

FLOOD RISK ASSESSMENT

PROPOSED COMMERCIAL DEVELOPMENT No.211 BURY ROAD ROCHDALE OL11 5EU

Author: Daniel Slattery
Client: Mr Steve Taylor
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T J Booth Associates.
20A Eastgate St,
Rochdale,
Lancs,
OL16 1DH.
Tel: 01706 868288.
Email: office@tjba.co.uk



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1 Introduction.

1.1 Purpose of Flood Risk Assessment.

The purpose of the assessment inform & accompany a planning application for a commercial extension.

For the purposes of the FRA, the development classes as a minor extension.

1.2 Flood Risk Reference.

Flood Risk Assessments are required for the following Sites:

- *in flood zones 2, 3 or 3b.*
- *within flood zone 1 with a site area of 1 hectare or more.*
- *in areas with critical drainage problems.*
- *within flood zone 1 where the LPA's strategic flood risk assessment (SFRA) shows it will be at increased risk of flooding during its lifetime.*
- *that increases the vulnerability classification and may be subject to sources of flooding other than rivers or sea.*

Environment Agency (EA) mapping data identifies the Application Site as having areas within areas within flood zone 2, although this is to the southeast corner of the development boundary; refer to EA flood map in the Appendix.

Flood zone 2 is defined as land assessed as having between a 1:100 & 1:1000 or greater annual probability of river flooding (0.1-1%) in any year (land shown in light blue on the EA flood map). Flood zone 3 is defined as land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) in any year (land shown in dark blue on the EA flood map). Flood zone 1 comprises all areas outside of flood zones 2 & 3.

The Planning Practice Guidance indicates the flood risk vulnerability classification (Table 2) for the Application Site end use to be 'less vulnerable'. The flood risk 'vulnerability' and flood zone 'compatibility' matrix (Table 3) indicates that 'less vulnerable' development is acceptable in flood zones 2.

1.3 Plans.

1.3.1 Location plan/Site Plan.

The Site comprises a group of former terraced houses/public house, now converted into office/commercial space.

The Site is fronted by Bury Road (north), and has a car park to the rear (south). The car park is shared with other businesses.

The River Roch borders the south side of the car park, flowing southwest.

Oakenrod Bridge crossing the Roch is to the southwest of the Site, adjacent to the car park, which causes flow restriction in exceedance events.

The proposal is for a small extension to the rear of the existing property.

Refer to Location Plan, Existing Plans & Proposed Plans in the Appendix.

1.4 Data & Surveys.

1.4.1 Existing and proposed topography.

T J Booth Associates hold topographic survey data of the local area, current as of 2024, noting features of the Site, levels, and contours. Lidar data has also been accessed.

There is a level difference between the front and rear of the Site building, with the front comprising ground and first floors, with the rear comprising an additional lower ground floor.

The following levels are obtained from the topo:

General ground level at the front of the building: c119.67m aOD.

General ground level at the rear of the building: c117.10m aOD.

With particular significance to the flood risk assessment is the north bank of the Roch adjacent to the car park which is approximately 117.69m aOD. However, further to the east the bank is lower, c114.20m aOD, allowing water onto the car park which is lowest at around 116.40, ref topographic and lidar data in the Appendix.

2 Flood Risk Assessment.

2.1 Existing fluvial & surface water system.

The Roch flows northeast to southwest past the Site/car park. Its confluence with the River Spodden tributary is approximately 240m northeast.

In exceedance events, the Oakenrod Bridge crossing to the southeast will constrict the river flow, until the Roch overflows its banks and spills just upstream of the Site within the rear car park. There also appears to be contributing overland flows in upper extreme events from the River Spodden bursting its banks, inundating Mellor Street and flowing back south to the Roch.

2.2 Proposed fluvial & surface water system.

From flood maps, the extreme >100yr+CC fluvial events will just encroach upon the southeast corner of the extension but will not inundate it.

2.3 Climate change impacts.

Climate change impacts on fluvial flooding are measured on the potential increase through the expected development lifetime. With a longer development lifetime, the assessment must consider a greater chance of river level increase.

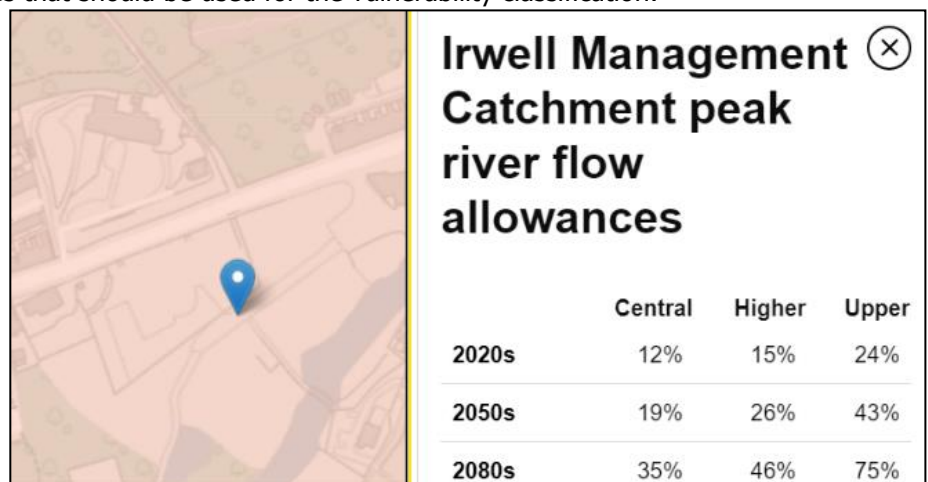
Residential developments are considered to have the longest potential development lifetimes. Commercial developments have shorter lifetimes owing to higher turnover of changes in use types etc, and therefore a higher frequency of associated redesign & updated flood risk assessment.

The proposed development is commercial, and as identified in Section 1, and the vulnerability of the development is 'less vulnerable'. The Planning Flood Maps designate the Site as being within flood zone 2.

EA guidance specifies climate change allowances by management catchment specific areas. Peak flow river maps have been produced which specify the climate change allowances to be used in a flood risk assessment:

EA guidance indicates the peak flow rates that should be used for the vulnerability classification:

- essential infrastructure – use the higher central allowance.
- highly vulnerable – use central allowance (development should not be permitted in flood zone 3a).
- more vulnerable – use the central allowance.
- less vulnerable – use the central allowance.
- water compatible – use the central allowance.



Given the less vulnerable development risk category, the central allowance climate change multiplier should be used as the basis for assessing the potential impact of climate change over the development lifetime.

As the Application Site is to be used for a commercial end use, the '2050s' timeline is appropriate.

Comparing the '2050s' timeline with the central allowance from the peak river flow predictions above, the data suggests a max 19% climate change allowance for the Site.

2.4 Fluvial morphological impacts.

The general external contours of the car park are to be retained as existing.

No in bank changes are proposed.

2.5 Potential sources of flooding.

- a. Fluvial flooding from main rivers.

Environment Agency Product 4 data was obtained for the adjacent site and local area in Sept 2024. The data is still current.

The flood data obtained from the Environment Agency included flood levels around Oakenrod Bridge which are specific to the current Application Site as follows:

- Node 7 – level upstream of Oakenrod Bridge.
- Node 6 – level downstream of Oakenrod Bridge.

As the Site does not have traditional flood defences, the undefended model has been used. The flood levels for the Site are tabulated below:

RIVER ROCH FLOOD MODEL			
Node Location	Undefended		
	100yr	100yr+20%	100yr +35%
Node 7 upstream Oakenrod Bridge	116.22	116.33	116.36
Node 6 Oakenrod Bridge	116.21	116.32	116.36

The max flood level in the vicinity of the Site upstream of Oakenrod Bridge is 116.33m aOD in the 100yr+20% exceedance event. Even for the 100yr+35% event, the level only reaches 116.36m aOD.

Flood waters of this magnitude will overflow the bank upstream of the Site and flow into the rear car park, encroaching up to the Application Site car park area, but arresting nominally just within the Site boundary due to the higher ground levels.

b. Surface water flood maps.

The Environment Agency surface water flood maps show in more detail the flow behaviour of surface water overland flow routes caused by periods of heavy rainfall, and thus indicate the mechanisms by which the local area floods & corresponding return periods that flood events occur between.

The surface water flood maps have 4 risk descriptors which correspond to specific return periods as follows:

- High Risk >30yr flood event.
- Medium risk between 30-100yr flood event.
- Low risk between 100-1000yr flood event.
- Very low >1000yr flood event (all areas outside of the high-low categories).

For the high to low-risk categories, coloured hatching on the maps relates to surface water depths designating approximate depths of <300mm (light blue), between 300-900mm (medium blue), and >900mm (dark blue).

The current maps show no surface water flood risk affecting the Application Site.

c. Artificial Watercourse/Canals.

None noted in the local area.

d. Loss of Floodplain & Flow Routes.

