Flood Risk Assessment

1 Brunel Way,

Yatton,

North Somerset

BS49 4RH

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Disclaimer

The information provided in this report is solely for the purpose of flood risk assessment for property owner's planning proposal mentioned in this report. We are not responsible or liable for any associated loss or damage if this document is used for any other purpose.

Contents

List of Abbreviations

S No.	Abbreviation	Description
1.	LLFA	Lead local flood authorities
2.	DEFRA	Department for environment, food and rural affairs
3.	EA	Environment Agency
4.	RoFSW	Risk of Flooding from Surface Water
5.	NPPF	Revised National Planning Policy Framework
6.	FRA	Flood Risk Assessment
8.	LPA	Local Planning Authority

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Flood Risk Assessment

Summary

This FRA has been carried out in accordance with the requirements of the Revised National Planning Policy Framework (NPPF) published on 19 June 2019 and the Environment Agency's Flood Risk Assessment (FRA) Guidance Notes.

1.1 Site Information

- Address: 1 Brunel Way, Yatton, North Somerset BS49 4RH
- LLFA: North Somerset council
- Planning Proposal: Single storey rear extension

1.2 Site Specific Flood Risk

This site lie within **Flood Zone 3** as identified by the Environment Agency, being the zone with risk of between 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.

The risk of flooding to the site, 1 Brunel Way, Yatton, North Somerset, BS49 4RH from fluvial flooding (river and sea flooding) is low risk (Appendix A, Figure 3) which means that each year this area has a chance of flooding of between 0.1% and 1%.

The site has very low risk of surface water flooding which means that each year this area has a chance of flooding of less than 0.1% (Appendix A, Figure 4). Site is at maximum risk of reservoir flooding with risk of water depth between 0.3 and 2m and risk of water speed below 0.5m/s. Particular reservoir that could affect this area is Blagdon (grid reference ST5018860098) which is owned by Bristol Water Plc.

The site has no history of flooding within 20m of its vicinity and is benefitting from flood defences. The risk of water depth from surface water flooding is below 300mm (Appendix A, Figure 5) so flood resistant measures should be taken to keep the water

out as much as possible in case of flooding. As a protection measure against flooding the proposed plans have floor levels not lower than the existing floor levels of the property and flood proofing will be incorporated appropriately according to flood resistance measures. This approach will provide minimum damage and easy recovery in case of flooding.

Residents are well informed about flood warnings and safety recommendations of government, environment agency and local flood authority. Resident's personal flood plans, check list, action plans and emergency flood kit are also in place.

This report demonstrates that in terms of flood risk, the proposal is safe for its design life and will not increase risk of flooding elsewhere.

1.3 Sources of Information

This flood risk assessment has been prepared using following information sources. Specific links for data used in this report are listed in references section at the end of report.

- Revised National Planning Policy Framework (NPPF) (19 June 2019)
- Environment Agency's Flood Risk Assessment (FRA) Guidance Notes
- Environment Agency's Maps
- North Somerset Core Strategy 2013
- Development and flood risk issues, North Somerset Council, 2019
- North Somerset Council Level 1 Strategic Flood Risk Assessment 2020
- North Somerset Council Strategic Flood Risk Assessment: Level 1

This FRA has been prepared and submitted on 14th April, 2021.

Objectives

The objectives of a site-specific flood risk assessment 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;
- 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.

Introduction and Site Specific Flood Risk

1.4 Site Description

Address of the site is 1 Brunel Way, Yatton, North Somerset BS49 4RH. This site is located in North Somerset. North Somerset lies in south west of Bristol, abutting the city boundary to the north and east, The Severn estuary coast to the west and the Mendip Hills in the south. There is a varied landscape with coastal and rural, international and national designations such as Sites of Special Scientific Interest and the Mendip Hills Area of Outstanding Natural Beauty. North Somerset is low-lying therefore flood risk is a very important matter.

Bedrock geology from BGS geological data (Appendix A, Figure 15) indicate Mercia Mudstone Group - Mudstone And Halite-stone. Sedimentary Bedrock formed approximately 201 to 252 million years ago in the Triassic Period. Local environment previously dominated by hot deserts. These sedimentary rocks are fluvial, lacustrine and marine in origin. They are detrital, deposited in lagoons or shallow seas; where a hot, arid climate also leads to the precipitation of beds of evaporites.

Superficial deposits of the site (Appendix A, Figure 16) indicate Tidal Flat Deposits - Clay And Silt. Superficial Deposits formed up to 2 million years ago in the Quaternary Period. Local environment previously dominated by shorelines (U). These sedimentary deposits are shallow-marine in origin. They are detrital, generally coarse-grained forming beaches and bars in a coastal setting.

1.5 Development Proposal

The development proposal is single storey rear extension.

1.6 Flood Zones

Flood zones describe the probability of flooding in any particular site. The Environment Agency divides area in to three flood zones according to nature of flooding probability.

These three flood zones are described in Table 1 below. These flood zones refer to the probability of river and sea flooding, ignoring the presence of defenses. Environment agency's data shows that this site is in zone 3 (Appendix A, Figure 2) which means 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding (Table 1).

Table 1: Description of flood zones

S. No.	Zone	Annual Probability of Flooding	Description
1.	Zone 1	Low probability <0.1%	Land having a less than 1 in 1,000 annual probability of river or sea flooding.
2.	Zone 2	Medium probability 1 - 0.1% River Flooding 0.5 – 0.1% Sea Flooding	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.
3.	Zone 3a	High probability >1% River Flodding >0.5% Sea Flooding	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.
4.	Zone 3b	The functional flood plain	This zone comprises land where water has to flow or be stored in times of flood.

1.7 Flood Risk Vulnerability

Flood risk vulnerability classifications are as follows,

Essential Infrastructure: Essential transport infrastructure, Essential utility Infrastructure, Wind Turbines

Highly vulnerable: Police and ambulance stations, Fire stations and command center, Telecommunication installations Emergency dispersal points, Basement dwellings Caravans, mobile homes, park homes, Installations requiring hazardous substances consent

More vulnerable Hospitals, residential institutes, dwelling, Houses, 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

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 and more

According to NPG, all residential places and dwelling houses come under more vulnerable category. This site is proposed to be converted to residential place so its flood risk vulnerability classification is **more vulnerable**.

1.8 Sequential Test and Exception Test

According to the guidelines of NPPF (Paragraph 158-163), the aim of the sequential test is to steer new development to areas with the lowest risk of flooding. If it is not possible for development to be located in zones with a lower risk of flooding (taking into account wider sustainable development objectives), the exception test may have to be applied.

For the exception test to be passed it should be demonstrated that (a) the development would provide wider sustainability benefits to the community that outweigh the flood risk; and (b) 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. Both elements of the exception test should be satisfied for development to be allocated or permitted.

However, it is stated in paragraph 164 of NPPF that the applications for some minor development and changes of use should not be subject to the sequential or exception tests but should still meet the requirements for site-specific flood risk assessments. The proposed development plan is a minor extension so we are not applying sequential or exception test but fulfilling all the requirements for site specific flood risk assessments as outlined in the objectives section.

1.9 Climate Change

Climate change is drastically affecting weather conditions globally and is most likely going to increase flood risk due to extreme weather. In order to manage flood risk over the life time of development, it is very important to consider climate change impact. The environment agency has prepared list of climate change allowances that predict the anticipated changes for peak river flow, peak rainfall intensity, sea level rise and offshore wind speed and extreme wave height based on UK climate change projection. The EA will use these climate change allowances when they provide advice on flood risk assessments and strategic flood risk assessments.

This site is located in **Severn river basin district** (Appendix A, Figure 14). The peak river flow allowances data for Thames basin district is given in Table 2. Site specific

peak river flow allowances depend on flood risk vulnerability classification of the site. Table 3 provides guidelines for using peak river flow allowances according to flood zones and flood risk vulnerability classification. According to table 2 and 3, the site of interest will follow higher central and upper allowances. Maximum total potential change anticipated from year 2015 to 2039 that is 15% and 25% respectively for higher central and upper end allowances whereas maximum total potential change anticipated from year 2070 to 2115 that is 35% and 70% respectively for higher central and upper allowances. These allowances should be used for assessing the impact of climate change to the flood risk to the site.

Table 2: Peak river flow allowances by site specific river basin district (use 1961 to 1990 baseline).

River basin district	Allowance Category	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Severn	H++	25%	45%	90%
	Upper End	25%	40%	70%
	Higher Central	15%	25%	35%
	Central	10%	20%	25%

Table 3: Peak river flow for flood risk assessments

Flood Zones	Flood Risk Vulnerability Classification				
	Essential Infrastructure	**Highly Vulnerable**	**More Vulnerable**	**Less Vulnerable**	**Water-Compatible**
Zone 2	Upper	Higher Central and Upper	Higher Central and Upper	Central	Central
Zone 3a	Upper	X	Higher Central and Upper	Central and Higher Central	Central
Zone 3b	Upper	X	X	X	Central

1.10 Flood Risk Maps

The flood risk maps indicate the potential risk and impacts of flooding in the flood risk areas. They are published to meet the requirements of the flood risk regulations and are reviewed and updated after every six years. These maps are static and are based on the existing data and risk assessment information from December 2019. The latest preliminary flood risk assessment (PFRA) was published in 2018, in which The Environment Agency identified all the flood risk areas. The maps do not show information at a property level. Risk of flooding can be found by viewing the long-term flood risk information.

All the flood risk maps for this site explained in flood risk assessment are given in Appendix A.

1.11 Sources of Flooding

The common sources of flooding Rivers (Fluvial Flooding), Groundwater Flooding, Surface water (Pluvial Flooding) and Reservoirs Flooding

1.11.1 River Flooding

When the capacity of watercourse is reached and water is spilled out of the channel into flood plain (surrounding areas) causing fluvial flooding (river and sea flooding).

There is **low risk** of river water flooding to this site (Appendix A, Figure 3) which means each year this area has a chance of flooding of between 0.1% and 1%. (Appendix A, Figure 3). This takes into account the effect of any flood defences in the area. These defences reduce but do not completely stop the chance of flooding as they can be overtopped, or fail.

1.11.2 Ground Water Flooding

Ground water flooding is caused by rising levels of water table that is the underground surface with rocks or soil saturated with water. Rising water table results in seepage of water to the ground and flooding. Buildings with basements are more prone to ground water flooding.

The proposed site does not include a basement element hence the risk from ground water flooding is **low.**

1.11.3 Surface Water Flooding (Pluvial Flooding)

Surface water flooding or sometimes referred as flash flooding, is caused by complete lack of or poor drainage of rain water. Surface water flooding can also happen up hills and away from rivers and other bodies of water and is more widespread in areas with harder surfaces like concrete.

It is hard to predict surface water flooding because it depends on the volume as well as location of rainfall and both of these factors are difficult to forecast. In addition, local

features can greatly affect the chance and severity of flooding. There are four categories of surface water flooding described in Table 4.

Table 4: Categories of extent of surface water flooding

S. No.	Extent of surface water flooding	Description
1.	High Flooding	Flood occurring as a result of rainfall with a greater than 1 in 30 chance in any given year (annual probability of flooding 3.3%)
2.	Medium Flooding	Flood Occurring as a result of rainfall of between 1 in 100 (1%) and 1 in 30 (3.3%) chance in any given year
3.	Low Flooding	Flood occurring as a result of rainfall of between 1 in 1000 (0.1%) and 1 in 100 (1%) chance in any given year
4.	Very Low Flooding	Flood occurring as a result of rainfall with less than 1 in 1000 (0.1%) chance in any given year

The risk of pluvial flooding or flooding from surface water to this property is **very low** according to environment agency maps (Appendix A, Figure 4). Moreover, in case of surface water flooding water depth indicated at site is below 300mm (Appendix A, Figure 5) and water velocity is less than 0.25 m/s (Appendix A, Figure 6). Direction of water flow is also away from the site.

1.11.4 Reservoirs Flooding

Reservoir flooding is caused by failure of a reservoir holding more than 25,000 cubic metres of water resulting in sudden release of water and flooding. Due to proper

maintenance, there has been no loss of life in the UK from reservoir flooding since 1925.

Environment agency's flood risk map for the extent of flooding from reservoirs at this site shows **maximum risk** (Appendix A, Figure 7) with risk of flood depth around 0.3 and 2m and water speed less than 0.5m/s.

A small number of reservoirs have been identified within North Somerset, including the Barrow Gurney reservoirs and Blagdon Lake. Particular reservoir that could affect this site is Blagdon (grid reference ST5018860098) which is owned by Bristol Water Plc.

1.12 Flood Warning Areas

Flood warning areas are the geographical areas where flooding is expected to occur. The data from environment agency include maps indicating flood warning areas, defining the discrete community at the risk of flooding. These areas include properties that are expected to flood from rivers or the sea and in some areas, from ground water. This data has been last updated on 20th March 2020.

Environment agency's map for flood warning areas, (depicted in purple boundary), include the site that is 1 Brunel Way, Yatton, North Somerset BS49 4RH (Appendix A, Figure 10). Flood defences around the site will be responsibility of the owners and recommended flood protection houses are flood boards, flood proofing of exterior walls of house to flood level, and sand/water bags.

1.13 Flood History of the Property

Environment agency historical flooding data does not include this site (Appendix A, Figure 11).

Flood Risk Management and Mitigation

Lead local flood authorities (LLFA) are responsible for managing the flood risk. Lead local flood authority (LLFA) for the site, 1 Brunel Way, Yatton, North Somerset BS49 4RH is North Somerset Council. This FRA has been prepared according to the guidance of the respected Council.

It is advised to take adequate measures in order to reduce damage from predicted flood risk. These protective measures do not reduce the risk of flooding, however, they can certainly limit the damage and provide maximum possible protection. Flood risk management is achieved by taking measures that would decrease the flow of flood and eventually reduce the risk of water entering the property. An example of such measures is building some structures like bunds and walls. In addition, there are certain construction techniques that are practically helpful to enhance flood resistance and resilience. Implementing these recommended construction strategies can effectively mitigate flood risk and damage.

The site 1 Brunel Way, Yatton, North Somerset BS49 4RH is protected by flood defences (Appendix A, Figure 12) and has no history of flooding (Appendix A, Figure 11). Flood resistance and resilience measures should be based on advice from either the Royal Institute of Chartered Surveyors (RICS) or the Flood Protection Association. These measures are discussed below.

1.14 Formal and Informal Flood Risk Management Assets

Flood risk management assets are divided into two categories: formal and informal assets. Formal flood risk management assets are built specifically in order to control floodwater. Owners should take care that it stays in functional state. Informal flood risk management assets are not specifically built to control floodwater but serve that purpose by retaining flood water in addition to their primary function. Examples of informal flood management assets are road and rail embarkments or buildings and boundary walls.

1.15 Finished Floor Levels

According to the Environment Agency's guidance (Ver 3.1, April 2012) on Householder and other minor extensions in Flood Zones 2 and 3, it will be ensured that floor levels within the proposed development will be set no lower than existing levels and flood proofing of proposed development will be incorporated wherever possible.

1.16 Flood Resistance Measures (Water Exclusion Strategy)

Flood resistance measures should be taken in areas at risk of low depth flooding that is less than 0.3m. These are precautionary measures that should be deployed before the occurrence of flooding. These measures help to prevent water ingress into a building through water exclusion strategy and are appropriate for preventing water entry associated with fluvial flooding as well as surface water and sewer flooding.

Flood resistance measures have the benefit of reducing the impact of flood water directly affecting buildings. In addition, this strategy give occupants more time to relocate. However, these measures will be effective for flood that is short in duration and depth (less than 0.3m).

Following are the strategies included in flood resistance measures:

1.16.1 Construction Material

Construction materials with low permeability should be used. Building materials that are effective for a 'water exclusion strategy' include: engineering bricks, cement-based materials including water retaining concrete and dense stone. Additionally air bricks will be installed.

1.16.2 Floors

Concrete ground-supported floors are the preferred option and concrete slabs of at least 100mm thickness should be specified.

1.16.3 Hardcore and blinding

Good compaction should be achieved to reduce the risk of settlement and consequential cracking.

1.16.4 Flood Gates

Flood gates with water proof seals will be used for proper flood resistance.

