of the site are: Easting: 377150, Northing: 444000.

2.2. Existing Site

As detailed on the topographical survey in Appendix A, the existing site consists of a single detached bungalow dwelling in the central / western area of the site, with a driveway and access from Pendle Avenue being from the north; gardens and part of the driveway being to the east; patio areas leading on to garden areas to the south; and further garden areas to the west.

2.3. Proposed Development

The proposed site is shown on the development plan in Appendix B, with a full description of the development being stated by the Architect.

In brief, and in relation to this flood risk assessment, the proposal is for refurbish the existing bungalow to create a porch extension; a single storey extension to the rear of the dwelling; a proposed extension above garage; and a proposed second floor extension creates a spacious bedroom suite, and for a new dwelling to be built to the east of the site, which will mirror the refurbished bungalow.

2.4. Topography

Also, as detailed on the topographical survey in Appendix A, the levels on the development site have a general fall from north to south, with the high point of the site being at the north west boundary at approximately 104.12m AOD, and the low-point being along the southern boundary (adjacent to Heys Brook) at approximate 97.75m AOD.

The levels along the northern boundary fall from west to east, with the levels ranging from 104.12m AOD to 102.46m AOD, and the levels along the southern boundary (along Heys Brook) fall from east to west, with levels ranging from 100.10m AOD to 96.57m AOD

2.5. Coast / Rivers / Canals / Artificial Waterbodies

As stated above, the nearest waterbody to the development site is Heys Brook located directly south of the site, along the southern Boundary. The nearest main river to the site is the River Ribble, which is located approximately 1km to the north west. There are no other known canals or artificial waterbodies near to the development site.

2.6. Drains and Sewers

The exact location of the water main or drains within the development site are to be confirmed. However, the topographical survey identifies drainage inspection chamber covers, and due to the existing building being residential it is also predicted that it is served by a water main.

2.7. Ground Conditions

On-site ground investigations to establish the ground strata are yet to take place. However, the ground conditions for the site can be determined via the British Geological Survey (BGS) website, where it identifies the site have superficial deposits of River Terrace Deposits (sands and gravels), over bedrock layer consisting of Chatburn Limestone Formation (limestone).

3. National Policy and Water Management Guidance

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

NPPF 2019 set 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 149 to 150 provide guidance for developments for the plans to take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk.

NPPF Paragraphs 155 to 165 provides 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 030, 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 the 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.

3.2. 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.

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 is 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 studied to establish which sources of flooding are at the site.

5.1. Environment Agency Flood Maps for Planning

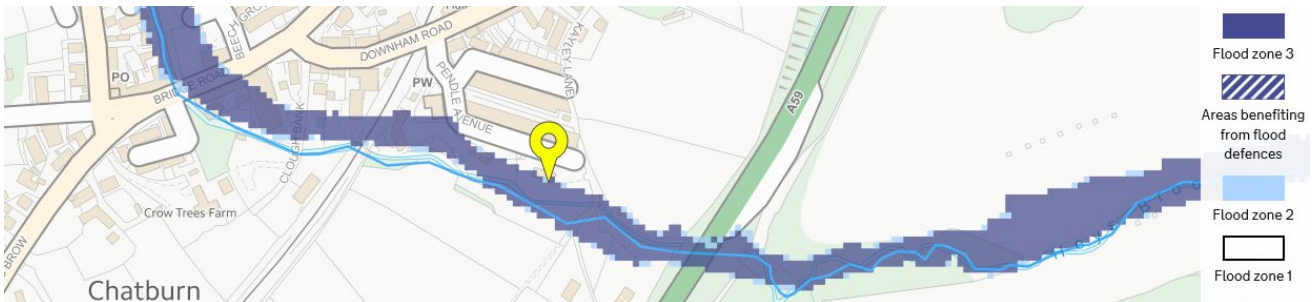


Figure 1 – EA Flood Zone Map

The Environment Agency (EA) fluvial flood map shown in Figure 1, indicates that the southern (lower) half of the development site is in Flood Zone 3, which is deemed to be a high probability of flooding, with the northern half and most of the existing dwelling being in Flood Zone 1, which is deemed to be a low probability of flooding.

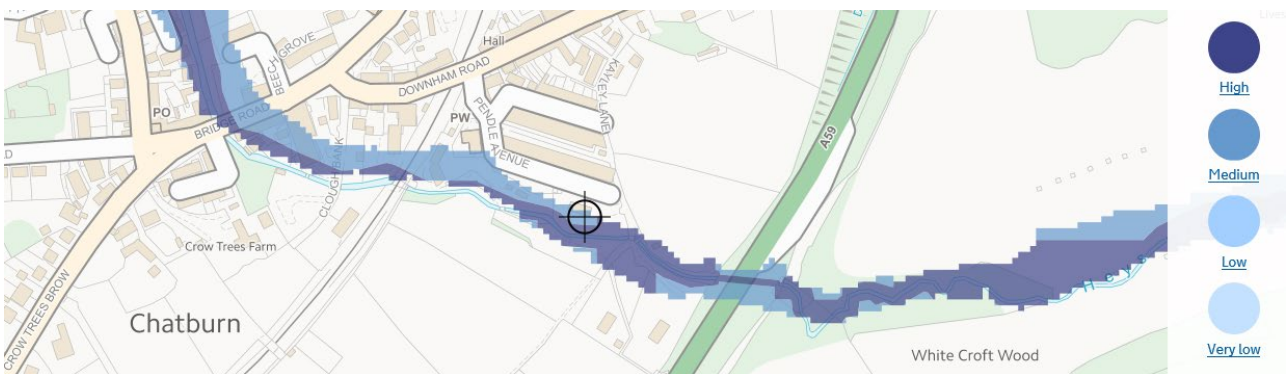


Figure 2 – EA Fluvial Flood Map

The EA fluvial flood map shown in Figure 2, indicates that the southern areas of the site (garden areas) have a high probability of fluvial flooding; the central areas including the southern edge of the existing dwelling have a medium probability of fluvial flooding; and the areas to the north, including most of the existing dwelling; having a better than very low probability of fluvial flooding.



Figure 3 – EA Pluvial Flood Map

The EA pluvial flood map shown in Figure 3, indicates that all the western areas of the site, including the existing dwelling have a very low probability of pluvial flooding, with the remaining eastern areas having a low probability of pluvial flooding.

5.2. Landmark Envirocheck Data Maps

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

Flood Data Map

The EA/NRW flood data map, also indicates that the southern (lower) half of the development site is in Flood Zone 3, which is deemed to be a high probability of flooding, with the northern half and most of the existing dwelling being in Flood Zone 1, which is deemed to be a low probability of flooding.

Pluvial, Fluvial and Coastal Flooding

The Envirocheck (JBA) 75-year return period flood map indicates that in an undefended scenario, there is no pluvial, fluvial or coastal flooding within the development site.

The Envirocheck (JBA) 100-year return period flood map indicates that in an undefended scenario, there is no fluvial or coastal flooding within the development site.

The Envirocheck (JBA) 200-year return period flood map indicates that in an undefended scenario, there is no pluvial, fluvial or coastal flooding within the development site.

The Envirocheck (JBA) 1000-year return period flood map indicates that in an undefended scenario, there is no pluvial, fluvial or coastal flooding within most of the development site, with a small area of fluvial flooding to the south east (low-point) of the site, at an approximate depth between 0.3m to 1.0m.

Surface Water (Pluvial) Flood Depths

The Envirocheck (EA/NRW) 30-year return period flood map indicates that there are no surface water / rainfall flood depths within the development site.

The Envirocheck (EA/NRW) 100-year return period flood map indicates that there are no surface water / rainfall flood depths within the development site.

The Envirocheck (EA/NRW) 1000-year return period flood map indicates that there are no surface water / rainfall flood depths to the western areas of the development site, with surface water / rainfall flood depths between 0.15m to 0.30m at the western areas of the development.

Canal Failure

The Envirocheck (JBA) canal failure map indicates that the development site is not within the canal coverage area, but is not in the canal failure area.

Ground Water Flooding

The Envirocheck / BGS flood data map indicates that there is limited risk of groundwater flooding the development site, and the ESI groundwater flood map indicates that there is a negligible risk of groundwater flooding at the development site area.

Historic Flood Map

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

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 (Sea and River) - *Probability: High (southern areas) to Low (northern areas)*

The source of the fluvial flooding appears to be from Heys Brook that flows along the southern boundary of the site. The assessed flood maps indicate that the southern (lower) half of the development site is in Flood Zone 3, which is deemed to be a high probability of flooding, with the northern half and most of the existing dwelling being in Flood Zone 1, which is deemed to be a low probability of flooding.

The proposed extension to the south of the existing dwelling will be in Flood Zone 3 (high probability of flooding), and the extension to the north of the existing building will be in Flood Zone 1 (low probability of flooding).

It is proposed to build the new dwelling along the same line as the existing dwelling. Therefore, parts of the southern areas of the new dwelling will be in Flood Zone 3 (high probability of flooding), with the remaining areas of the proposed dwelling to be in Flood Zone 1 (low probability of flooding).

As parts of the extended existing and proposed dwellings will be in Flood Zone 3, suitable flood mitigation, resistance and resilience measures are required.

6.2. Pluvial Flooding - *Probability: Low*

The studied flood map indicates that there is no surface water / pluvial flooding at any area of the development site up to and including the 200-year return period, with the lower eastern areas having a pluvial flooding of depths between 0.15m to 0.30m during the 1000-year return period.

As flooding at the eastern areas of the development only occurs during the 1000-year return period, the probability of pluvial flooding at the development site is deemed to be low. This concurs with the EA flood map as detailed in Figure 3. However, suitable flood mitigation, resistance and resilience measures are required, to ensure no pluvial occurs at the new dwelling.

6.3. Ground Water Flooding - *Probability: Low*

The Envirocheck / BGS flood data map indicates that there is limited risk of groundwater flooding the development site, and the ESI groundwater flood map indicates that there is a negligible risk of groundwater flooding at the development site area. Therefore, based on this data, the probability of ground water flooding is deemed to be low.

6.4. Flooding from Drains and Sewers - *Probability: Low*

The exact location of the water main or drains within the development site are to be confirmed. However, the topographical survey identifies drainage inspection chamber covers, and due to the existing building being residential it is also predicted that it is served by a water main. There has also been no history of flooding from any drains or sewers, and if flooding were to occur it would flow to the south of the site (away from the buildings), and in to Heys Brook. Therefore, based on this, the probability of flooding from drains and sewers is deemed to be low.

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

There are no known canals, reservoirs or other artificial sources nearest the to the development site, with the development not being in the flood coverage area. Therefore, the flood probability from canals, reservoirs or other artificial sources is deemed to be low.

7. Flood Risk and Vulnerability

The NPPG Paragraphs 065 to 067 sets out the flood risk for a site by assessing the flood zones, flood risk vulnerability classification, and flood risk vulnerability and flood zone 'compatibility'.

7.1. Flood Zones

There are four classifications for flood zones, as defined in Table 1 of the NPPF and NPPG document.

Table 1 – Flood Zones	
Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water should flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

The EA flood map data has identified that the southern areas, the southern sections of the extended existing dwelling, and the southern section of the proposed dwelling will be in Flood Zone 3.

7.2. Flood Risk Vulnerability Classification

NPPG Paragraph 066, Table 2 stated the flood risk vulnerability classifications as:

Table 2 - Flood Risk Vulnerability Classification
<p>Essential Infrastructure</p> <p>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.</p>
<p>Highly Vulnerable</p> <p>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.</p>
<p>More Vulnerable</p> <p>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.</p>
<p>Less Vulnerable</p> <p>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.</p>
<p>Water-Compatible Development</p> <p>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.</p>

The development is classed as a 'More Vulnerable' as the development is to have buildings used for dwelling houses.

7.3. Flood Risk Vulnerability and Flood Zone ‘Compatibility’

NPPG Paragraph 067 Table 3, gives guidance on flood risk vulnerability compared with flood zone, to determine the compatibility.

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

In accordance with Table 3 of the NPPF, if parts of the proposed development are in Flood Zone 3, and the development is classed as ‘More Vulnerable’, an exception test will be required.

