FLOOD RISK ASSESSMENT

RETROSPECTIVE APPLICATION FOR COMMERCIAL DEVELOPMENT

THE OLD STONE YARD
OFF NEAR BANK
SHELLEY

Author: Daniel Slattery
Client: Beneficial Tree Care
Doc Ref: rep-tjba-beneficial-the old stone yard, shelley-FRA-300925.docx

Revision	Date	Reason
0	Jun 2020	Original to support planning application.
1	Oct 2025	Update for new application.

T J Booth Associates.
20A Eastgate St,
Rochdale,
Lancs,
OL16 1DH.
Tel: 01706 868288.
Email: office@tjba.co.uk

Contents.

1 Introduction. 3
1.1 Purpose of Flood Risk Assessment. 3
1.2 Flood Risk Reference. 3
1.3 Plans. 3
1.3.1 Location plan. 3
1.3.2 Site plan. 3
1.4 Data & Surveys. 4
1.4.1 Existing and proposed topography. 4
2 Flood Risk Assessment. 4
2.1 Existing fluvial & surface water system. 4
2.2 Proposed fluvial & surface water system. 4
2.3 Climate change impacts. 4
2.4 Fluvial morphological impacts. 5
2.5 Potential sources of flooding. 5
2.5.1 Fluvial flooding from rivers. 5
2.5.2 Surface water flood maps. 6
2.5.3 Artificial Watercourse/Canals. 6
2.5.4 Springs and high groundwater levels. 6
2.5.5 Surcharging of local drainage & sewerage systems. 6
2.5.6 Reservoirs. 6
2.6 Design. 6
2.7 Emergency Evacuation Plan 6
2.7.1 Section 5. Flood Warnings and Associated Actions 7
2.7.2 Section 6. Safe Access and Escape 8
2.7.3 Section 7. Temporary refuge. 8
2.7.4 Section 8. After the Flood 8
2.7.5 Section 9. List of Roles 9
2.7.6 Section 10. Plan Upkeep and Awareness 9
2.8 FRA Conclusion & Residual risks. 9
3 Appendix. 11
3.1 Location Plan. 11
3.2 Predevelopment Plan/Topographic Survey. 12
3.3 Proposed Plan. 13
3.4 Environment Agency Flood Risk Data October 2025. 14
3.5 Environment Agency Technical Rivers & Sea Climate Change Flood Risk Extents Map. 15
3.6 Environment Agency Technical Rivers & Sea Climate Change Flood Risk Depth Maps. 16
3.7 Environment Agency Technical Surface Water Climate Change Flood Risk Extent Maps. 20
3.8 Environment Agency Technical Surface Water Climate Change Flood Risk Depth Maps. 21
3.9 Environment Agency Technical Reservoir Flood Risk Depth Map. 25
3.10 Sewer Plans. 26

1 Introduction.

1.1 Purpose of Flood Risk Assessment.

The purpose of the assessment is to inform & accompany a retrospective planning application for commercial development at The Old Stone Yard.

Planning permission was originally obtained for the Site, and the 'Proposed Development' was constructed but differed to the approved, and so a retrospective application has been submitted.

The original approval did not require a flood risk assessment as part of the planning process; however, the flood risk element of the Site has been flagged on the retrospective application which requires a flood risk assessment prior to validation.

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 being in flood zone 2 & 3, refer to EA Flood Zone 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'.

1.3 Plans.

1.3.1 Location plan.

See Location Plan in Appendix showing the area features.

The Application Site is located on a parcel of land within a small commercial area off Near Bank, Shelley; identified by the red line boundary on the Location Plan.

Shepley Dyke forms the south boundary and flows east to west. There is also a small stream which is culverted beneath the east of the site before flowing past the north site boundary as an open watercourse towards Shepley Dyke to the west.

There were also two small mill ponds in the neighbouring site to the west, which were part of the Barncliffe Mills complex. These ponds were fed by a sluice from Shepley Dyke and have recently been filled in with inert material as part of a separate development.

The Site is accessed along an unnamed lane off Near bank. There is a public footpath across the lane (immediately north of the Site), leading to the north and back to Near Bank at higher elevation.

1.3.2 Site plan.

Refer to Proposed Plans in the appendix.

The red line plan is an open piece of land nominally rectangular in shape, and was formerly used as a stone yard/masons and storage yard.

The retrospective planning permission is for a workshop to the north half of the red line plan.

The building comprises a workshop/storage space, small office and WC.

1.4 Data & Surveys.

1.4.1 Existing and proposed topography.

A topographic survey for the site was undertaken by HH Surveys Ltd in June 2020.

The proposed Development Site is part of a wider red line boundary. The four Site corners of the Proposed Development Site are as follows in m aOD:

NE 154.40

SE 154.85

SW 155.00

NW 154.20.

The south part of the site is at slightly higher level nominally 155.40, with a bund adjacent to Shepley Dike up to 157.90.

The Shepley Dike water level on the day of the topographic survey was 154.24.

The drainage ditch to the unnamed watercourse to the north west boundary has a bed level of 153.15 to where it issues from the 600dia pipe on the east side, to 152.32 to the north west corner.

The commercial building has been constructed a minimum of 150mm above existing Site ground level, finished floor level nominally 154.95m aOD.

2 Flood Risk Assessment.

2.1 Existing fluvial & surface water system.

The Site generally comprises permeable granular surfacing.

Shepley Dike and an unnamed watercourse running along the north boundary have a confluence 75m west flowing under the Near Bank highway.

There is understood to be a combined sewer to the south bank of Shepley Dike.

2.2 Proposed fluvial & surface water system.

No changes anticipated.

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, the vulnerability of the development is 'less vulnerable'. The Planning Flood Maps designate the Site as being within flood zone 2 & 3.

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:

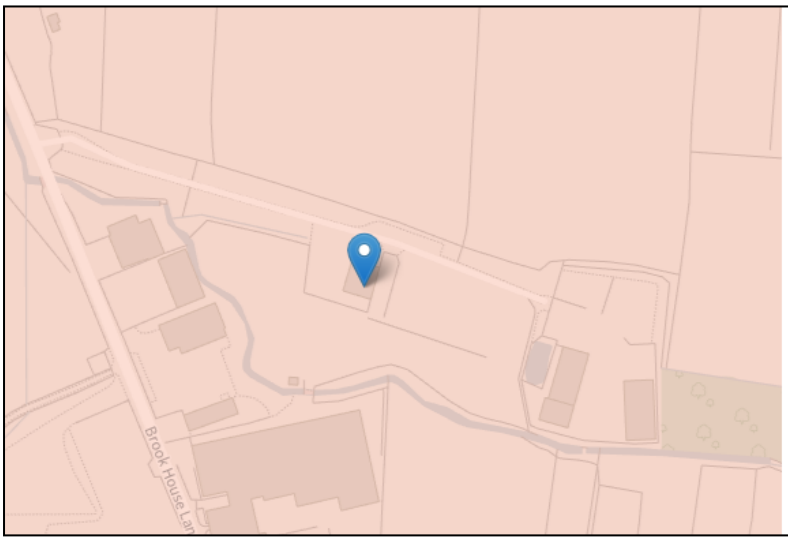
EA guidance indicates the peak flow rates that should be used for the vulnerability classification:

- 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, limited development lifetimes apply, and the '2050s epoch' development lifetime is appropriate.

Comparing the '2050s epoch' development lifetime with the central allowance from the peak river flow predictions above, suggests a 13% climate change allowance for the Site to be used on flow data.



Aire and Calder Management Catchment peak river flow allowances

	Central	Higher	Upper
2020s	11%	15%	24%
2050s	13%	18%	31%
2080s	23%	31%	51%

2.4 Fluvial morphological impacts.

The site will not impact fluvial morphology.

2.5 Potential sources of flooding.

The product 4 fluvial flood map from the Environment Agency shows flood hatching over the Application Site. However, no modelled data was given.

The EA detailed online technical flood maps show detailed flooding in the local area from various sources, including allowances from climate change, and consider return period events & depth as follows:

- High chance/3.3% AEP (30yr).
- Medium chance/1-3.3% AEP (30-100yr).
- Low chance/0.1-1% AEP (100-1000yr).
- Very low chance/<0.1% AEP (<1000yr).

For each of the above chances of flooding, the maps also show potential flood depths as follows:

- To 20cm depth.
- To 30cm depth.
- To 60cm depth.
- To 90cm depth.

2.5.1 Fluvial flooding from rivers.

The rivers/sea flood extents map shows that the site is susceptible to flood risk, generally between a 100-1000yr fluvial event. As discussed above, the maps include allowance for climate change.

The depth analysis suggests the site generally has a low probability of flooding with >1000yr chance of up to 20cm depth. At worst case this means the site is unlikely to flood to depths greater than 20cm depth unless a 1000yr or greater flood event occurs.

The site building actually shows a higher risk rating, but this is not considered possible due to being higher than the rest of the site.

The stream to the north boundary suggests depths of up to 60cm at >30yr events, but only gets to depths of c90cm at >1000yr events.

The lane to the north of the site is also has a low probability of flooding with >1000yr chance of up to 20cm depth.

With site flood water depths only up to max 20cm deep, the building is generally considered safe from flooding for most return period events. Due to its use as a warehouse, and being 150mm above its surroundings, the risk is considered low from rivers/sea flooding.

2.5.2 Surface water flood maps.

The surface water flood extents map shows that the site is generally susceptible to minor flooding, generally low chance/100-1000yr events, apart from the southwest boundary which is up to a high chance/>30yr event. As discussed above, the maps include allowance for climate change.

The corresponding depth analysis suggests the site generally has a low probability of flooding, with much of the area to the north and around the building free from surface water flooding up to 20cm.

There is some minor inundation of the southwest corner up to 20-30cm at >30yr events, but generally the risk of this depth of flooding is between a 100-1000yr event.

There is no flooding of the site of up to 60cm.

There is no flooding of the access road to the north of the site from surface water events.

2.5.3 Artificial Watercourse/Canals.

There are no artificial watercourses in the local area.

2.5.4 Springs and high groundwater levels.

None noted.

2.5.5 Surcharging of local drainage & sewerage systems.

No surcharging of local sewerage is thought to impact the Site.