1.17 Flood Resilience Measure (Water Entry Strategy)

Flood resilience measures are recommended for areas at risk of frequent or prolonged flooding with flood depths greater than 0.6m. Excessive water pressure in such cases is likely to damage structure therefore the recommended strategy is to allow entry of water into the building. Some examples are using timber floors above solid concrete, raised cupboards, water resistant door frames, non-return valves on drainage pipes and water resistant plaster.

The electrical wiring should drop from the ceiling on the ground floor to sockets 400mm above ground level and all drainage and waste pipes should be fitted with ‘non-return valves’ to prevent the ingress of contaminated water back into the building.

More construction strategies recommended as flood resilience measures are as follows:

1.17.1 Construction Material

Construction material used should have good drying and cleaning properties so integral structure can be retained after water entry. Other option is to use sacrificial materials which can be easily replaced after flooding. An example is suing gypsum plasterboard that can be easily replaced later.

The denser materials such as concrete and engineering bricks have good resilience characteristics. Building materials that are suitable for a water entry strategy include facing bricks, concrete blocks, sacrificial or easily removable external finishes or internal linings.

1.17.2 Fittings

Flood resilient fittings should be used to at least 0.1m above the design flood level.

1.17.3 Floors

Ground supported floors are the preferred option and concrete slabs of at least 150mm thickness should be specified for non-reinforced construction. Hollow slabs are not suitable if the elements are not effectively sealed. Reinforced concrete floors are acceptable but may be prone to corrosion of any exposed steel in areas of prolonged flooding.

Damp Proof Membranes should be included in any design to minimize the passage of water through ground floors. Impermeable polythene membranes should be at least 1200 gauge to minimize ripping.

1.17.4 Insulation materials

Water will lower the insulation properties of some insulation materials. Floor insulation should be of the closed-cell type to minimize the impact of flood water. The location of insulation materials, whether above or below the floor slab, is usually based on either achieving rapid heating of the building or aiming for more even temperature distribution with reduced risk of condensation. Insulation placed above the floor slab (and underneath the floor finish) rather than below would minimize the effect of flood water on the insulation properties and be more easily replaced, if needed.

1.17.5 Floor finishes

Suitable floor finishes include ceramic or concrete-based floor tiles, stone, and sand/cement screeds. All tiles should be bedded on a cement-based adhesive/bedding compound and water resistant grout should be used.

Concrete screeds above polystyrene or polyurethane insulation should be avoided as they hinder drying of the insulation material. Suitable materials for skirting boards

include ceramic tiles and PVC. Ceramic tiles are likely to be more economically viable and environmentally acceptable.

1.18 Surface Water Drainage

In order to discharge surface run off, the following hierarchy of drainage options are reasonably practicable:

- Infiltration (Drainage into the ground)
- Drainage to a surface water body
- Drainage to a surface water sewer, highway drain, or another drainage system;
- Drainage to a combined sewer.

Drainage to surface water sewer or combine sewer is a better approach for this site. The proposed surface water drainage site is main sewer. It would be necessary to fit interceptors to the drainage to make sure only clean water enters the receptor. It would also be necessary to fit flow control valves to the system, such as hydro-brakes, to make sure there is no “surge” into the system which could cause a surcharge to take place. Backflow from any drainage should be prevented by the use of non-return valves.

1.19 Flood Warning and Evacuation Plans

Environment Agency recommends prepare, act and survive strategy. Warning signs, recommended strategies and helpline numbers are shown in a promotional campaign material depicted in Figure15.

Environment Agency has a tool on its website to prepare personal flood plan that would be useful in case of emergency. This plan includes a checklist of things to do before, during and after flooding. Personal flood plan also records important emergency contact details. Figure 16 shows example of personal flood plan.

For the site under consideration a printed and filled copy of personal flood plan has been prepared and kept at a handy location by house owner.

Following are the stepwise recommendations in case of flooding

1. Check your household plan, if you have already created one.

2. Move people, pets, valuables, grab bag, sentimental items, electrical equipment and furniture upstairs or raise high off the floor. Make sure to also move your car to a safe or higher land level.
3. See if you can stay with family or friends in a safe area. Remember to take your grab bag!

4. Collect personal information together in a waterproof bag, including insurance details, bank details, essential telephone numbers (including your insurance company and Floodline 0345 988 1188).

5. Make sure to turn off your gas and electricity before water enters your home.

6. Alert neighbours and assist the elderly, infirm and those with small children if it is safe to do so.

Conclusion

This site lies within Flood Zone 3 that indicates medium risk. Risk of flooding to the site from river/sea flooding is low whereas risk of surface water flooding is very low. There is no ground water flooding risk. The maximum risk of flooding to the site is from reservoir flooding. This site is also protected by flood defences and has no history of flooding. and the site has risk of water depth from surface water flooding lower than 300mm. It is more reasonable to apply flood resistant measures for this site to keep the water out as much as possible.

Residents are well informed about flood warnings and safety recommendations of government, environment agency and local flood authority.

This report demonstrates that in terms of flood risk, the proposal is safe for its design life and will not increase risk of flooding elsewhere.

Appendix A: List of Figures

Site Location Map

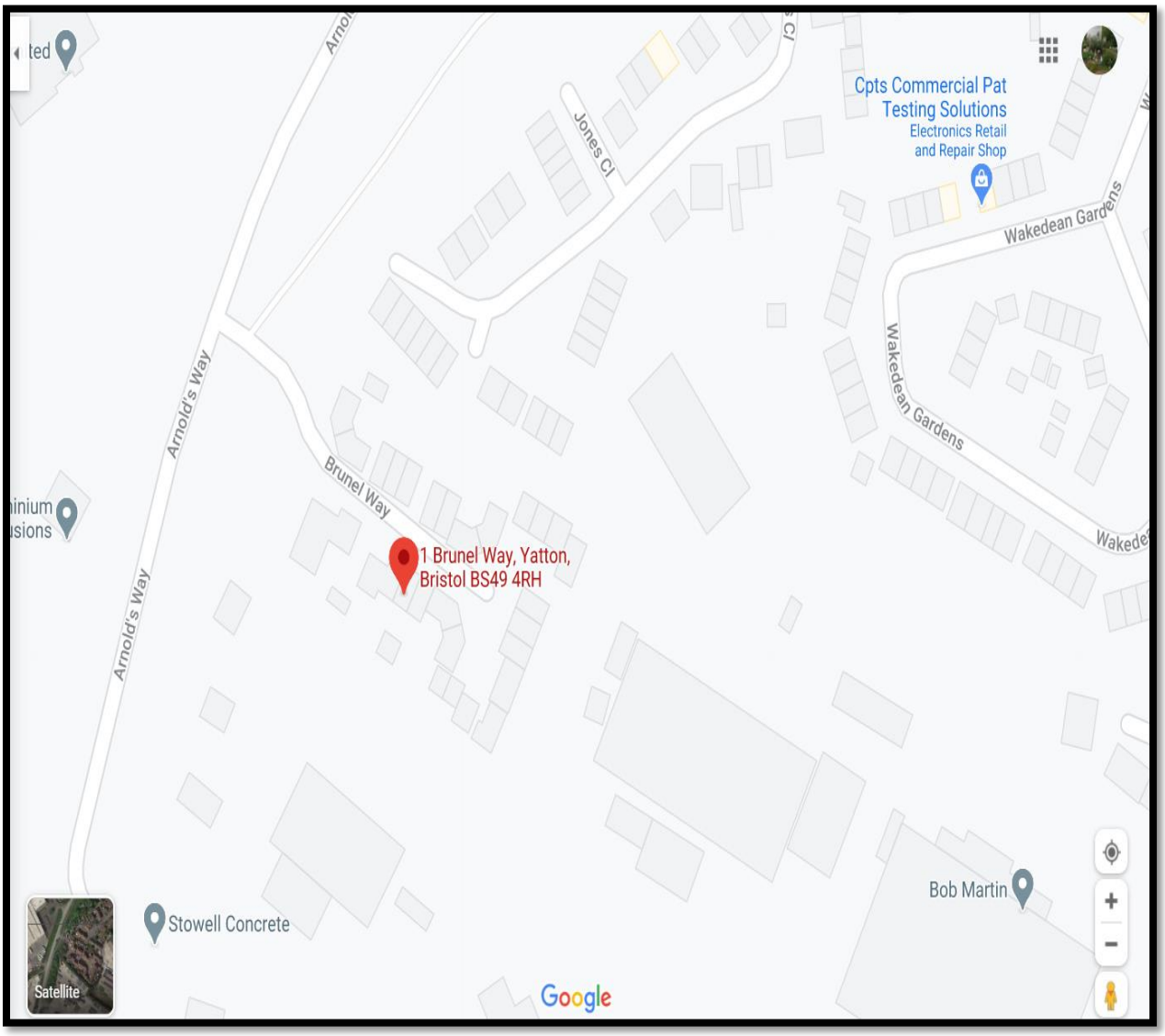

Figure 1: Site location map from Google Maps showing location of the site 1 Brunel Way, Yatton, North Somerset BS49 4RH.

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Flood Zone Map

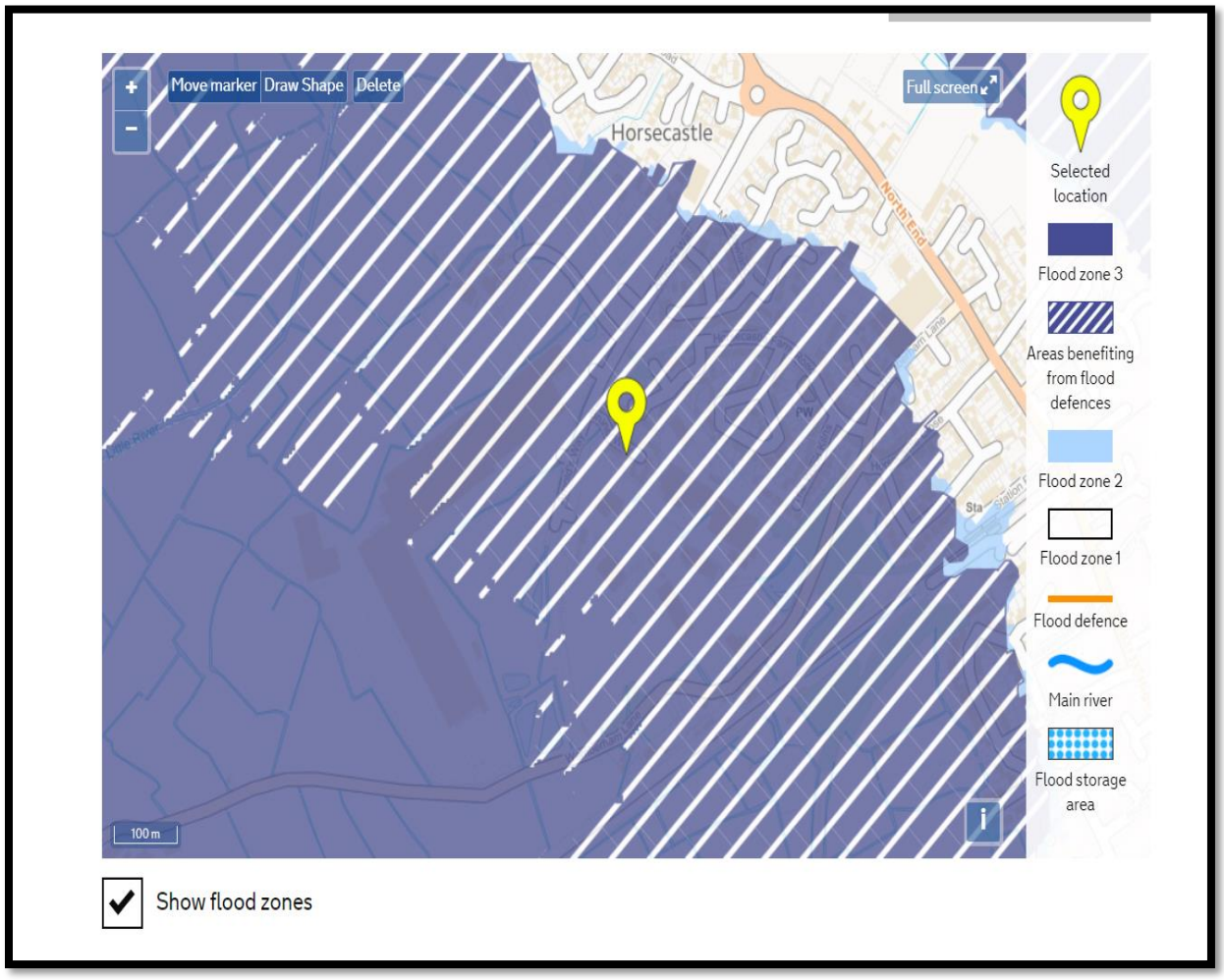

Figure 2: Environment agency's flood zone map shows that the site 1 Brunel Way, Yatton, North Somerset BS49 4RH lies in flood **zone 3, with area benefitting from flood defences.**.

Extent of Fluvial or River/Sea Flooding

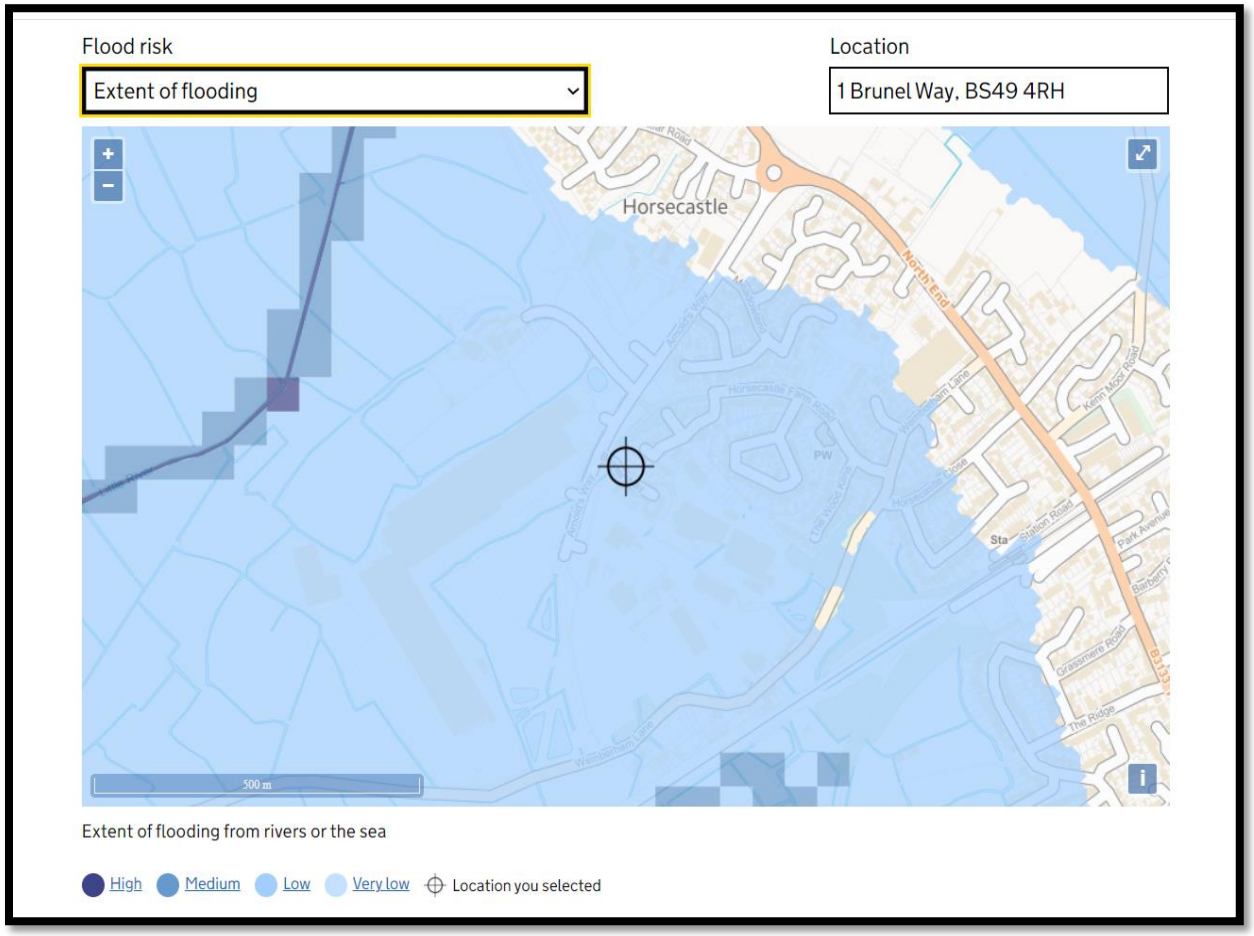

Figure 3: Environment agency's flood risk map and description for the extent of flooding from river or sea water at 1 Brunel Way, Yatton, North Somerset BS49 4RH shows **low risk**.

