

Detailed Flood Risk Assessment

Land North of 74 Main Street

Tickton

East Riding of Yorkshire

HU17 9RZ

Client:

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1. Introduction

East Riding Consultants Ltd have been commissioned to prepare a detailed flood risk assessment (FRA) for an outline planning application for a residential development.

A FRA is required because part of the development is identified as being in flood risk Zone 3a.

This is a supplementary document to a planning application; the conditions of a planning consent are likely to refer to this document, which means the applicant must comply with specific requirements set out in this report and consider its recommendations.

The Local Planning Authority (LPA) may condition a planning consent using information set out in this report.

2. Approach

2.1 National and Local Planning Policy (Flood Risk)

This report complies with the requirements set out in the Flood and Coastal Risk Change section of the planning practice guidance and the LPA Strategic Flood Risk Assessment (SFRA). It clearly considers:

- The effect of a range of flooding events including extreme events on people and property.
- Residual Risks taking into account the presence of any flood defences.
- How people will be kept safe from flood hazards identified.

This report does not rule out the risk of flooding to the development in any circumstances, it does however consider if the development is at risk in the design event(s) for planning purposes over its expected lifetime, including allowances for climate change based on best available data at the time.

2.2 Scope of Report

This report:

- Will assess the risk of flooding to the development.
- Will assess the risk of flooding that this development might present elsewhere.
- Will signpost Sequential & Exception test Information

This report:

- Will not give any guarantee that a planning application will be granted, this is a matter for the LPA.
- Will not set out any detailed design.
- Will not set out any detailed hydraulic calculations.
- Is not intended to replace the advice of a town planning expert in respect of a Sequential Test, Exception Test, or identification of sustainability benefits.

2.3 Sources of Data

The following publications and data sources were used in the production of this report:

- National Flood Risk Map for Planning – Rivers and Sea
- National Map for Risk of Flooding from Surface Water (UFMSW)
- ERYC Strategic Flood Risk Assessment, Level 1: 2019
- ERYC SPD - Flood Risk Sequential and Exception Test: 2021
- National Planning Policy Framework (NPPF): MHCLG: 2021
- Planning Practice Guidance (Flood Risk & Coastal Change): MHCLG: 2022
- Flood Risk Assessments Guide for New Development (FD2320): EA: 2005
- Flood Risk Assessments: Climate Change Allowances: EA: 2016 (2022 Update)
- LIDAR Composite Digital Surface Model 1m: EA: 2020

2.4 Licence and Attribution Information

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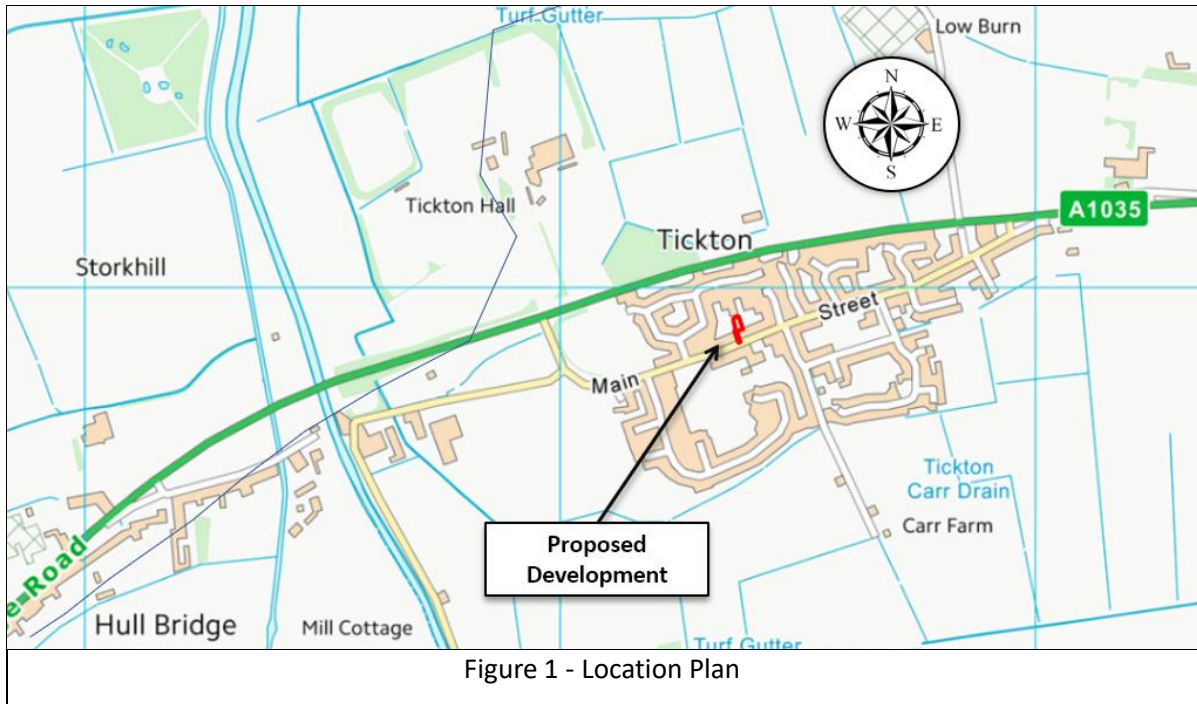
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Contains extracts from various East Riding of Yorkshire Council Policy Documents.