2.5.6 Reservoirs.

There is no risk of reservoir flooding locally.

Reservoir flood map in Appendix.

2.6 Design.

As a retrospective application, the building is already erected.

However, the flood risk depth to the general site is estimated at <20cm for events up to and including a 1000yr+CC event.

As the building is 150mm above the surrounding site, the max possible depth is around 50mm.

Considering the commercial nature of the development, the resilient nature of construction materials (concrete floors, steel clad warehouse), the low-risk vulnerability of the proposed use, and the minor flooding noted to the Site; it would instead be prudent to concentrate on safety of persons using the premises, and access/egress in an evacuation plan.

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.

As the main body of this flood risk assessment has covered the information required for sub-sections 1-4 of an EP, this EP part of FRA shall only further detail the requirements of sub-sections 5-10.

2.7.1 Section 5. Flood Warnings and Associated Actions

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 current & simple to follow flood alert/warnings used by the Environment Agency, including a simple/easy to understand statement of what is required for each as follows:



Flood Alert

What it means

Flooding is possible. Be prepared.

When it's used

Two hours to two days in advance of flooding.

What to do

- 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

What it means

Flooding is expected. Immediate action required.

When it's used

Half an hour to one day in advance of flooding.

What to do

- 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

What it means

Severe flooding. Danger to life.

When it's used

When flooding poses a significant threat to life.

What to do

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

The Flood Information Service can been found on the internet using the following URL: https://www.gov.uk/sign-up-for-flood-warnings.

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.

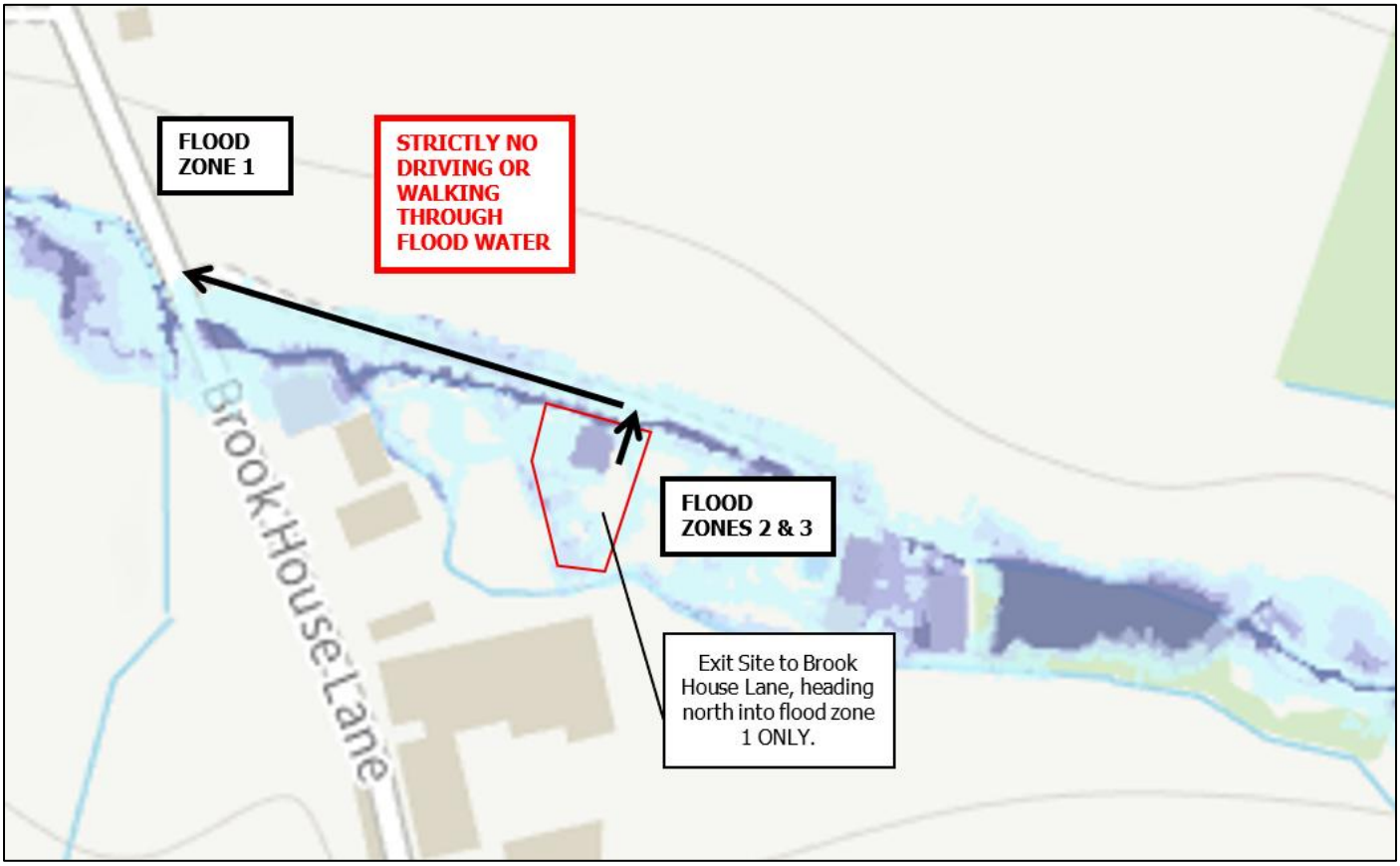
GENERAL MEDIA

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.

2.7.2 Section 6. Safe Access and Escape

The Environment Agency flood zone maps show the Site to be within flood zone 2&3. Following flood warnings & instruction to ACT, emergency escape from the Site via foot or vehicle is illustrated on the Emergency Evacuation Route Plan below:

Flood waters are considered to be less than 200mm for up to a 1000yr event, so will be suitable for users of the site.



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 residents are ready for this scenario. When a flood warning to ACT is issued, residents should follow instructions & evacuate as per the Emergency Evacuation Route Plan above.

2.7.3 Section 7. Temporary refuge

As the Site is for a commercial use, temporary refuge will not be required.

Employees and Site users will have access to residential refuge away from the Development Site.

If required 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.

2.7.4 Section 8. After the Flood

After a flood, the Site owners/tenants should:

- Contact their insurance company.
- Find their local flood action group or flood warden for advice.
- Check if they can return home with the emergency services.
- Clean and repair the property/premises noting the flowing:

  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 LPA 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.

2.7.5 Section 9. List of Roles

It is the Site owners responsibility to ensure all tenants (if applicable) know they are within a flood zone, and should be notified of this flood risk assessment and Emergency Evacuation Plan.

It is then the individual tenant's responsibility to sign up for flood alerts/warnings, and to keep up to date with current advice.

2.7.6 Section 10. Plan Upkeep and Awareness

The individual building 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.

This report is to accompany a retrospective planning application for a development, and the building has already been erected.

The commercial use and low flood risk vulnerability along with minimal flood depths noted in the assessment, suggest flood risk to the development is low.

Finished floor levels are elevated from the surrounding ground level by at least 150mm.

Flood risk levels are considered to be a maximum of up to 200mm, which is approximately 50mm above slab level.

The resilient nature of the building materials will negate any minor risk from flooding.

Flood waters to the access land to the north of the site are suitable for the owners/tenants to gain access/egress if required. These groups should sign up to the emergency flood alert/warning scheme, and emergency flood evacuation plans should be made clear as part of the site health and safety management files and within the building.

This FRA should be submitted for approval to planning as part of the current planning application.

Signed……  .

D.S.Slattery BSc (Hons).

T J Booth Associates.

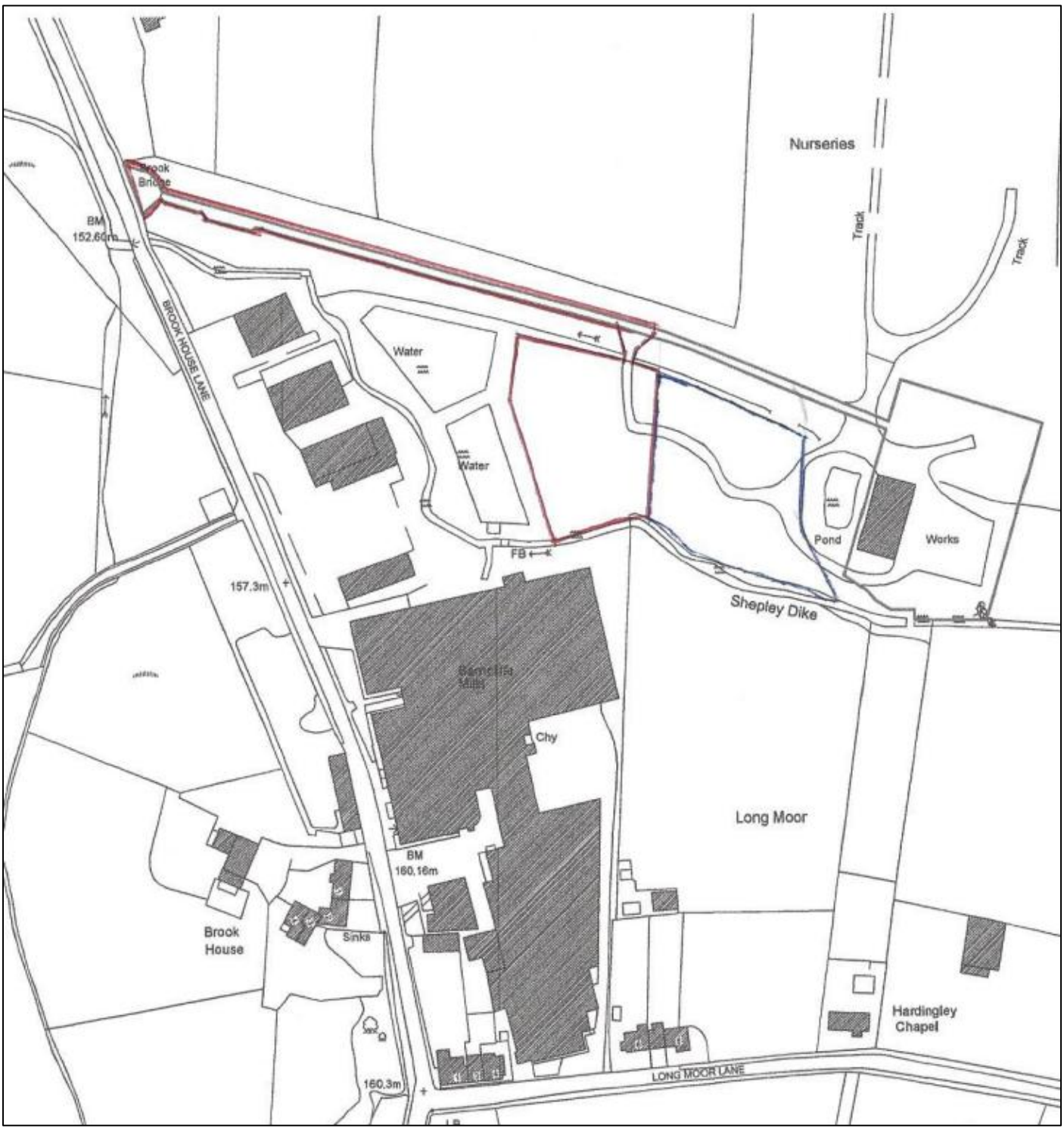
Authorised…  .