Extent of Surface Water Flooding

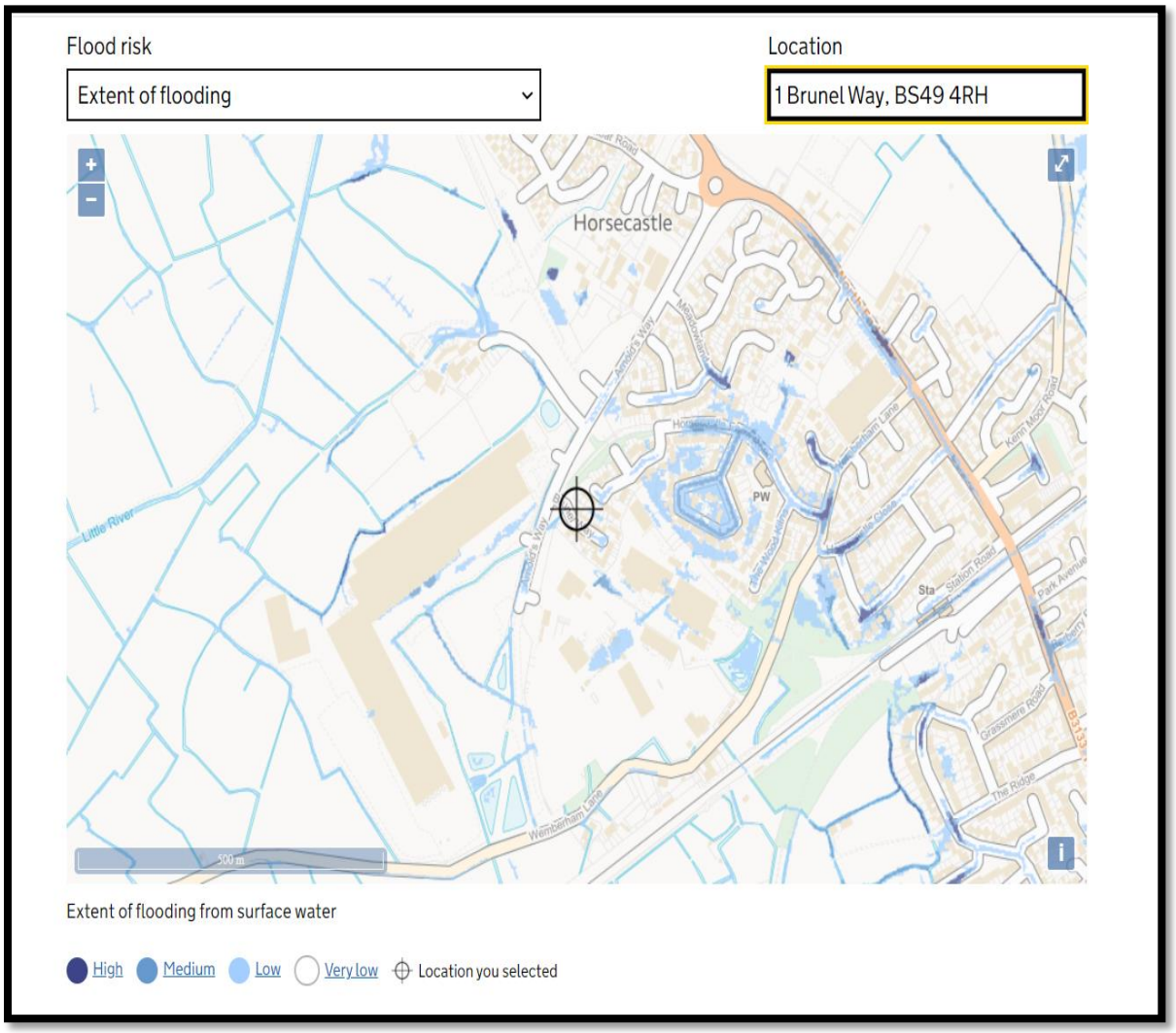

Figure 4: Environment agency's flood risk map and description for the risk of flooding from surface water at 1 Brunel Way, Yatton, North Somerset BS49 4RH shows very low risk.

Surface Water Depth

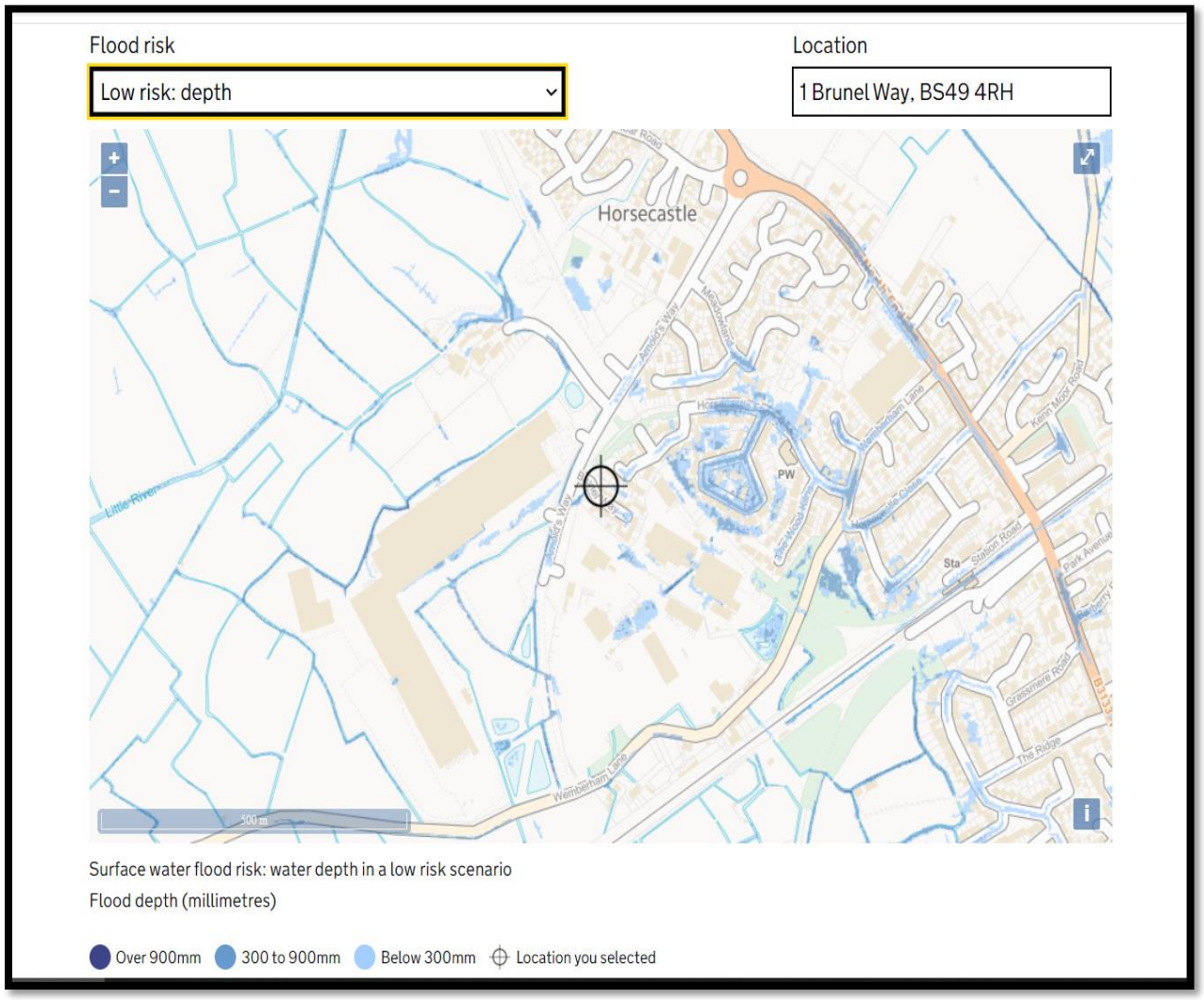

Figure 5: Environment agency's flood risk map for water depth in a low risk scenario of surface water flooding shows that 1 Brunel Way, Yatton, North Somerset BS49 4RH is close to area with water depth below 300mm.

Surface Water Velocity

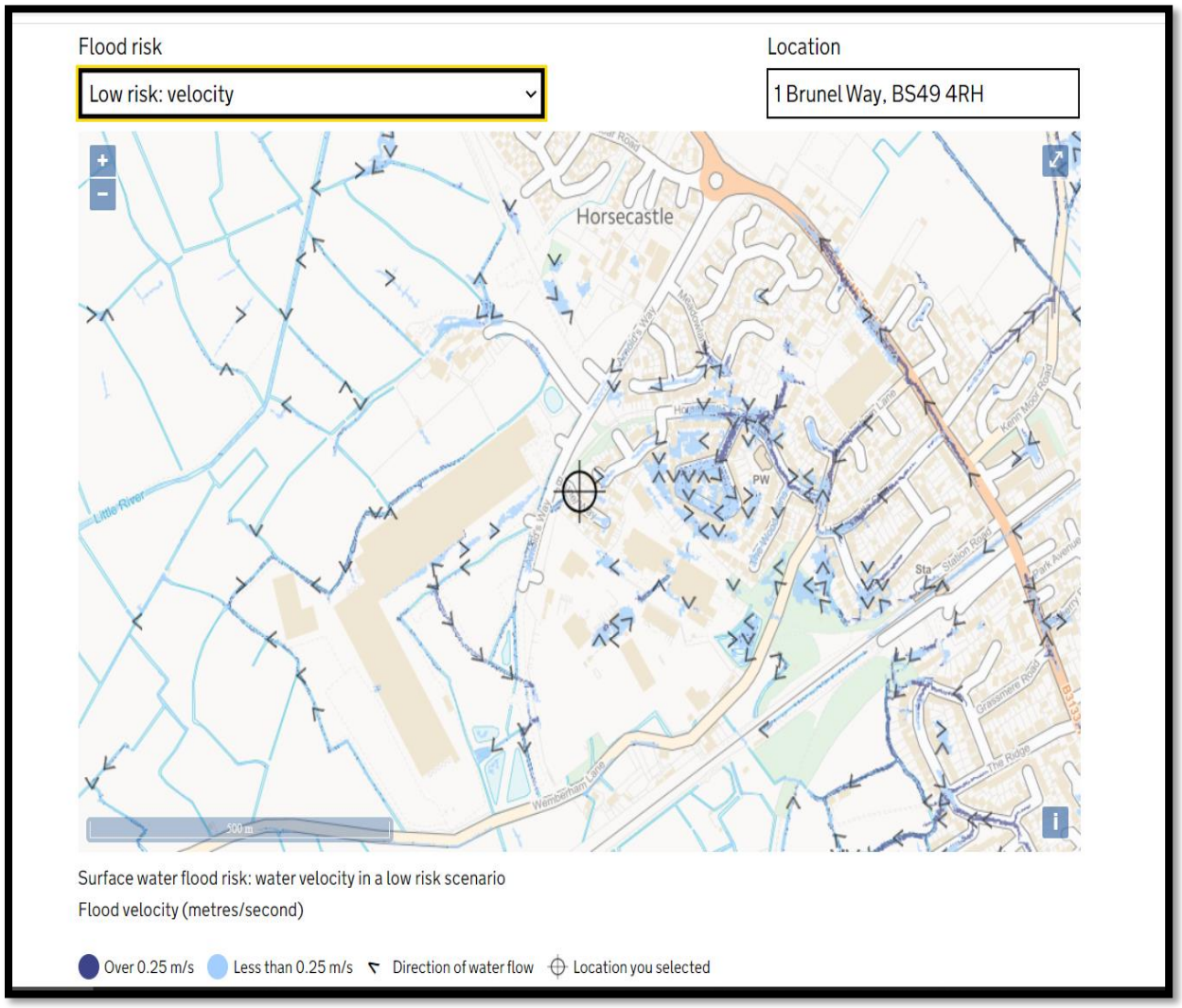

Figure 6: Environment agency's flood risk map for water velocity in a low risk scenario of surface water flooding shows that 1 Brunel Way, Yatton, North Somerset BS49 4RH is close to area with water velocity less than 0.25 m/s.

Extent of Reservoirs Flooding

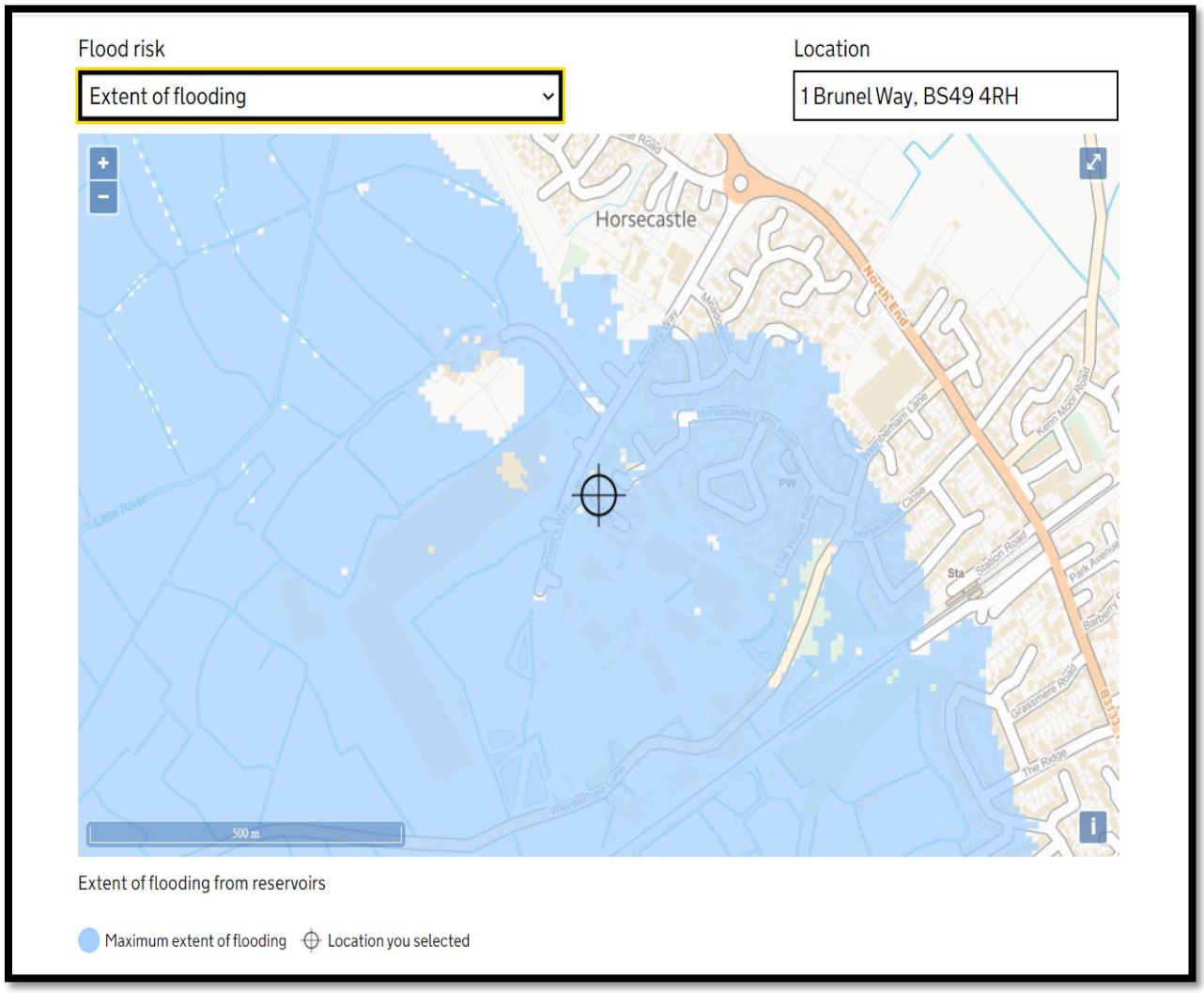

Figure 7: Environment agency's flood risk map for the extent of flooding from reservoirs at 1 Brunel Way, Yatton, North Somerset BS49 4RH shows maximum extent of flooding.