3. Context

3.1 Location

The proposed development is north of 74 Main Street, Tickton. The national grid reference for the development is TA 0637 4192.



3.2 Study Area

The study area will be the Holderness Drain Catchment and consider impacts from the river Hull.

3.3 Description of Proposed Development

The proposal is to demolish existing outbuildings to be replaced with a residential development.

3.4 Topography

A detailed topographical survey has been conducted in and around the development, the average site level is 4.2m Above Ordnance Datum (mAOD), the road frontage level is 3.94mAOD.

A wider topographical analysis has been undertaken using source data from the EA 2020 1m EA LIDAR digital terrain model which was accessed in November 2022 and converted into a contour map at 1000mm, and 500mm intervals. The method used was to extrapolate the LIDAR raster files using a Geospatial Data Abstraction Library (GDAL) algorithm.

A comparison of the flood map 3a extent has been made to the wider topographical map, this matches the 1%AEP design flood extent to a maximum elevation of 4mAOD.

4. Flood Risk Information

4.1 Flood Risk and Topographical Information

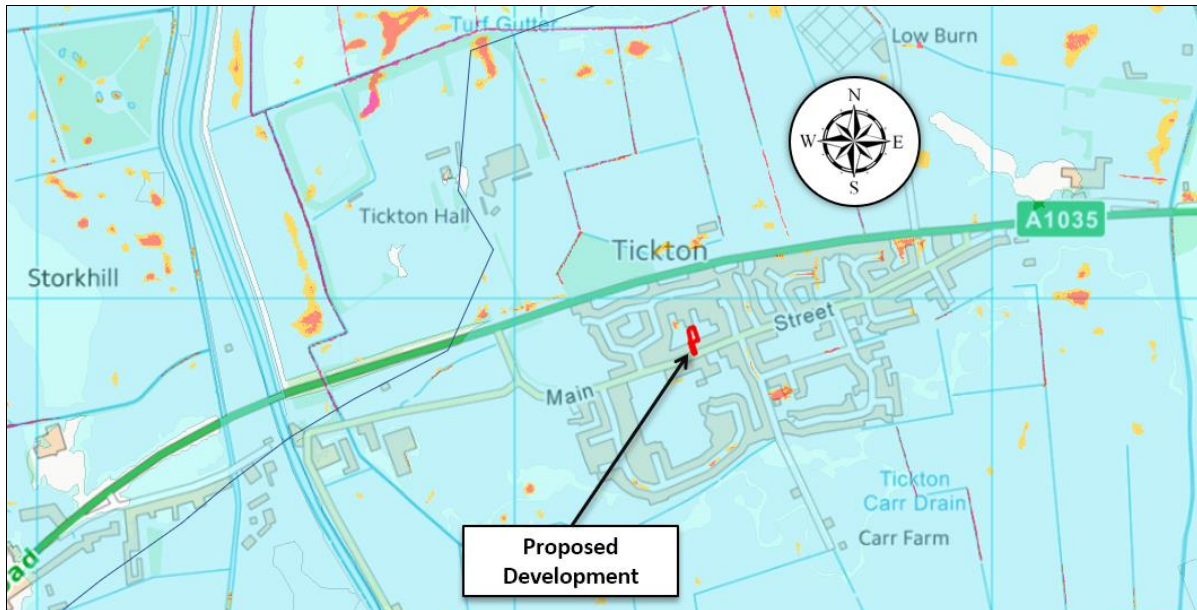


Figure 2 - Flood Risk Map for Planning Rivers and Sea and Surface Water Hazard 1% AEP