There is no construction within the floodplain and therefore no loss of floodplain or flow routes associated with proposed development.

e. Springs and high groundwater levels.

None noted.

f. Surcharging of local drainage & sewerage systems.

No evidence of sewer surcharging in the local area.

g. Reservoirs.

Reservoir flood maps show the Site is impacted by reservoir. However, this is considered unlikely and secondary to the fluvial flood risk.

2.6 Design.

Lower ground floor levels to the rear of the building are c117.10m aOD, approximately 770mm above the 100yr+20% level identified as the design flood level, and 740mm above the 100yr+35% level.

This floor levels allows more than adequate freeboard above predicted flood levels, and no specialist design is required.

2.7 Emergency Evacuation Plan

The Adept/Environment Agency guidelines indicate the requirements for flood risk emergency plans (EP) for new development. An EP would generally contain the following sub-sections:

- Section 1. Scope, Objectives and Background.
- Section 2. Location and Proposal.
- Section 3. Risk Summary.
- Section 4. Mitigation Measures.
- Section 5. Flood Warnings and Associated Actions.
- Section 6. Safe Access and Escape.
- Section 7. Temporary Refuge.
- Section 8. After the Flood.
- Section 9. List of Roles.
- Section 10. Plan Upkeep and Awareness.

2.7.1 Section 1. Scope, Objectives & Background

The reason for making an EP is to ensure the safety of Site users in times of extreme flood events. Although there is no risk of flooding to the building footprint, there is some residual flooding to the car par to the rear of the Site, and users will need to know escape routes.

2.7.2 Section 2. Location & Proposal

Discussed in earlier sections of the report.

2.7.3 Section 3. Risk Summary

The maximum design flood level noted in the assessment is for the 100yr+20% fluvial event (116.33m aOD) to the rear car park.

2.7.4 Section 4. Mitigation Measures

Not required.

The access/egress to the Site is not within the flood zone, and is situated at a level of >117.60m aOD.

2.7.5 Section 5. Flood Warnings and Associated Actions

The Site is within a flood warning area, refer to associated Flood Warning Map below:



FLOOD INFORMATION SERVICE

Dwellings or businesses in England can sign up for the Environment Agency free flood alert service by phone, email or text message, if either homes or businesses are at risk of flooding.

The Site is within the Environment Agency Flood Warning Area and it is strongly advised that the Owner must sign up to receive flood warnings via the Environment Agency Flood Information Service.

The current & simple flood alert/warnings guidance used by the Environment Agency, including an easy-to-understand statement of the following:

- PREPARE.
- ACT.
- SURVIVE.

Flood alert - Prepare  • prepare a bag that includes medicines and insurance documents • check flood warnings
Flood warning - Act  • turn off gas, water and electricity • move things upstairs or to safety • move family, pets and car to safety
Severe flood warning - Survive  • call 999 if in immediate danger • follow advice from emergency services • keep yourself and your family safe

The Flood Information Service can be found on the internet using the following URL: <https://flood-warning-information.service.gov.uk/warnings>.

See inset graphic above for additional general details what is required for each warning stage.

FLOODLINE

Alternatively, people at risk from flooding and without access to the internet can register for flood alert warnings & get in touch by calling Floodline on telephone: 0345 988 1188 OR Type talk: 0345 602 6340 (for the hard of hearing), which is a 24hr service.

For flood alerts/warnings, people will need to provide the following information:

- the address to be registered.
- a phone number for the person or people requesting the service can be contacted on 24hrs a day.
- an email address for the person or people requesting the service.

FLOOD WARDENS

Flood Wardens operate in some areas to provide alerts to the local community when flood warnings are issued. Contact Floodline on 0845 988 1188 to find out if this service is available in the area.

SIRENS/LOUDHAILERS

Sirens/loudhailers operate in some areas at risk from extreme flooding to alert residents that a flood warning is in force. Contact Floodline on 0845 988 1188 to find out if this service is available in the area.

GENERAL MEDIA

Media such as the Flood Information Service website details maps and current (up-to-date) area specific advice for all areas of England, including the type of flooding and flood alert/warning level in force for those areas. Other websites such as the Met Office have their own flood alert service. TV & radio news channels give warnings.

2.7.6 Section 6. Safe Access and Escape

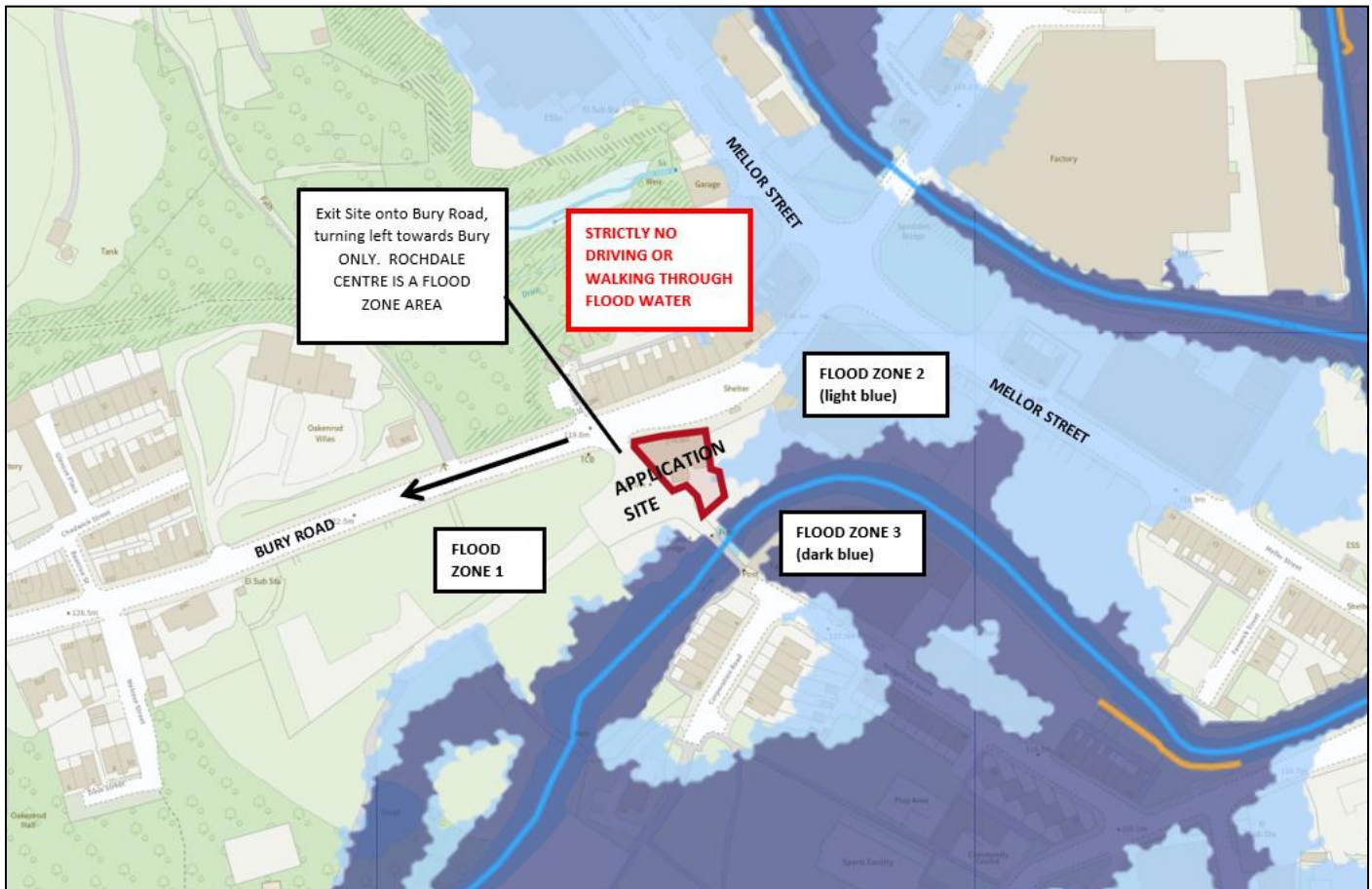
In flood risk areas, safe access and egress from new developments should be in accordance with the Adept EP guidance, and that of the referenced background documentation Defra/EA R&D Technical Report FD2320/TR2; and should be in the following order of preference:

- Safe dry route for people and vehicles.
- Safe dry route for people.
- If a dry route for people is not possible, a route for people where the flood hazard (in terms of depth and velocity of flooding) is low and should not cause a risk to people.

- If a dry route for vehicles is not possible, a route for vehicles where the flood hazard (in terms of depth and velocity of flooding) is low to permit access for emergency vehicles. However, the public should not drive vehicles in floodwater.

Much of the Application Site is within Flood Zone 1, however, flood waters encroaching on to the car park from the east where river banks are lower.