8. The Sequential Test and Exception Test

8.1. Sequential and Exception Test Guidance

Paragraph 101 of the NPPG states that: The aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding. A sequential approach should be used in areas known to be at risk from any form of flooding.

Paragraph 102 of the NPPG states that: If, following application of the Sequential Test, it is not possible, consistent with wider sustainability objectives, for the development to be located in zones with a lower probability of flooding, the Exception Test can be applied if appropriate. For the Exception Test to be passed:

- *it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a Strategic Flood Risk Assessment where one has been prepared; and*
- *a site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.*

8.2. Exception Test

As stated above, for the Exception Test to be passed, it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a Strategic Flood Risk Assessment where one has been prepared; and a site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

8.3. Sustainable Benefits

It is well documented that there is a housing shortage across the UK, and therefore all available developments should be considered to meet the housing needs. The developer currently owns the existing dwelling to be extended, and the associated land for the new dwelling. Therefore, cannot relocate the new dwellings another site.

The development will add to the sustainable benefit to the community, where the local tradesman will at the site for the build. The site is near to a residential area, and therefore already has the suitable infrastructure; transport and services in place for the existing residential building.

8.4. Safe Development

For the development to be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall. There are several design principles for any development at the site which include:

- Analysis of finished floor levels of proposed dwellings to ensure analyses the effect of the flood depths;
- Safe and access and egress from each of the new dwellings, where footpaths and roads are to be above the 0.1% AEP level;
- Effective flood warning systems for each dwelling, with appropriate flood evacuation plans;
- Sustainable surface water drainage methods to ensure the surface water run-off rates and volumes from the development are reduced to not increase flood risk elsewhere.

Each of the design principles to be applied for any development at the site are detailed below, and will demonstrate that the site will pass the exception test.

8.5. Finished Floor Level Analysis

The topographical survey shows that the development site falls from north to south, and from east to west. The fluvial flood water rises from Heys Brook within the site to a peak / 0.1% annual event probability (AEP) flood level that is to the edge the existing dwelling, and to the levels along the same line to the east.

The topographical survey identifies the finished floor level of the existing dwelling to be 103.41m AOD, and the external levels to be between a high point of 103.41m AOD along the northern face, and a low point of 103.04m AOD along the southern face. The levels at the flood extent to the east of the site are shown to be between 102.30m AOD to 102.46m AOD.

Therefore, by comparing the flood map data and the levels of the topographical survey existing dwelling, it is anticipated that the peak 0.1% AEP flood level at the site is 103.04m AOD to the west and 102.46m AOD to the east of the site.

The finished floor level for the extended areas are to be the same as the existing dwelling finished floor level of **103.41m AOD**. This will ensure that the extended areas will be higher than the 0.1% AEP flood level.

With regards to the finished floor level of the new dwelling, the NPPF states that to reduce the probability of flooding, the finished floor levels of the new dwellings should be a minimum of whichever is higher of:

- 300millimetres (mm) above the general ground level of the site;
- 600mm above the estimated 1% AEP river or sea flood level.

The estimated 1% AEP levels are not known, and therefore it is recommended that the finished floor level is 300mm above the assessed 0.1% flood level of 102.46m AOD to the west of the site. This subsequently equates to the new dwelling having a minimum finished floor level of **102.760m AOD**.

8.6. Safe Access and Egress

Safe access and egress it to be made to the proposed residential units during the extreme AEP's. The studied flood data identifies that the northern driveway areas and Pendle Avenue are in Flood Zone 1. Therefore, safe access and egress can be gained via Pendle Avenue, the proposed driveways and to the front of the dwellings.

8.7. Flood Flows / Water Displacement

The extended area of the existing dwelling and the new dwelling will affect the fluvial flood flow and potential displace the surface water to other areas outside the development boundary.

Therefore, it is proposed to have suitable fluvial flood compensation for the equivalent areas and volume of the flood areas lost due to the development. This can be achieved to the west (sides of each of the developments), where the ground is higher than the 0.1% flood level, and will be excavated to the existing level which will be raised.

For the existing dwelling, the levels will be reduced to the west of the building to a level of 103.04m AOD across the same area of the extension, and for the new development, the levels will be reduced to 102.30m AOD, along the west of building across the same area as the southern section of the new building.

8.8. Flood Resilience and Flood Resistance

NPPF Guidance, Paragraph 059 states:

'Flood resilient: Flood-resilient buildings are designed and constructed to reduce the impact of flood water entering the building so that no permanent damage is caused, structural integrity is maintained and drying, and cleaning is easier. The Department for Communities and Local Government has published Improving the Flood Performance of New Buildings: flood resilient construction (2007). This provides guidance on how to improve the resilience of new properties in low or residual flood risk areas using suitable materials and construction details.'

Flood resistance: Flood-resistant construction can prevent entry of water or minimise the amount that may enter a building where there is short duration flooding outside with water depths of 0.6 metres or less. This form of construction should be used with caution and accompanied by resilience measures, as effective flood exclusion may depend on occupiers ensuring some elements, such as barriers to doorways, are put in place and maintained in a good state'.

Based on the NPPF guidance, and to ensure the safety of the dwelling users, the following flood resistance and reliance measures are to be incorporated into the new development design:

- use of flood gates to external openings at ground floor (as Figure 5 below);
- to have the external walls to be tanked to prevent the ingress of water;
- to ensure all ground floor walls to be finished in plasterboard laid horizontally, so in the event of a flood only the bottom section needs to be removed;
- to have all cable to run down the wall from first floor level;
- to have all service meters to be at high level; to have all service entry points to be sealed with bitumen;
- and to fit all kitchen units on upvc adjustable legs;



Figure 5 – Proposed Flood Gate at New Door Opening

8.9. Flood Warning and Evacuation Plan

it is advised that the owners / tenant sign up to, and aware of various flood warnings so that they can take appropriate action (such as installing flood barriers), and ensure safe egress from the dwelling, in the unlikely event of flooding of the proposed dwelling. There are several flood warnings codes which are:

ONLINE FLOOD RISK FORECAST

Meaning

Be aware.
Keep an eye on the weather situation.

General advice

- Check weather conditions.
- Check for updated flood forecasts on the Environment Agency website.



FLOOD ALERT

Meaning

Flooding is possible
Be prepared.

General advice

- Be prepared to act on your flood plan.
- Prepare a flood kit of essential items.
- Monitor local water levels and the flood forecast on our website.



FLOOD WARNING

Meaning

Flooding is expected.
Immediate action required.

General advice

- Move family, pets and valuables to a safe place.
- Turn off gas, electricity and water supplies if safe to do so.
- Put flood protection equipment in place.



SEVERE FLOOD WARNING

Meaning

Severe flooding.
Danger to life.

General advice

- Stay in a safe place with a means of escape.
- Be ready should you need to evacuate.
- Co-operate with the emergency services.
- Call 999 if you are in immediate danger.

WARNING NO LONGER IN FORCE

Meaning

No further flooding is currently expected in your area.

General advice

- Be careful. Flood water may still be around for several days.
- If you've been flooded, ring your insurance company as soon as possible.

The owners / occupants of the dwelling are to sign up to the EA and local authority flood warning system, where they can be alerted to any of the above warning codes by either phone; fax; mobile; or email. There is also to be a flood plan in the event of the coastal defence breach, for the owners / occupants of the residential units to take appropriate actions for any of the flood warning codes detailed above.

A flood plan is to be put together prior to the occupation of the dwelling, and given to the new owners / occupants as part of the property deeds / information. Details of how the flood plan is to be put together is stated in the 'EA Personal Flood Plan' (Appendix D).

Based on the EA guidance, the evacuation plan could be for the owners / occupants to evacuate the dwelling to the north of the building, to the driveways and Pendle Avenue which are in Flood Zone 1.

8.10. Surface Water Management Principles

The surface water for the new development is to be managed so that it adheres to the current regulations, and local authority requirements, where the principles of the surface water management will be as follows:

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.

The Management Train

A concept fundamental to implementing a successful SuDS scheme is the management train. This is a sequence of SuDS components that serve to reduce run-off rates and volumes and reduce pollution. The hierarchy of techniques that are to be used for the surface water management of the development are:

- Prevention - Prevention of run-off by good site design and reduction of impermeable areas;
- Source Control - Dealing with water where and when it falls (e.g. infiltration techniques);
- Site Control - Management of water in the local area (e.g. swales, detention basins);
- Regional Control - Management of run-off from sites (e.g. balancing ponds, wetlands).

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

The peak surface water flow from the post development site is not to exceed the pre-development rate. The post development surface water is to be restricted to the equivalent pre-development rates, as a minimum, with the aim to restrict to the equivalent greenfield run-off rates, with the consideration of future climate change as a minimum.

Flood Risk

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

Climate Change

The NPPF makes it a planning requirement to account for climate change in the proposed design. The recommended allowances are taken from the Environment Agency guidance (Table 2) summarised in Table 4 below.

Applies across all of England	Total change anticipated for the 2020's	Total change anticipated for the 2050's	Total change anticipated for the 2080's
Upper End	10%	20%	40%
Central	5%	10%	20%

The baseline year is 1961 to 1990. It is anticipated the life span of the proposed buildings will be approximately 80 years, and therefore will fall at least into the 2080's and will have rainfall intensity increase of 40%.

This increase in rainfall is to be taken into consideration for the surface water management of the proposed development, to ensure that the probability of flooding remains low.

9. Residual Risk

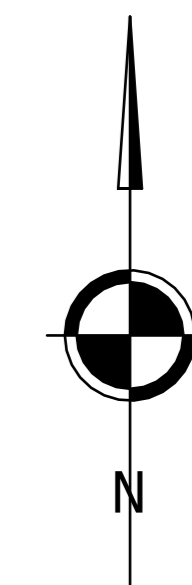
It is difficult to completely guard against flooding since extreme events greater than the design standard event are always possible, however, there are practicable ways to minimise the risk such as by allowing a freeboard (safety margin) and by using suitable construction and management techniques.

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.

Earth Environmental and Geotechnical 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 property 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.