Reservoir Flood: Water Depth

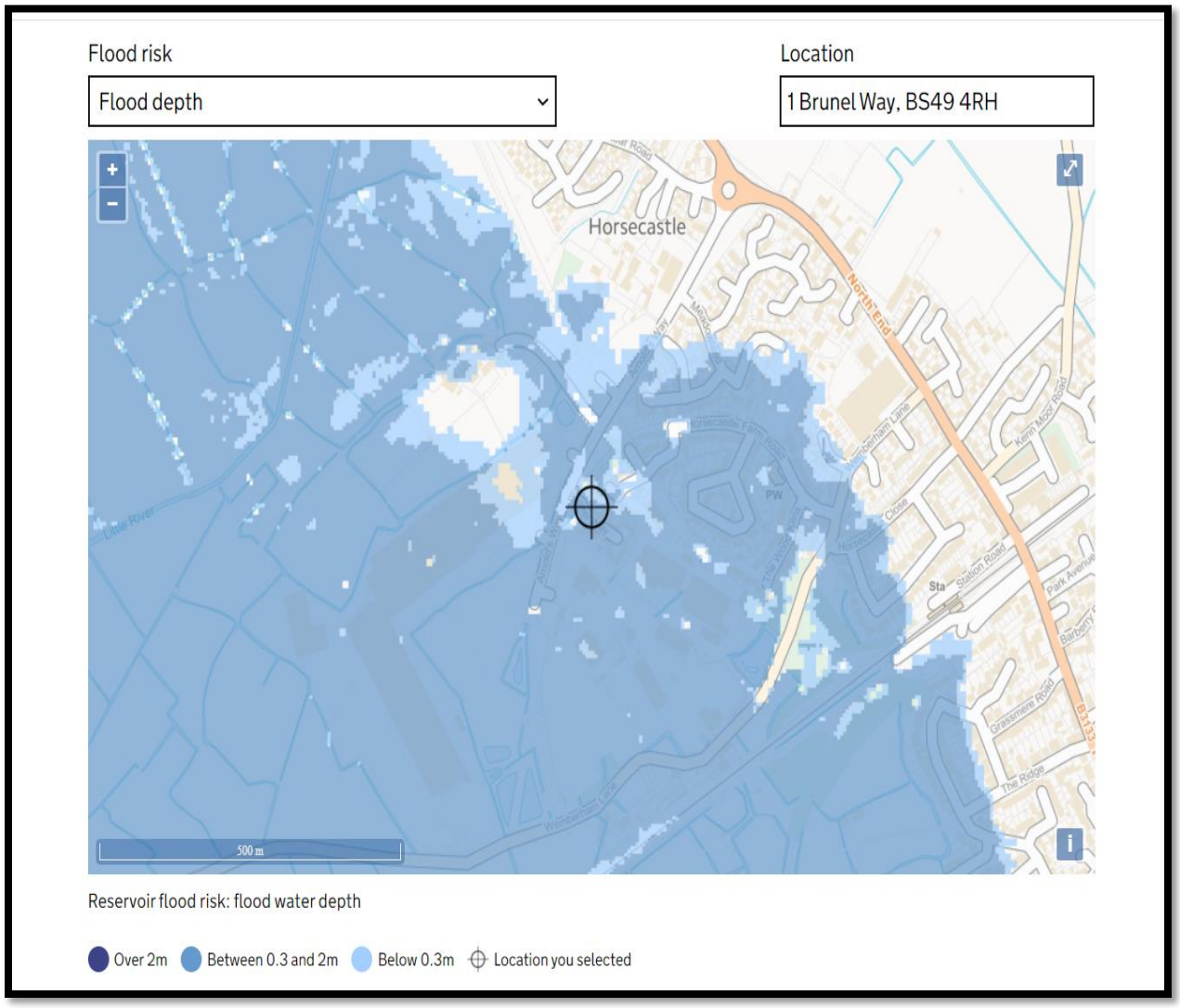

Figure 8: Environment agency's flood risk map for the depth of flooding from reservoirs at 1 Brunel Way, Yatton, North Somerset BS49 4RH shows between 0.3 and 2m of flooding risk

Reservoir Flood: Water Speed

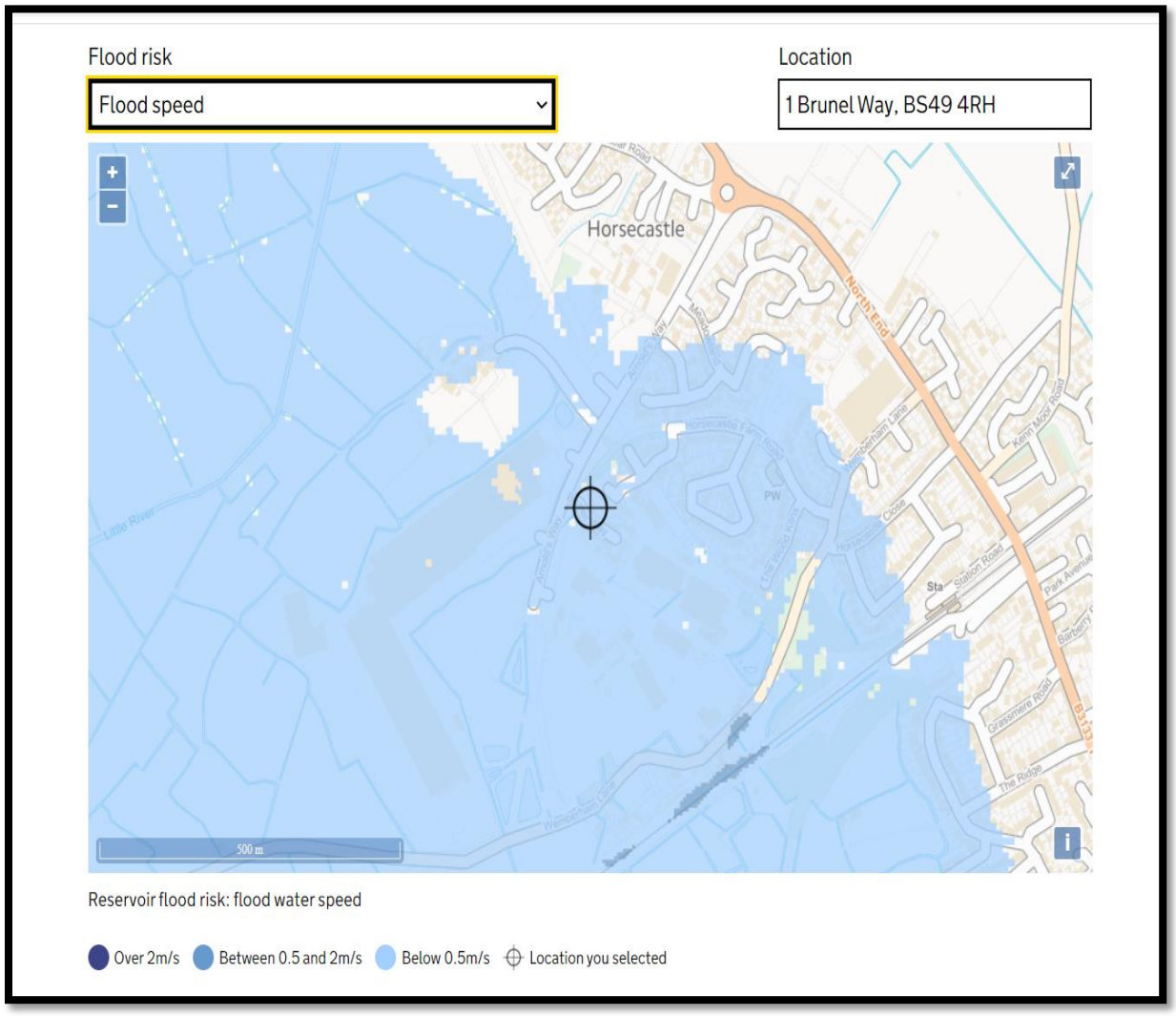

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Figure 9: Environment agency's flood risk map for the speed of flooding from reservoirs at 1 Brunel Way, Yatton, North Somerset BS49 4RH shows below 0.5m/s of flooding speed.

Site in Flood Warning Area Map

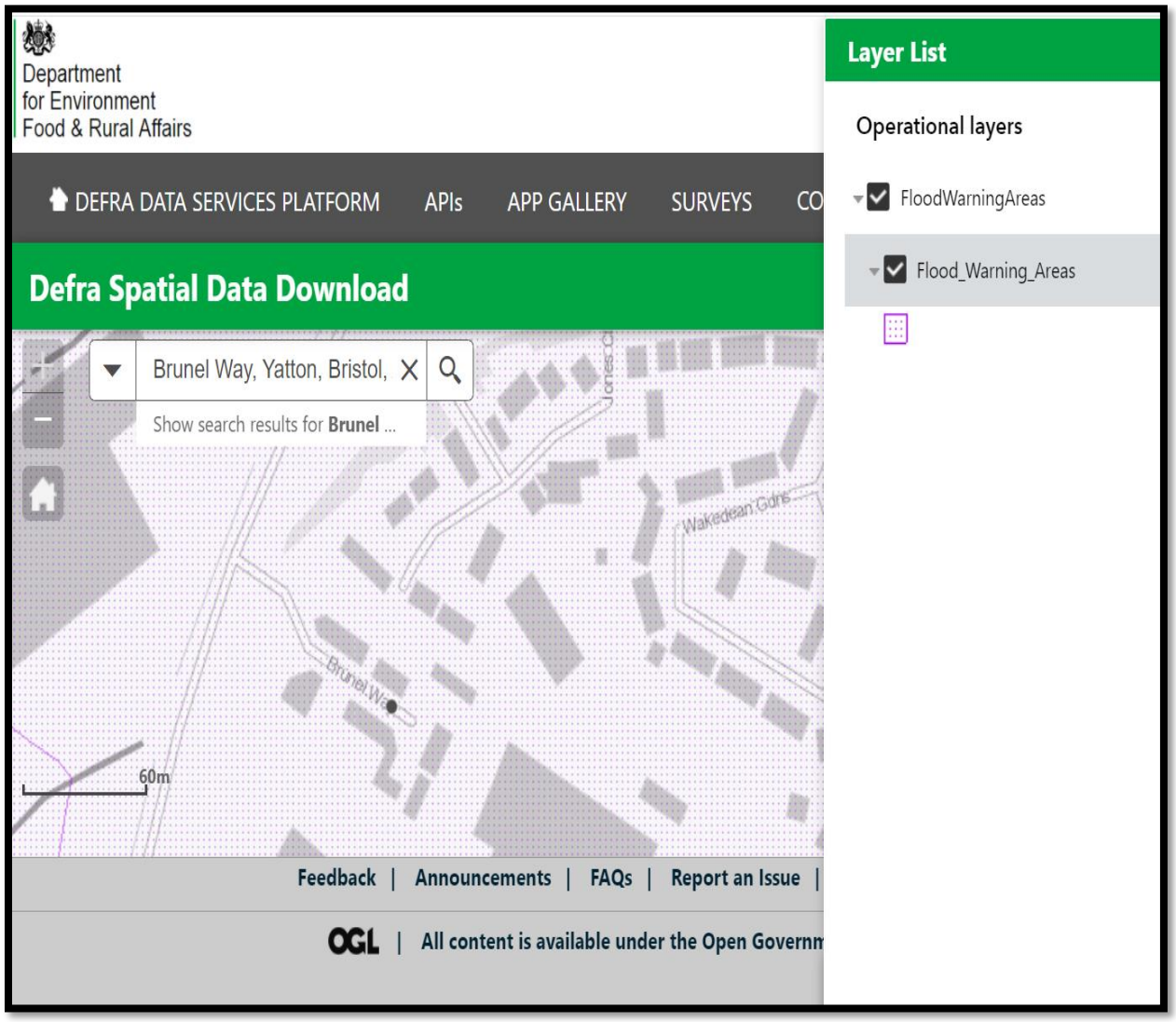


Figure 10: Environment agency's map for flood warning areas, (depicted in purple boundary) include 1 Brunel Way, Yatton, North Somerset BS49 4RH.

History of Flooding on Site

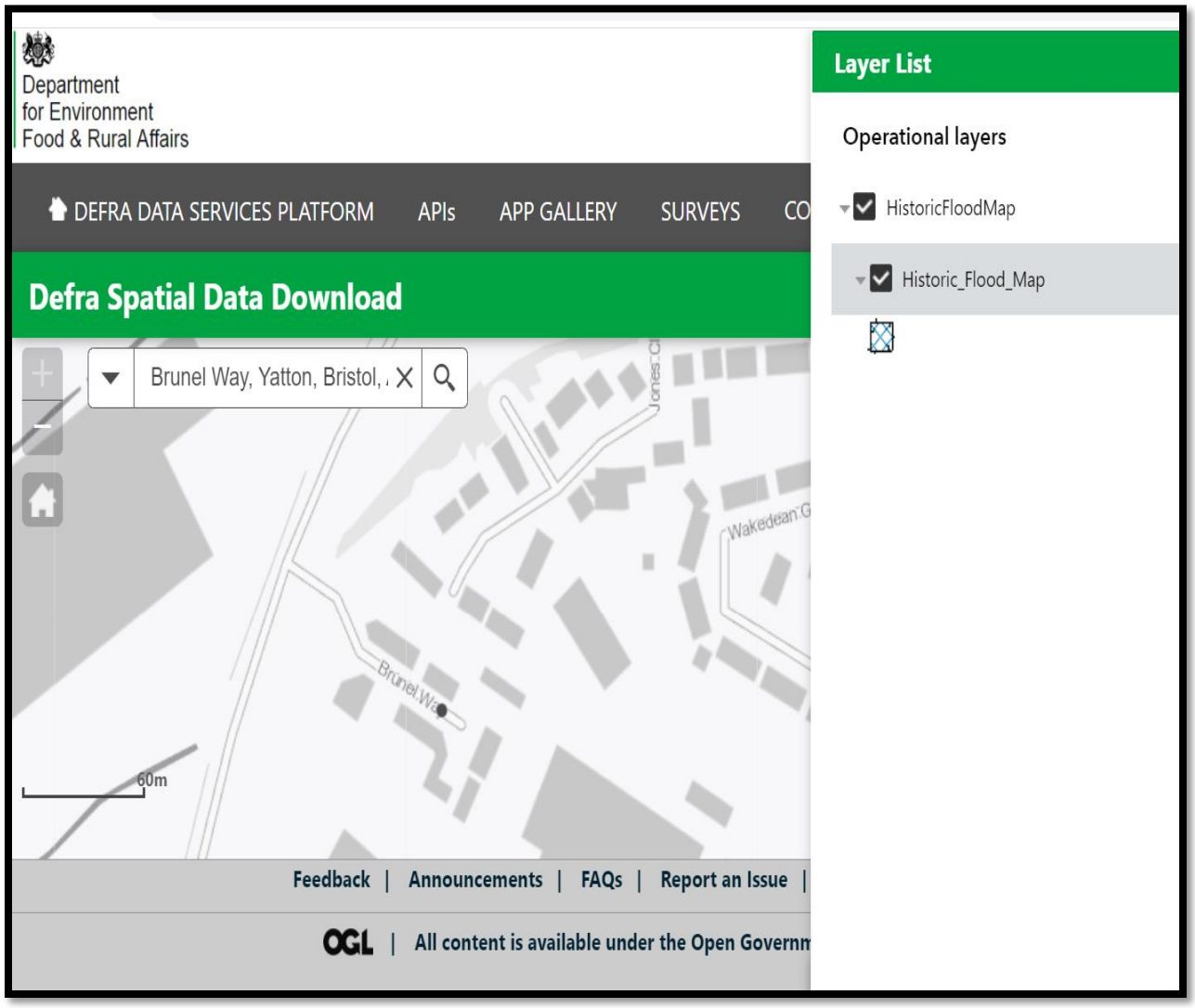


Figure 11: Environment agency's map historic flooding (depicted in blue), does not include the site1 Brunel Way, Yatton, North Somerset BS49 4RH.