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

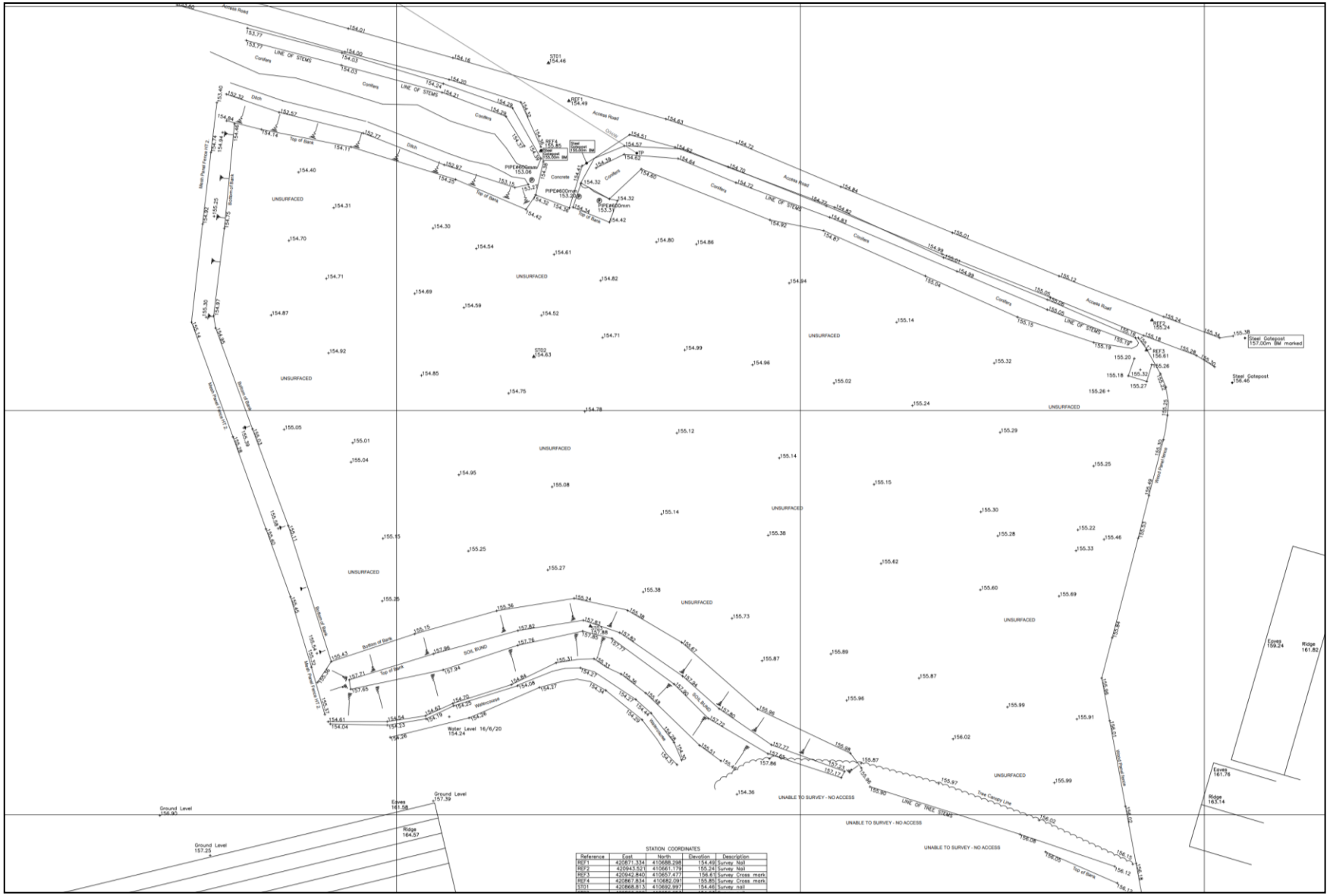
T J Booth Associates.

3 Appendix.

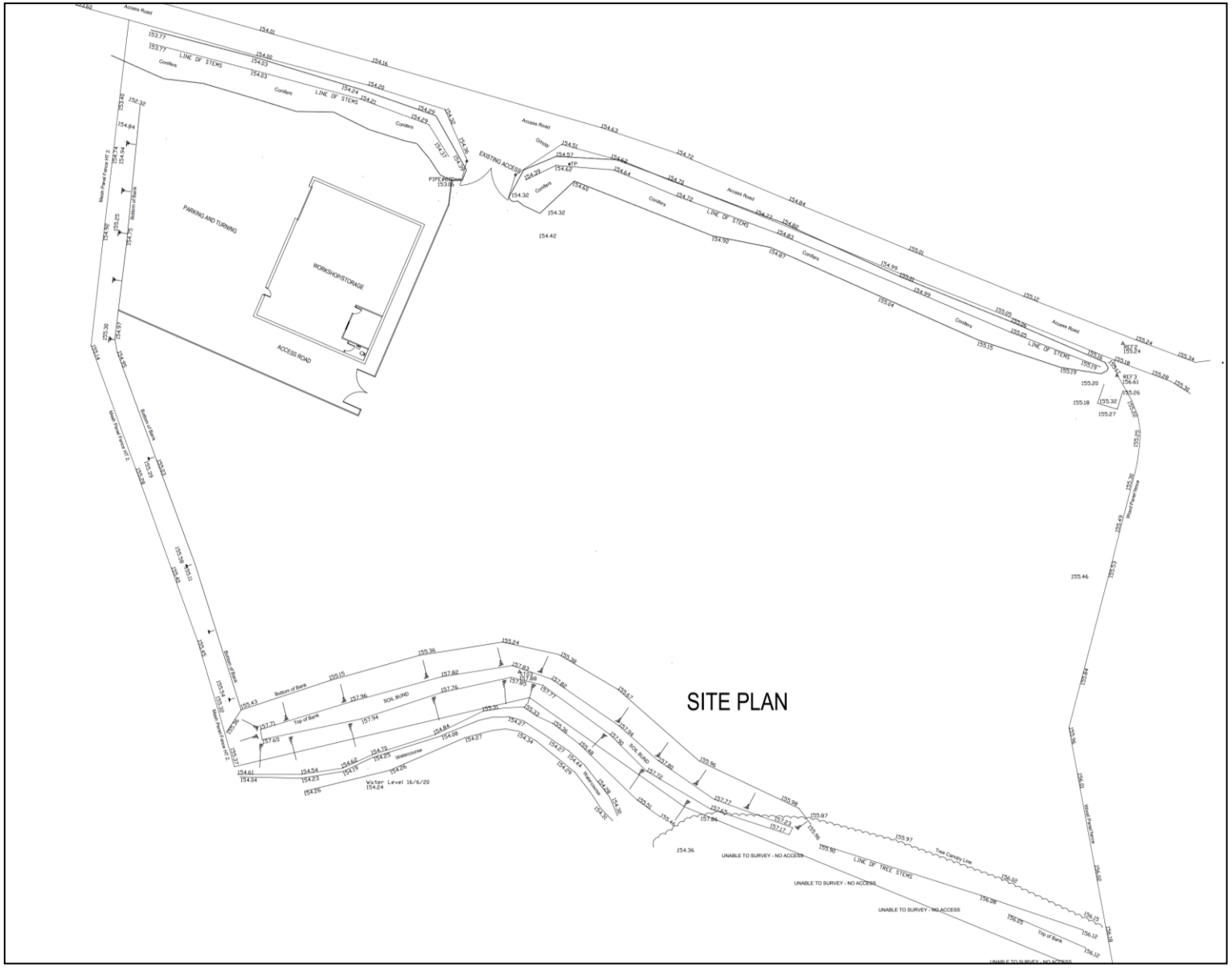
3.1 Location Plan.