Appendix A - Topographical Survey

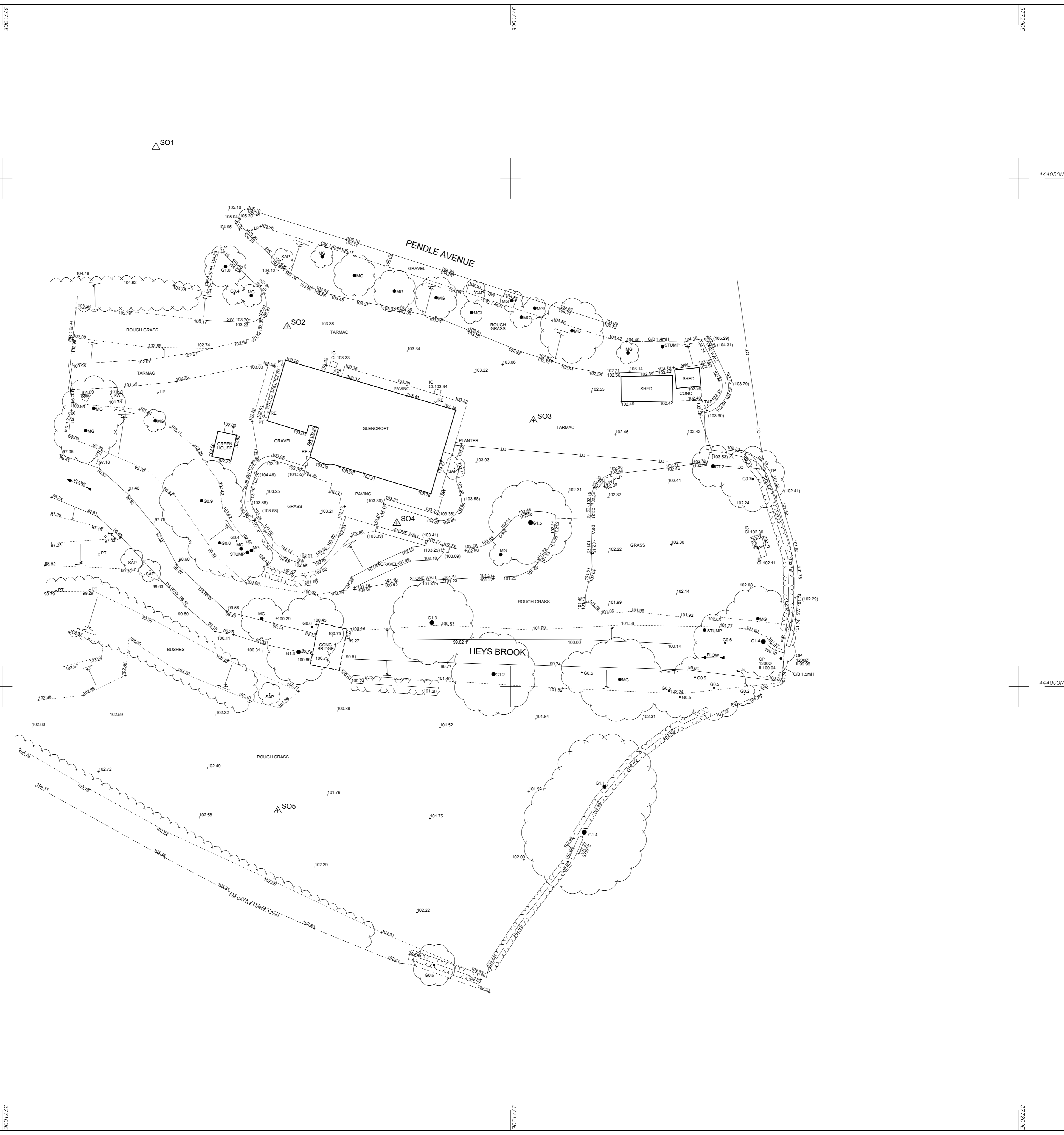


Note:
 The survey is plotted on a plane local Grid. Orientation to National Grid.
 All levels relate to Ordnance Datum, achieved using the OS National GPS Network.
 Survey Control Markers established for Mapping purposes only and should not be used for Construction without the written approval of Survey Operations Ltd.
 Levels in parenthesis indicate top of walls.

SURVEY STATIONS			
None	Easting	Northing	Height
SO1	377115.13	444053.07	105.23
SO2	377128.03	444035.39	103.59
SO3	377152.25	444026.15	102.74
SO4	377138.81	444016.08	103.54
SO5	377127.10	443987.78	102.21

STANDARD REFERENCE & ABBREVIATIONS

- (AR).....Assumed Route
- AB.....Air Brick
- AV.....Air Valve
- BW.....Barbed Wire
- SAR.....Barrier
- BB.....Bellish Beacon
- BN.....Borehole
- BL.....Bed Level
- BDL.....Billiard
- BS.....Bus Stop
- BT.....British Telecom Box
- BTW.....British Telecom IC
- BRTW.....Brick Retaining Wall
- BW.....Brick Wall
- C/B.....Close Boarded
- C/I.....Corrugated Iron
- C/P.....Chestnut Paving
- CB.....Control Box
- CBW.....Concrete Block Wall
- CCW.....Closed Circuit TV
- CD.....Cable Duct
- CEL.....Cellar Light
- CHL.....Chain Link
- CHM.....Chimney
- CL.....Cover Level
- CM.....Cable Marker
- COL.....Column
- CONC.....Concrete
- CP.....Catch Pit
- CRW.....Concrete Retaining Wall
- CTV.....Cable Television
- CUL.....Culvert
- CK.....Concrete Block Wall
- DC.....Drainage Channel
- DPC.....Damp Proof Course
- DR.....Drain
- DSW.....Dry Stone Wall
- EEP.....Electricity Cable Pit
- EIC.....Electricity Inspection Cover
- EJ.....Expansion Joint
- EJB.....Electricity Junction Box
- ELB.....Electricity Sub Station
- EL.....Eave Level
- ELB.....Electricity Box
- EP.....Electricity Pole
- ER.....Earth Rod
- ETL.....Electricity Transmission Line
- FB.....Flower Bed
- FR.....Fire Hydrant
- FL.....Floor Level
- FP.....Flagpole
- G.....Gravel
- GAB.....Gibson
- GIP.....Gas Inlet Pipe
- GMR.....Gas Marker
- GST.....Gas Stop Tap (domestic)
- GSS.....Gas Stop Valve (Mains)
- HSE.....Housing
- HT.....Height
- HV.....High Voltage
- IR.....Iron Railing
- IC.....Inspection Cover
- IL.....Invert Level
- IP.....Inlet Pipe
- KS.....Kern Socket
- LS.....Letter Box
- LP.....Lamp Post
- MS.....Multi-Girth
- MH.....Manhole
- MK.....Marker
- MP.....Mooring Point
- NP.....Narrow Name Plate
- O/W.....Overhead
- O/P.....Open Paving
- OE.....Overhead Electric Wire
- OP.....Outfall Pipe
- OSM.....Ordnance Survey Bench Mark
- OT.....Overhead Telecom Wire
- P/C.....Post & Chain
- P/B.....Post & Rail
- P/W.....Post & Wire
- P/W.....Paving
- P/B.....Pillar Box
- PC.....Pedestrian Crossing
- PP.....Petrol Pump
- PT.....Post or Pillar
- RE.....Roding Eye
- RS.....Rear Sign
- R/W.....Retaining Wall
- RWP.....Rain Water Pipe
- SAP.....Sgpling
- SL.....Sump Level
- SOL.....Soffit Level
- SP.....Sign Post
- SPL.....Springing Level
- SRW.....Stone Retaining Wall
- SV.....Stop Valve (uncompressed)
- SVP.....Soil Vent Pipe
- SW.....Stone Wall
- TAC.....Tactile Paving
- TB.....Traffic Bollard
- TW.....Temporary Bench Mark
- TCP.....Telephone Call Box
- TFR.....Tree From Boundary
- TIE.....Anchor Point (Masts/Poles)
- TS.....Tree Screen
- U/C.....Under Construction
- U/S.....Underground
- UTL.....Unable to Lift (M, IC etc)
- UTS.....Unable to Survey
- VDP.....Vehicle Detector Pad
- VP.....Vent Pipe
- W/W.....Water Wash
- WL.....Water Level
- WM.....Water Meter
- WO.....Wash Out
- WP.....Waste Pipe
- WST.....Water Stop Tap (domestic)
- WSV.....Water Stop Valve (mains)



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 Tel: 01695 725662 Fax: 01695 51816
 Email: mail@survops.co.uk - www.survops.co.uk

Client
 Studio SDA

Drawing Title
 Topographical Survey of Land at:
 Glencroft, Pendle Avenue, Chatburn,
 Clitheroe, Lancashire, BB7 4AX

Scale(s)	1:200	Surveyor	PA
Date	June 19	Drawn	DIF
Job Number	19E234	Checked	MG

Sheet Size & Drg Number & Revision
A1 19E234/001

Appendix B - Proposed Site Plan



Deviating from these drawings without consultation and/or agreement with the employer is unacceptable. This drawing is indicative and exact dimensions should be checked and confirmed on site by the nominated contractor or competent person's prior to commencement of building works. All drawings and dimensions shall be verified by the relevant contractor on site prior to commencement of any works, ordering of materials or setting out. Any discrepancies should be reported in writing to SDA Architecture Ltd.

Do not scale from this drawing unless trained to use a scale ruler - only work from written and checked dimensions. This drawing is the property of SDA Architecture Ltd and copyright reserved by them. This drawing is not to be used, copied or disclosed by or to any unauthorised persons without prior written authorisation consent from SDA Architecture Ltd.

DO NOT PROCEED WITH WORKS IN THE EVENT OF A DRAWING DISCREPANCY

For all structural aspects please refer to Structural Engineers project information and cross reference all drawings, details and calculations with the architectural drawing prior to commencement of building works.

SDA Architecture Ltd is a trading name of Style Design and Architecture Ltd and holds no responsibility or liability for any works carried out on site.

DO NOT SCALE ONLY USE DIMENSIONS SHOWN

Project Information:

Client: Chatham Developments Ltd - Paul MacMahon
 Project Title: Extension & Alteration of Existing Dwelling and Erection of One New Dwelling
 Project Address: Glencroft, Pendle Avenue, Chatham, Clitheroe, Lancashire, BB7 4AX
 Project Stage: Planning Permission
 Date of Drawing: 23/07/2019

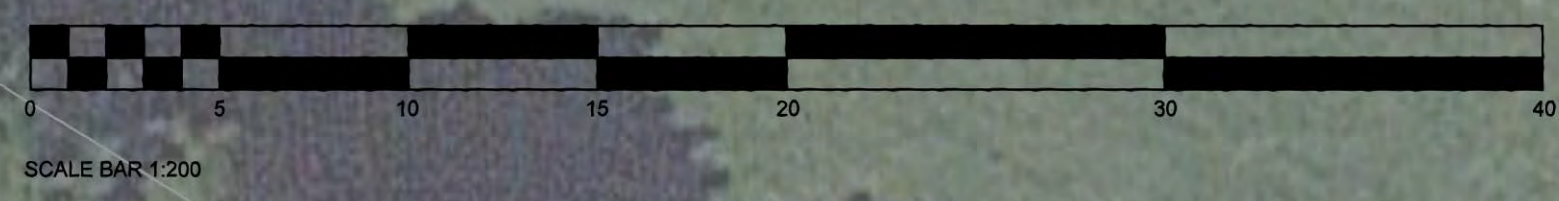
Drawn By: JP
 Checked By: SLP
 Drawing Sheet Size: A1 (841 x 594)
 Drawing Scale: As indicated on drawing
 Site Area Hectare:
 Extension Area CIL (m²): -

Site Plan, as Proposed

Project Number:	Drawing Number:	Revision:
0344	(S)2-02-PP	-

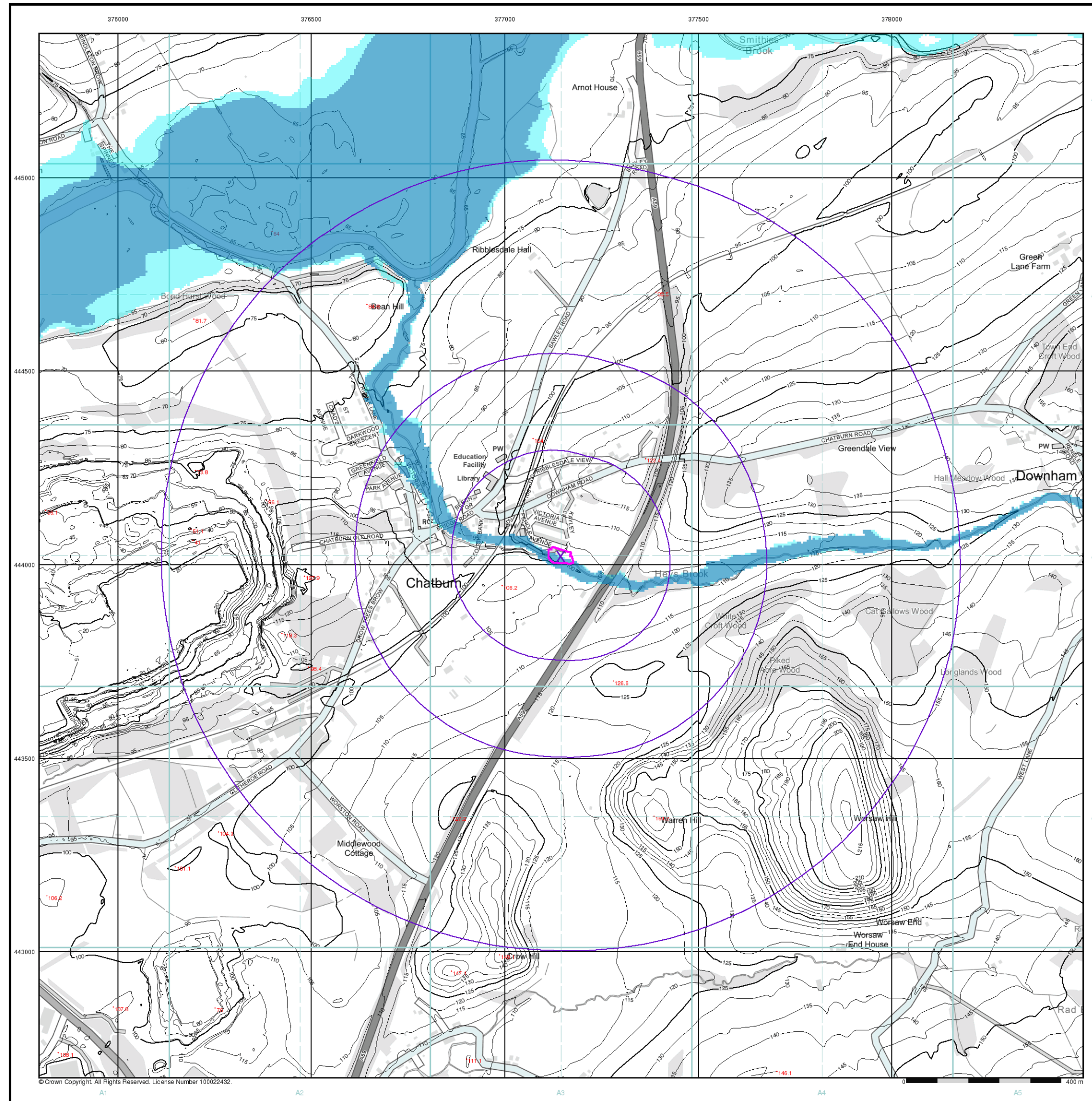
Drawing Registry

Rev.	Date	Description	Author



Head Office: Reddy House, 20 Queens Road, Clitheroe, Lancashire, PR7 1JZ
 Tel: 01207 441 111, Fax: 01207 441 112, Email: info@studiosda.co.uk, www.studiosda.co.uk
 Company Registration: 05196771, VAT Registration: 143 0817 03
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Appendix C - Landmark Envirocheck Flood Map Data