Areas Benefitting from Flood Defences

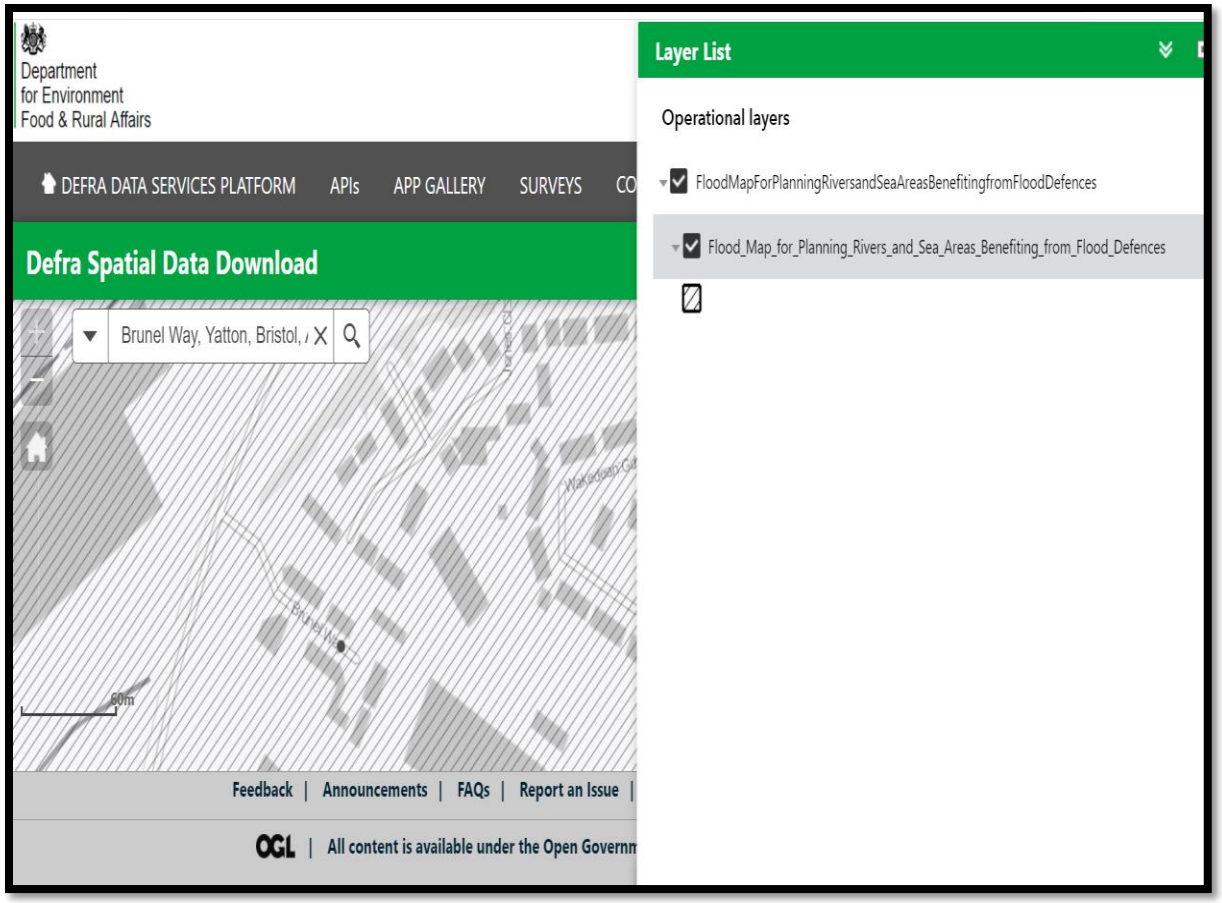


Figure 12: Environment agency's map for areas benefitting from flood defences includes the site 1 Brunel Way, Yatton, North Somerset BS49 4RH.

Topographical Map

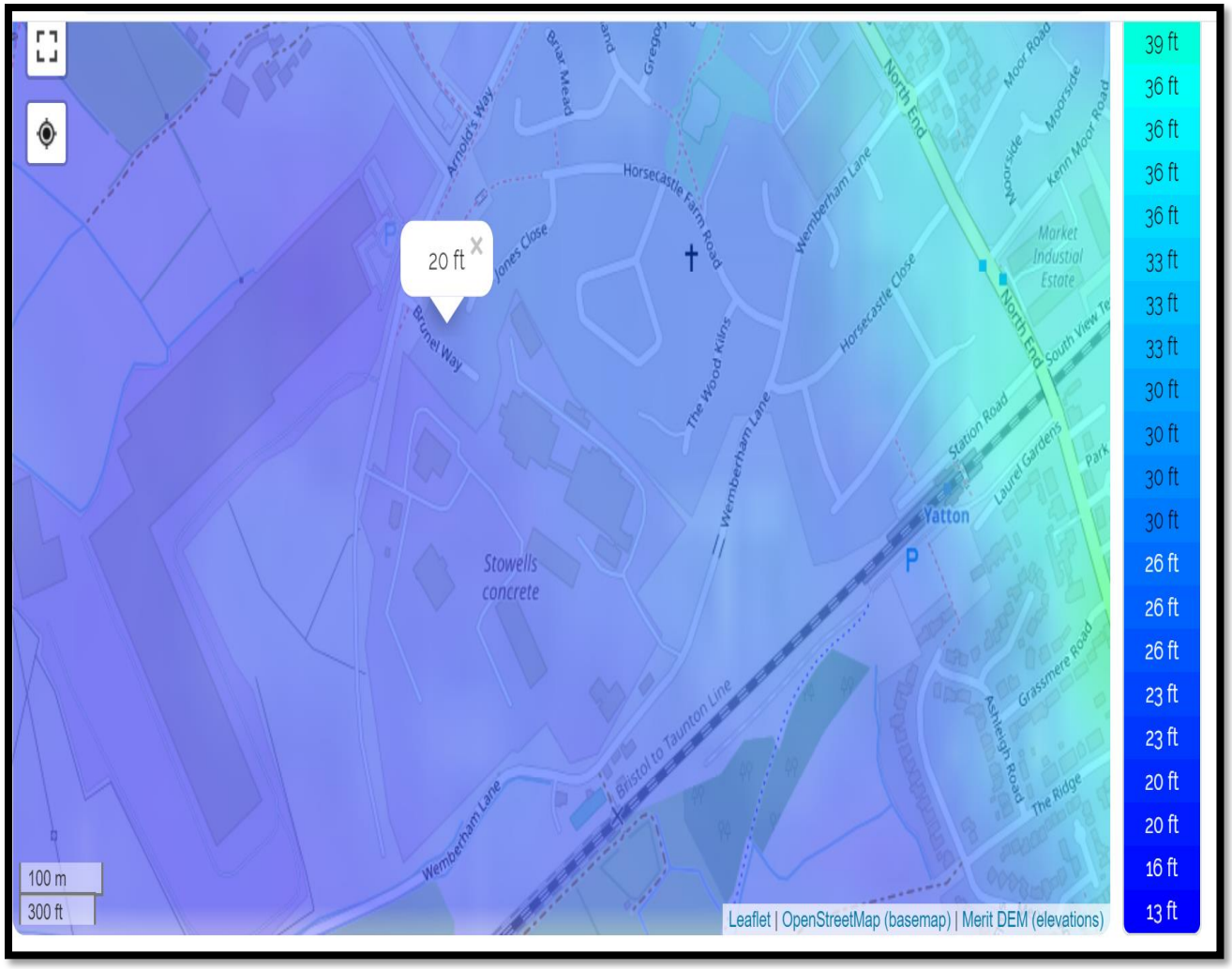


Figure 13: Topographical map of the site, 1 Brunel Way, Yatton, North Somerset BS49 4RH, shows average elevation of 20 ft.

River Basin District Map

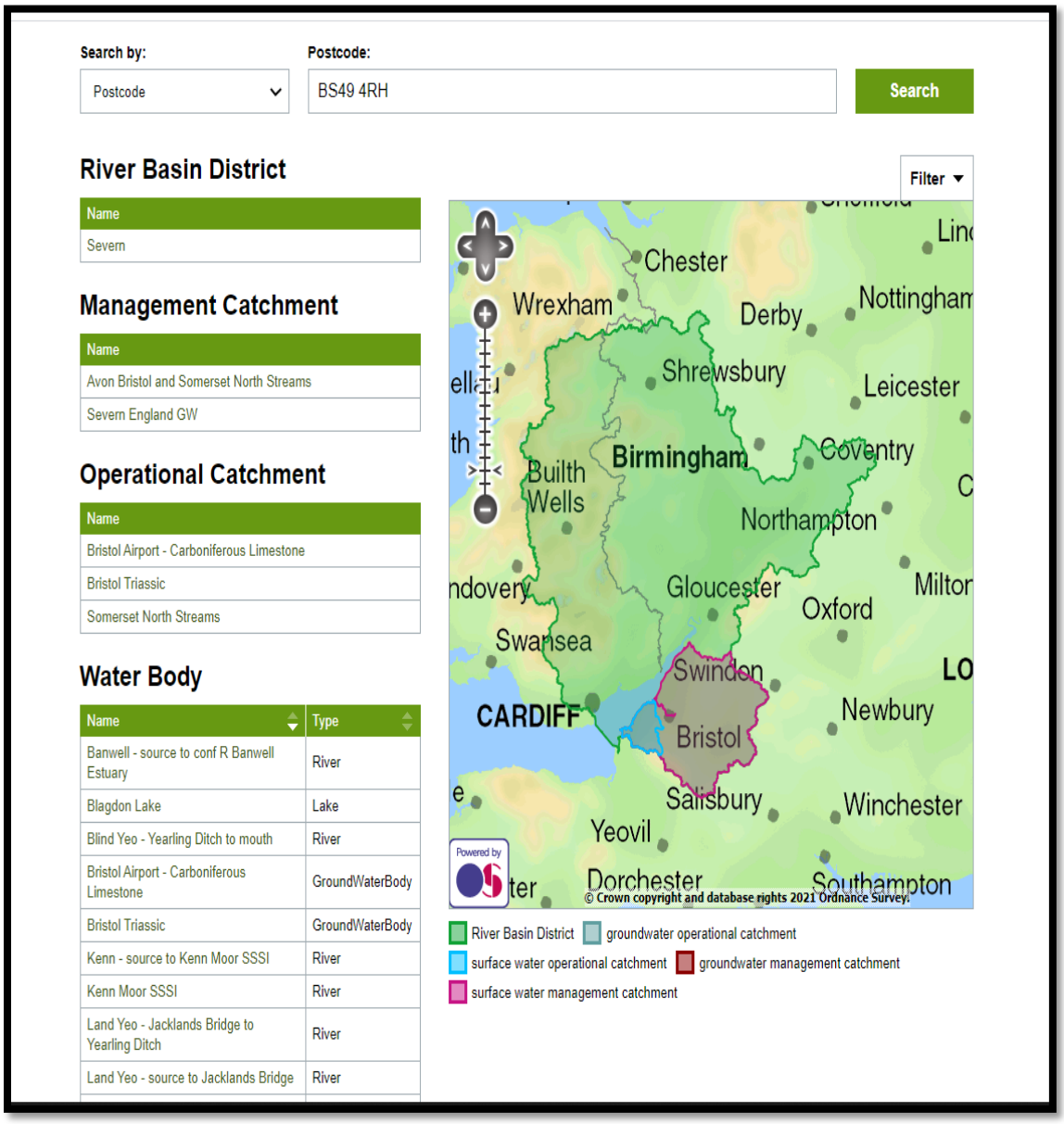


Figure 14: Environment agency's river basin district map showing site in Severn River basin district.

Bedrock Geology of the Site

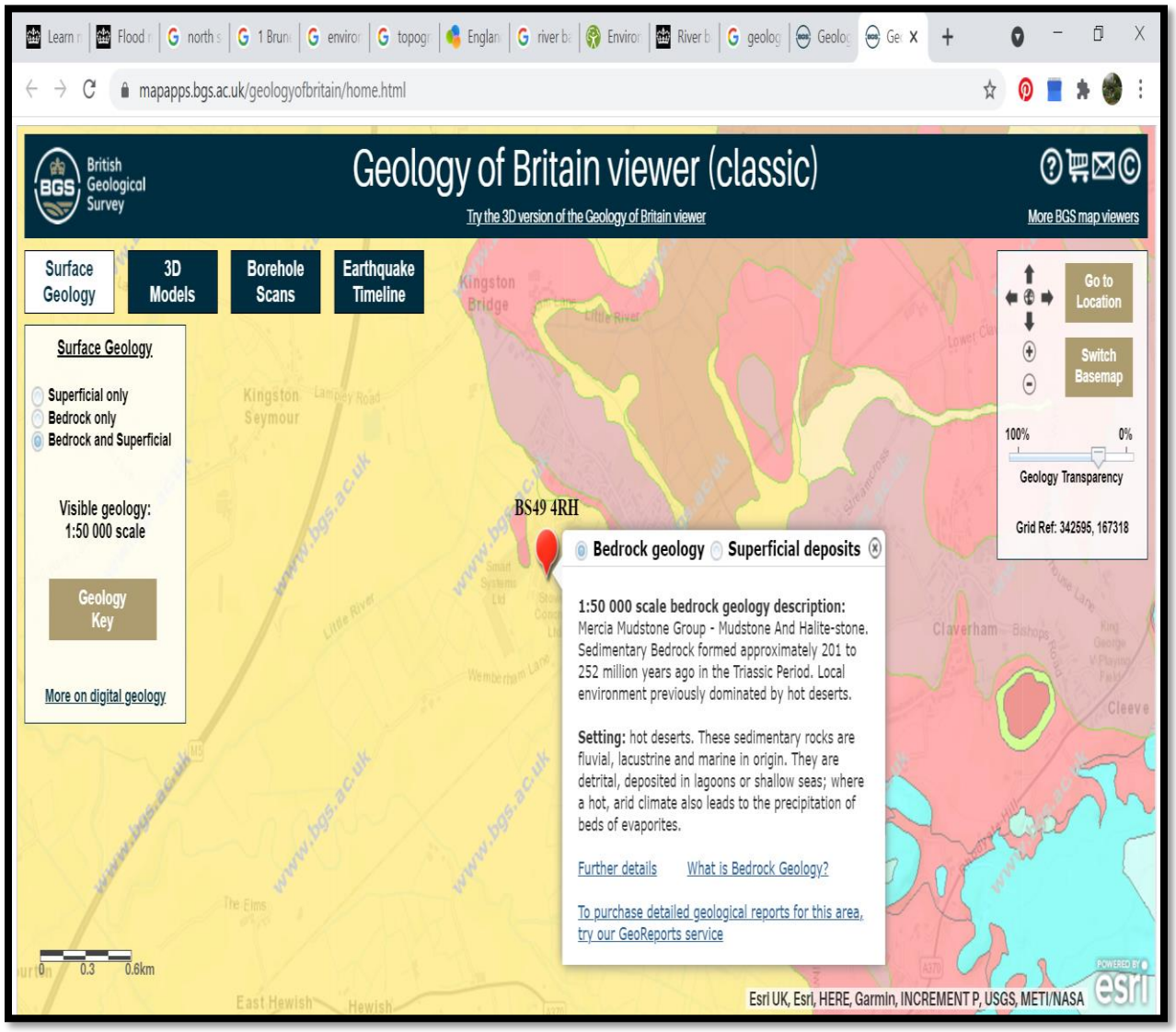


Figure 15: General description of bedrock geology local to the site, 1 Brunel Way, Yatton, North Somerset BS49 4RH.