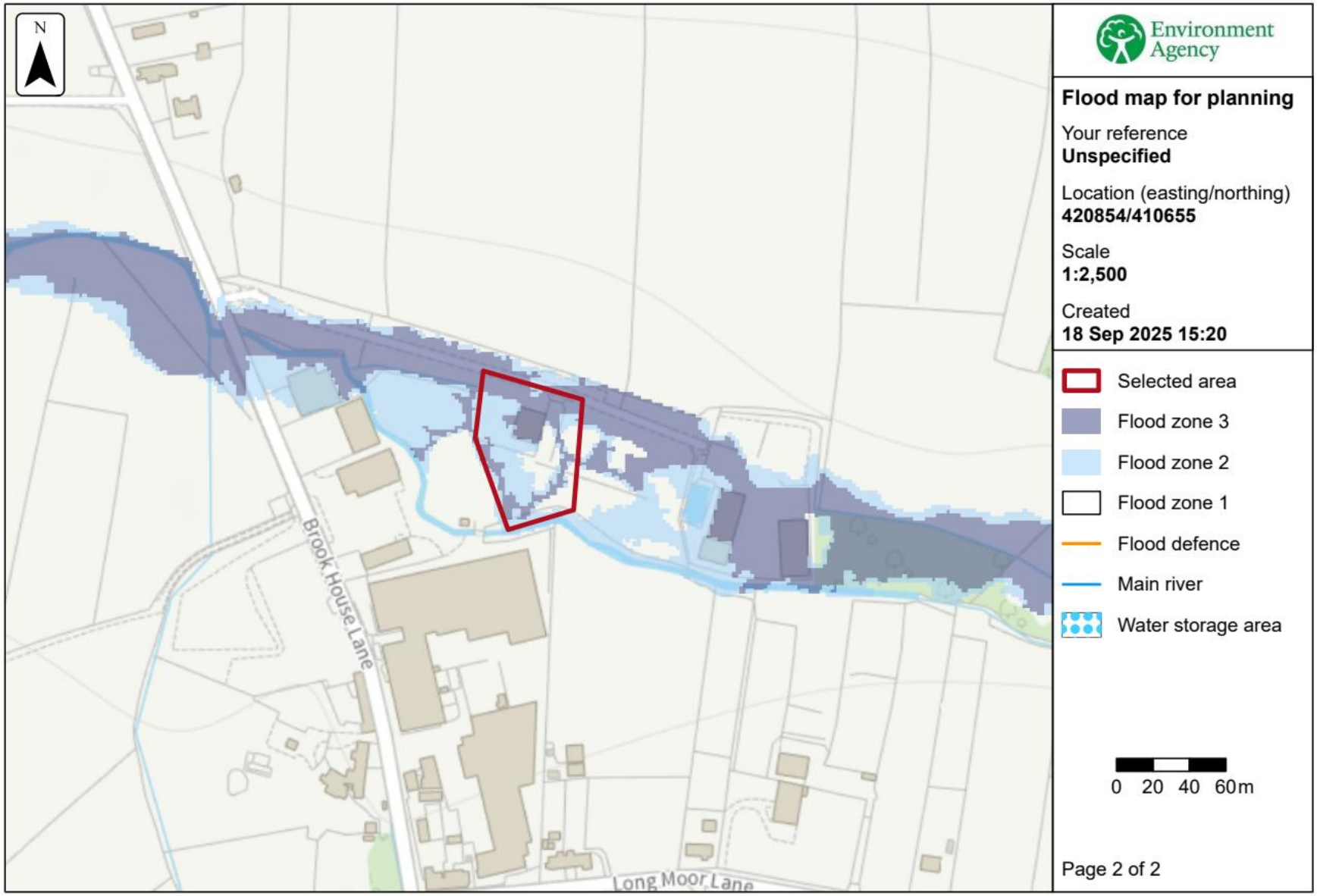
3.2 Predevelopment Plan/Topographic Survey.



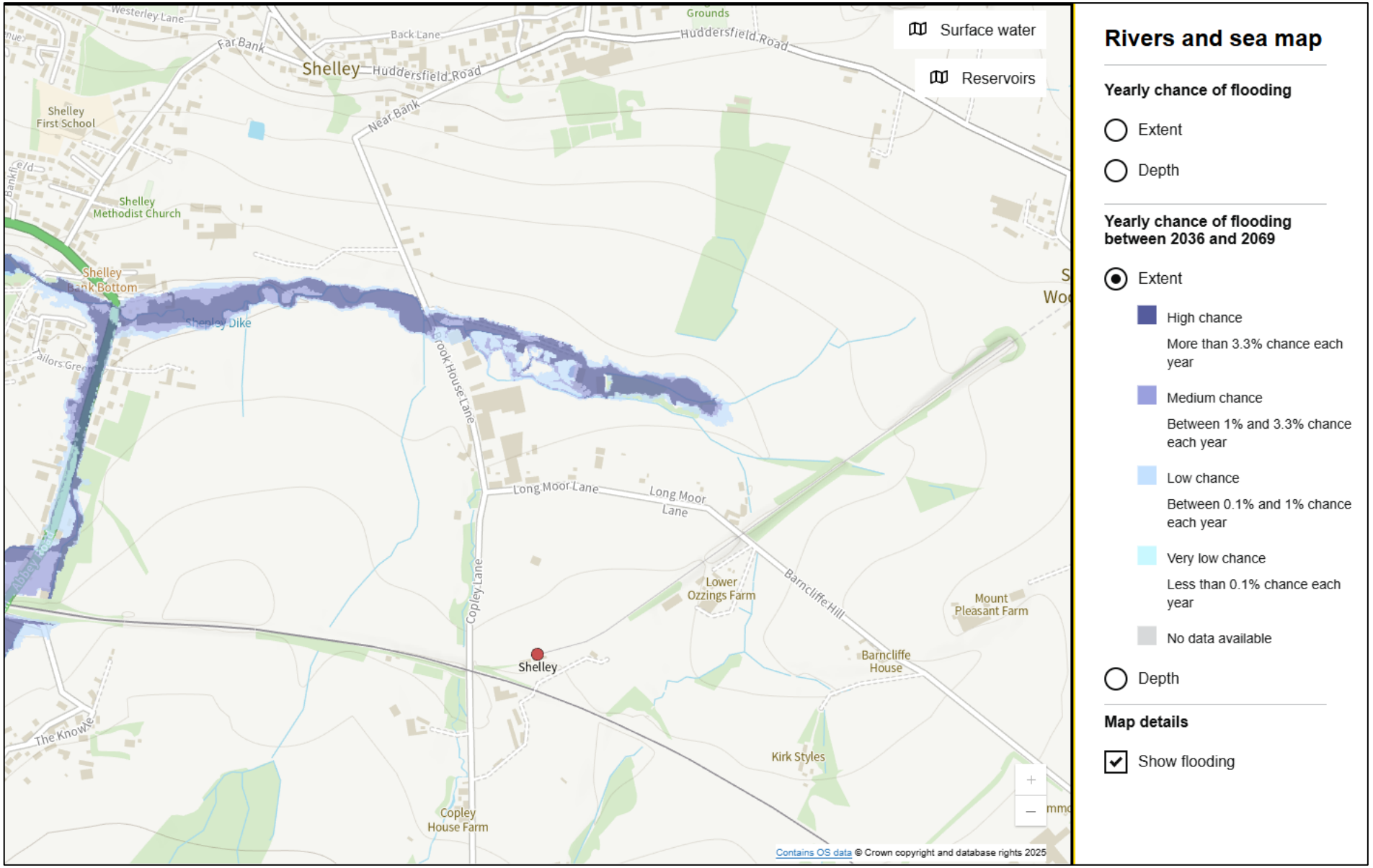
3.3 Proposed Plan.



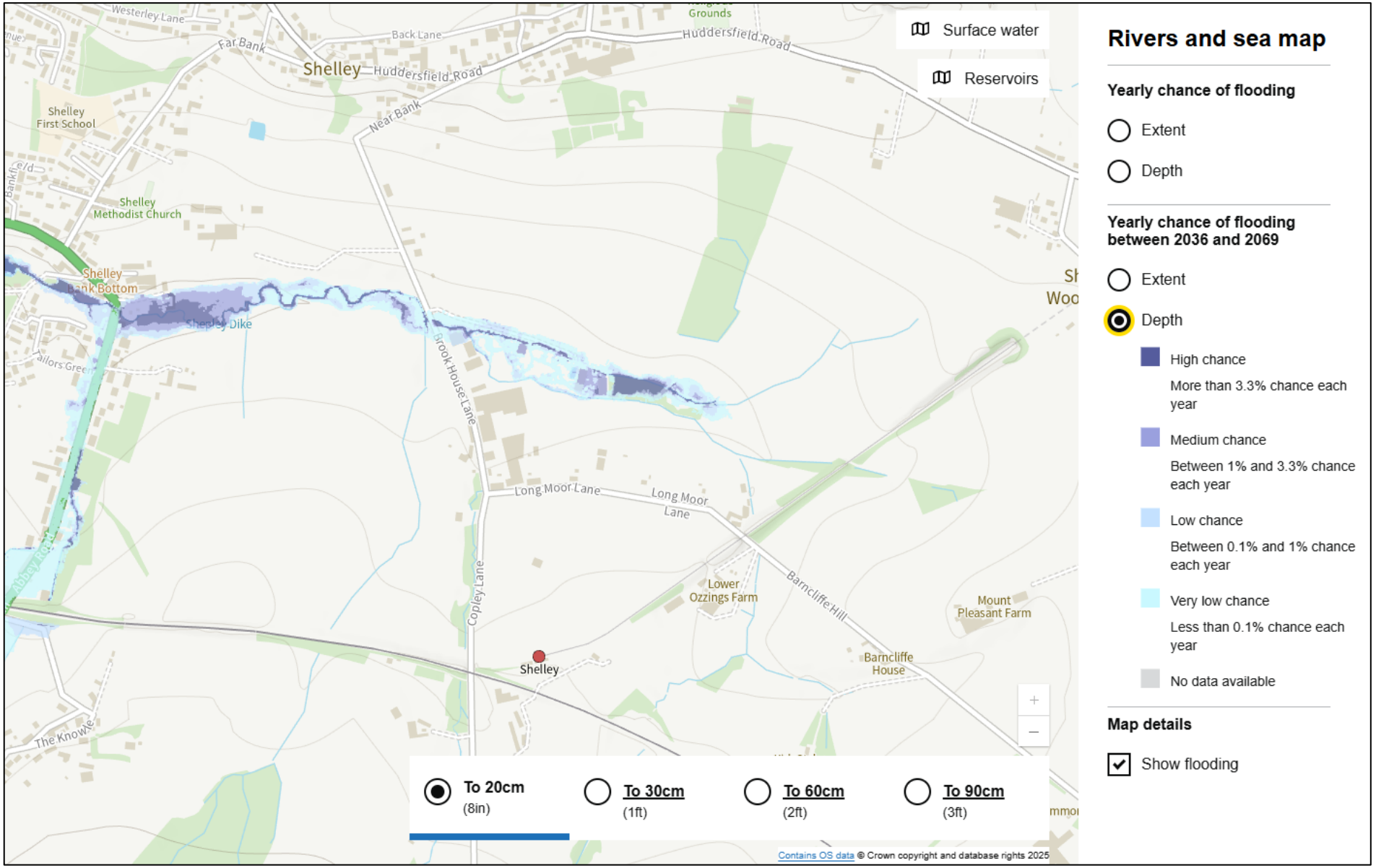
3.4 Environment Agency Flood Risk Data October 2025.