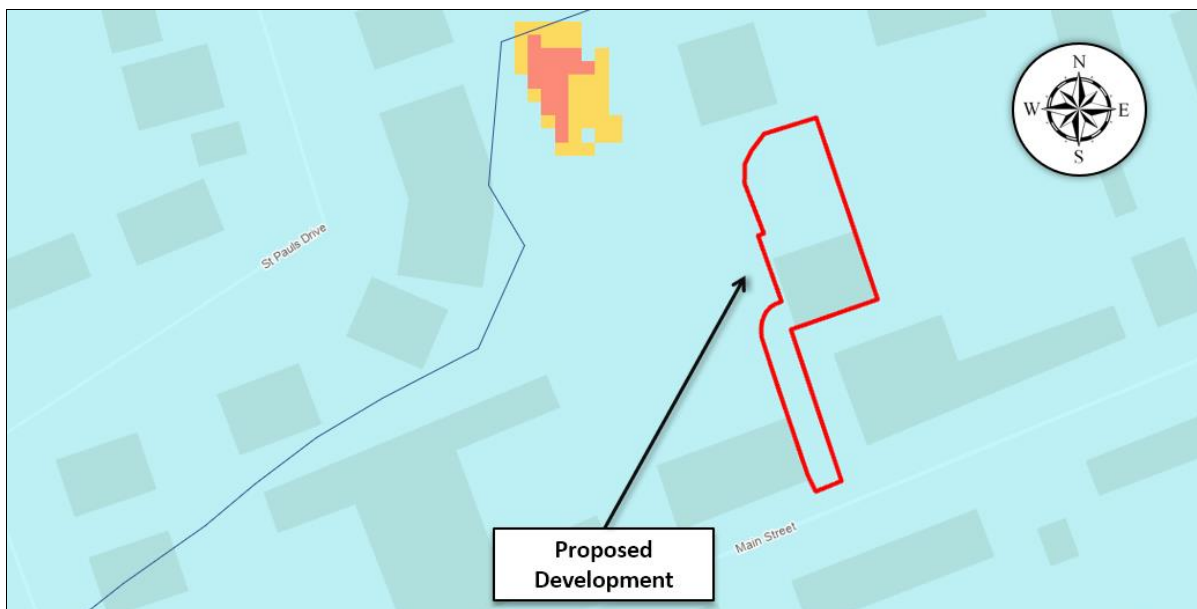


Figure 3 - Flood Risk Map for Planning Rivers and Sea and Surface Water Hazard 1%AEP

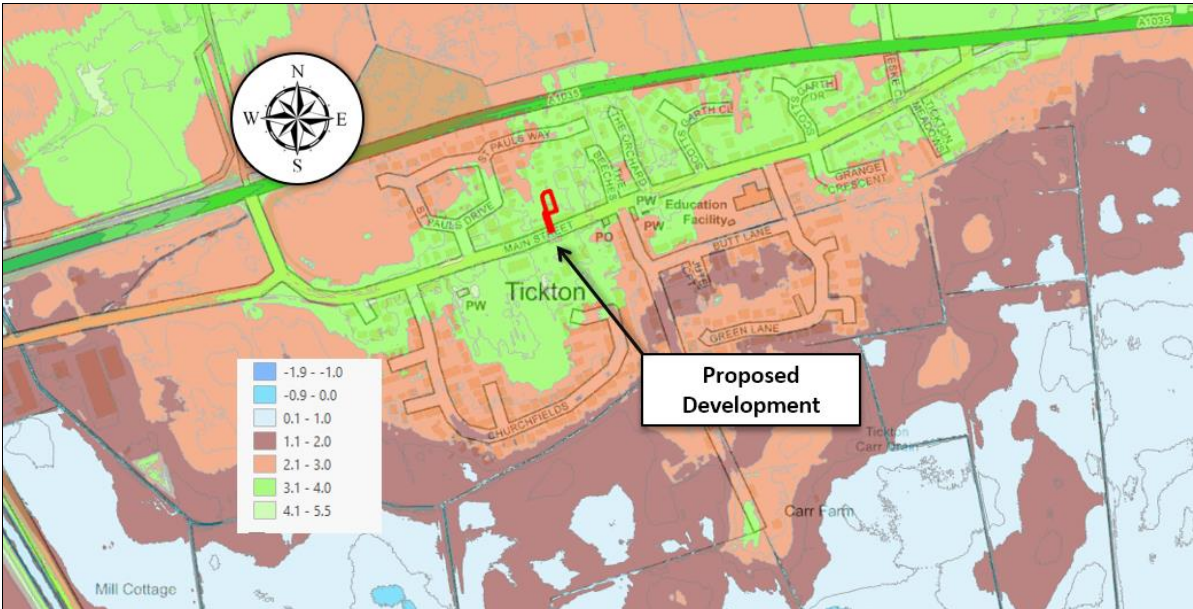


Figure 4 - Contour Map (Shows Maximum Elevations to mAAD)