Superficial Deposits of the Site

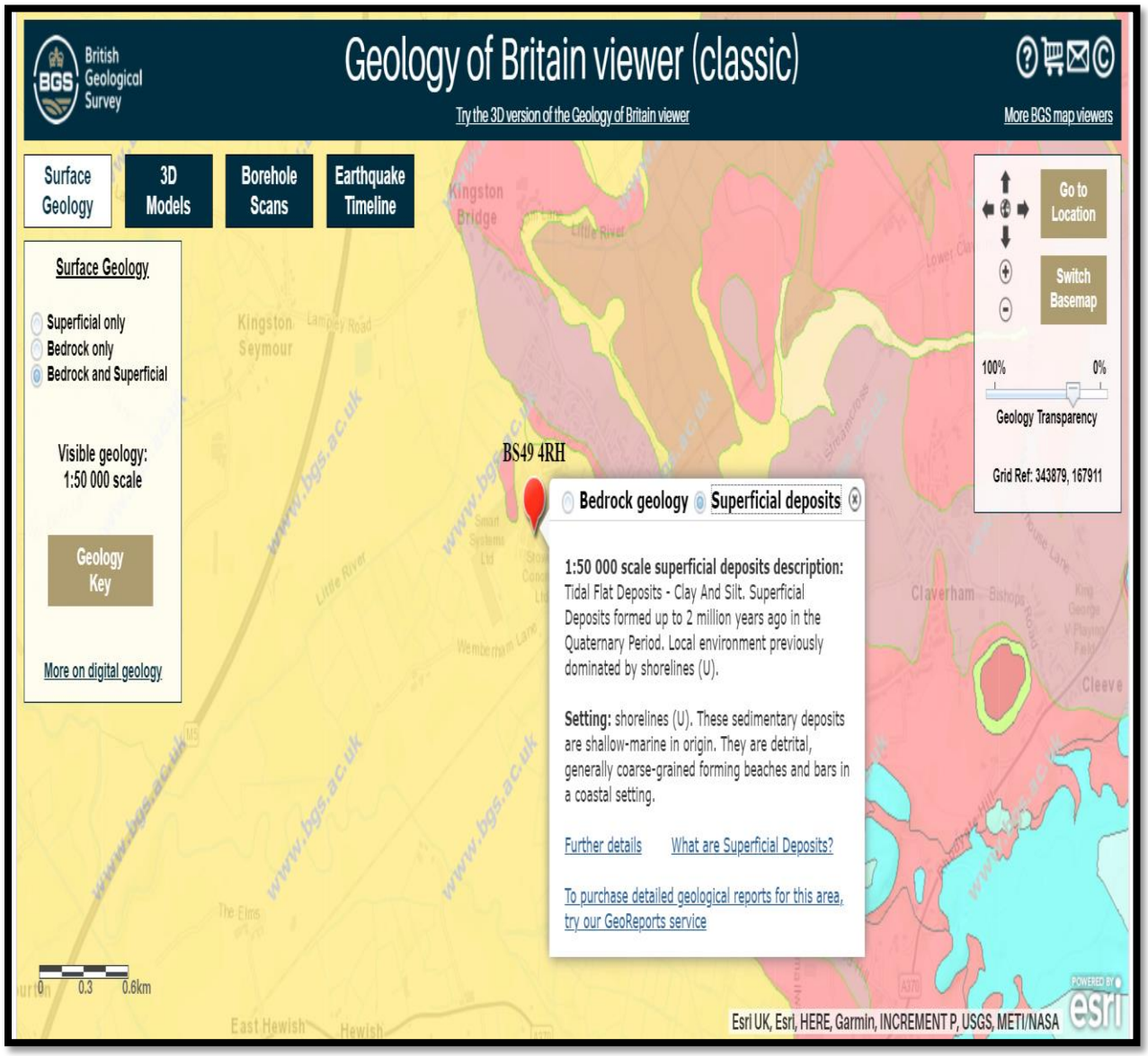


Figure 16: General description of superficial deposits local to the site 1 Brunel Way, Yatton, North Somerset BS49 4RH**.**

Flood Warning and Evacuation

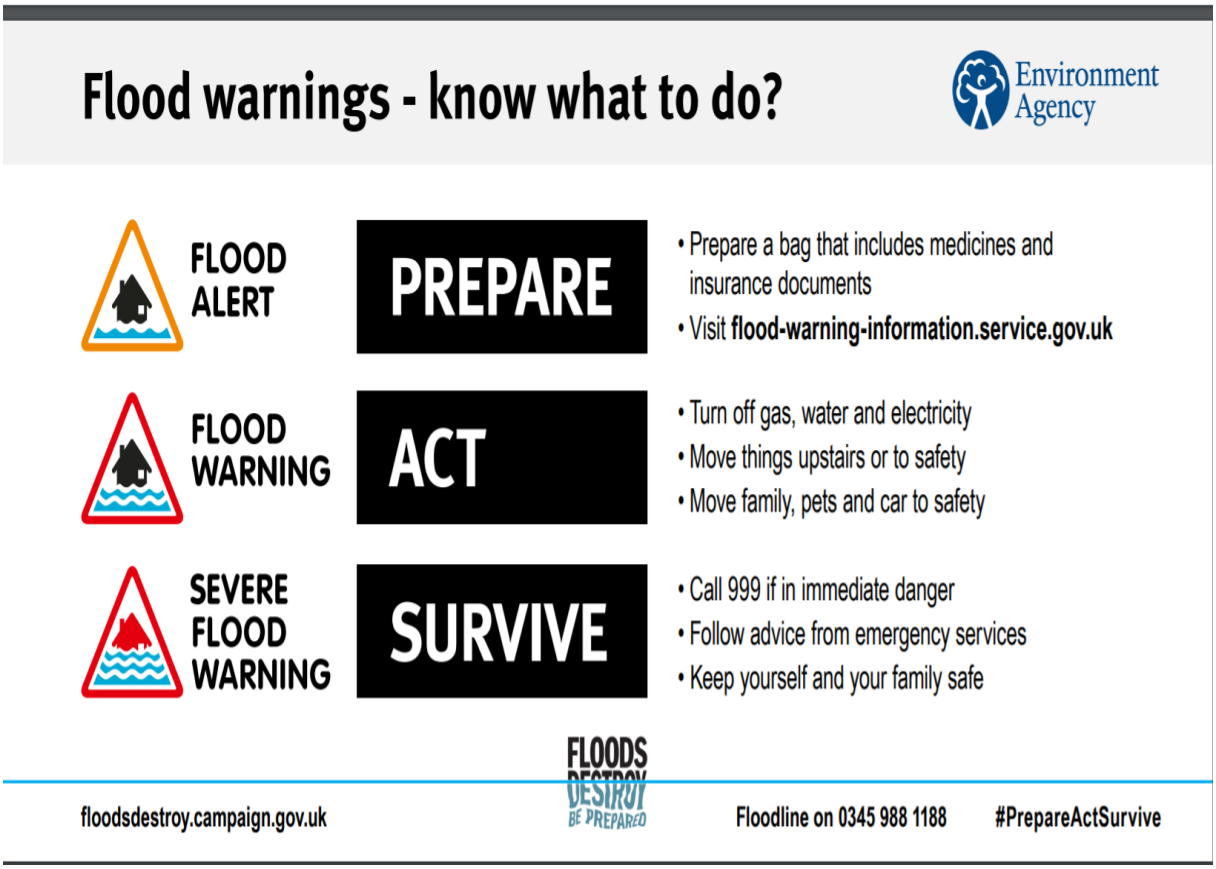
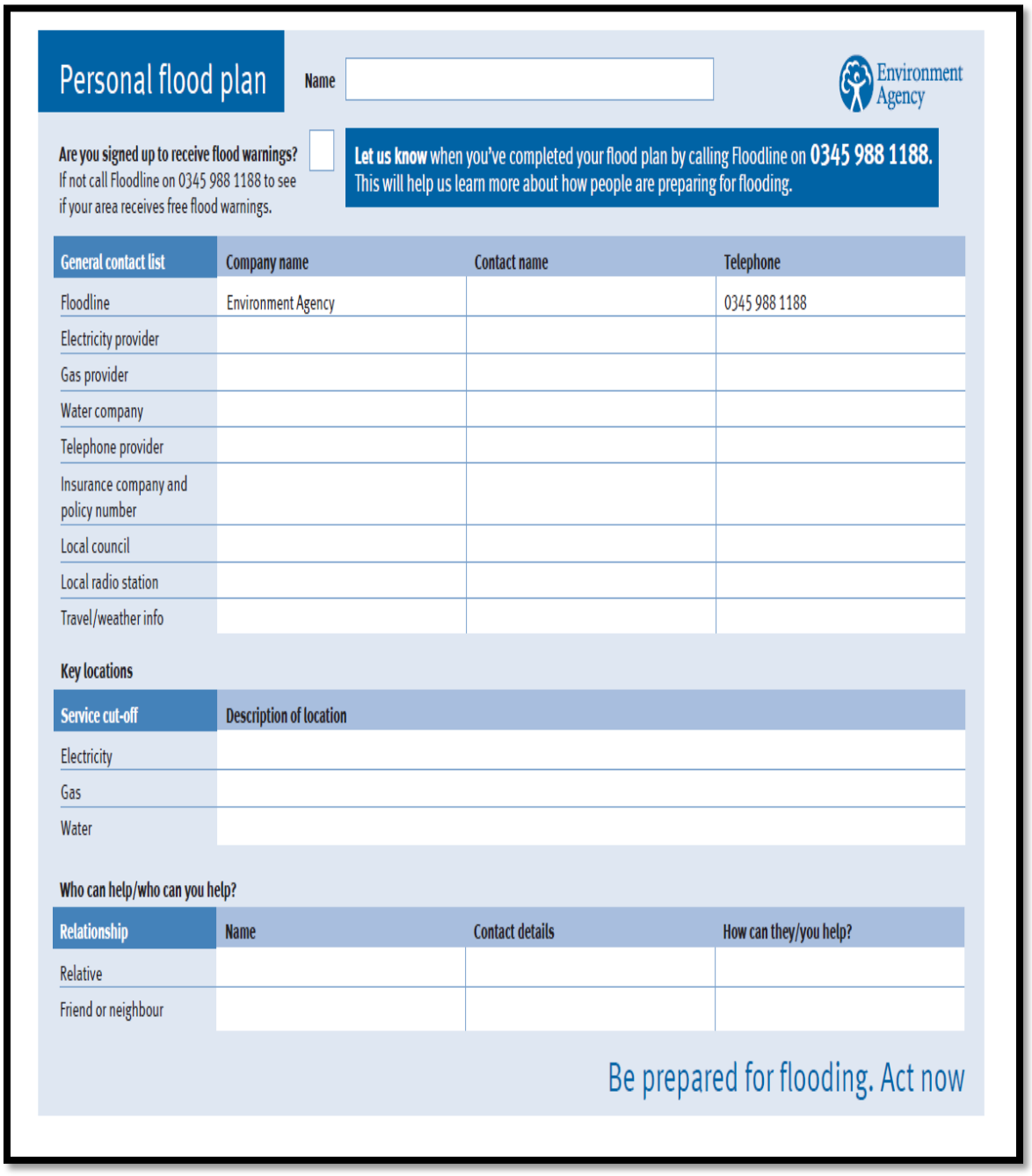


Figure 17: Flood warning signs with instructions to be prepared for flooding.

Personal Flood Plan



Personal flood plan

Name

Environment Agency

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

Figure 18: Personal flood plan document to be printed and filled.

Personal flood plan

What can I do NOW?

Environment Agency

- 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?

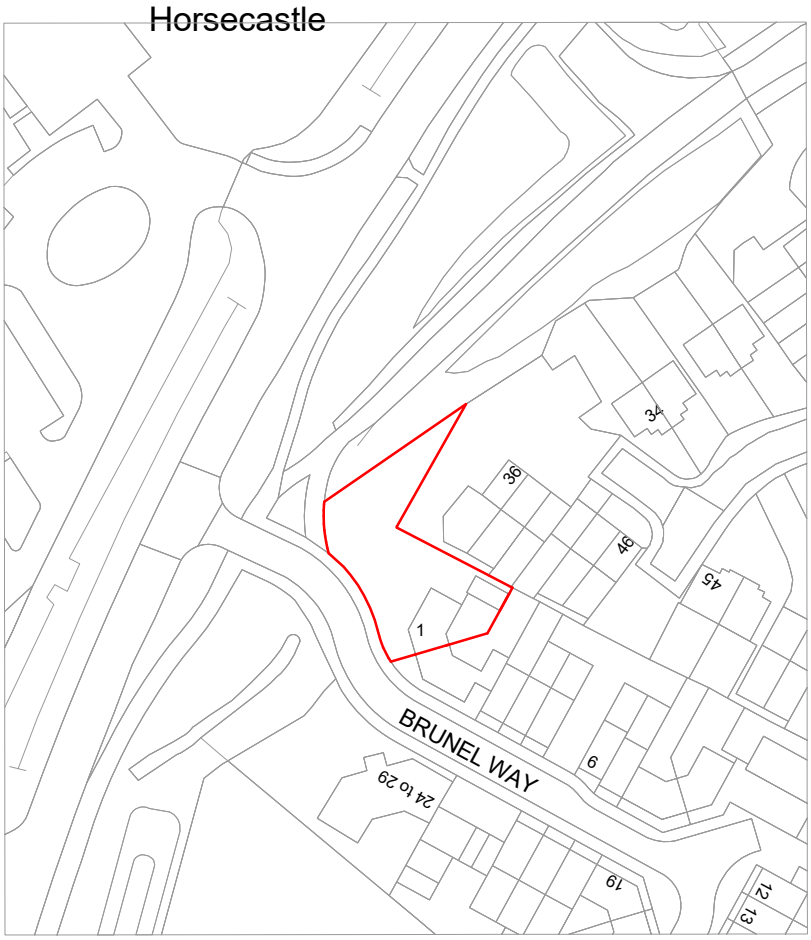
Actions	Location
Home	
• Move furniture and electrical items to safety	
• Put flood boards, polythene and sandbags in place	
• Make a list now of what you can move away from the risk	
• Turn off electricity, water and gas supplies	
• Roll up carpets and rugs	
• Unless you have time to remove them hang 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

GEHO0709BQPU-E-E

Appendix B: Existing Site and Proposed Plans



1 Site
1 : 1250

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project
1 Brunel Way,
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North Somerset.
BS49 4 RH

client
Becky Saunders

date
January 2021

drawn by
RG

checked by
SF

scale (@ a4)
1 : 1250

drawing
Site

drawing number
BW01.01

approval ☐ planning ☒ regulations ☐

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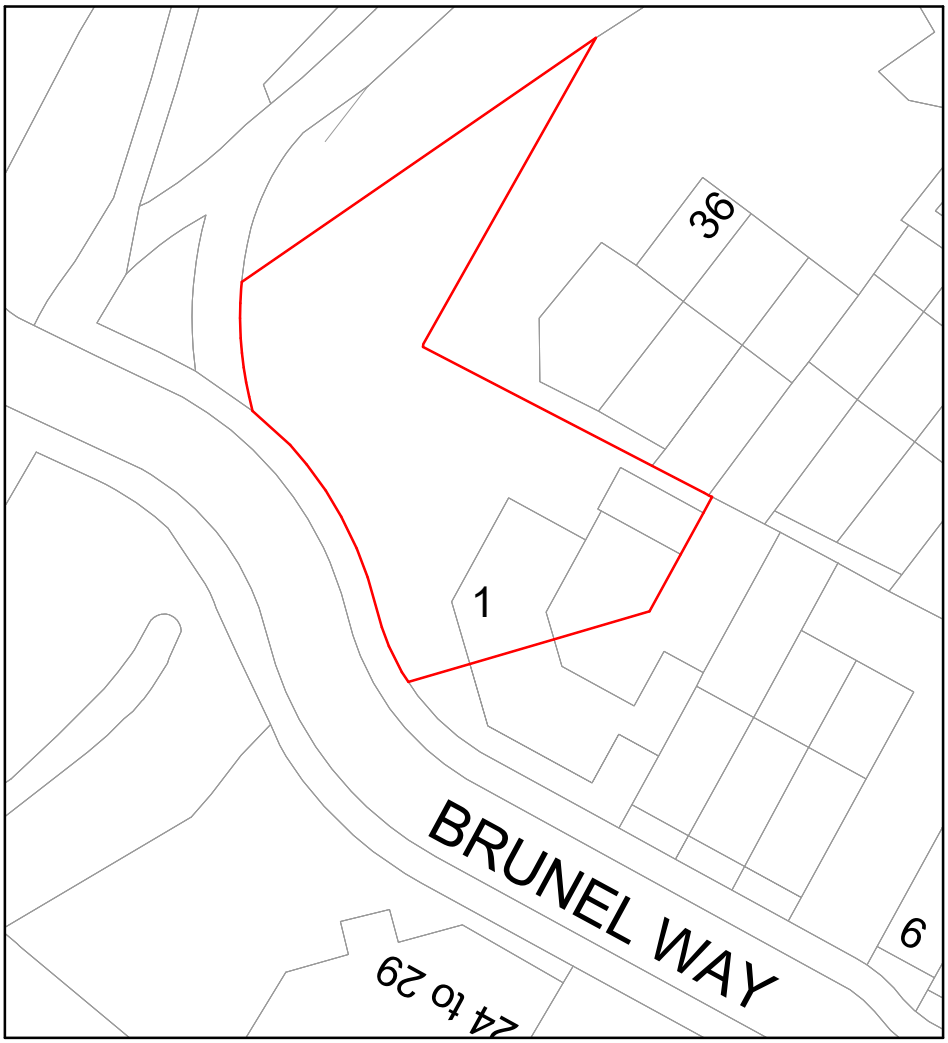