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EANRW Flood Data Map (1:10,000)

General

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

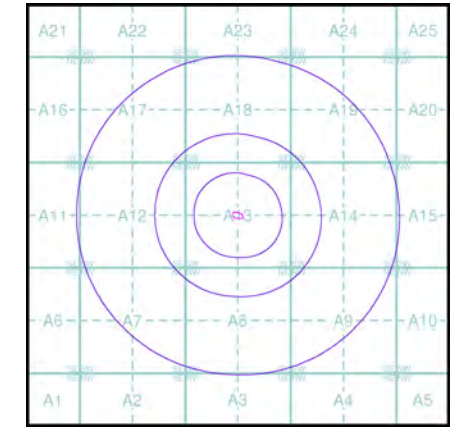
Flood Data

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

EANRW Flood Data Map - Slice A



Order Details

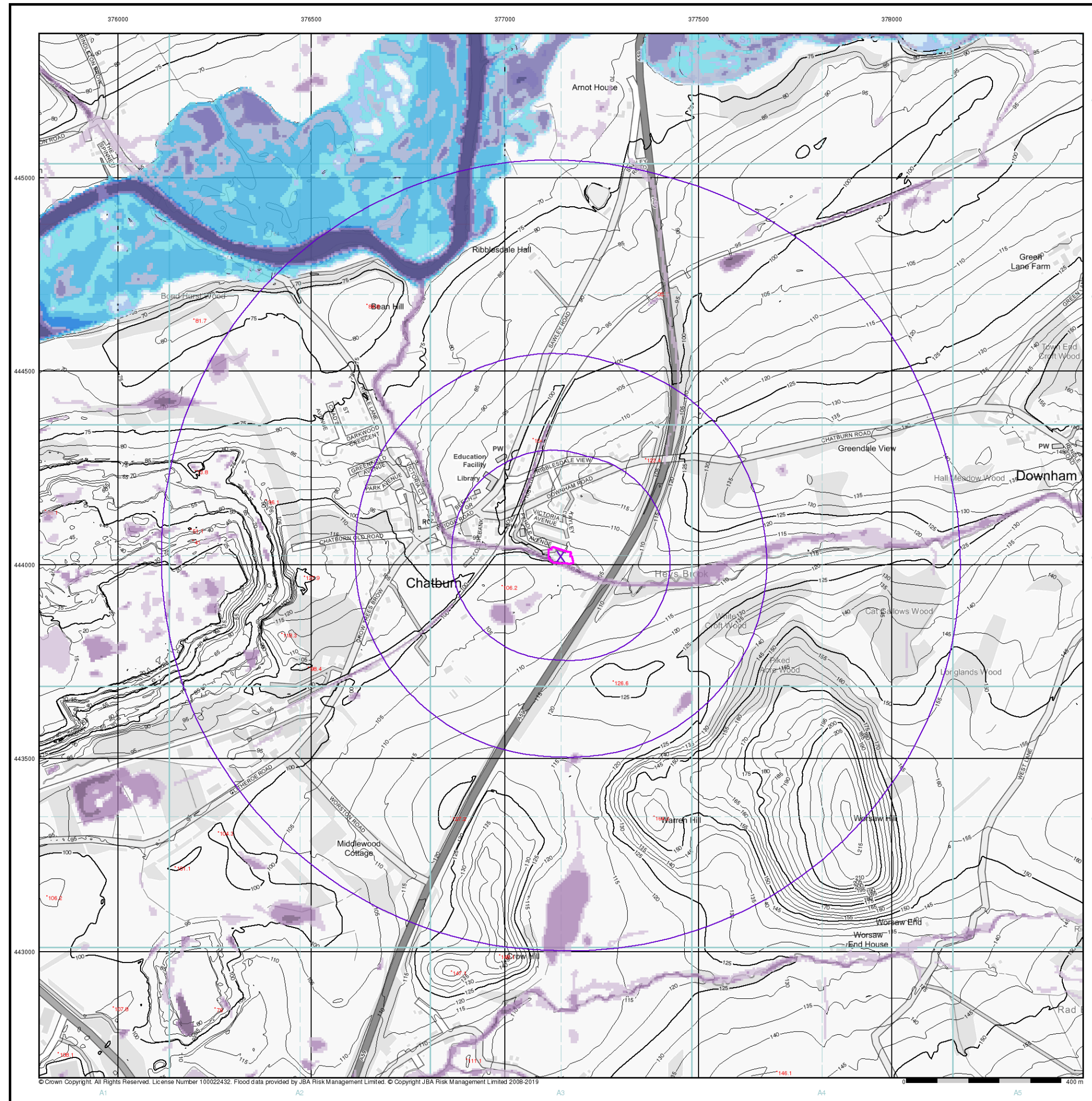
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 National Grid Reference: 377140, 444020
 Slice: A
 Site Area (Ha): 0.21
 Search Buffer (m): 1000

Site Details

Glencroft, Pendle Avenue, Chatburn, CLITHEROE, BB7 4AX

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 INFORMATION GROUP

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 Fax: 0844 844 9951
 Web: www.envirocheck.co.uk



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LANDMARK INFORMATION GROUP®

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

General

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

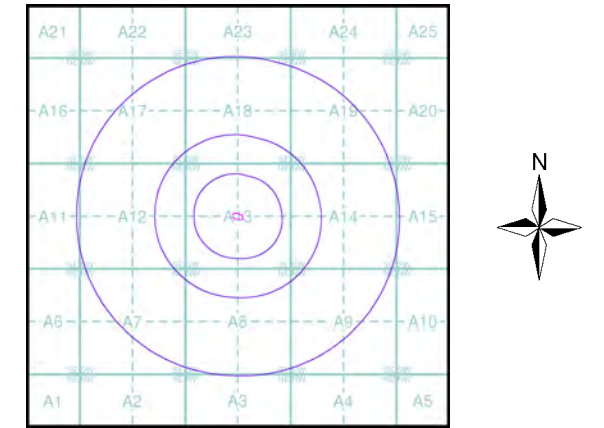
Modelled Flood Depth

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

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



Order Details

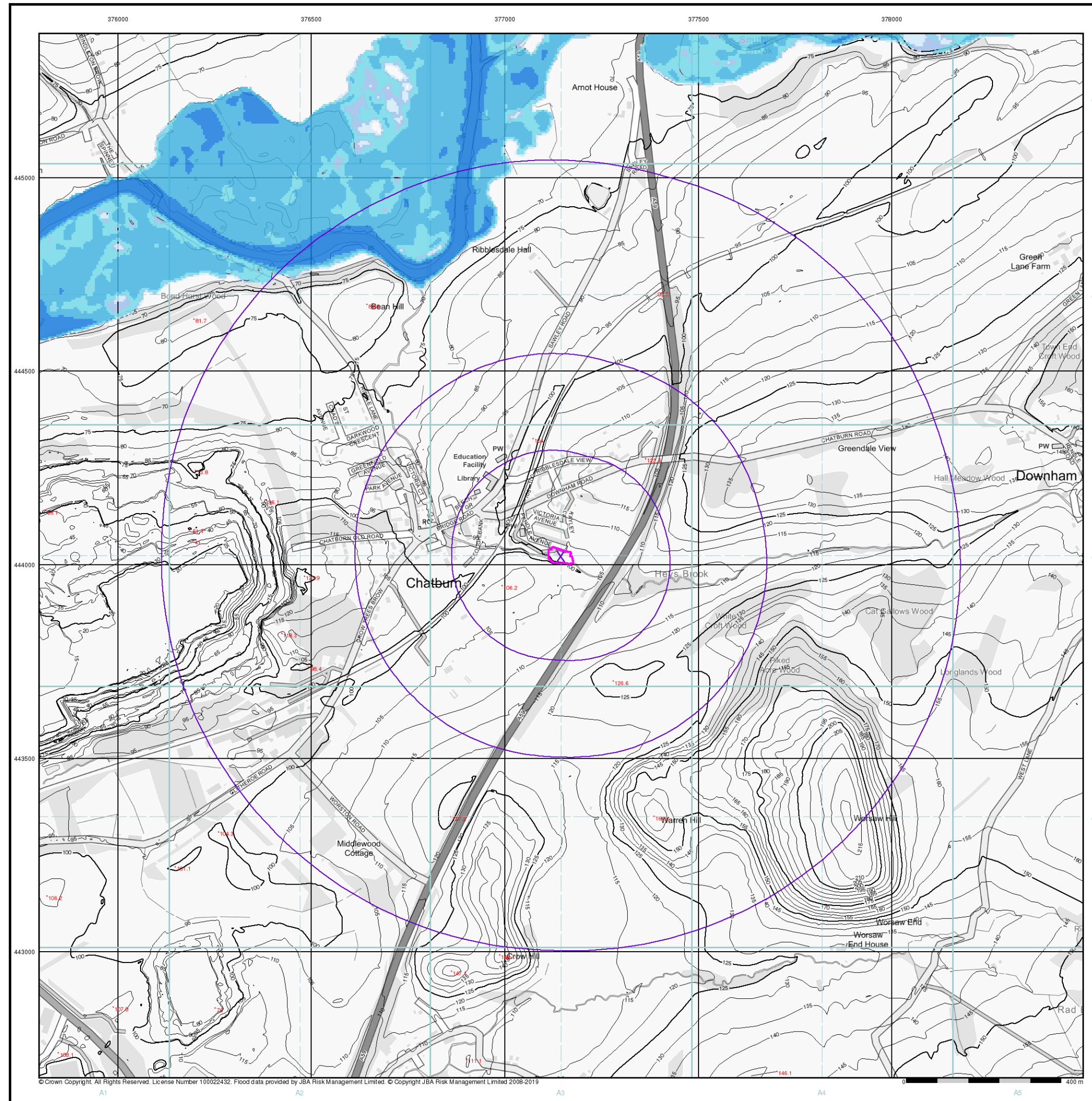
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 Customer Ref: 517 - Glencroft, Chatburn
 National Grid Reference: 377140, 444020
 Slice: A
 Site Area (Ha): 0.21
 Search Buffer (m): 1000

