

AtkinsRéalis



Flood Risk Assessment

West Sussex County Council

15th June 2026

100124937_FRA

HOMEFIELD PRIMARY SCHOOL

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1. Introduction

1.1 Purpose of this report

This report presents an assessment of flood risk associated with the redevelopment and expansion of Homefield Primary School, located on Chesswood Road in Worthing (BN11 2AA). The proposals comprise the internal refurbishment of the existing main block and the construction of a new single-storey school building to include a Special Support Centre (SSC). The Client is West Sussex County Council.

The assessment has included the following key tasks:

- Review of available data and relevant information.
- Evaluation of flood risk to the site, including potential changes resulting from the proposed development.
- Assessment of mitigation measures, where necessary, to manage and reduce flood risk to acceptable levels.

1.2 Background

This assessment has been undertaken in accordance with the National Planning Policy Framework (NPPF)¹. The NPPF requires that proposed development sites exceeding 1 hectare in area, located within Flood Zones 2 or 3, or identified as having critical drainage issues, are supported by a Flood Risk Assessment (FRA).

The broad aim of the NPPF is to minimise flood risk to people and property within both the natural and built environment. To achieve this, Local Planning Authorities must ensure that flood risk is appropriately considered at the initial stages of the planning process. Responsibility for undertaking this assessment rests with the developer, who must demonstrate:

- 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.

An FRA is required for the Homefield Primary School redevelopment and expansion for the following reasons:

- Parts of the site are at risk of surface water flooding.

¹ [National Planning Policy Framework](#)



The developer must demonstrate to the Local Planning Authority and the Environment Agency that both the existing and potential future flood risks associated with the development can be appropriately managed.

1.3 Environment Agency requirements

The scope, detail, and complexity of a Flood Risk Assessment (FRA) should be proportionate to the level of flood risk associated with the proposed development. Guidance is provided on the gov.uk website² and reflects differing requirements based on the scale of development and its location within the floodplain.

The FRA should include the following:

1. Plans and drawings

- A location plan and detailed site layout showing existing conditions and the proposed development.

2. Topographical information

- Survey data illustrating site levels.

3. Flood risk assessment, including:

- Information of all potential sources of flooding and their impacts on the site.
- Details of the sequential test and if required the exception test.
- An assessment of how users of the development can avoid exposure to flooding in and around the development, including whether safe access and exit can be provided for routine and emergency access under both frequent and extreme flood conditions.
- Consideration of potential impacts on third parties, including displacement of floodwater due to changes in ground levels or defences.
- Consideration of climate change and its potential influence on flood risk over the lifetime of the development.
- Arrangements for surface water management.
- Identification of residual flood risks.
- Review of the proposals in the context of the relevant Strategic Flood Risk Assessment (SFRA).

1.4 Flood risk definitions

Flood risk includes the statistical probability of an event occurring and the scale of the potential consequences. The risk is estimated from historical data and expressed in terms of the expected

² [Flood risk assessments: applying for planning permission - GOV.UK](https://www.gov.uk/guidance/flood-risk-assessments-applying-for-planning-permission)



frequency (or 'return period') of a flood of a given magnitude. The 10-year, 50-year and the 100-year floods have a respective 10%, 2% and 1% chance of occurring in any given year (this is termed the Annual Exceedance Probability [AEP]), however, over a longer period the probability of flooding is considerably greater. For example, for the 100-year return period flood, there is a:

- 1% chance of the 100-year flood occurring or being exceeded in any year.
- 26% chance of it occurring or being exceeded in a 30-year period.
- 51% chance of it occurring or being exceeded in a 70-year period.

Table 1-1 provides a summary of the relevant AEP and corresponding return periods.

Table 1-1 Definition of AEP and 'return period' flood events

AEP (%)	Return period (years)
50%	2
10%	10
5%	20
4%	25
2%	50
1%	100
0.5%	200
0.1%	1,000



2. Proposed development site

2.1 Site location

The Homefield Primary School site is located off Chesswood Road in Worthing within a predominantly residential urban area. It is bounded by a railway line to the north, Ladydell Road to the east, and Chesswood Road to the south, which provides the main vehicular and pedestrian access.