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SF

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Block

drawing number
BW01.02

approval ☐ planning ☒ regulations ☐

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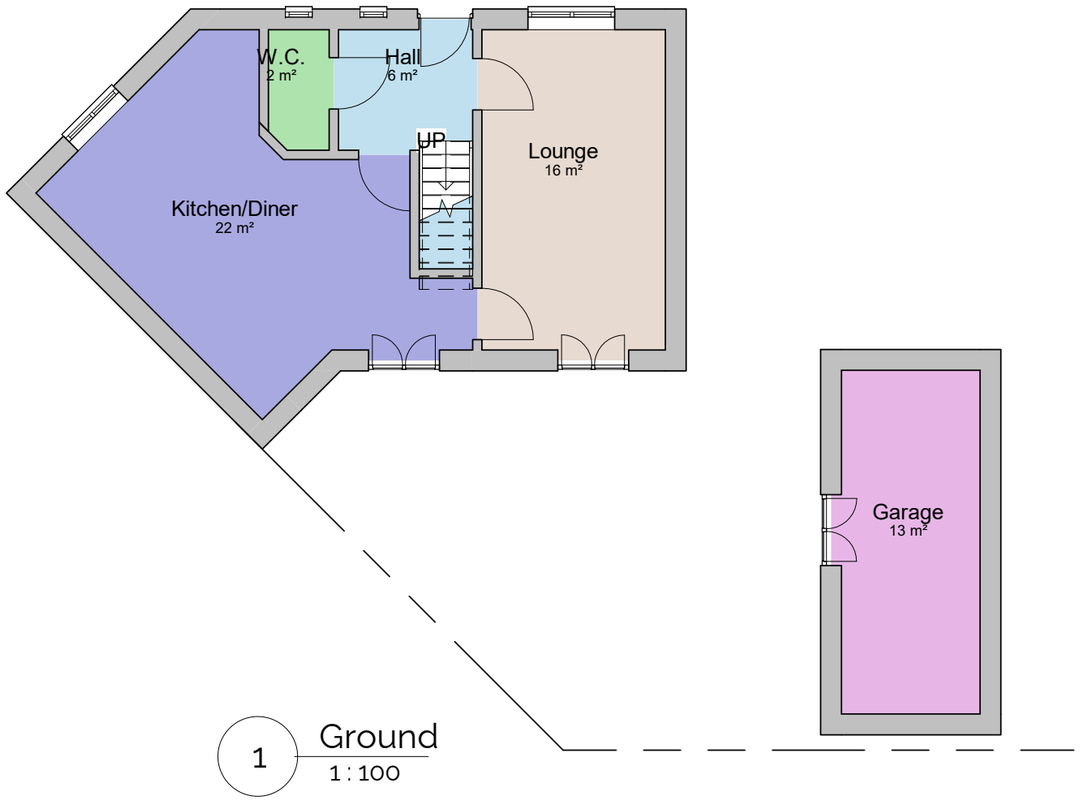

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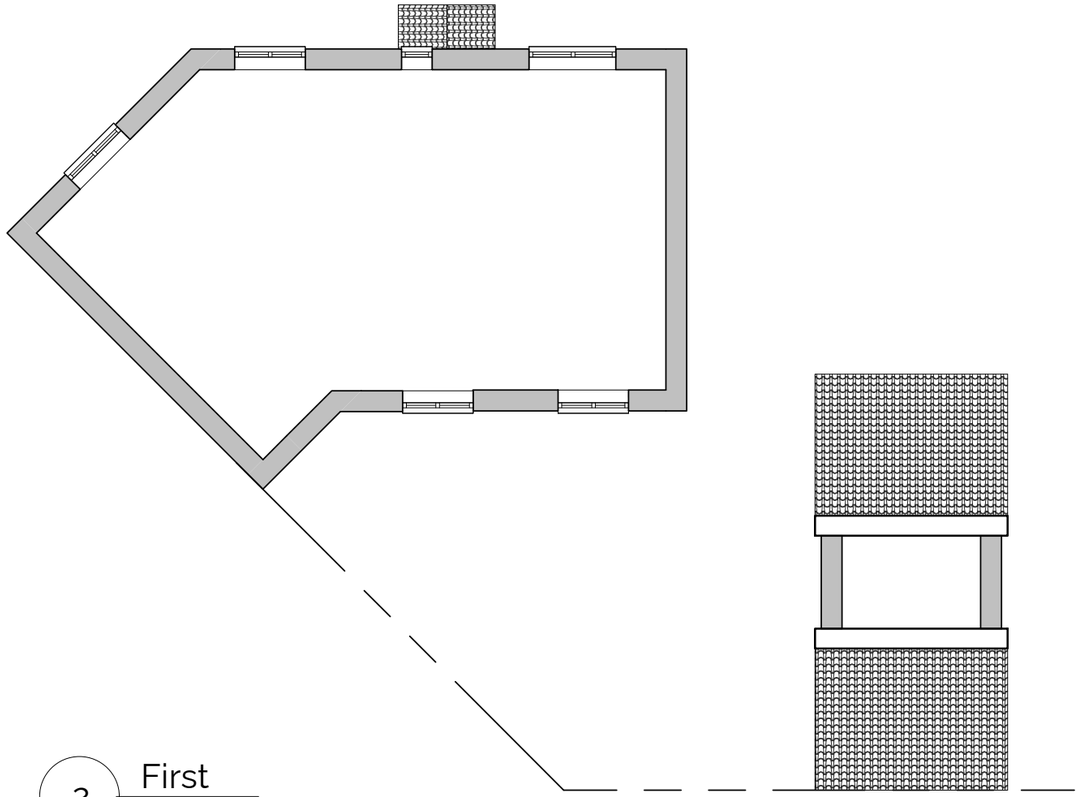

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BW01.03

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planning X
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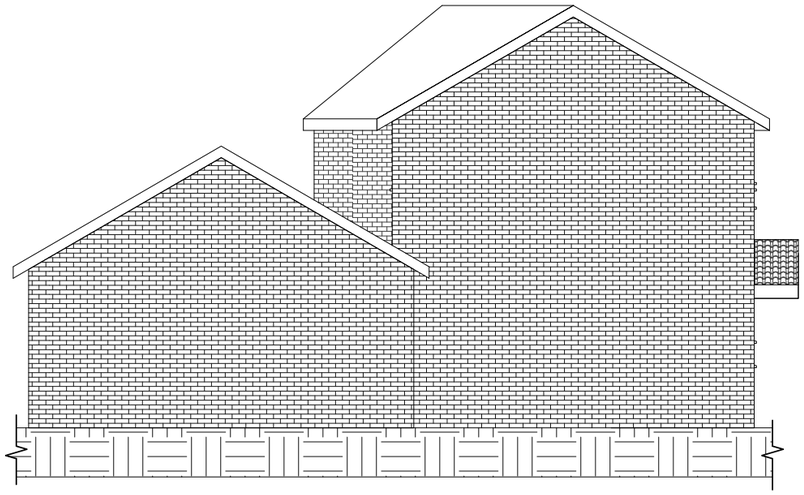

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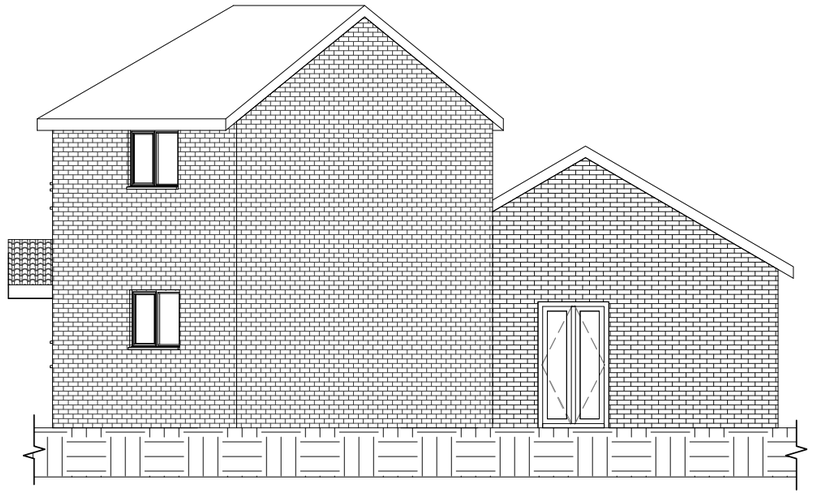

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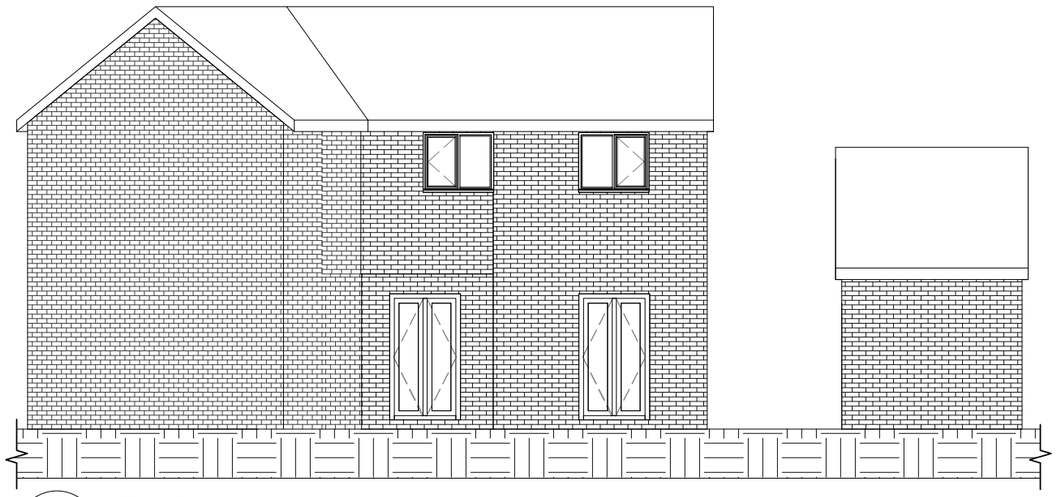

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4 West
1 : 100

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BW01.04

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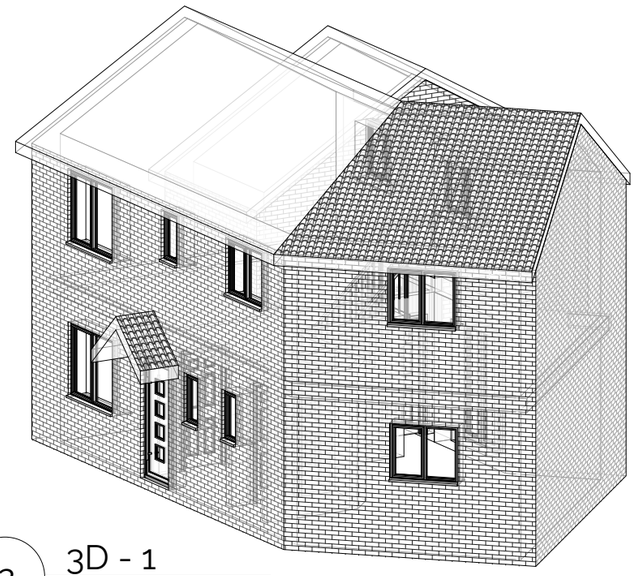

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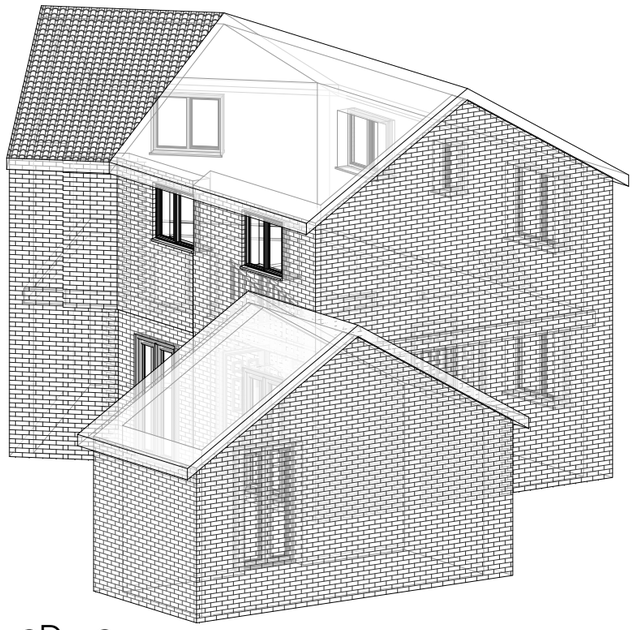

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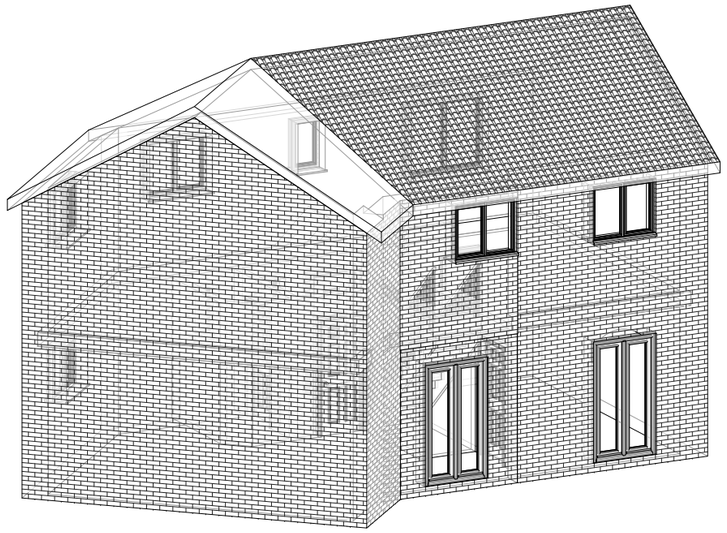