Site Details

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

General

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

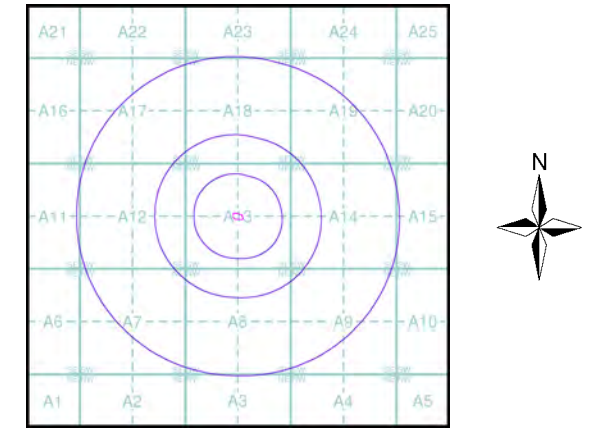
Modelled Flood Depth

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 — MLW — Mean Low Water
- Master Contour 100 95 — MHW — Mean High Water
- Spot Height *167.8

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



Order Details

Order Number: 215758123_1_1
 Customer Ref: 517 - Glencroft, Chatburn
 National Grid Reference: 377140, 444020
 Slice: A
 Site Area (Ha): 0.21
 Search Buffer (m): 1000

Site Details

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

General

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

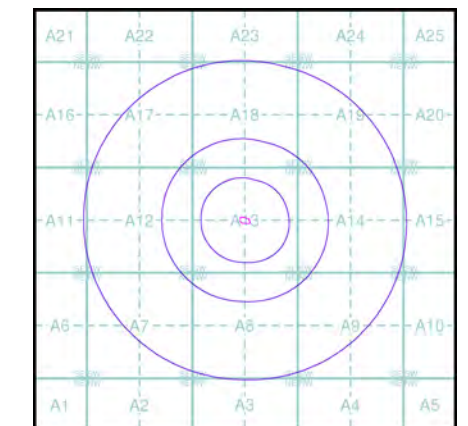
Modelled Flood Depth

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
- Mean Low Water
- Mean High Water

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

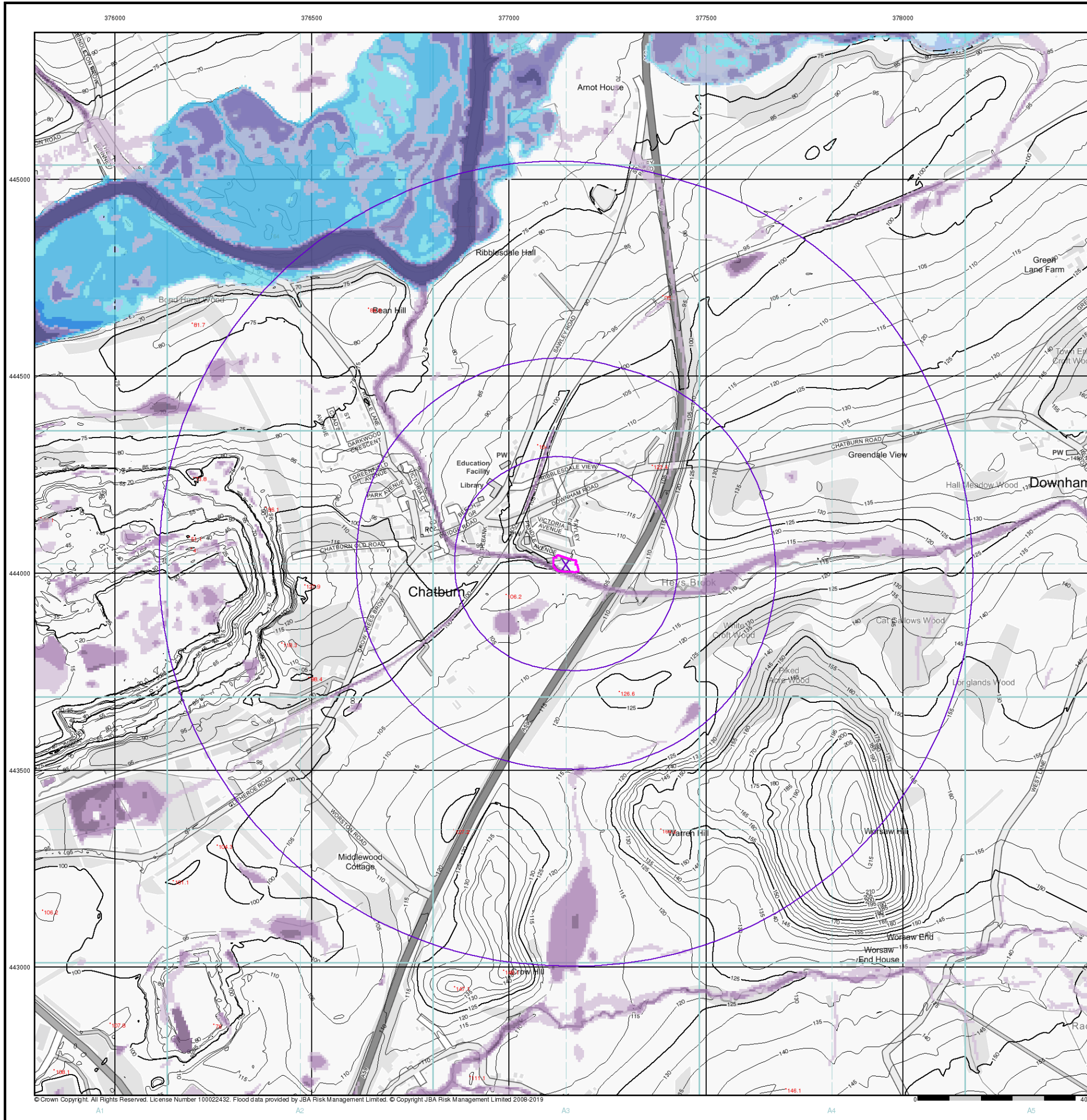


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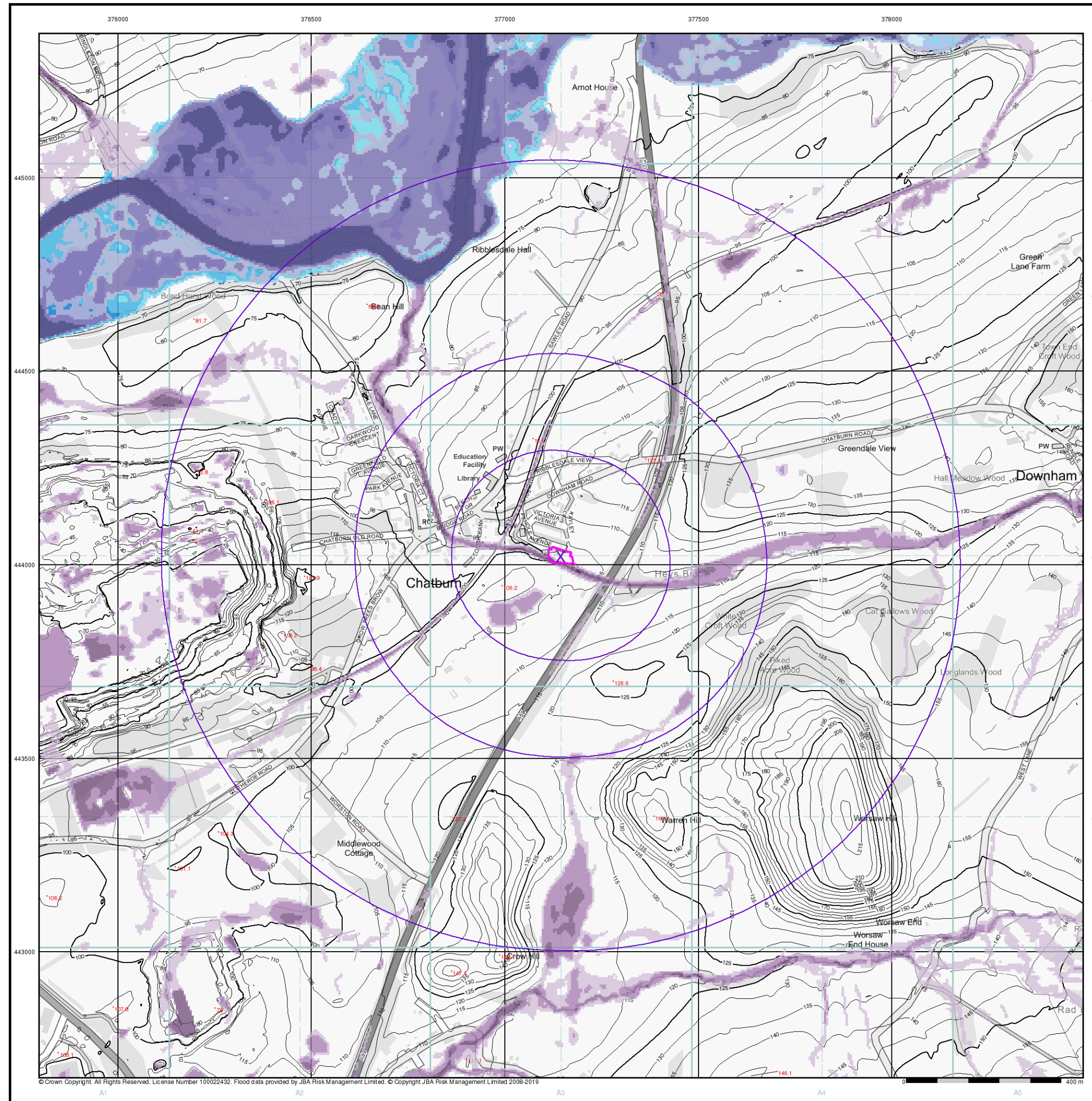
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 Slice: A
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 Search Buffer (m): 1000