If egress is required, due to the Site being safe from flooding, evacuation is proposed as a dry route for pedestrians and vehicles. Refer to the Emergency Evacuation Plan below:



The Environment Agency guidance is clear: when a flood alert to PREPARE is issued, preparations should be enacted in case a further flood warning to ACT is given, and business owners should be ready for this scenario.

When a flood warning to ACT is issued, people should follow instructions to evacuate as per the above Emergency Evacuation Route Plan – assuming a flood event could be imminent.

DRIVING OR PEDESTRIAN MOVEMENTS SHOULD NOT BE ATTEMPTED THOROUGH FLOOD WATERS.

2.7.7 Section 7. Temporary Refuge

Not required.

If flood advice is required in an emergency, the Environment Agency has specially trained flood support officers who provide information and advice during and after floods. Call Floodline (24-hour service) on 0345 988 1188 or type-talk (for the hard of hearing) on 0345 602 6340 to find out if they are active in the local area.

2.7.8 Section 8. After the Flood

Clean-up information & procedures if required following an extreme storm event are as follows:

- Contact your insurance company.
- Cleaning and repairing the property.
- Specialist advice will likely be required and may need to be undertaken in accordance with insurance company requirements.

- Photographs to document damage and record the flood water height.
- Flood water can be hazardous and contain sewage, chemicals, and animal waste. Care should be taken with personal protective equipment.
- Contact the local council about disposing of large flood damaged items.
- Stay healthy – ensure services are running properly and potable water does not have a change in colour, taste or smell. Ensure food touched by flood water is disposed of.
- Get help via Floodline if required.
- Get emotional support if required from family, friends, GP, or charity organisations.
- Apply for financial aid if required. Apply to the local council for eligibility.

2.7.9 Section 9. List of Roles

It is the owner's responsibility to enact this guidance and pass onto future tenants if and when required.

It is owner's responsibility to follow this EP and keep up to date with current flood warning advice thereafter.

2.7.10 Section 10. Plan Upkeep and Awareness

Owners/tenants should ensure they are familiar with the Evacuation Plan and procedures, and keep up to date with latest Environment Agency Guidance.

2.8 FRA Conclusion & Residual risks.

The Application Site & extension are safe from fluvial flooding up to and including a 100+35% design flood event.

The development will not suffer flooding, not cause flooding elsewhere.

No specific design requirements are necessary.

As long as the guidance in this flood risk assessment is followed, no other residual risks remain.

Signed.....



D.S. Slattery BSc (Hons).

T J Booth Associates.

Authorised...

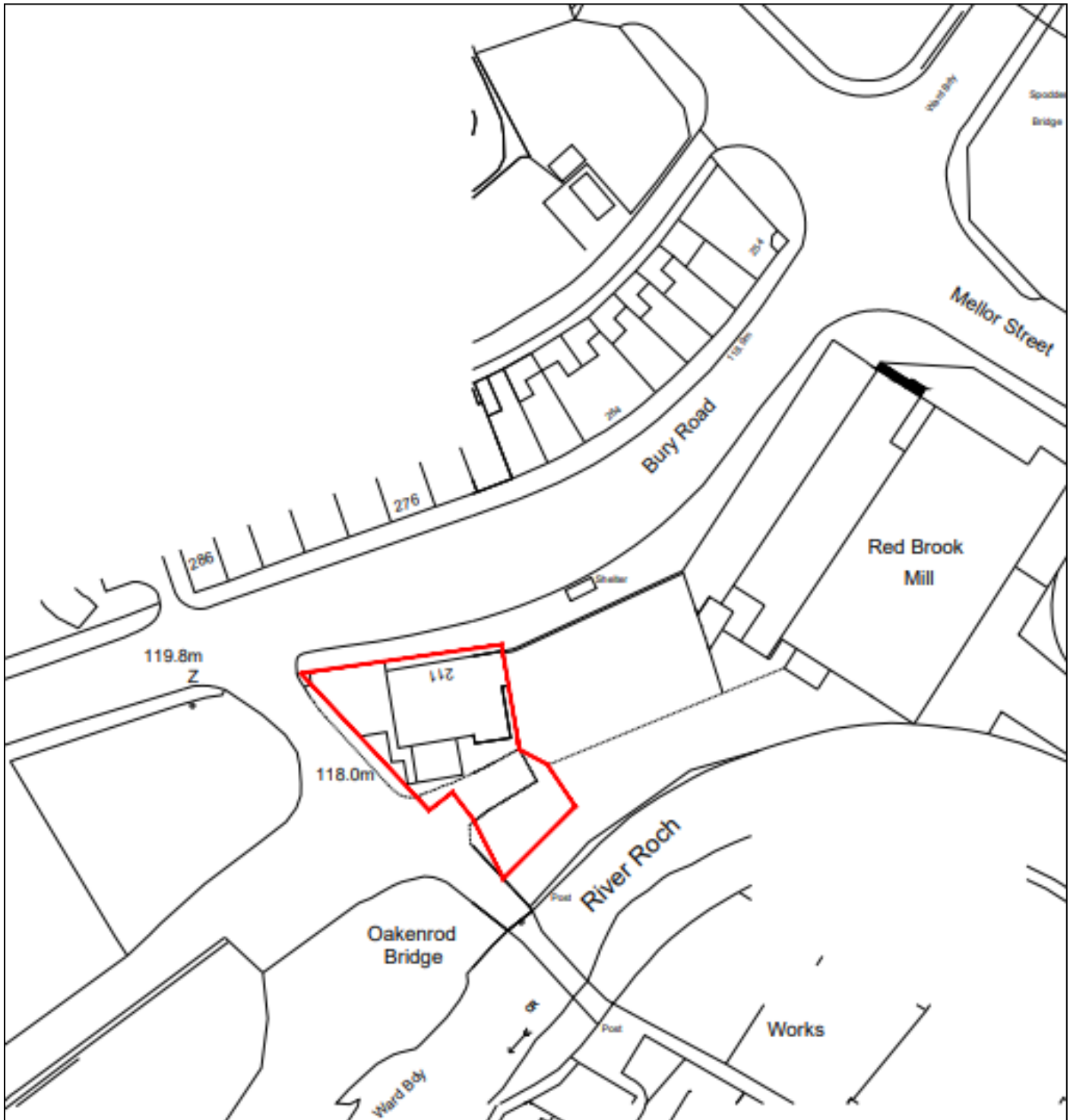


T J Booth BSc (Hons), C. Eng. C. Env. MICE.

T J Booth Associates.

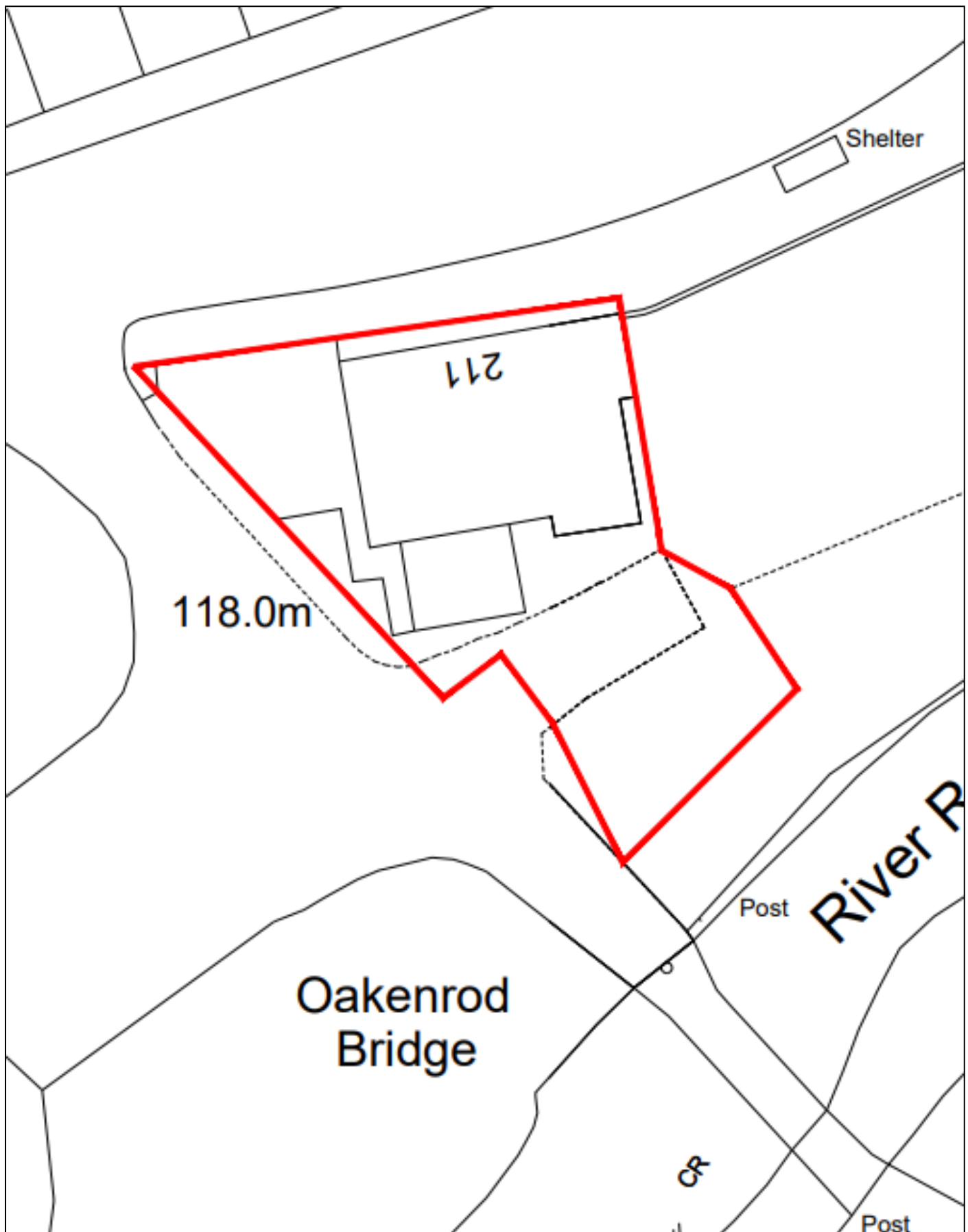
3 Appendix.