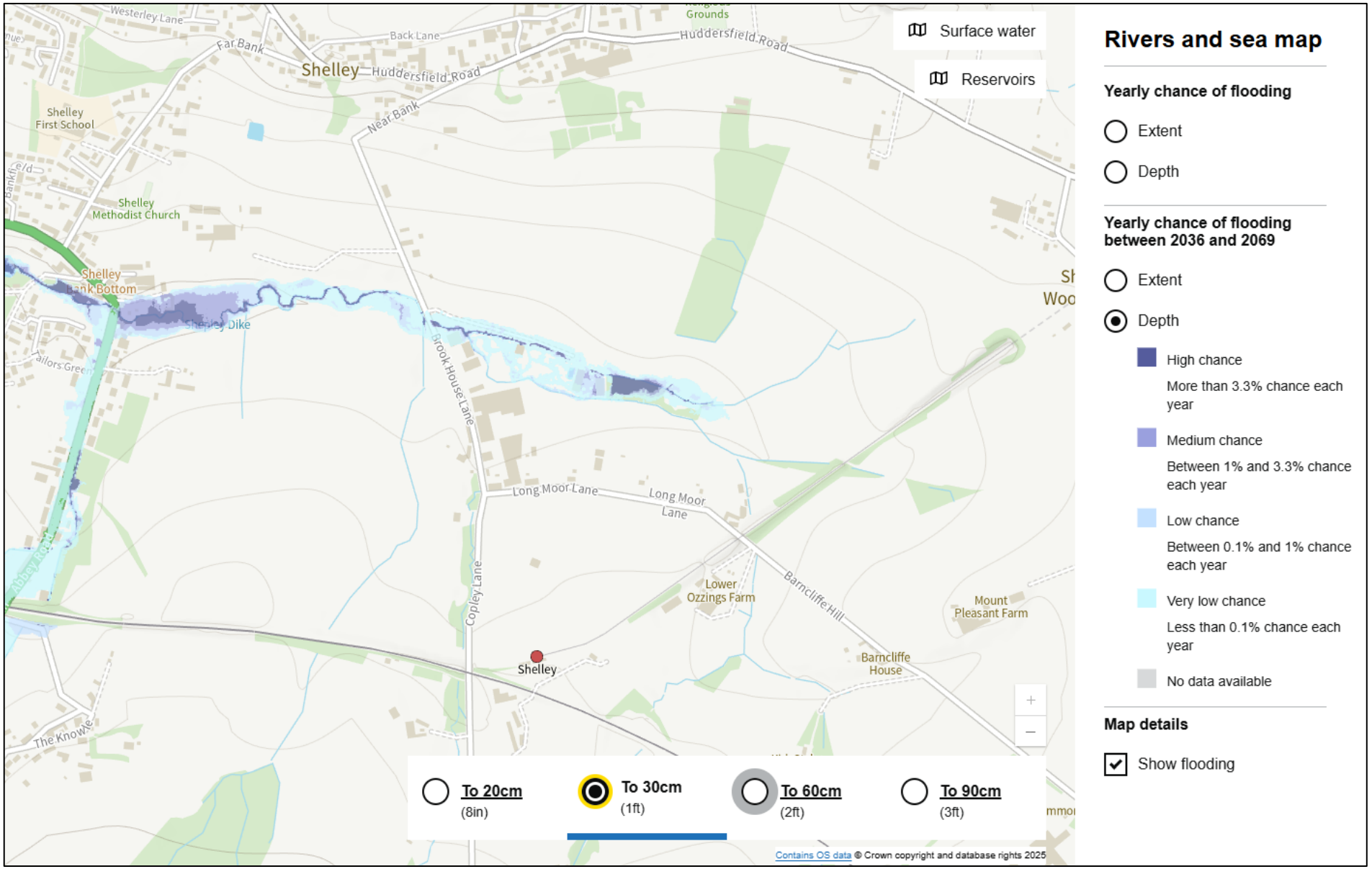


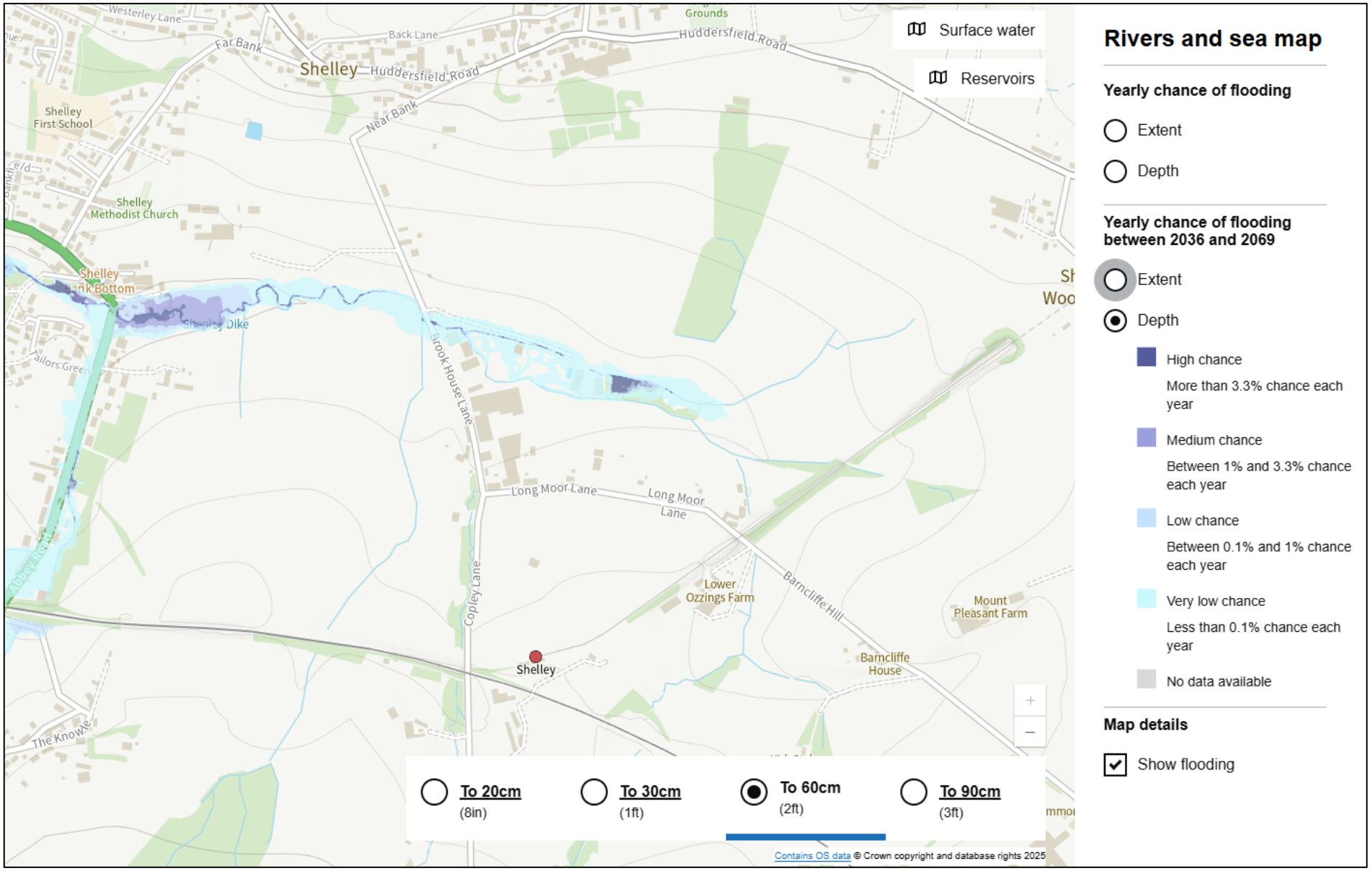
3.5 Environment Agency Technical Rivers & Sea Climate Change Flood Risk Extents Map.