Site Details

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

General

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

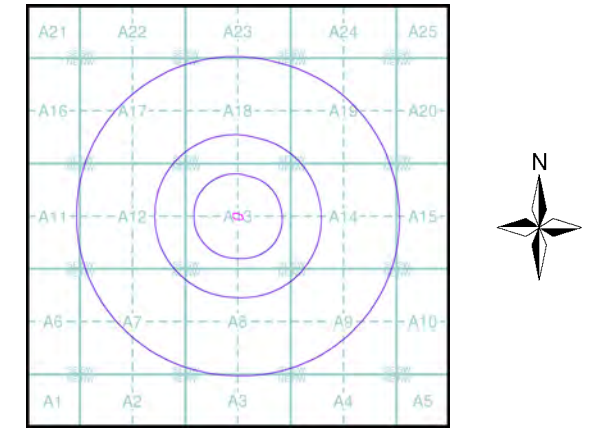
Modelled Flood Depth

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

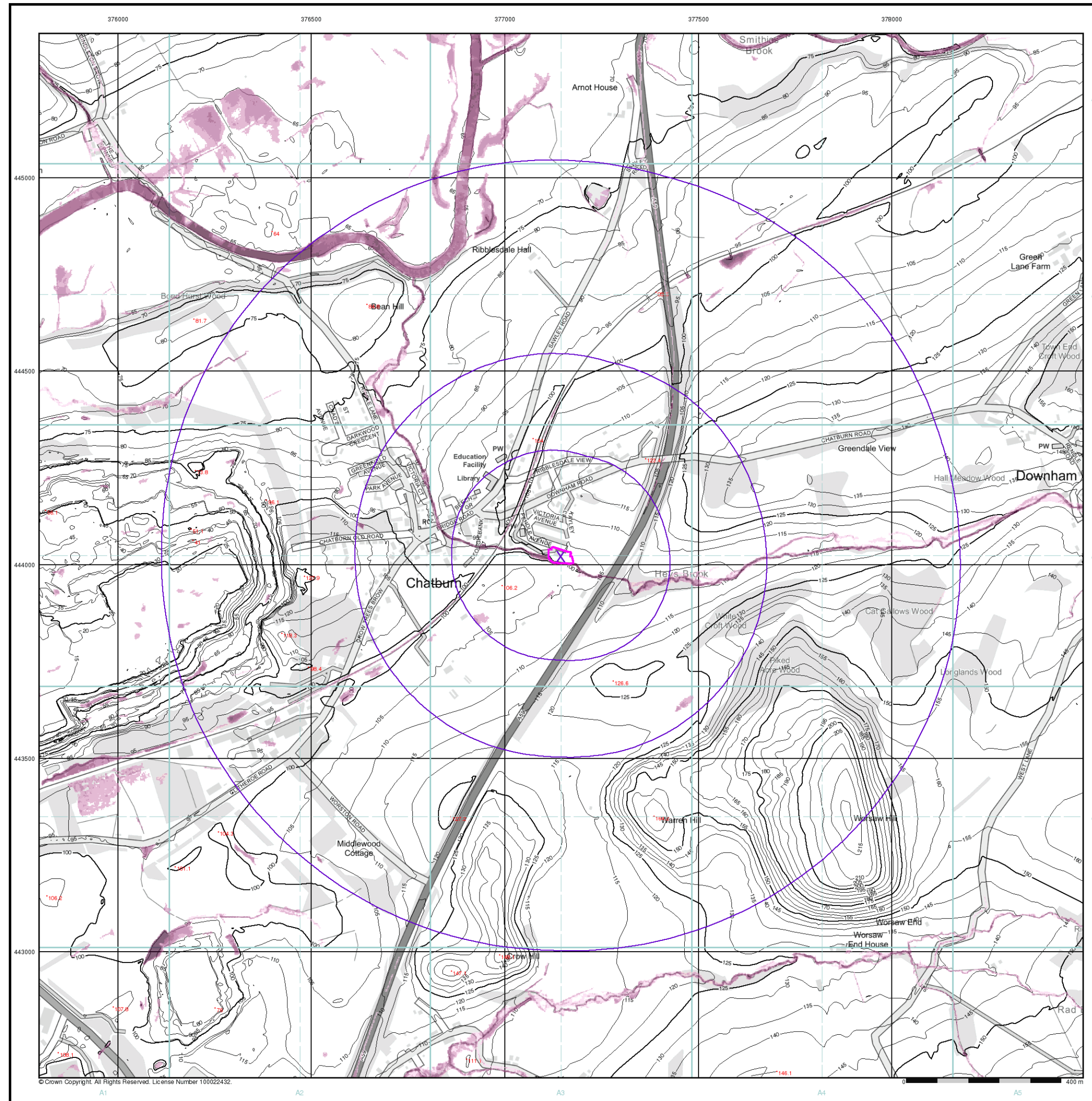
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 Site Area (Ha): 0.21
 Search Buffer (m): 1000

Site Details

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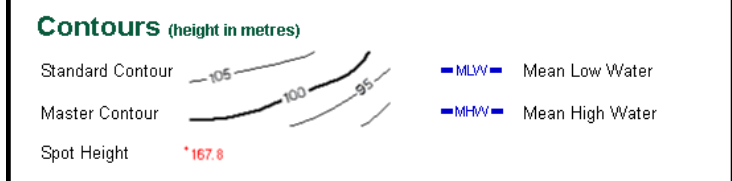


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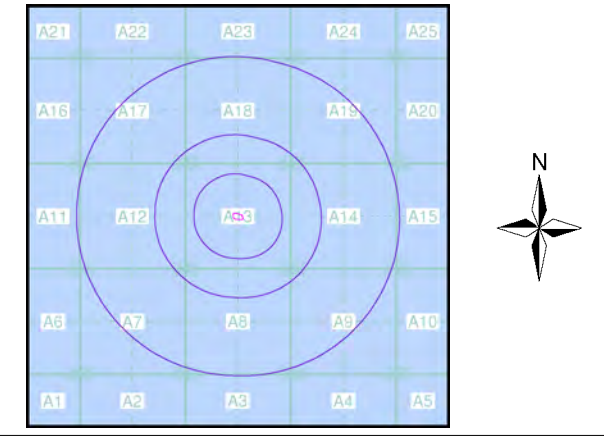
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E/ANRW Surface Water 30 Year Return Depth Map (1:10,000)

General
 Specified Site (pink circle) Specified Buffer(s) (purple circle) Bearing Reference Point (X)



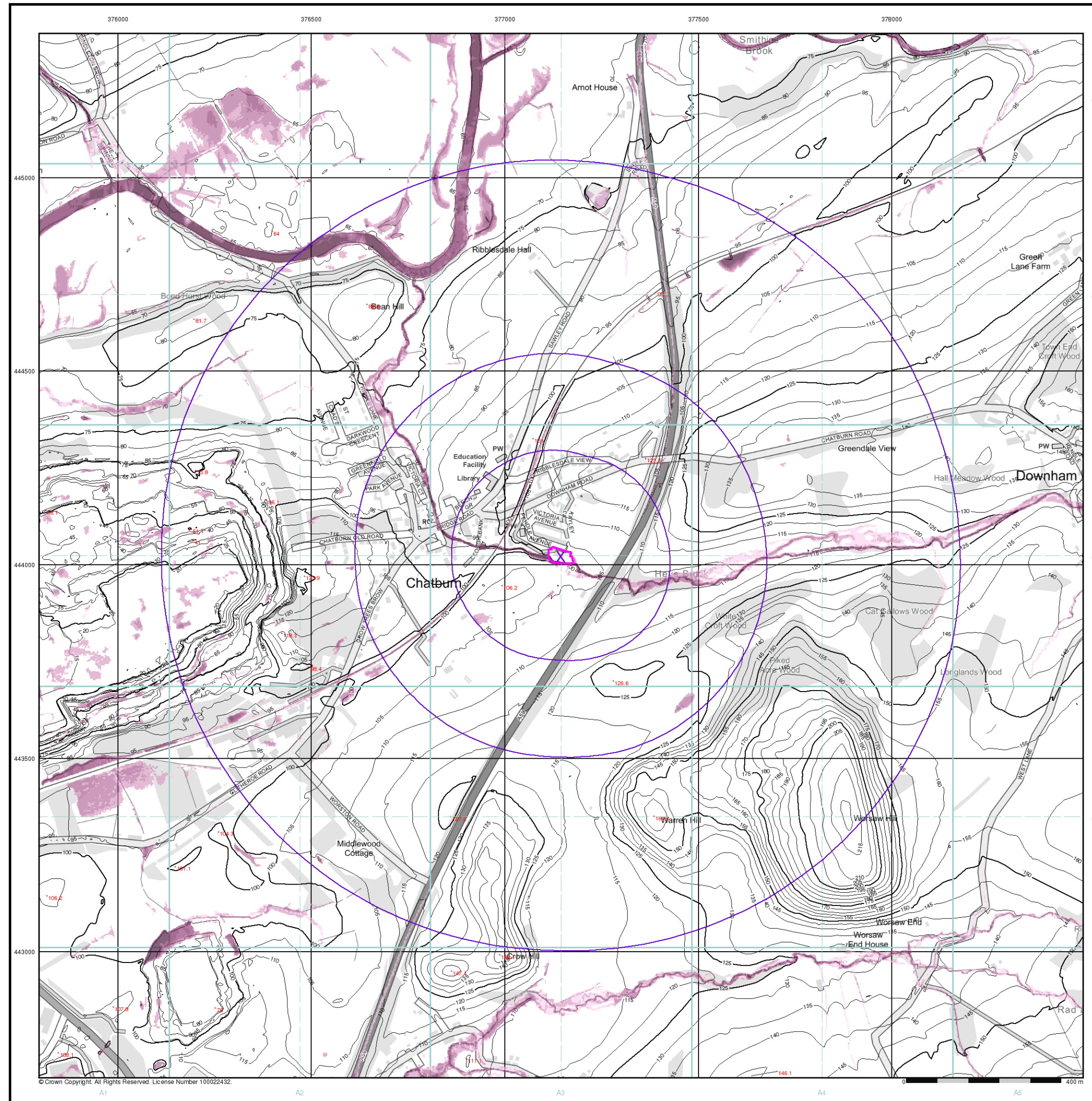
E/ANRW Suitability Map - Slice A



Order Details
 Order Number: 215758123_1_1
 Customer Ref: 517 - Glencroft, Chatburn
 National Grid Reference: 377140, 444020
 Slice: A
 Site Area (Ha): 0.21
 Search Buffer (m): 1000

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EANRW Surface Water 100 Year Return Depth Map

General
 Specified Site (pink circle) Specified Buffer(s) (purple circle) Bearing Reference Point (X)

Surface Water Depth

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

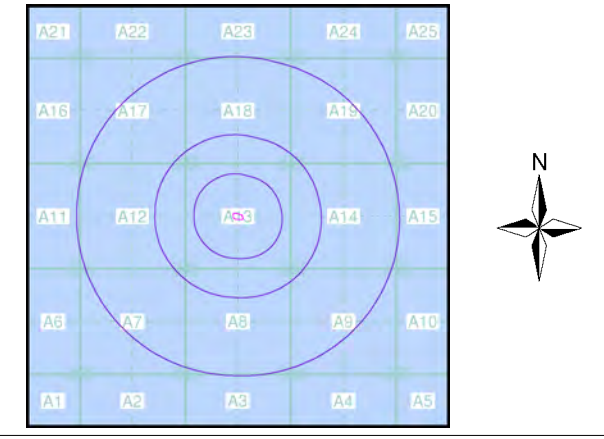
Contours (height in metres)

Standard Contour (105) — MLW — Mean Low Water
 Master Contour (100) — MHW — Mean High Water
 Spot Height (*167.8)

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: 215758123_1_1
 Customer Ref: 517 - Glencroft, Chatburn
 National Grid Reference: 377140, 444020
 Slice: A
 Site Area (Ha): 0.21
 Search Buffer (m): 1000

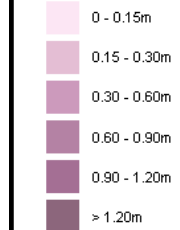
Site Details
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 Tel: 0844 844 9952
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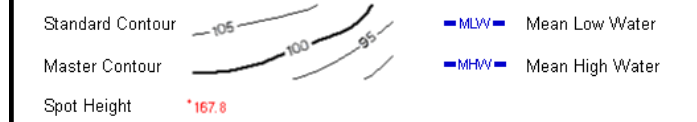
E/ANRW Surface Water 1000 Year Return Depth Map (1:10,000)

General
 Specified Site Specified Buffer(s) Bearing Reference Point

Surface Water Depth



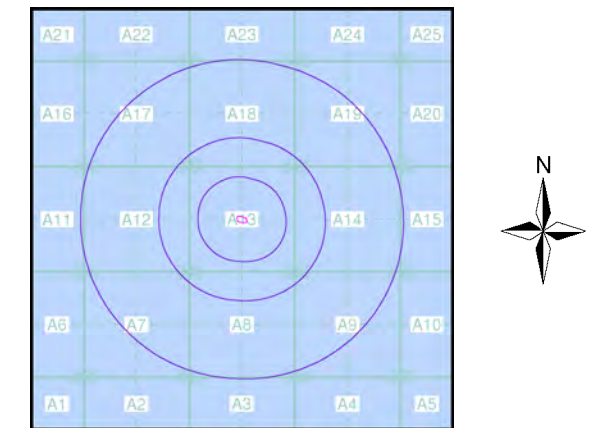
Contours (height in metres)