3.1 Location Plan.

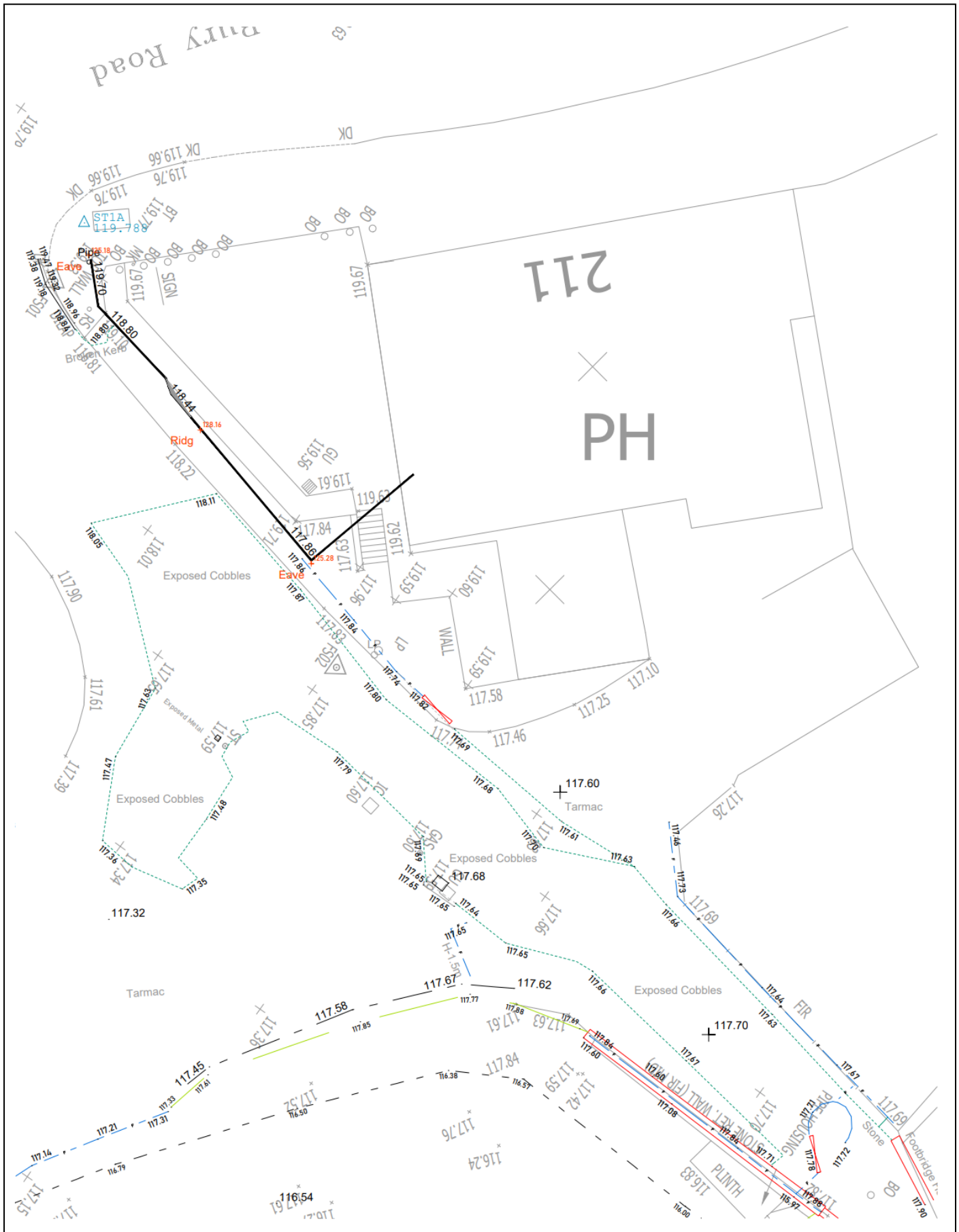




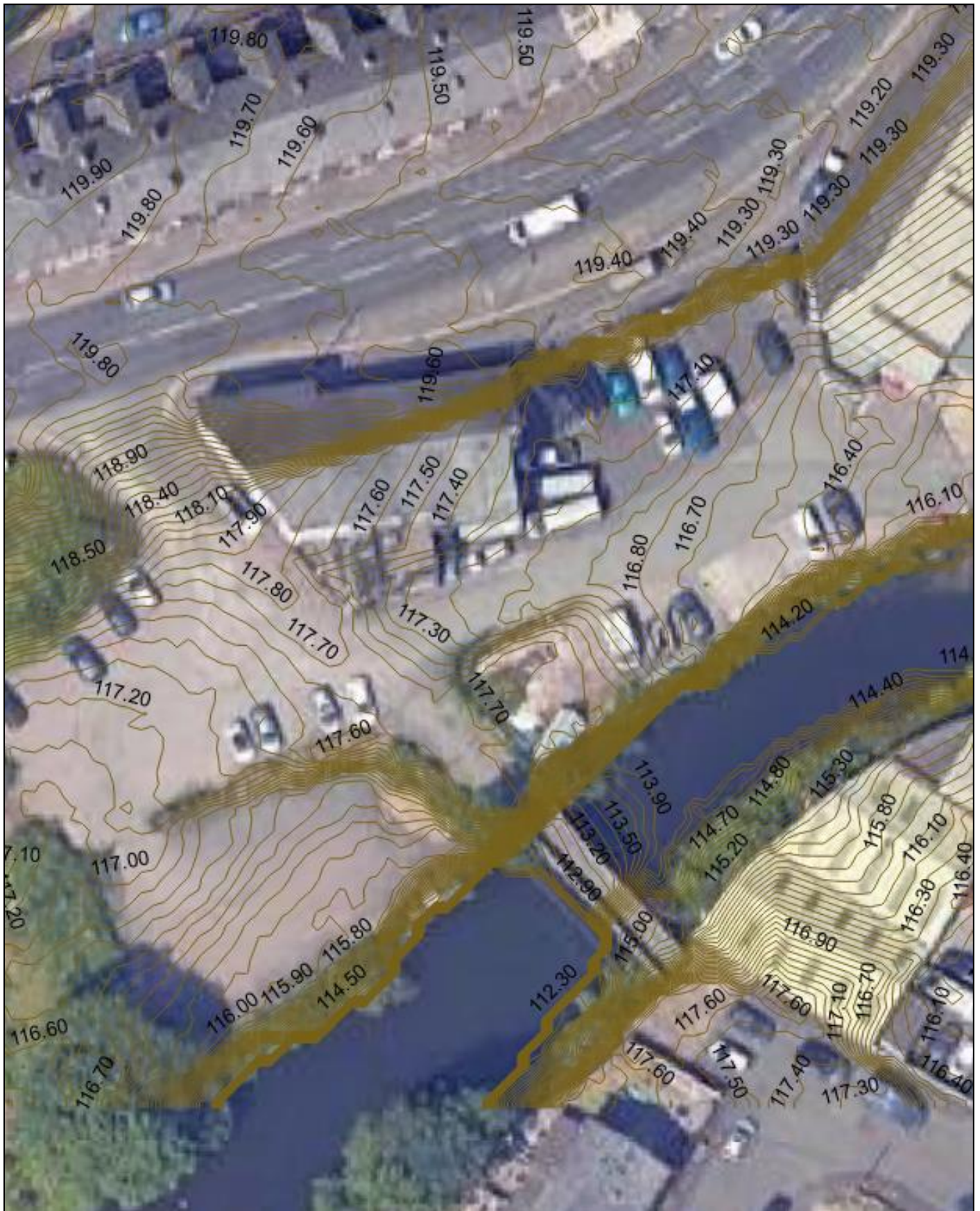
3.2 Existing Plan.