The site boundaries are shown in Figure 2-1 and a map showing the general location is in Figure 2-2.

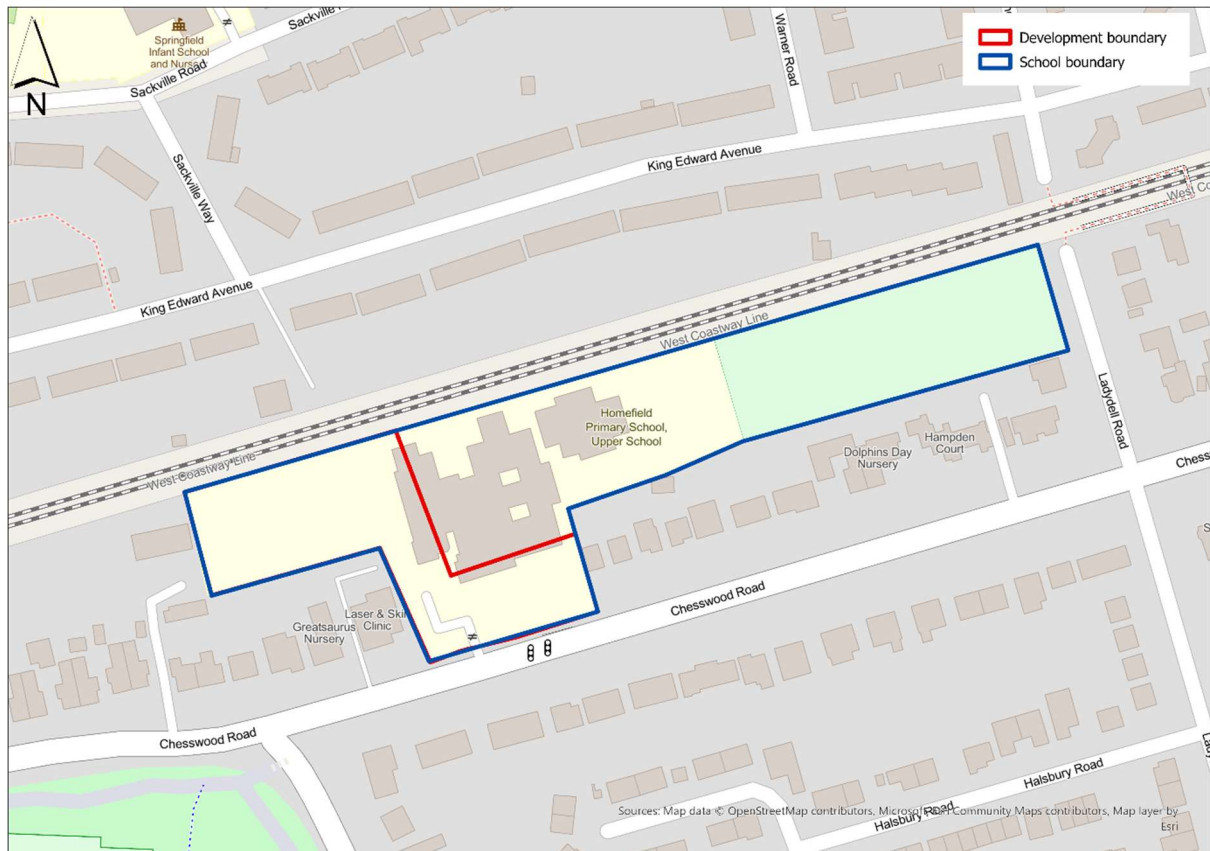


Figure 2-1 – Development and school boundary



Figure 2-2 – General location

2.2 Site description

The wider school site currently comprises existing school buildings with associated hardstanding areas, including playgrounds and car parking, as well as open grass playing fields to the east. The site has historically been used for educational purposes, with extensions and temporary structures added over time. Vegetation includes mature trees, primarily along the northern boundary and within the proposed development area. An existing pond is also located in the north-west corner, adjacent to boundary fencing opposite the railway line. The nearest watercourse to the site is a tributary of the Teville Stream, which is over 500 metres to the northeast.