Suitability



E/ANRW Suitability Map - Slice A

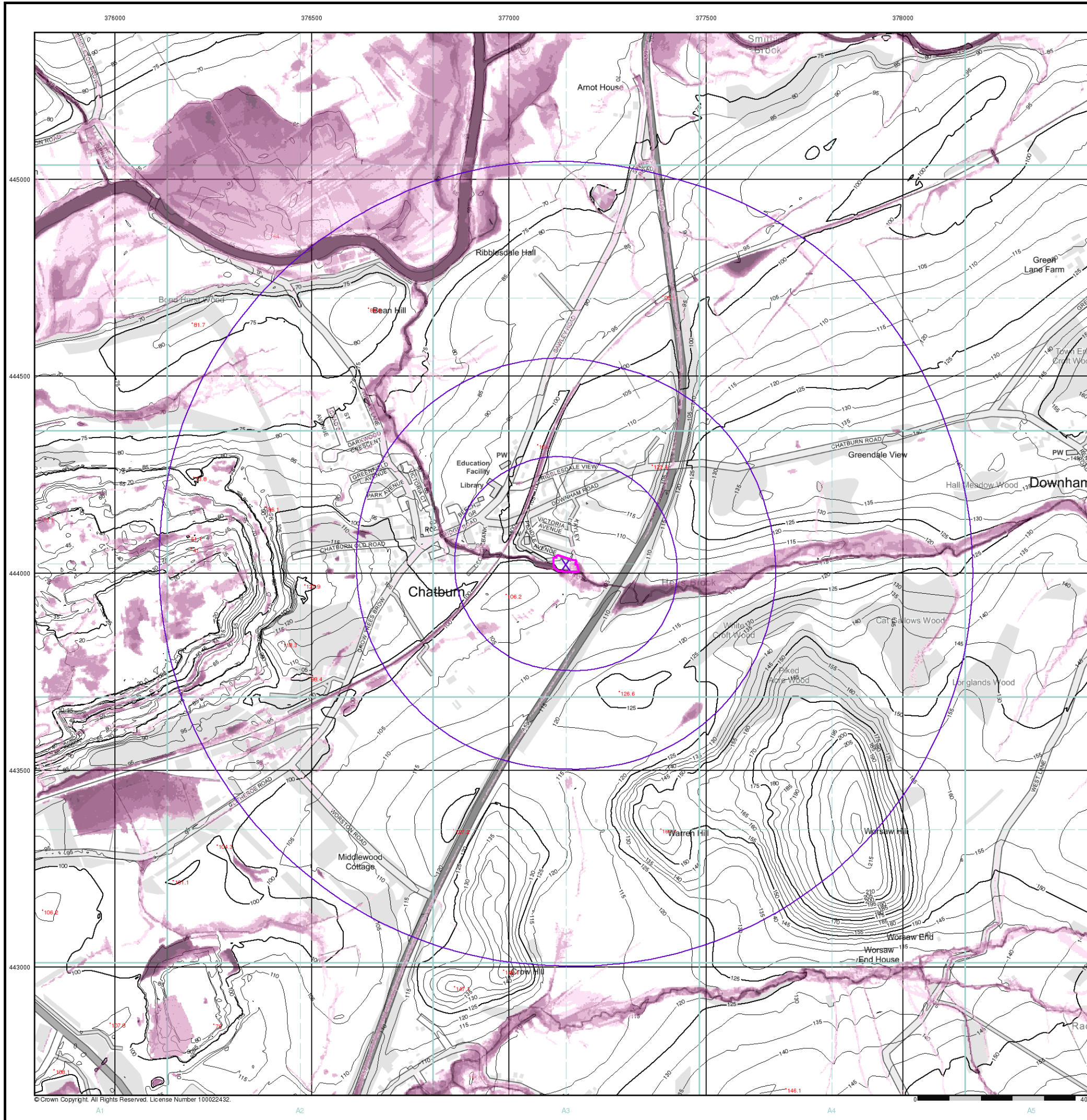


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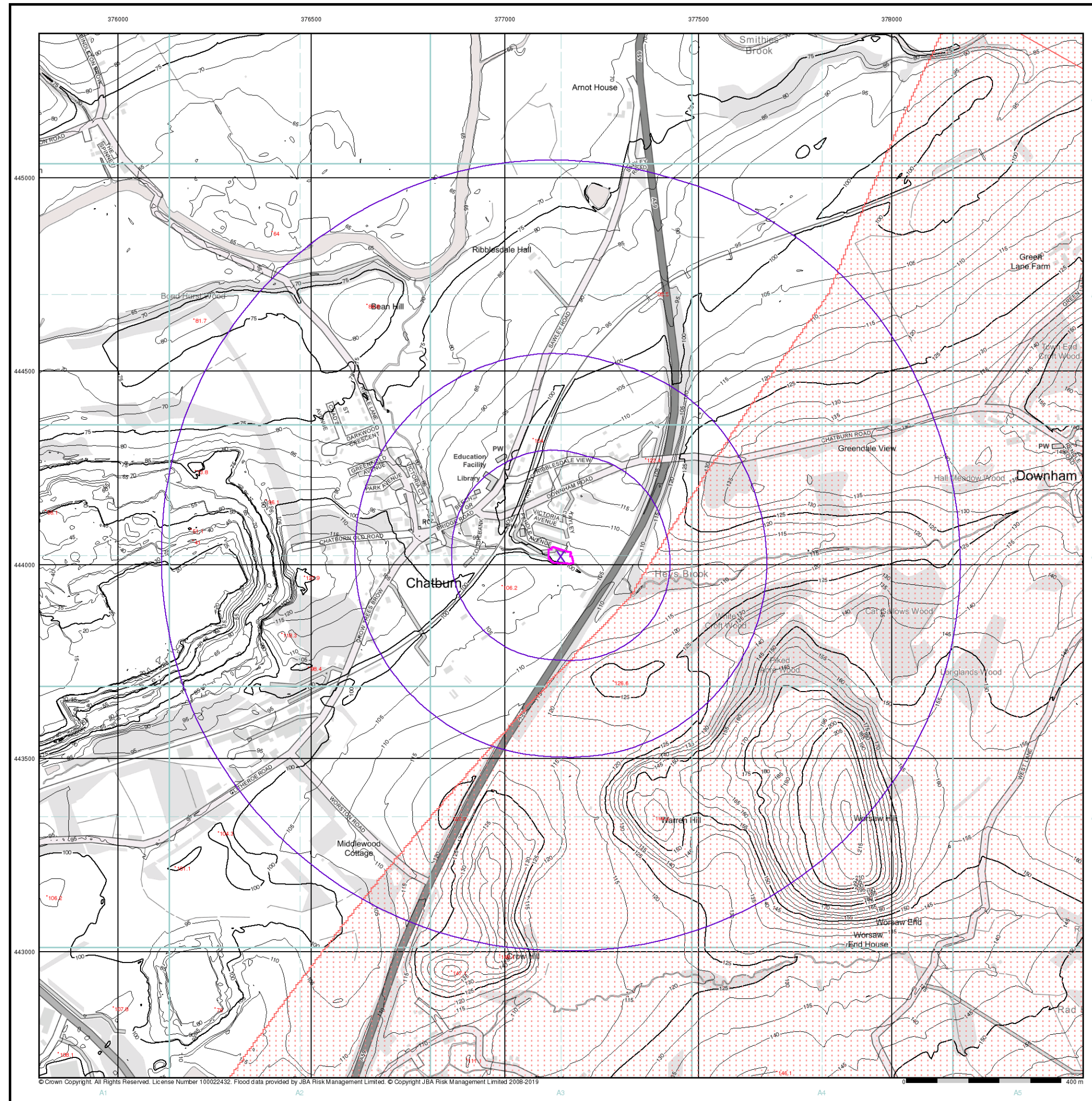
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 National Grid Reference: 377140, 444020
 Slice: A
 Site Area (Ha): 0.21
 Search Buffer (m): 1000

Site Details

Glencroft, Pendle Avenue, Chatburn, CLITHEROE, BB7 4AX



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JBA Canal Failure Map (1:10,000)

General

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

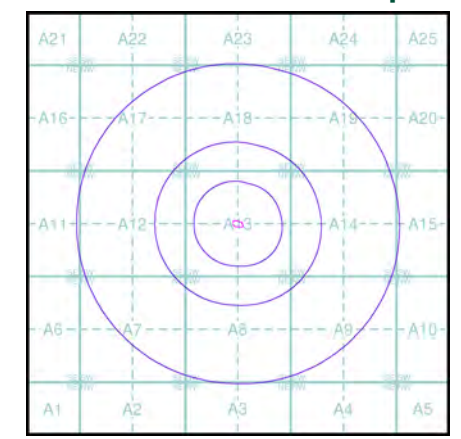
Flood Data

- Canal Failure
- Coverage

Contours (height in metres)

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

JBA Canal Failure Flood Map - Slice A

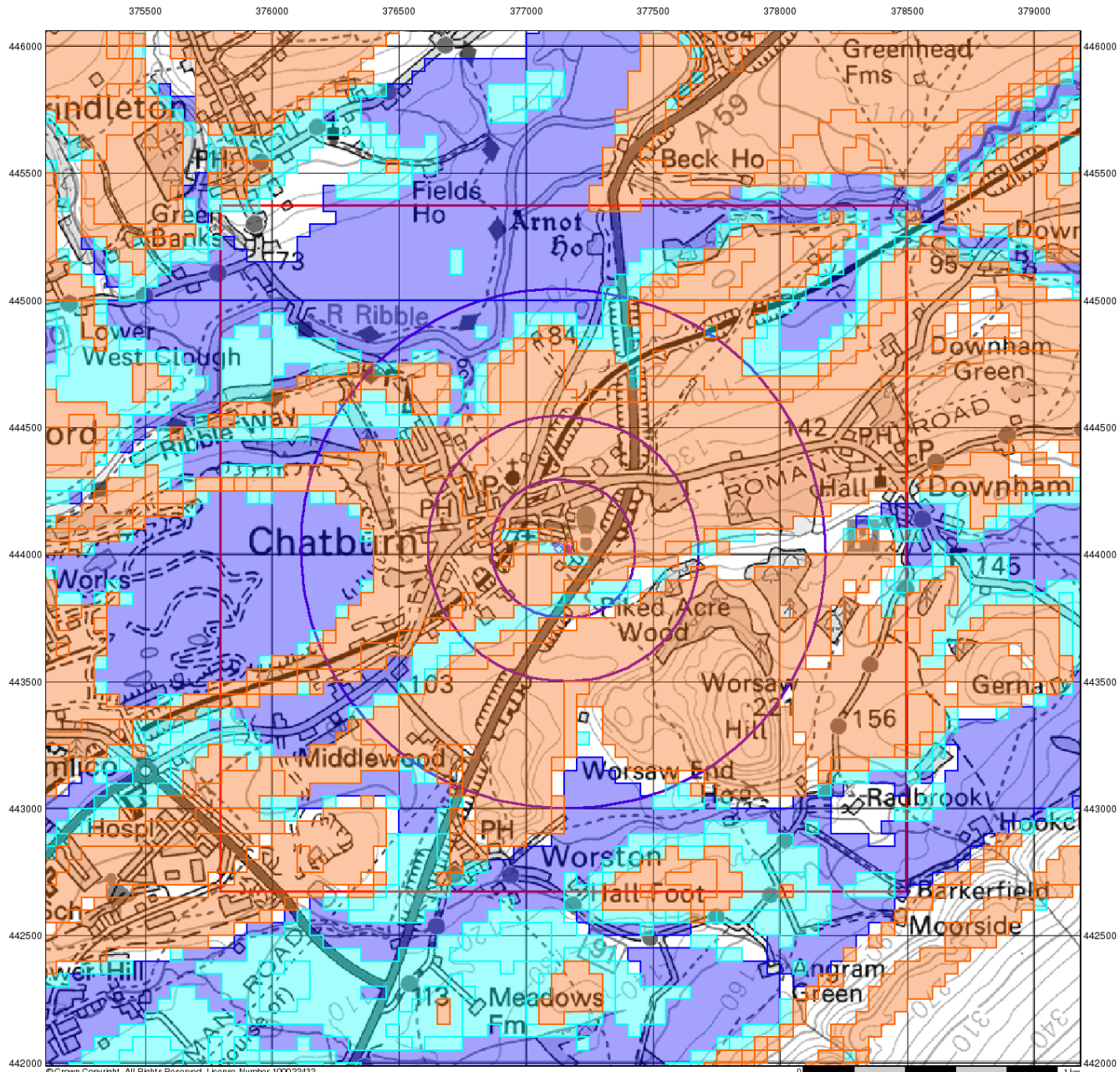


Order Details

Order Number: 215758123_1_1
 Customer Ref: 517 - Glencroft, Chatburn
 National Grid Reference: 377140, 444020
 Slice: A
 Site Area (Ha): 0.21
 Search Buffer (m): 1000

Site Details

Glencroft, Pendle Avenue, Chatburn, CLITHEROE, BB7 4AX



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BGS Flood Data (1:50,000)