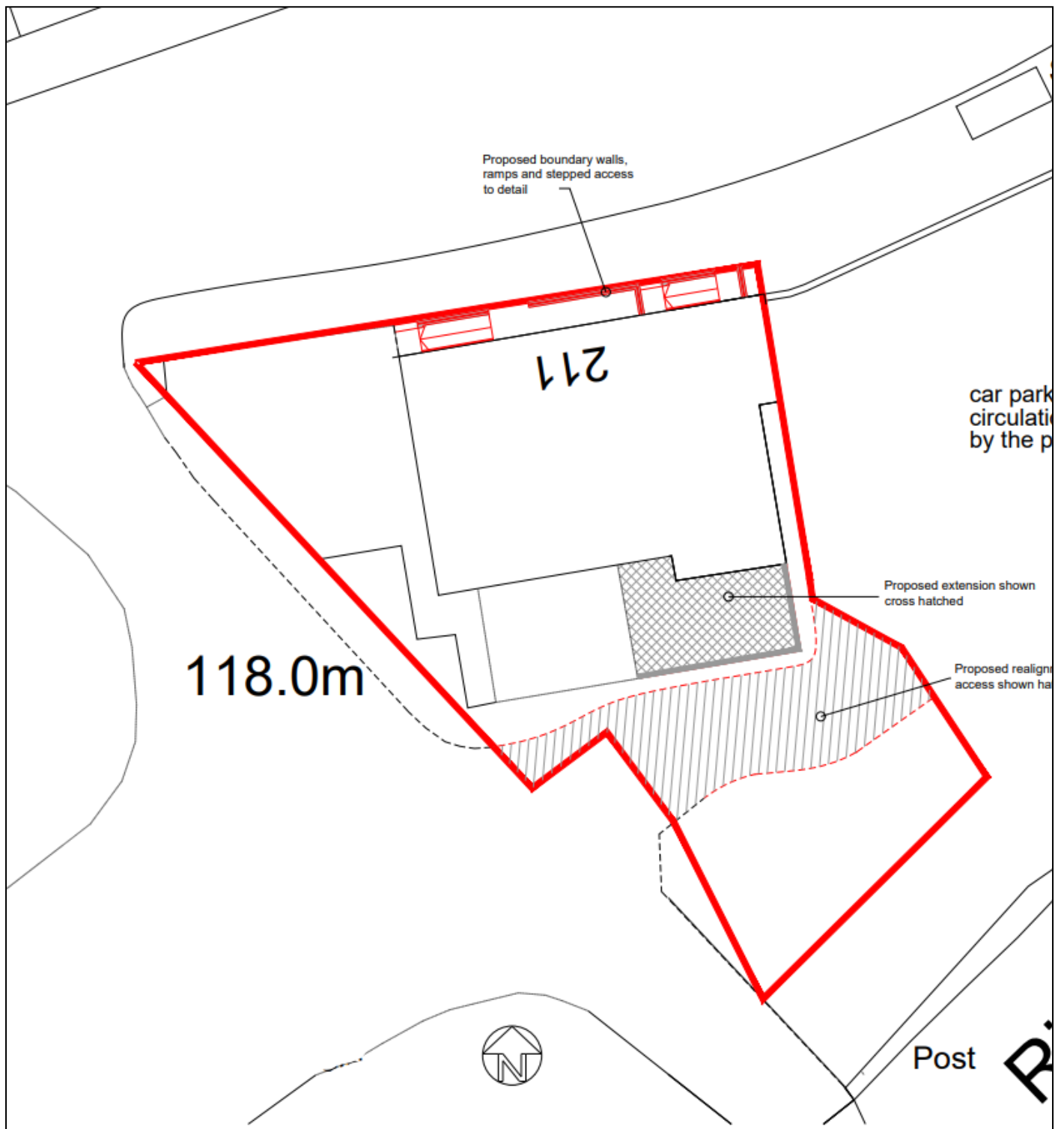
3.3 Topographic Data.



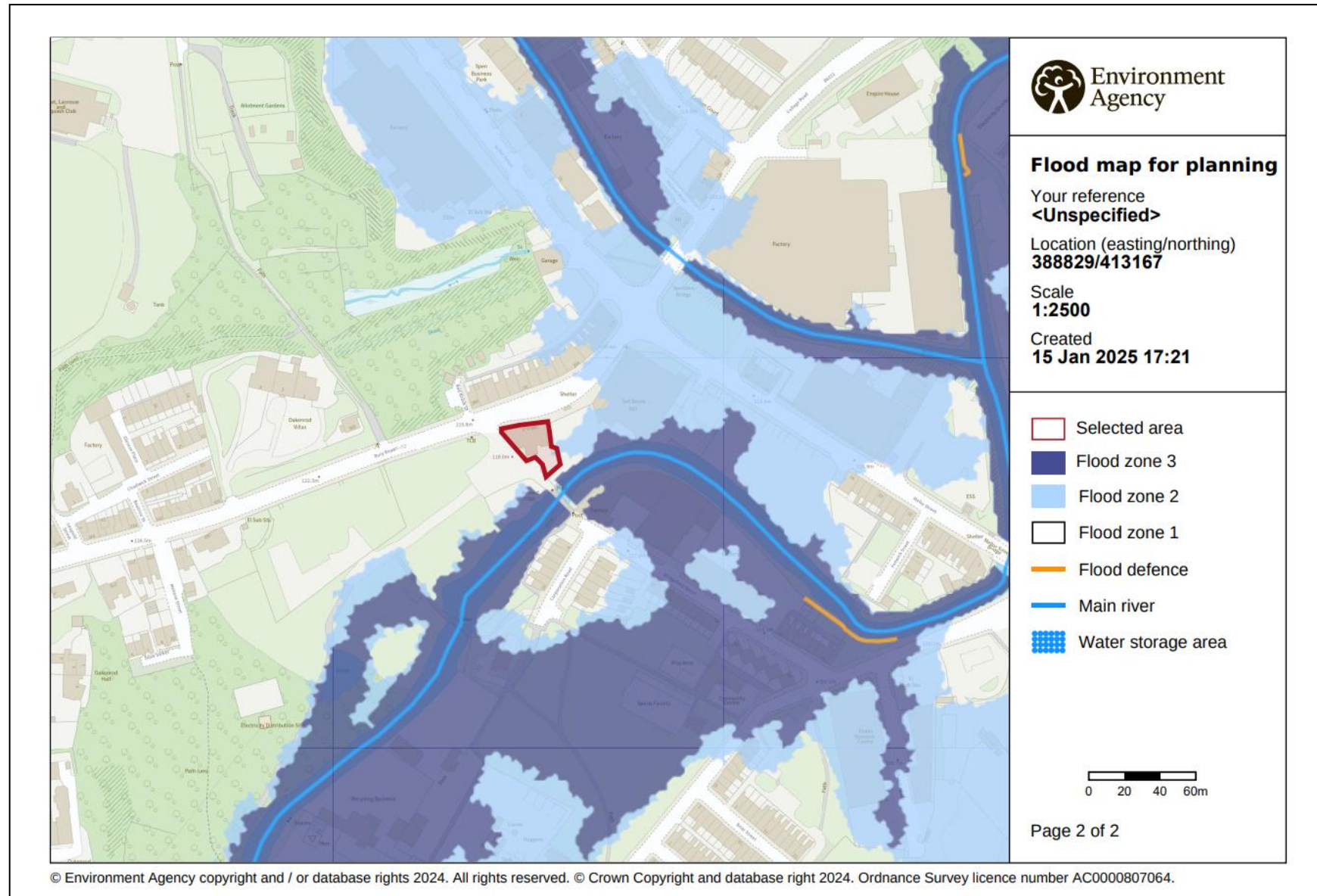
3.4 Lidar Data.