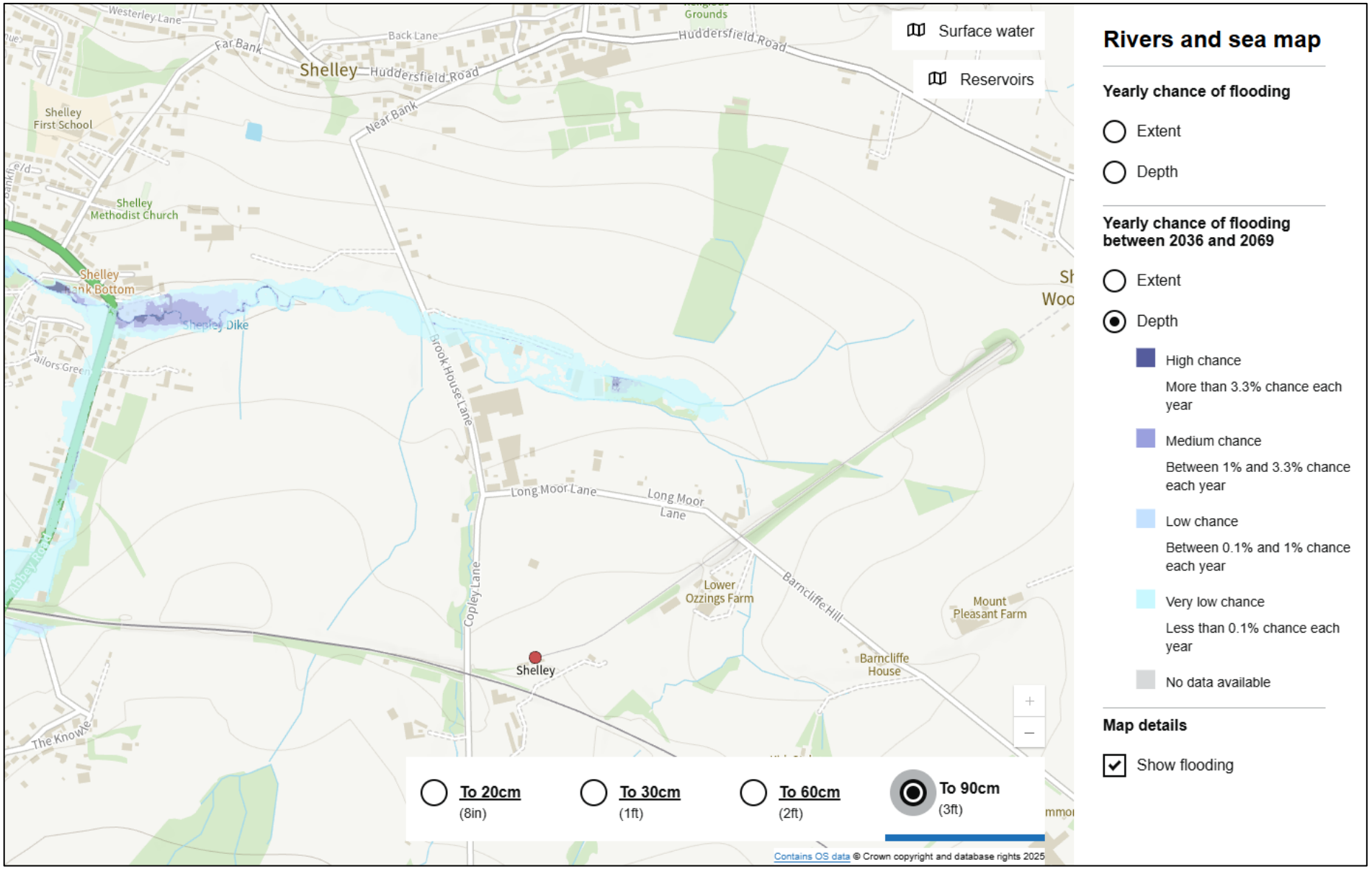


3.6 Environment Agency Technical Rivers & Sea Climate Change Flood Risk Depth Maps.

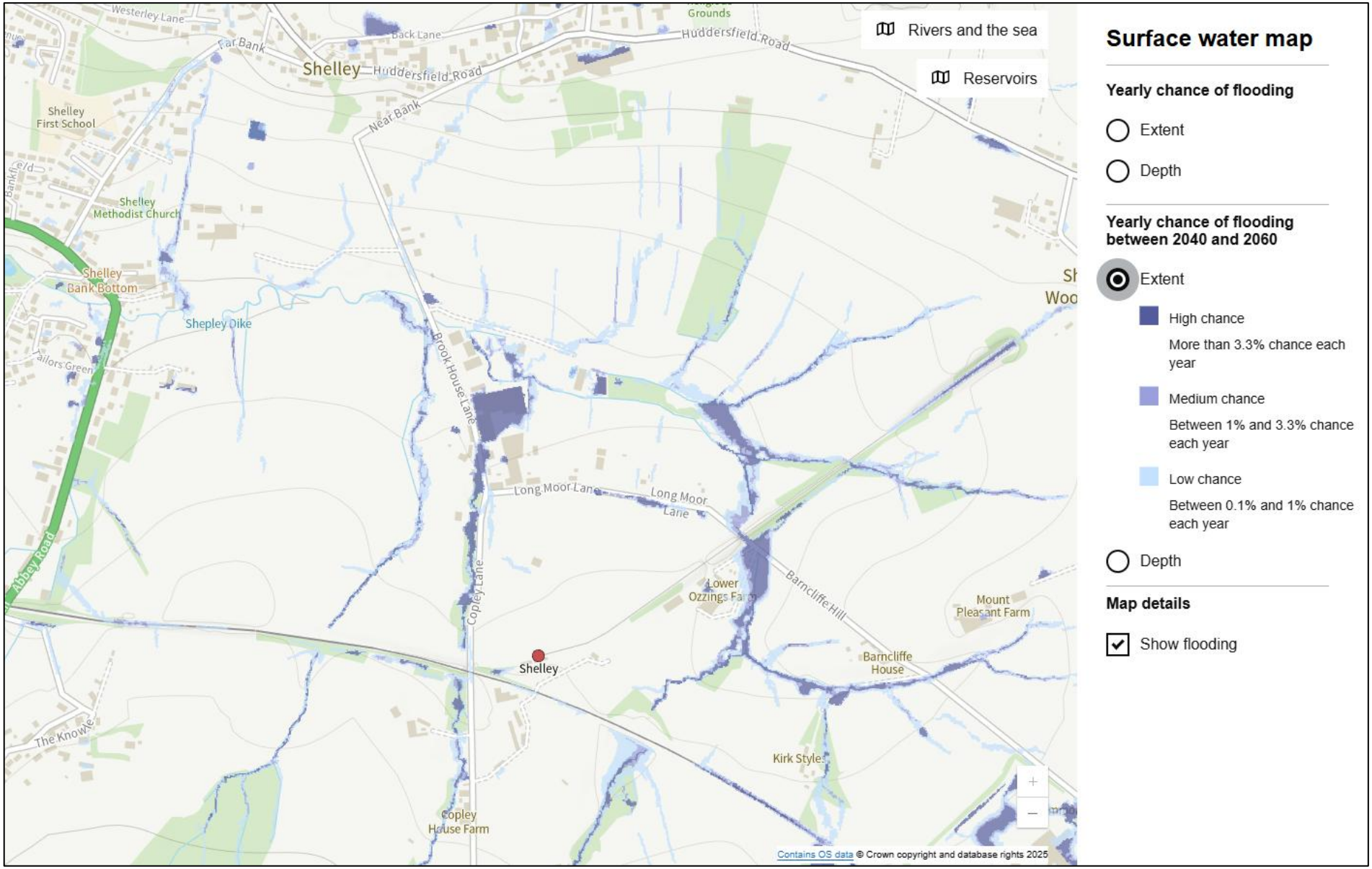



Surface water
Reservoirs
Rivers and sea map
Yearly chance of flooding
Extent
Depth
Yearly chance of flooding between 2036 and 2069
Extent
Depth
High chance
More than 3.3% chance each year
Medium chance
Between 1% and 3.3% chance each year
Low chance
Between 0.1% and 1% chance each year
Very low chance
Less than 0.1% chance each year
No data available
Map details
Show flooding
To 20cm (8in)
To 30cm (1ft)
To 60cm (2ft)
To 90cm (3ft)
Shelley
Huddersfield Road
Back Lane
Far Bank
Near Bank
Shelley First School
Shelley Methodist Church
Shelley Bank Bottom
Shirley Dike
Tailors Green
Brook House Lane
Long Moor Lane
Copley Lane
Lower Ozzings Farm
Barncliffe Hill
Mount Pleasant Farm
Barncliffe House
The Knowle
Contains OS data © Crown copyright and database rights 2025

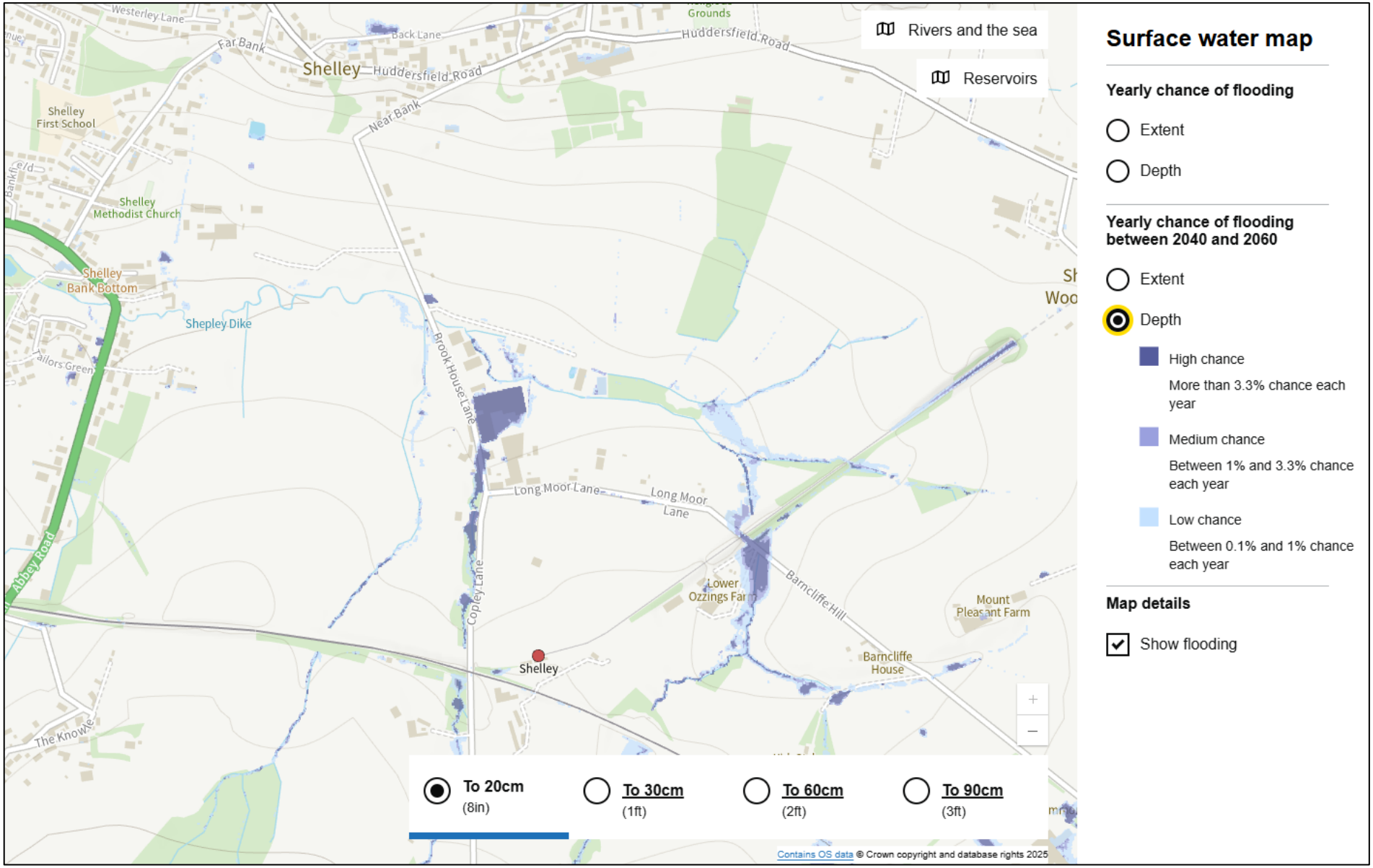

Surface water
Reservoirs
Rivers and sea map
Yearly chance of flooding
Extent
Depth
Yearly chance of flooding between 2036 and 2069
Extent
Depth
High chance
More than 3.3% chance each year
Medium chance
Between 1% and 3.3% chance each year
Low chance
Between 0.1% and 1% chance each year
Very low chance
Less than 0.1% chance each year
No data available
Map details
Show flooding
To 20cm (8in)
To 30cm (1ft)
To 60cm (2ft)
To 90cm (3ft)
Shelley
Huddersfield Road
Back Lane
Far Bank
Near Bank
Shelley First School
Shelley Methodist Church
Shelley Bank Bottom
Shipley Dike
Brook House Lane
Long Moor Lane
Copley Lane
Barncliffe Hill
Lower Ozzings Farm
Mount Pleasant Farm
Barncliffe House
The Knowle
Contains OS data © Crown copyright and database rights 2025