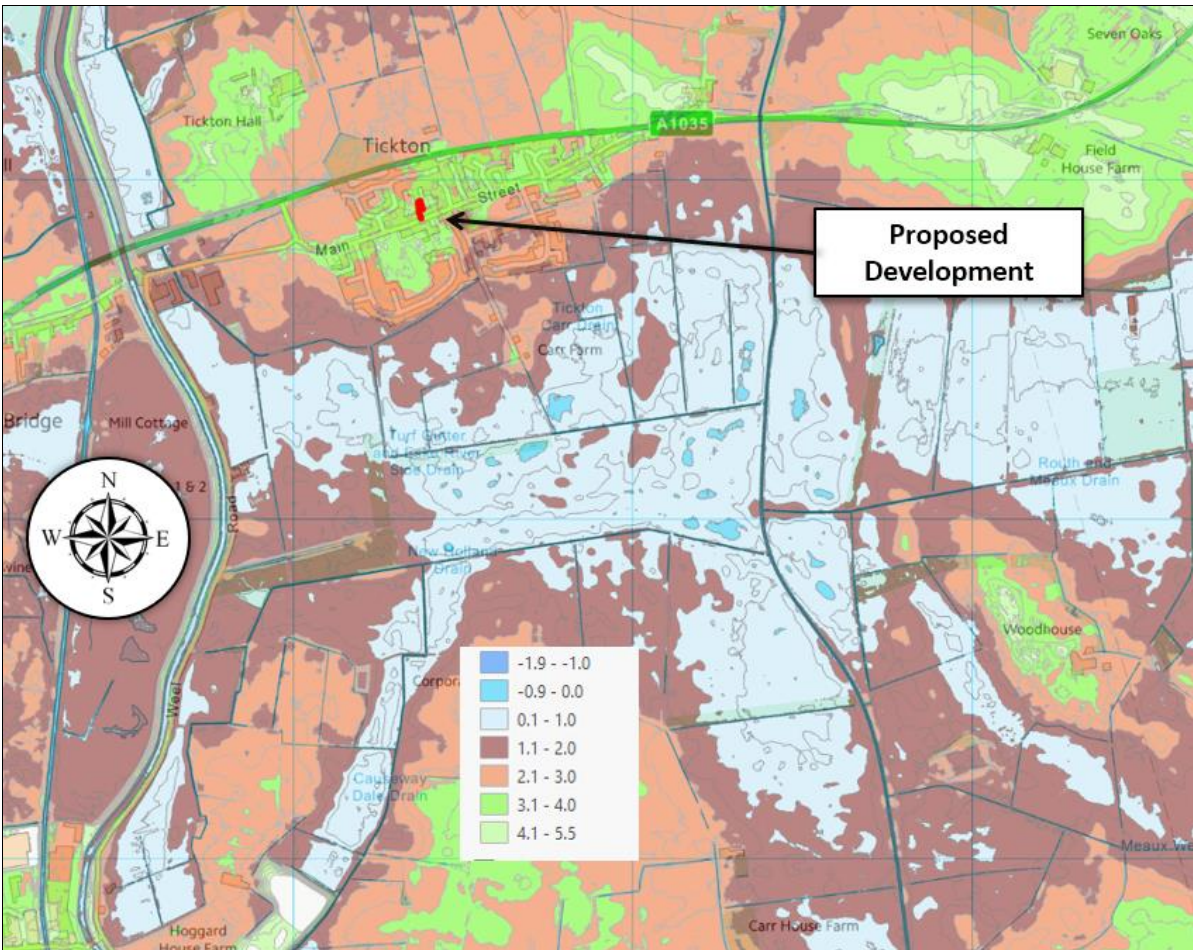


Figure 5 - Contour Map (Shows Maximum Elevations to mAAD)

5. Flood Risk Map Commentary

The National flood risk map for planning - rivers and sea shows the development is in Flood Risk Zone 3a.