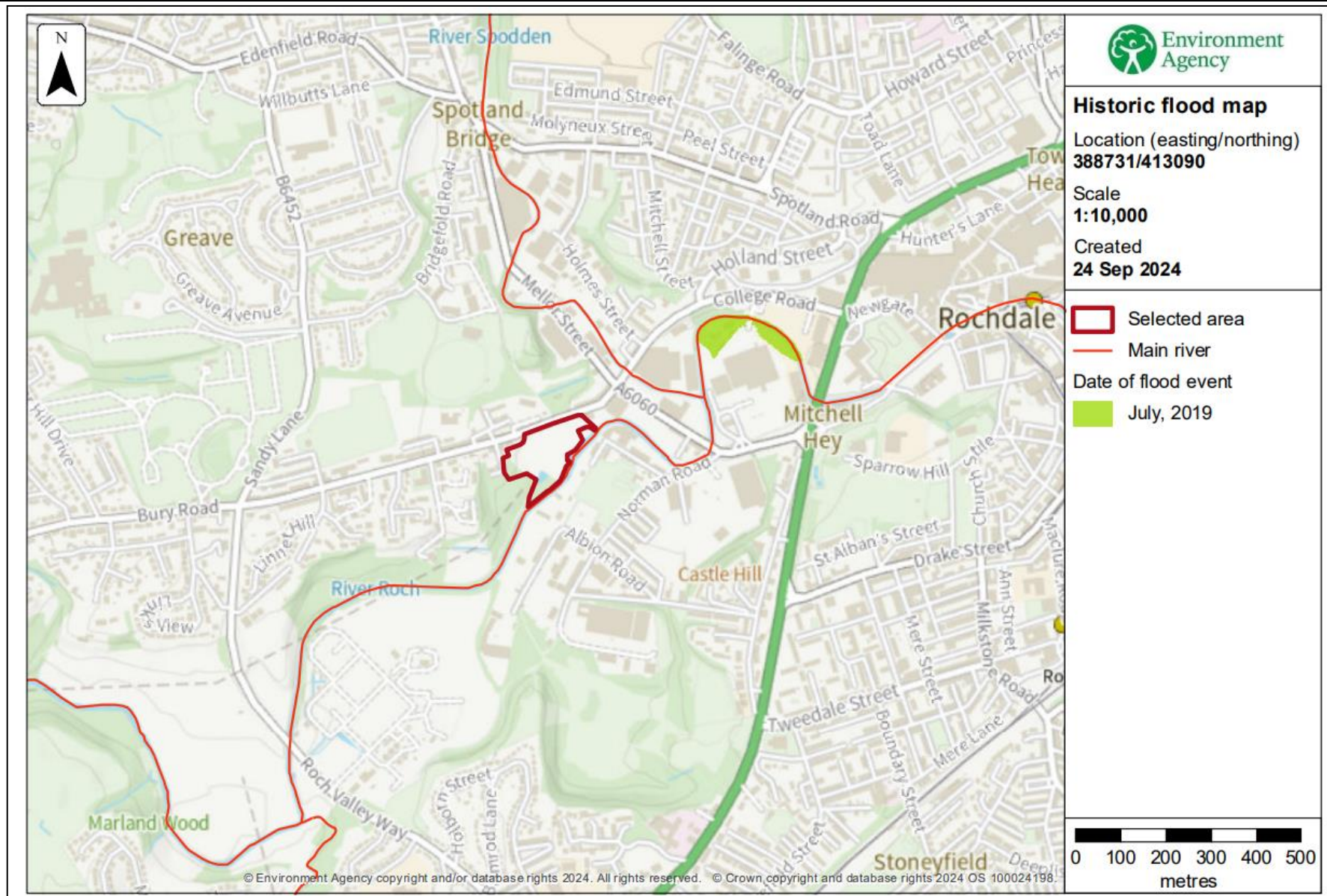


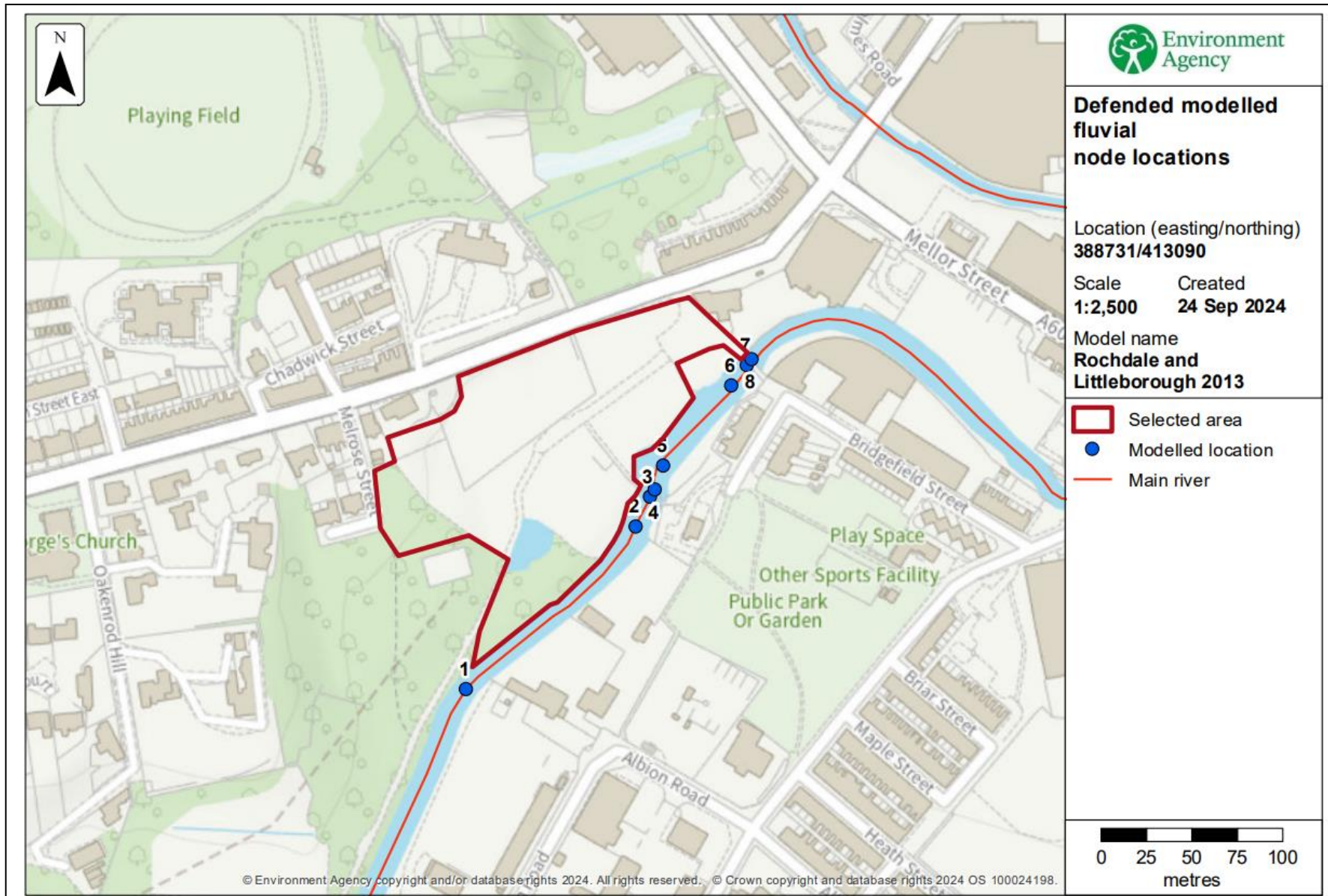
3.5 Proposed Plan.