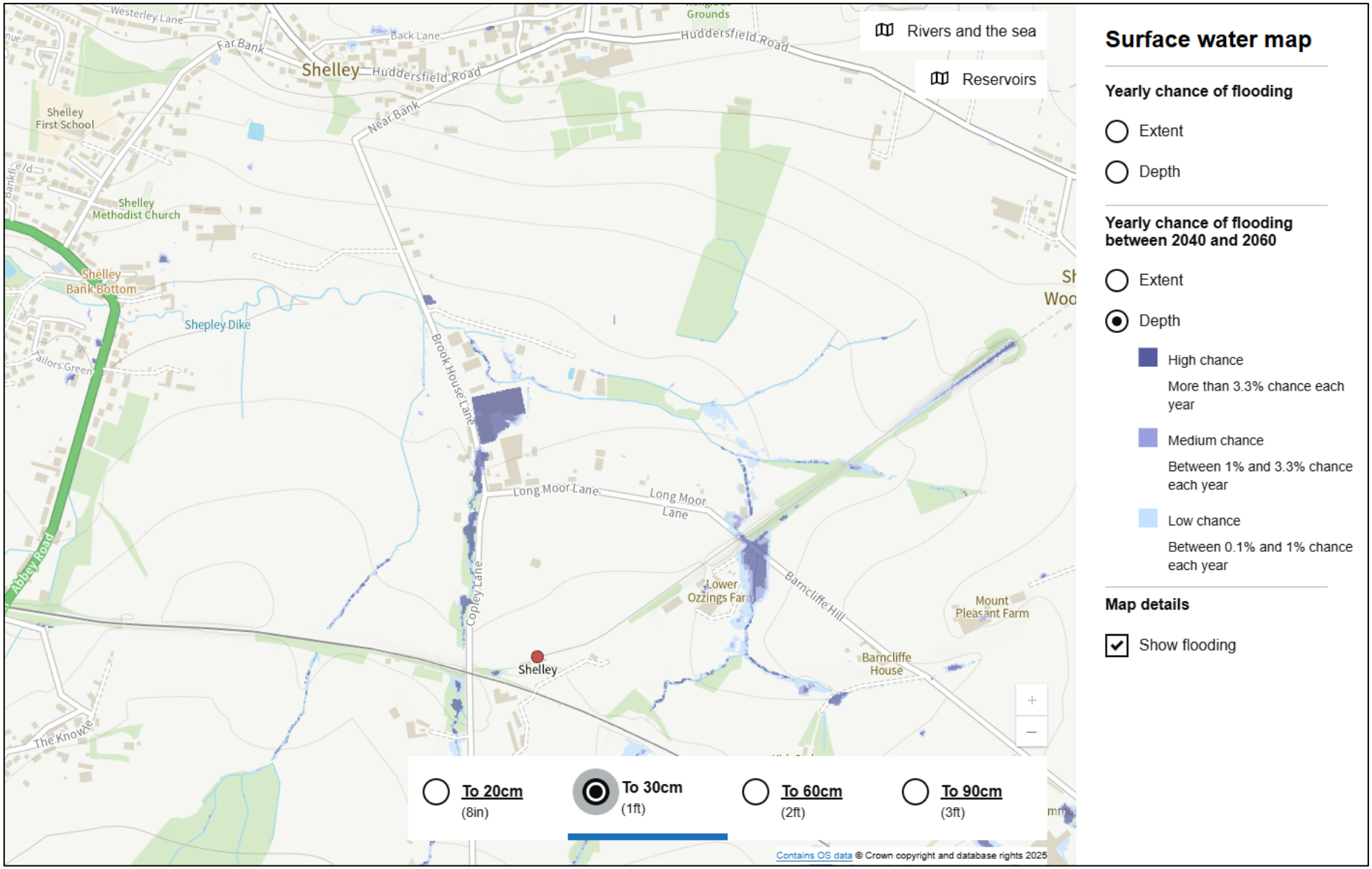

Surface water
Reservoirs
Rivers and sea map
Yearly chance of flooding
Extent
Depth
Yearly chance of flooding between 2036 and 2069
Extent
Depth
High chance
More than 3.3% chance each year
Medium chance
Between 1% and 3.3% chance each year
Low chance
Between 0.1% and 1% chance each year
Very low chance
Less than 0.1% chance each year
No data available
Map details
Show flooding
To 20cm (8in)
To 30cm (1ft)
To 60cm (2ft)
To 90cm (3ft)
Shelley
Huddersfield Road
Back Lane
Far Bank
Near Bank
Shelley First School
Shelley Methodist Church
Shelley Bank Bottom
Shepley Dike
Brook House Lane
Long Moor Lane
Copley Lane
Barncliffe Hill
Lower Ozzings Farm
Mount Pleasant Farm
Barncliffe House
The Knowle
Contains OS data © Crown copyright and database rights 2025

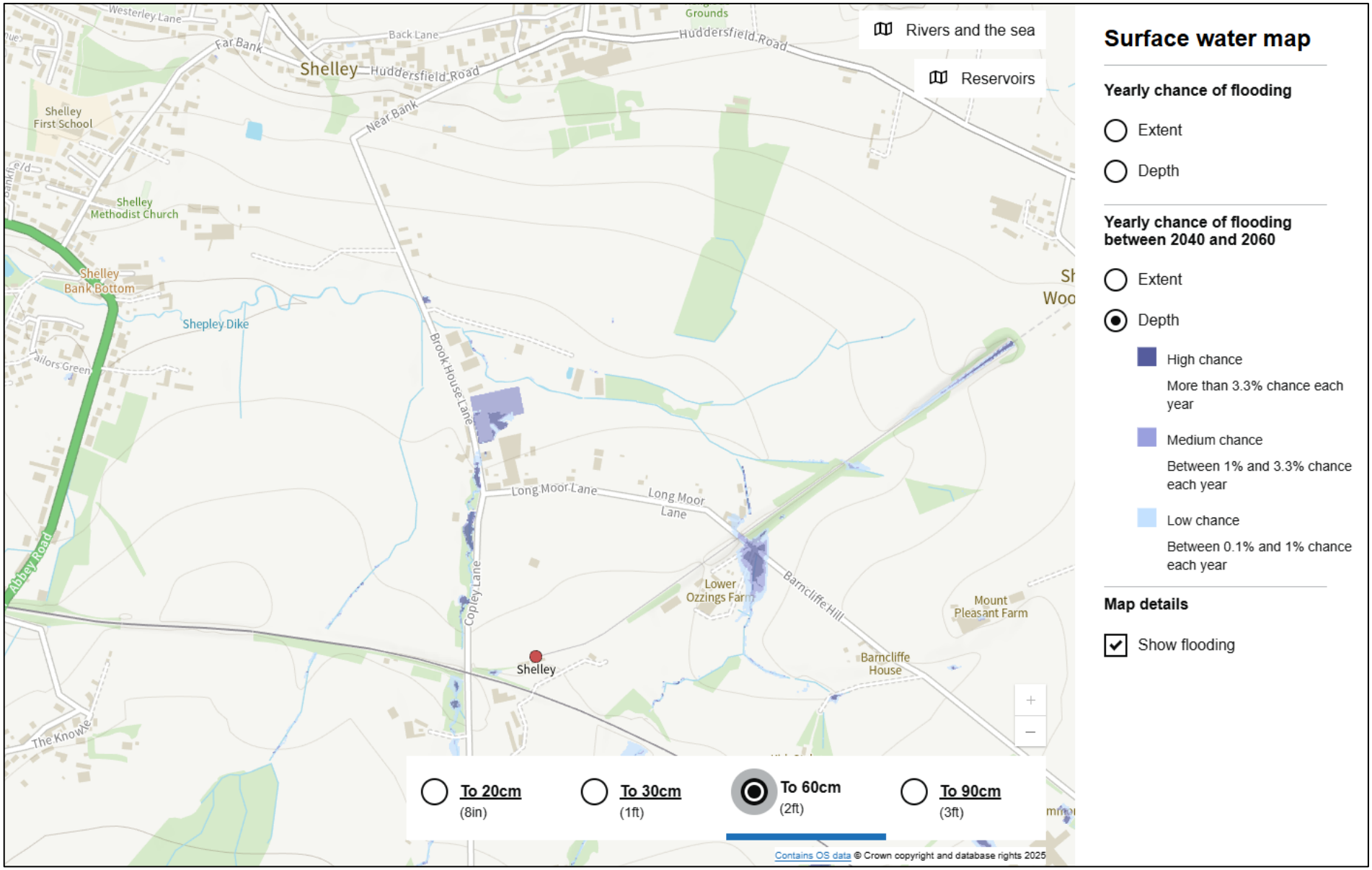
3.7 Environment Agency Technical Surface Water Climate Change Flood Risk Extent Maps.