The national surface water mapping product shows that the development has a very low hazard from surface water flooding.

6. Sequential Test

The LPA Supplementary Planning Document on the Sequential and Exception Test (SPD) advises the use of the proposed development is “More Vulnerable”.

| | |
|-----------------|---|
| More Vulnerable | <ul style="list-style-type: none"> 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. Landfill³⁰ 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. |
|-----------------|---|

Figure 10 in the SPD shows which types of development should not be permitted. The SPD table shows these are Highly Vulnerable uses in Flood Zone 3a. A sequential and exception test is required for the More Vulnerable uses in Flood Zone 3a.

| | Essential Infrastructure | Highly Vulnerable | More Vulnerable | Less Vulnerable | Water Compatible |
|---------------|--------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------------------|
| Flood Zone 1 | Development is appropriate | Development is appropriate | Development is appropriate | Development is appropriate | Development is appropriate |
| Flood Zone 2 | Development is appropriate | Exception test required | Development is appropriate | Development is appropriate | Development is appropriate |
| Flood Zone 3a | Exception test required ⁷ | Development should not be permitted | Exception test required | Development is appropriate | Development is appropriate |
| Flood Zone 3b | Exception test required ⁸ | Development should not be permitted | Development should not be permitted | Development should not be permitted | Development is appropriate |

The SPD advises that for the Sequential Test an area of search should be established, the planning practice guidance which is referenced in the SPD defines the area of search to be over a geographic area defined by local circumstances, referenced below.

Policy S3 of the Local Plan “Focusing Development” makes it clear that new development will be supported on land within the development limits of Tickton.

Policy S3: Focusing development

- A. New development will be supported where it is focused within the following locations:
- I. The defined Settlement Network which consists of land within the development limits of:
 - i. The Major Haltemprice Settlements – those settlements in the East Riding immediately to the west of the City of Hull – Anlaby, Cottingham, Hessle, Kirk Ella and Willerby;
 - ii. Principal Towns – Beverley⁽³⁾, Bridlington, Driffield and Goole⁽⁴⁾;
 - iii. Towns – Elloughton-cum-Brough⁽⁵⁾, Hedon⁽⁶⁾, Hornsea, Howden, Market Weighton, Pocklington and Withernsea;
 - iv. Rural Service Centres – Aldbrough, Beeford, Bubwith, Gilberdyke/Newport, Holme on Spalding Moor, Hutton Cranswick, Keyingham, Kilham, Leven, Middleton on the Wolds, Patrington, Snaith, Stamford Bridge and Wetwang; and
 - v. Primary Villages – Bilton, Brandesburton, Cherry Burton, Dunswell, Easington, Eastrington, Flamborough, Leconfield, Melbourne, Nafferton, North Cave, North Ferriby, Preston, Rawcliffe, Roos, Skirlaugh, South Cave, Swanland, Thorngumbald, **Tickton**, Walkington, Wawne, Wilberfoss and Woodmansey.

Section 5.12 of the Local Plan recognises that Tickton is a Primary village completely within flood zone 3a. The same section states: *“Housing may be appropriate if it can be delivered safely in accordance with policy ENV6”*. This FRA sets out the management of flood risk as prescribed in ENV6 - Section B through D.

Section 3.8 of the SPD states that the area of search should be related to the type, scale, size, nature and character of the proposed development and should be agreed with the Council (case officer) on a case-by-case basis.

Based on the information given above, combined with the type, scale, size, nature and character of the proposed development, it is proposed that the search area is within the development limits of the village. As can be seen in Figure 2, no part of the village is at a lower level of flood risk than the proposed development.

7. Exception Test

7.1 Flood Risk

This FRA is prepared so to demonstrate 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.

7.2 Sustainability

This development offers wider sustainability benefits as it is a redevelopment of a brownfield site.

With reference to Primary Villages (of which Tickton is one) Section 5.11 of the Local Plan states that *“the policy recognises their basic sustainability credentials and promotes an approach which would increase the current number of dwellings by 10%”*, analysis of the planning lists since the adoption of the local plan suggest this target has not yet been reached.

8. Detailed Analysis of Flood Risk

8.1 Historic Flooding

The Environment Agency Historic Flood Map does not show that the development has flooded. There is some documentary evidence of flooding closer to the river Hull. No evidence of historical flooding was found at the location of the proposed development.