3.6 Environment Agency Flood Risk Data Sept 2024.







Defended

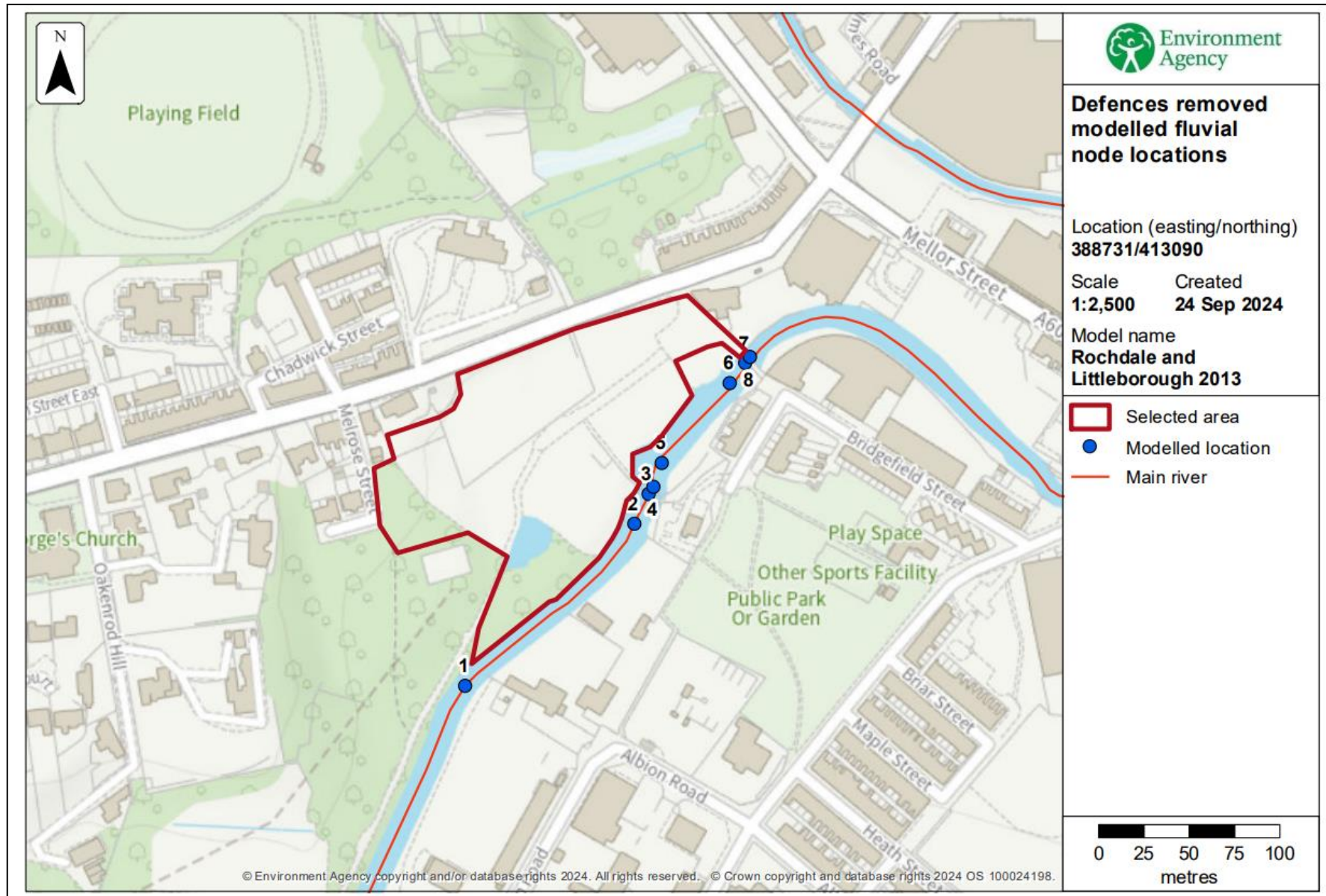
Label	Modelled location ID	Easting	Northing	5% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
				Level	Level	Level	Level	Level
1	1547248	388687	412960	113.45	113.85	113.96	114.17	114.80
2	1548031	388781	413050	113.80	114.23	114.36	114.60	115.30
3	1547500	388789	413067	113.84	114.31	114.44	114.69	115.40
4	1547915	388791	413071	115.88	116.10	116.16	116.25	116.50
5	1547588	388796	413084	116.10	116.32	116.37	116.45	116.61
6	1547993	388834	413128	116.07	116.26	116.31	116.37	116.44
7	1547949	388843	413139	116.08	116.26	116.31	116.36	116.42
8	1547734	388846	413143	116.24	116.53	116.62	116.76	117.24

Data in this table comes from the Rochdale and Littleborough 2013 model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.
If no level or flow data is available for a scenario, no table will be shown.

Defended climate change

Label	Modelled location ID	Easting	Northing	1.0% AEP (+20%)	1.0% AEP (+35%)	1.0% AEP (+70%)	1.0% AEP (+20%)	1.0% AEP (+35%)	1.0% AEP (+70%)
				Level	Level	Level	Flow	Flow	Flow
1	1547248	388687	412960	114.30	114.52	114.81	128.64	140.88	159.31
2	1548031	388781	413050	114.74	114.96	115.31	120.14	131.78	141.47
3	1547500	388789	413067	114.83	115.05	115.38	105.48	115.99	123.24
4	1547915	388791	413071	116.31	116.33	116.43	105.48	115.99	123.24
5	1547588	388796	413084	116.49	116.55	116.60	131.61	146.07	166.56
6	1547993	388834	413128	116.40	116.42	116.44	132.02	147.04	168.35
7	1547949	388843	413139	116.39	116.41	116.42	131.59	146.51	167.68
8	1547734	388846	413143	116.85	117.0	117.22	131.59	146.51	167.68

Data in this table comes from the Rochdale and Littleborough 2013 model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.
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Defences removed

Label	Modelled location ID	Easting	Northing	5% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
				Level	Level	Level	Level	Level
1	1547248	388687	412960	113.44	113.85	113.95	114.21	114.81
2	1548031	388781	413050	113.77	114.21	114.32	114.63	115.31
3	1547500	388789	413067	113.81	114.28	114.40	114.71	115.38
4	1547915	388791	413071	115.84	116.01	116.04	116.13	116.38
5	1547588	388796	413084	116.05	116.23	116.26	116.35	116.55
6	1547993	388834	413128	116.02	116.18	116.21	116.28	116.43
7	1547949	388843	413139	116.04	116.19	116.22	116.29	116.42
8	1547734	388846	413143	116.18	116.40	116.44	116.58	116.98

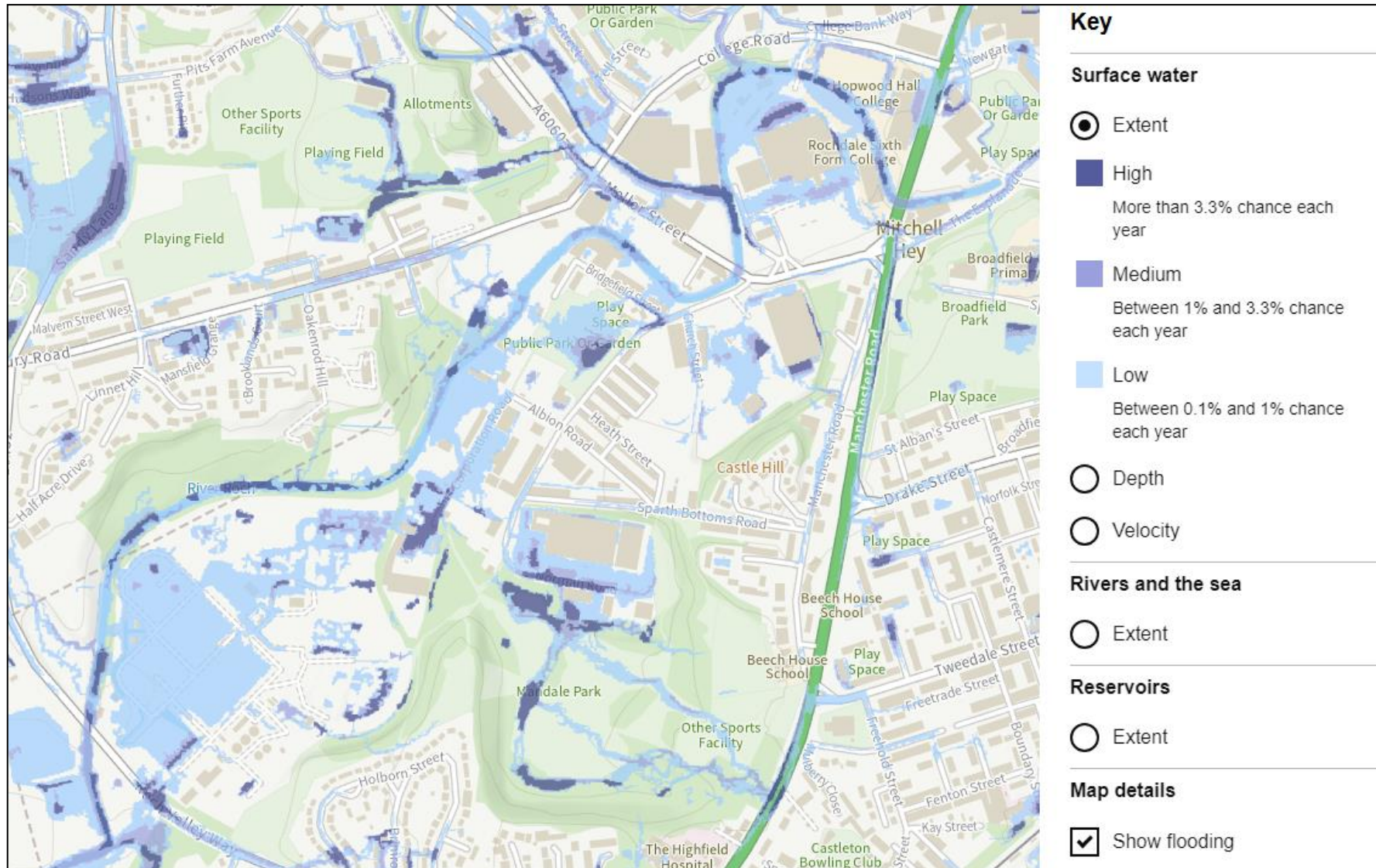
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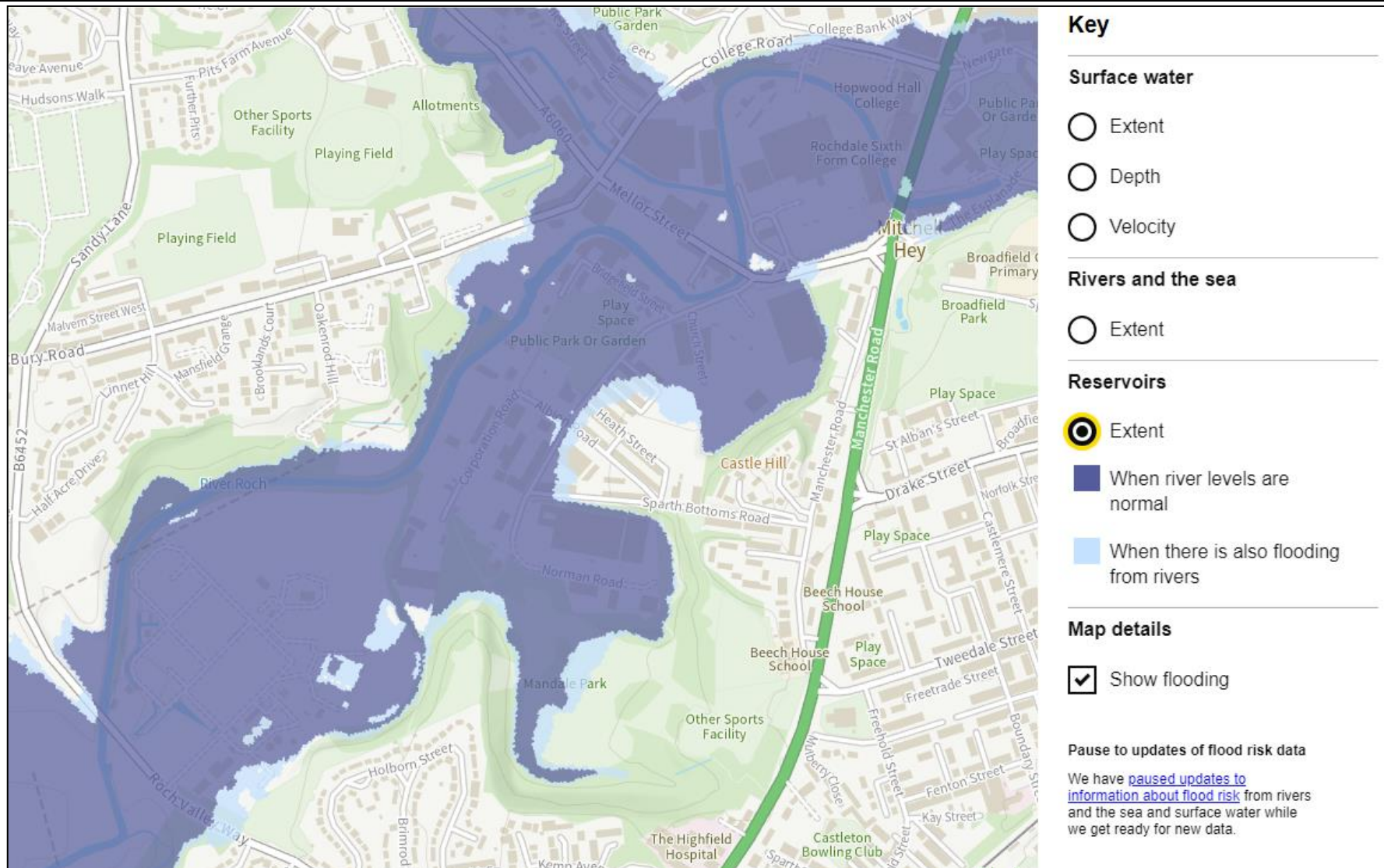
Defences removed climate change