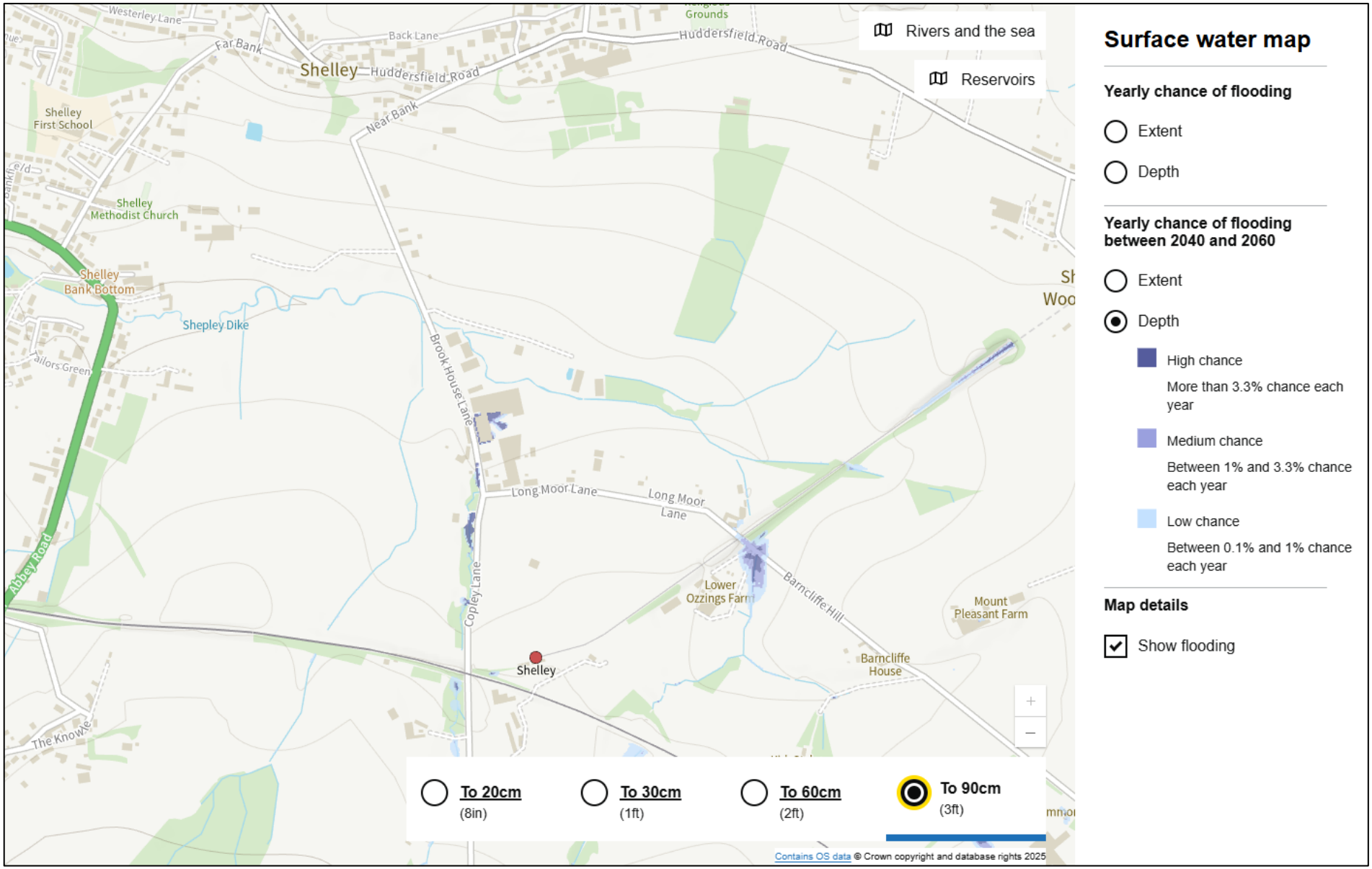


3.8 Environment Agency Technical Surface Water Climate Change Flood Risk Depth Maps.

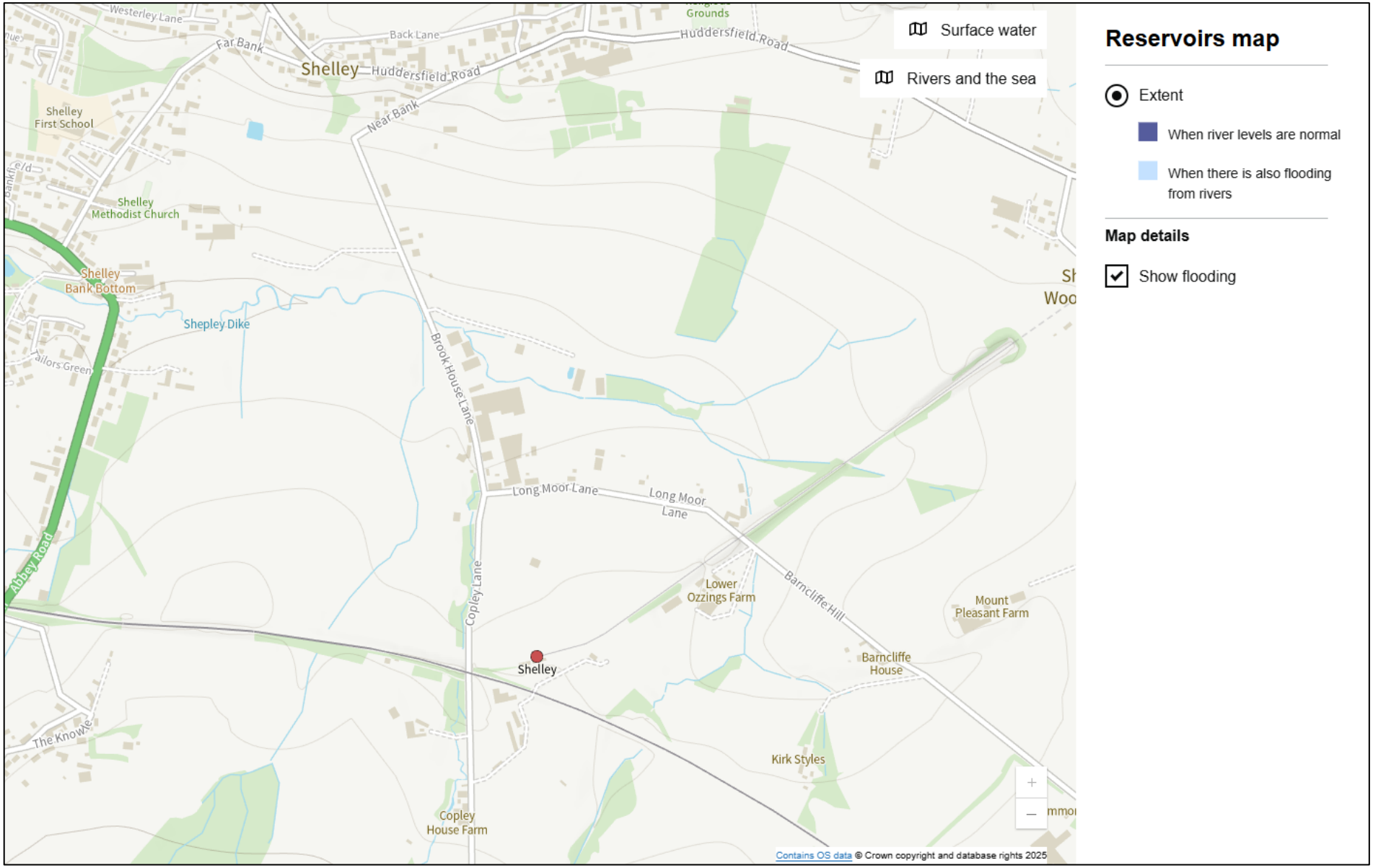



Rivers and the sea
Reservoirs
Surface water map
Yearly chance of flooding
Extent
Depth
Yearly chance of flooding between 2040 and 2060
Extent
Depth
High chance
More than 3.3% chance each year
Medium chance
Between 1% and 3.3% chance each year
Low chance
Between 0.1% and 1% chance each year
Map details
Show flooding
To 20cm (8in)
To 30cm (1ft)
To 60cm (2ft)
To 90cm (3ft)
Shelley
Huddersfield Road
Back Lane
Far Bank
Near Bank
Westerley Lane
Shelley First School
Shelley Methodist Church
Shelley Bank Bottom
Shepley Dike
Brook House Lane
Long Moor Lane
Copley Lane
Abbey Road
Lower Ozzings Farm
Barncliffe Hill
Mount Pleasant Farm
Barncliffe House
The Knowle
Contains OS data © Crown copyright and database rights 2025


Rivers and the sea
Reservoirs
Surface water map
Yearly chance of flooding
Extent
Depth
Yearly chance of flooding between 2040 and 2060
Extent
Depth
High chance
More than 3.3% chance each year
Medium chance
Between 1% and 3.3% chance each year
Low chance
Between 0.1% and 1% chance each year
Map details
Show flooding
To 20cm (8in)
To 30cm (1ft)
To 60cm (2ft)
To 90cm (3ft)
Shelley
Huddersfield Road
Back Lane
Far Bank
Near Bank
Shelley First School
Shelley Methodist Church
Shelley Bank Bottom
Shepley Dike
Brook House Lane
Long Moor Lane
Copley Lane
Abbey Road
Lower Ozzings Farm
Barncliffe Hill
Mount Pleasant Farm
Barncliffe House
The Knowle
Contains OS data © Crown copyright and database rights 2025


Rivers and the sea
Reservoirs
Surface water map
Yearly chance of flooding
Extent
Depth
Yearly chance of flooding between 2040 and 2060
Extent
Depth
High chance
More than 3.3% chance each year
Medium chance
Between 1% and 3.3% chance each year
Low chance
Between 0.1% and 1% chance each year
Map details
Show flooding
To 20cm (8in)
To 30cm (1ft)
To 60cm (2ft)
To 90cm (3ft)
Shelley
Huddersfield Road
Back Lane
Far Bank
Near Bank
Shelley First School
Shelley Methodist Church
Shelley Bank Bottom
Shepley Dike
Tailors Green
Abbey Road
Brook House Lane
Long Moor Lane
Copley Lane
Lower Ozzings Farm
Barncliffe Hill
Mount Pleasant Farm
Barncliffe House
The Knowle
Contains OS data © Crown copyright and database rights 2025

3.9 Environment Agency Technical Reservoir Flood Risk Depth Map.



3.10 Sewer Plans.

None obtained for the site.