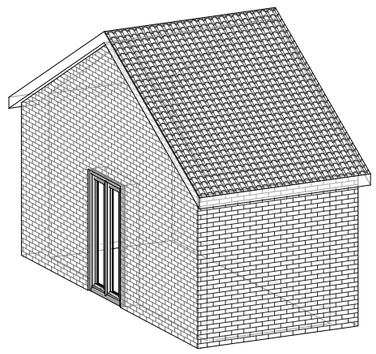

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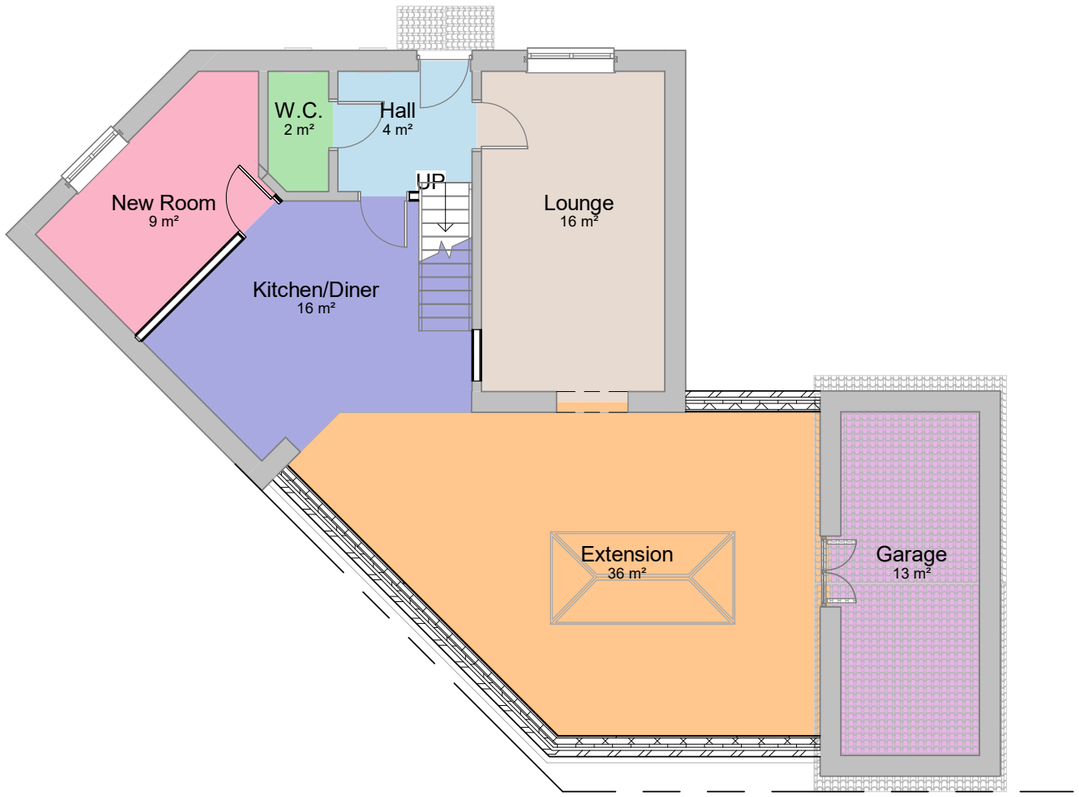
Steel to engineer's specification



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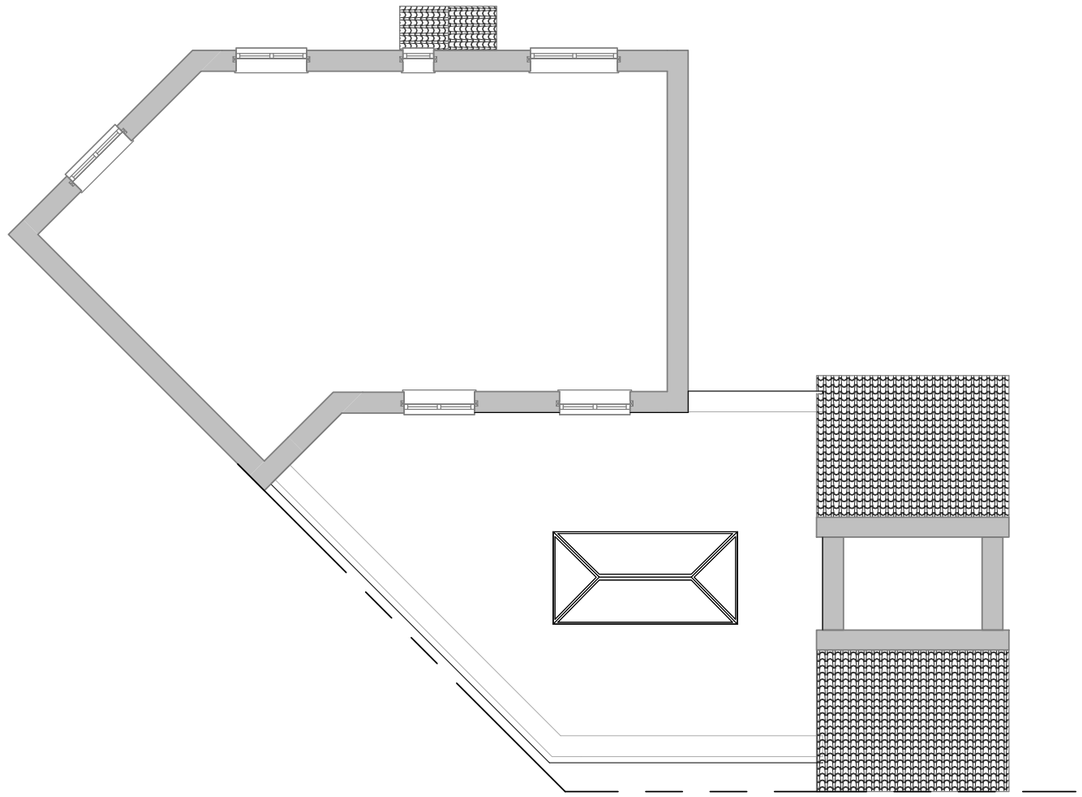

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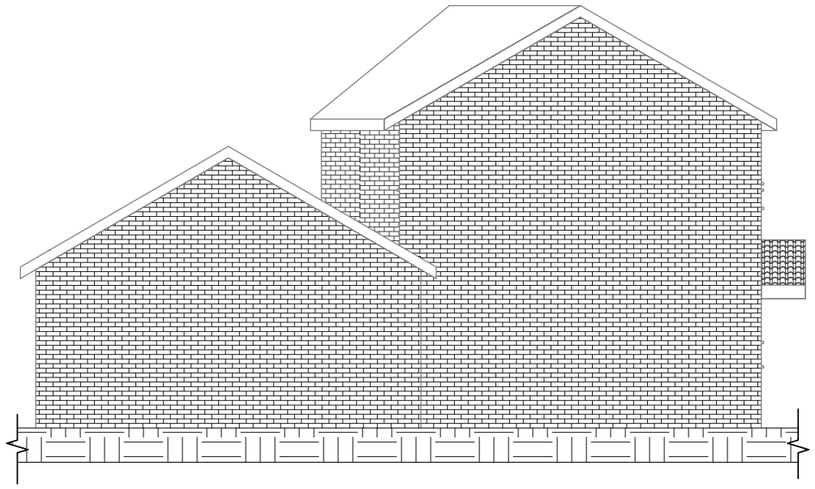

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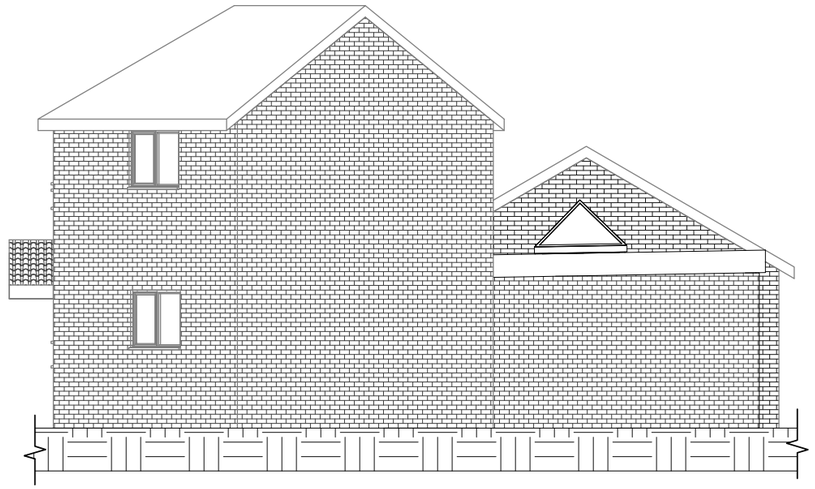

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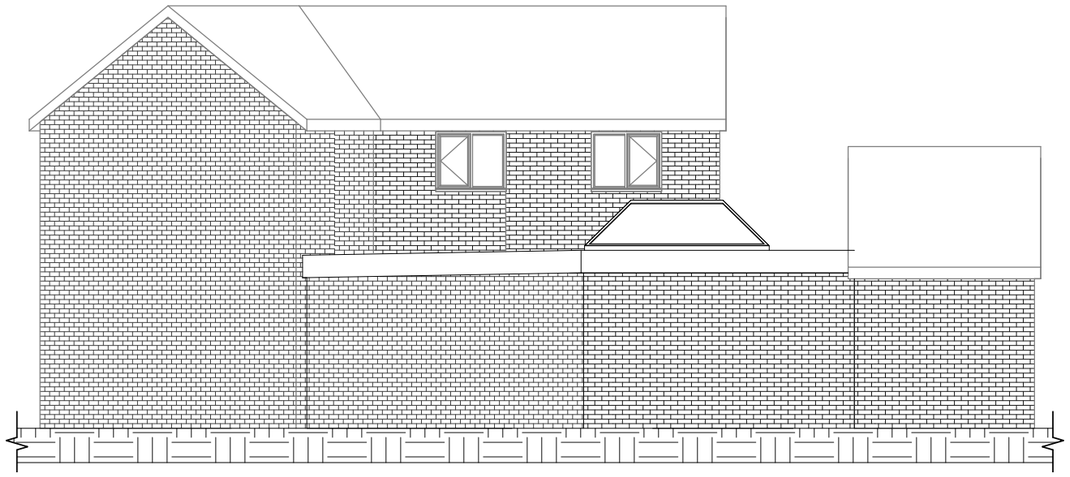

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04/01/2021 - Front dormer now rendered not clad

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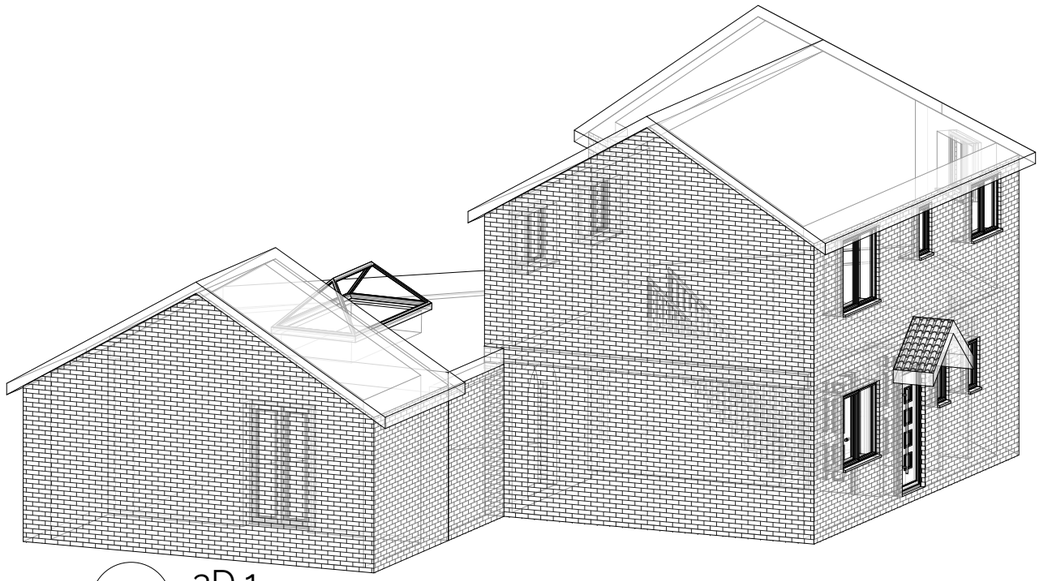

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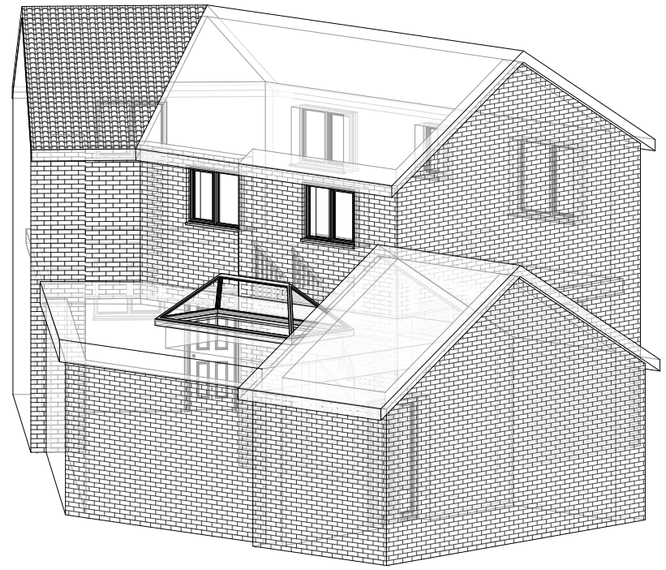

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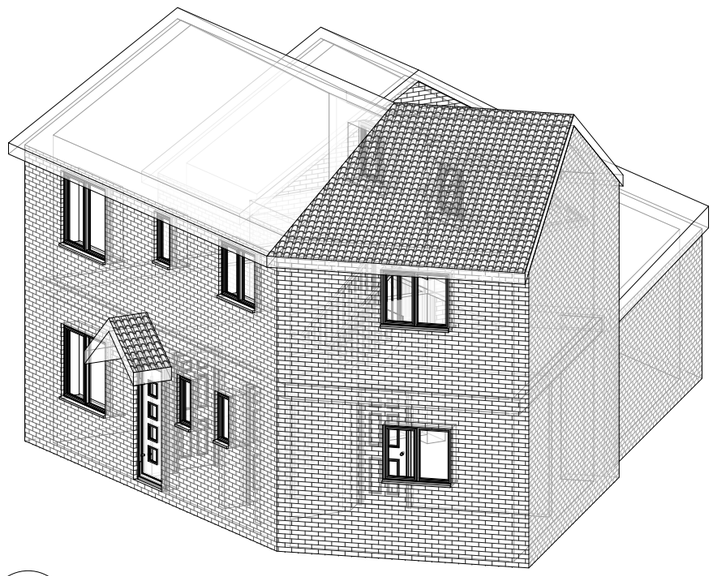

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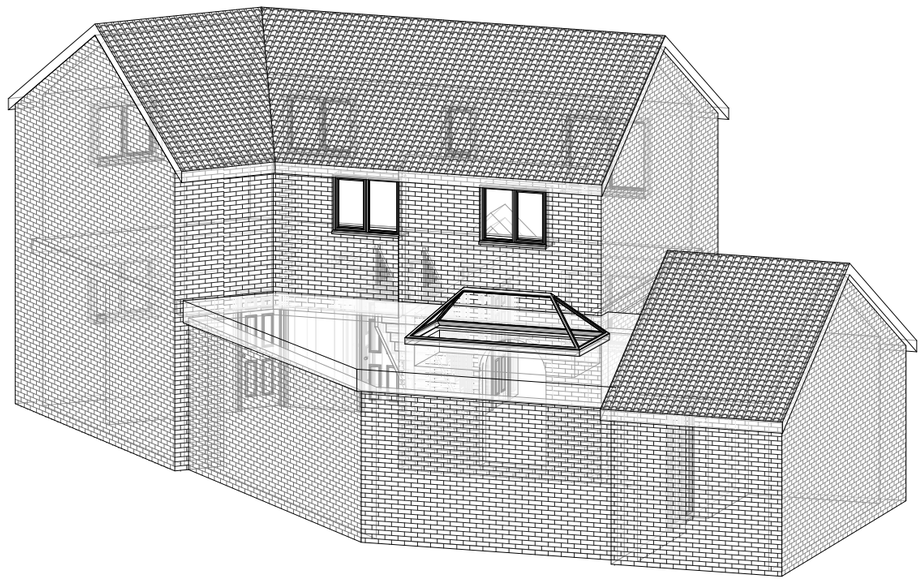

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