Label	Modelled location ID	Easting	Northing	1.0% AEP (+20%)	1.0% AEP (+35%)	1.0% AEP (+70%)	1.0% AEP (+20%)	1.0% AEP (+35%)	1.0% AEP (+70%)
				Level	Level	Level	Flow	Flow	Flow
1	1547248	388687	412960	114.36	114.50	114.71	127.86	133.66	146.35
2	1548031	388781	413050	114.80	114.94	115.17	112.13	115.90	122.50
3	1547500	388789	413067	114.87	115.01	115.24	97.54	100.73	106.72
4	1547915	388791	413071	116.19	116.24	116.33	97.54	100.73	106.72
5	1547588	388796	413084	116.40	116.44	116.50	113.38	120.28	135.19
6	1547993	388834	413128	116.32	116.36	116.40	113.58	120.55	135.71
7	1547949	388843	413139	116.33	116.36	116.40	113.38	120.31	135.30
8	1547734	388846	413143	116.66	116.73	116.88	113.38	120.31	135.30

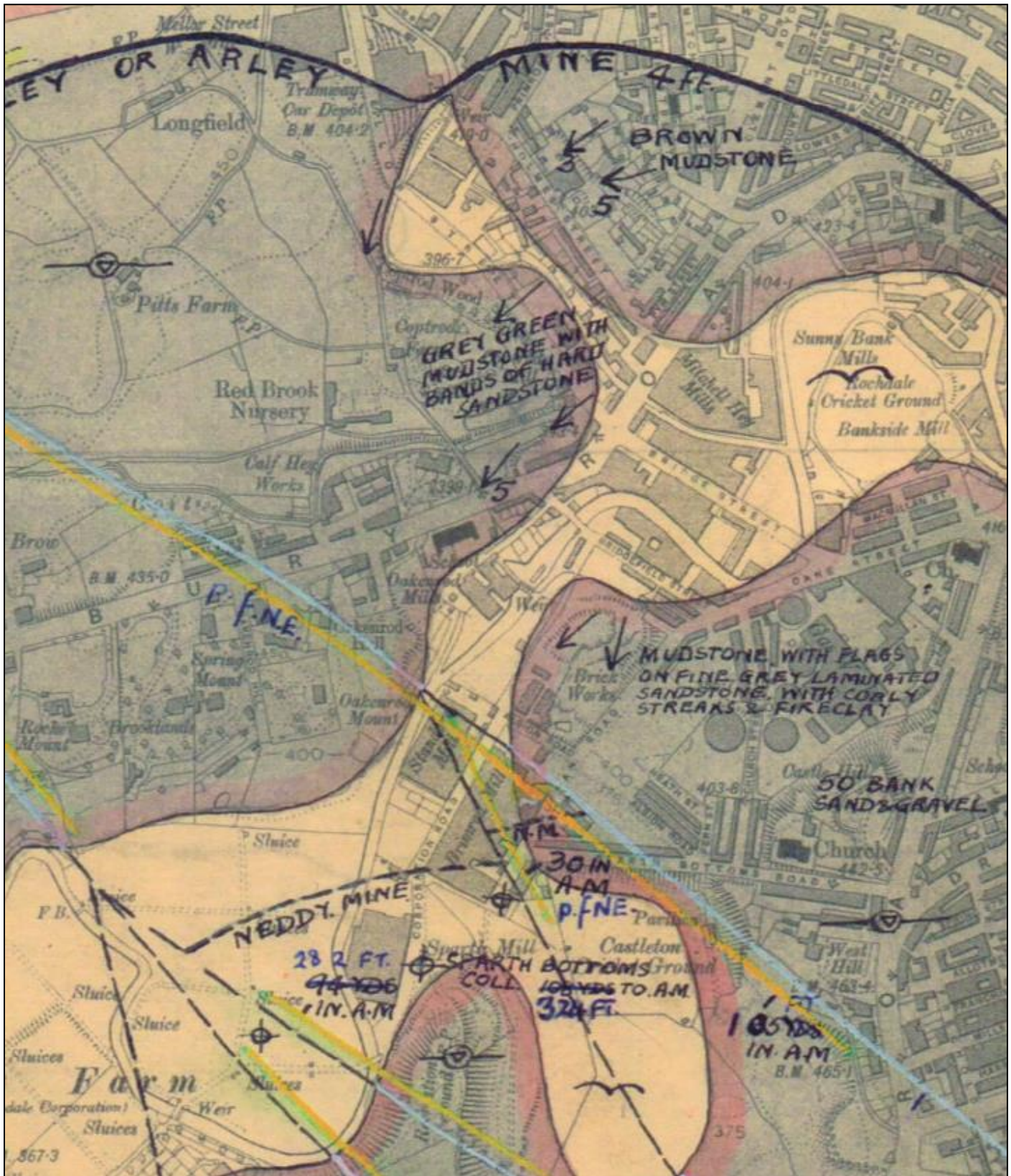
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Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.
If no level or flow data is available for a scenario, no table will be shown.

3.7 Environment Agency Surface Water Flood Maps.





3.8 BGS Superficial Geology Map.



3.10 NPPF Planning Practice Guidance Table 1.**Table 1: Flood Zones**

These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. They are shown on the Environment Agency's [Flood Map for Planning \(Rivers and Sea\)](#), available on the Environment Agency's web site, as indicated in the table below.

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 has to 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)

3.11 NPPF Planning Practice Guidance Annex 3.**Annex 3: Flood risk vulnerability classification**

Information on flood risk vulnerability classification.

Essential infrastructure

- Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk.
- Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including infrastructure for electricity supply including generation, storage and distribution systems; including electricity generating power stations, grid and primary substations storage; and water treatment works that need to remain operational in times of flood.
- Wind turbines.
- Solar farms.

Highly vulnerable

- Police and ambulance stations; fire stations and command centres; 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. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure'.)

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.