8.2 Climate Change

The central and higher-central estimates for peak flow allowances are between **17%** and **37%** over the anticipated lifetime of this development, this will lead to an increase in peak flood depths over the 100-year lifetime of the development during the design event.

8.3 Flooding from Surface Water

The national maps for surface water flooding indicate very low risk from surface water flooding.

8.4 Flooding from Rivers and Large Watercourses (Fluvial Flooding)

The development is situated in the Holderness Drain catchment area. The Holderness Drain is a low-level engineered watercourse that relies on pumps at Great Culvert (Bransholme) and East Hull Pumping Station. Should pumps fail over a prolonged period and the system is overwhelmed then a series of catts will fill up sequentially starting at Wawne Common and then northwards.

The area is flanked by two high level carrier systems to the east and west, Monk Dyke and the River Hull respectively. There is no gravity drainage into these systems locally, should these systems overtop, or their raised banks fail, out of catchment flow will enter the Holderness Drain System.

The development is on relatively high ground compared to much of the area, at around 4.2mAOD. Some of the Carr land that surrounds the village is at or below datum, meaning that there would need to be a significant volume of flood water distributed elsewhere in the catchment before the development is impacted. These factors are clearly illustrated on the contour maps in Figures 4 and 5.

8.5 Flooding from Groundwater

The development is situated on a superficial geology of sands and gravels overlaying a chalk bedrock. Although groundwater emergence is feasible in this location it is unlikely to be acting under any head, so is less likely to cause flooding.

8.6 Flooding due to Breach.

Failure of hard and earth defences on the left bank of the river Hull would result in rapid inundation of land immediately to the east of the river. Given the development is only 300mm lower than the river Hull raised embankments and around 840m away at its closest point, such a breach is unlikely to create a direct danger to users of the development. Such a failure would see the river empty onto the flood plain in the first instance. The flood flow route would be south towards the lower carr land in any case, this can be seen in Figure 5.

8.7 Flooding due to Overtopping

The risk due to overtopping from the Monk Dyke and river Hull is considered above in 7.4.

8.8 *Flooding from other Local Sources*

There are no other significant sources of flooding identified.

8.9 *Flooding from the Development Site Itself*

As the development replaces existing buildings of approximately the same footprint there is no increased runoff from the development.

9. **Conclusion**

Although the national flood risk maps suggest the development is at risk of flooding it should be noted that there is no evidence this site flooded during the 2007 flooding event, an event which had a a rarity of 1 in 544 (FEH 2013), however it should be noted that although overtopping of the river Hull and Monk Dyke occurred during this event, the raised banks did not fail. When considering flood risk, residual risk, such as the failure of raised defences must also be considered.

9.1 *Finished Floor Levels (FFL)*

Appendix 3 of the SFRA requires that the FFL of any property must be set at 600mm above average site level or adjacent road frontage level, 'design flood' level or maximum historic flood level (if available), whichever is higher.

The highest of these values is the average site level at 4.2mAOD, this means the finished floor level is required to be 4.8mAOD.

9.2 *Flood Protection and Resilience Measures*

Appendix 3 of the SFRA requires that an additional 300mm of flood proofing measures should be provided above FFL. Appropriate measures include:

- The installation of passive flood doors and flood protection measures to BSI: PAS 1188 on vents and apertures.
- The installation of shower trays or wet rooms where the drain point is close to the FFL should be avoided; otherwise, wastepipes should include passive inline non-return valves. Consider the installation of passive inline non-return valves between WCs and soil pipes.
- Install a solid concrete floor with appropriate waterproofing between oversight concrete and internal floors.
- Use cement, lime, and aggregate plaster to back and skim ground floor internal walls. Dry lined partition walls should be avoided on the ground floor, use aerated concrete blocks instead.
- Incoming utility supply pipes and cables should be terminated at least 600mm above FFL, with all pipes and ducting sealed at entry points with flexible duct sealants. Internal electrical distribution systems should be at ceiling height and sockets should be wired down to 300mm above FFL.
- Avoid composite timber products such as MDF and chipboard in downstairs construction including staircases, use solid treated constructional timbers instead. Avoid composite floor

coverings or natural wood floor coverings such as parquet in kitchens and bathrooms, use ceramic tiles instead.

10. Flood Warnings

The occupier should register with the Governments flood information service which can be found here: <https://flood-warning-information.service.gov.uk/warnings>.

Report Ends