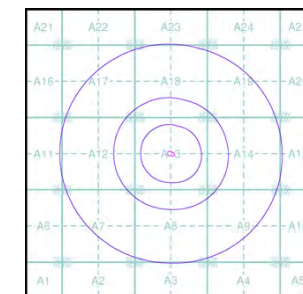
General

- 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

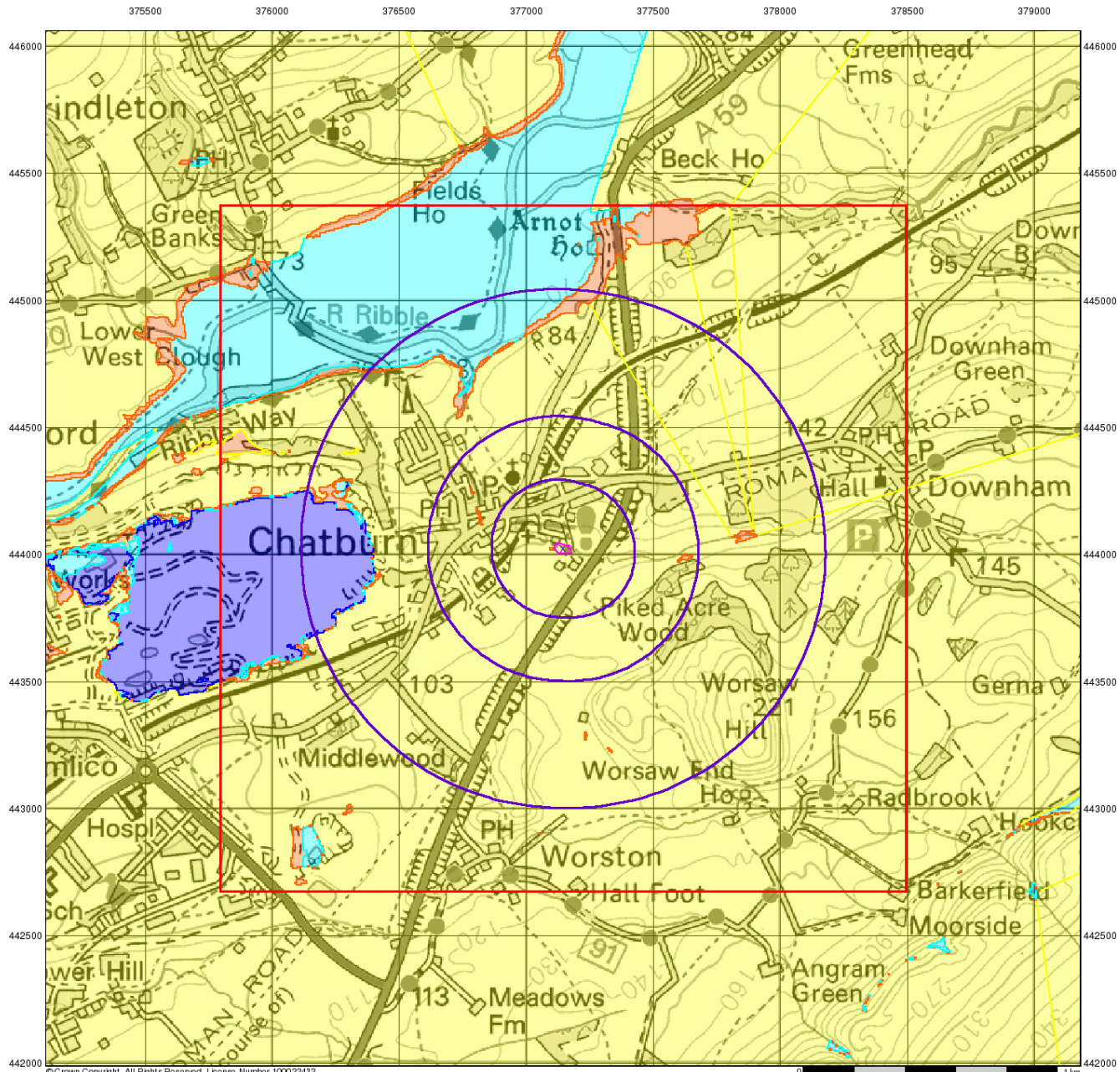
Order Number: 215758123_1_1
 Customer Ref: 517 - Glencroft, Chatburn
 National Grid Reference: 377140, 444020
 Slice: A
 Site Area (Ha): 0.21
 Search Buffer (m): 1000

Site Details

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Tel: 0844 844 9952
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 Web: www.envirocheck.co.uk



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GeoSmart Information Groundwater Flood Map (1:50,000)

General

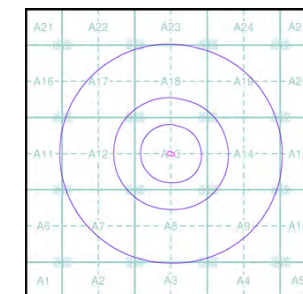
- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

- Slice

GeoSmart Information Groundwater Flooding Risk

- High Risk
- Moderate Risk
- Low Risk
- Negligible Risk

GeoSmart Information Groundwater Flood Map - Slice A



Order Details

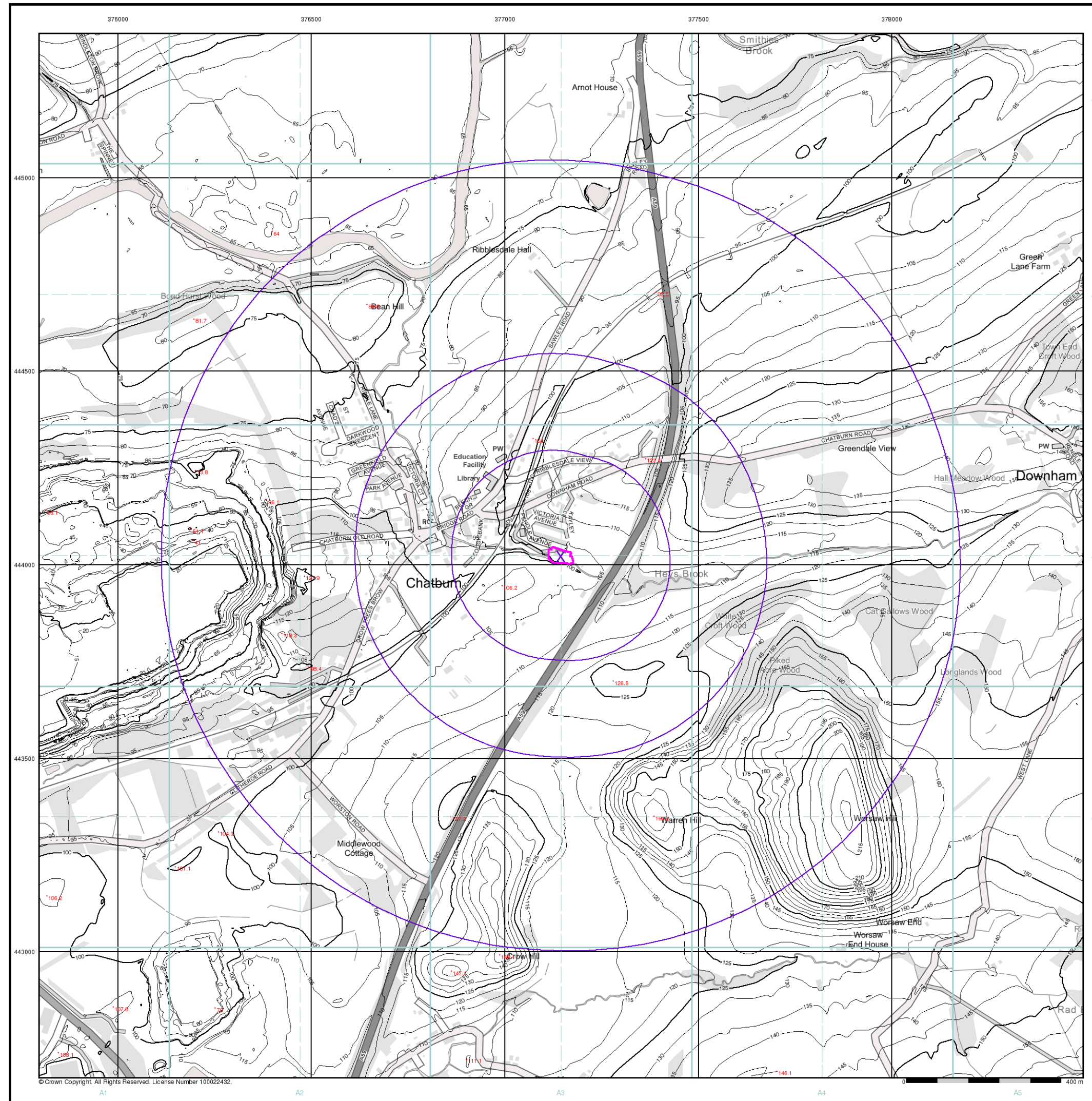
Order Number: 215758123_1_1
 Customer Ref: 517 - Glencroft, Chatburn
 National Grid Reference: 377140, 444020
 Slice: A
 Site Area (Ha): 0.21
 Search Buffer (m): 1000

Site Details

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EANRW Historic Flood Map (1:10,000)

General

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

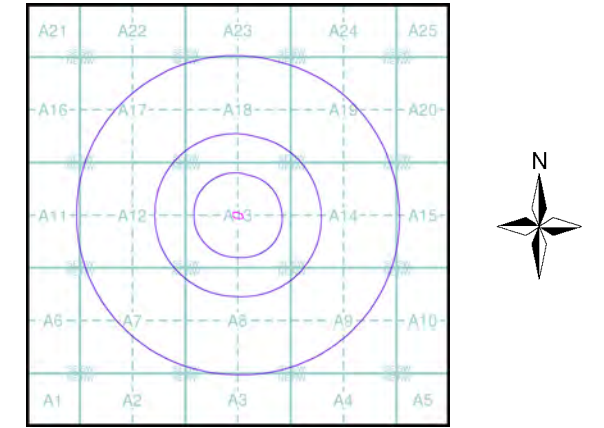
Historic Flood Events Data

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

EANRW Historic Flood Map - Slice A



Order Details

Order Number: 215758123_1_1
 Customer Ref: 517 - Glencroft, Chatburn
 National Grid Reference: 377140, 444020
 Slice: A
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Site Details

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Appendix D - Environment Agency Flood Plan

Personal flood plan

Name



Are you signed up to receive flood warnings?

If not call Floodline on 0345 988 1188 to see if your area receives free flood warnings.

Let us know when you've completed your flood plan by calling Floodline on **0345 988 1188**. This will help us learn more about how people are preparing for flooding.

General contact list	Company name	Contact name	Telephone
Floodline	Environment Agency		0345 988 1188
Electricity provider			
Gas provider			
Water company			
Telephone provider			
Insurance company and policy number			
Local council			
Local radio station			
Travel/weather info			

Key locations

Service cut-off	Description of location
Electricity	
Gas	
Water	

Who can help/who can you help?

Relationship	Name	Contact details	How can they/you help?
Relative			
Friend or neighbour			

Be prepared for flooding. Act now

Personal flood plan

What can I do NOW?



Put important documents out of flood risk and protect in polythene

Look at the best way of stopping floodwater entering your property

Find out where you can get sandbags

Identify what you would need to take with you if you had to leave your home

Check your insurance covers you for flooding

Make a flood plan and prepare a flood kit

Identify who can help you/ who you can help

Understand the flood warning codes

What can you do if a flood is expected in your area?

Actions	Location
Home	
● Move furniture and electrical items to safety	
● Put flood boards, polythene and sandbags in place	
● Make a list now of what you can move away from the risk	
● Turn off electricity, water and gas supplies	
● Roll up carpets and rugs	
● Unless you have time to remove them hang curtains over rods	
● Move sentimental items to safety	
● Put important documents in polythene bags and move to safety	
Garden and outside	
● Move your car out of the flood risk area	
● Move any large or loose items or weigh them down	
Business	
● Move important documents, computers and stock	
● Alert staff and request their help	
● Farmers move animals and livestock to safety	
Evacuation - Prepare a flood kit in advance	
● Inform your family or friends that you may need to leave your home	
● Get your flood kit together and include a torch, warm and waterproof clothing, water, food, medication, toys for children and pets, rubber gloves and wellingtons	

There are a range of flood protection products on the market to help you protect your property from flood damage. A directory of these is available from the **National Flood Forum** at www.bluepages.org.uk

Be prepared for flooding. Act now