2.3 Development proposals

A plan of the proposed development is provided in Appendix A. The proposals comprise the internal refurbishment of the existing main school building and the construction of a new single-storey building to the west to accommodate classrooms and the Special Support Centre (SSC). Externally, the works include the provision of dedicated SSC and reception play areas, together with the reconfiguration of access routes and parking areas within the western part of the site.

The footprint of the building and associated access routes are currently formed of hardstanding (impermeable surfaces). The proposed building and roof structure are assumed to have a design life of approximately 50 years.

In accordance with the NPPF, the proposed development is classified as 'More Vulnerable'.

2.4 Topography

The general elevation of the site has been assessed using LiDAR data, downloaded from [Defra Survey Data Download](#) and from a detailed topographical survey of the site, which was undertaken by 1st Horizon on 14/11/2025 (Ref No. AR-HPS12987-01/B to AR-HPS12987-05/B) and is shown in Figure 2-3.





Figure 2-3 – Existing site topography

The site is located within a generally flat coastal plain, with ground levels ranging between approximately 4.84 mAO D and 5.97 mAO D, representing an overall variation of 1.13 m. The site slopes broadly from north to south, with LiDAR-derived overland flow paths indicating runoff directed south towards Chesswood Road, before routing west to east along the road. This is illustrated in Figure 2-4.

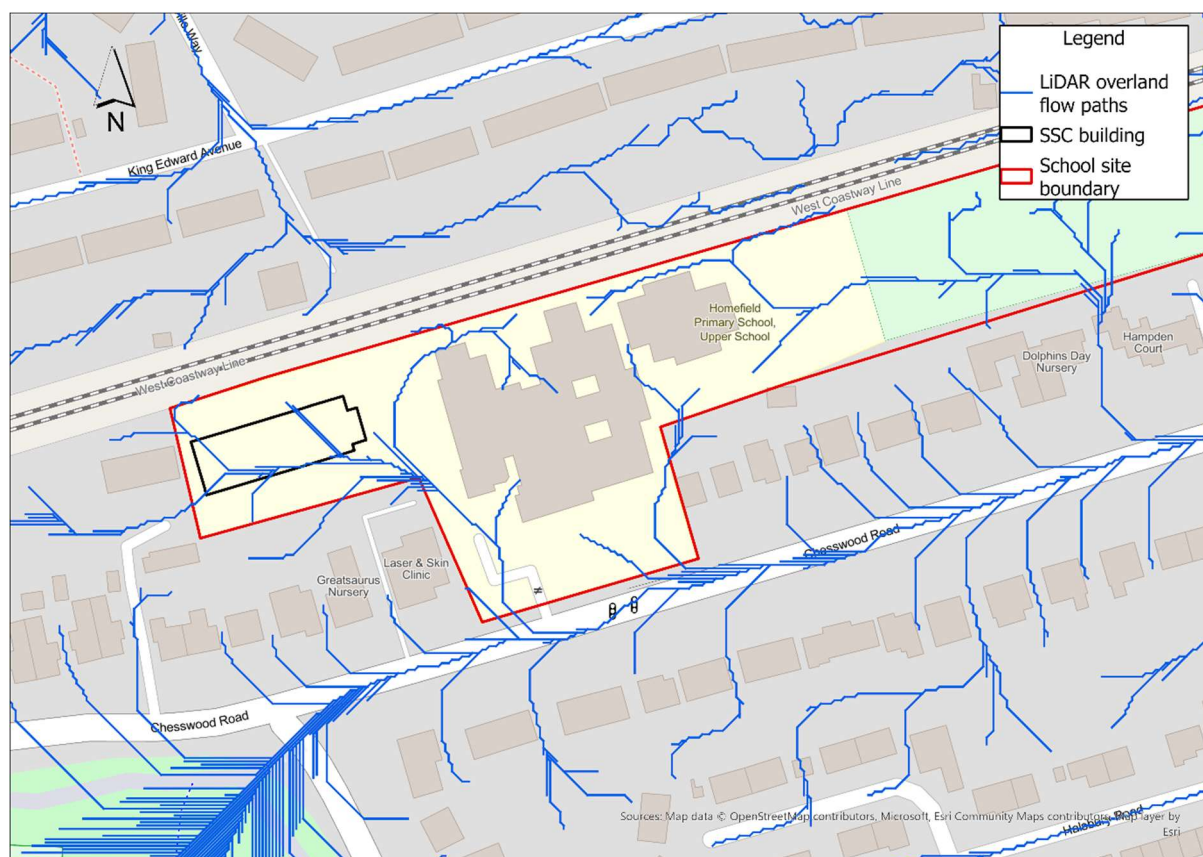


Figure 2-4 – Overland flow routes

Key topographical features identified include:

- The existing school building occupies the higher ground, with levels typically ranging between 5.37 mAOD and 5.61m AOD.
- At the location of the proposed SSC, the ground falls from the northwest to the southeast, with levels ranging from 5.49 mAOD to 4.88 mAOD.
- The car park area to the south is lower than the main building, with an average level of 5.29 AOD.
- Higher ground is noted along the northern perimeter of the site adjacent to the railway line embankment.

2.5 Geology, soils and groundwater

2.5.1 Online sources of information

Geology information obtained from the British Geological Survey online viewer ³ shows the development site to be underlain by a bedrock geology of London Clay Formation - Clay, silt and sand Formation. The area around the site is underlain by Lambeth Group - Clay, silt and sand. The underling superficial geology is River Terrace Deposits (Undifferentiated) - Sand, silt and clay and Raised beach deposits-Sand and gravel.

Soil information obtained from Soilsclapes viewer⁴ indicate that the soils at the development site are Soilscape 6: Freely draining slightly acid loamy soils.

2.5.2 Geotechnical report

A Combined Geotechnical and Ground Contamination Risk Assessment report prepared for the school site by Ashdown Site Investigation (Report Ref: LW25208, dated August 2014) was available. A total of nine geotechnical exploratory positions were undertaken across the development site. Of specific relevance are three positions located at the western edge of the site as shown below in Figure 2-5:

- HD1 (Hand Dug Pit): Located in the north-west planter/soft landscaping.
- HD2 (Hand Dug Pit): Located in the western hard play area (proposed extension footprint).
- HA1 (Hand Auger): Located adjacent to the sub-station.

The remaining boreholes (WS1-WS5 and HD3) were distributed across the eastern car park and playing fields, providing broader context for the geology and groundwater regime.

³ [GeoIndex - British Geological Survey \(bgs.ac.uk\)](https://www.bgs.ac.uk/geoindex/)

⁴ [Soilsclapes soil types viewer - Cranfield Environment Centre, Cranfield University \(landis.org.uk\)](https://landis.org.uk/soilsclapes-soil-types-viewer/)





Figure 2-5 - Homefield Primary School - Geotech Site Plan

In the western zone (HD1, HD2 and HA1), Made Ground is present, comprising brown gravelly, sandy, silty clay with anthropogenic inclusions such as brick, concrete and clinker, extending to depths of approximately 0.35–0.70 m bgl. Beneath this, the natural geology comprises River Terrace Deposits, described as firm to stiff, orange-brown gravelly clay. Across the wider site (WS1–WS5), ground investigation indicates cohesive clay deposits extending to around 2.10 m bgl, underlain by Raised Beach Deposits comprising medium dense gravelly sand.

Groundwater levels between 1.40m and 2.30m bgl (below ground level) were recorded at monitoring standpipes and suggested that a high groundwater table is present within the granular Raised Beach Deposits. The recorded groundwater levels are considered to represent the main water table within the permeable strata, rather than isolated perched water above clay bandings.

Soakage testing yielded variable results across the site:

- **Western Zone (HD2):** Testing in the shallow clay deposits yielded a low infiltration rate of 2.7×10^{-6} m/s.
- **Eastern Zone (HD3/WS2):** Testing in the deeper granular deposits yielded faster rates between 3.8×10^{-5} and 5.2×10^{-5} m/s.

Given the poor infiltration rates recorded specifically in the western extension zone (HD2), combined with the high groundwater table across the wider site, shallow infiltration (soakaways or permeable paving with infiltration) is deemed unfeasible and the drainage strategy has therefore prioritised attenuation and controlled discharge in the western region.

3. Existing reports

3.1 West Sussex Local Flood Risk Management Strategy: 2025 – 2030 July 2025

The designated Lead Local Flood Authority (LLFA) where the proposed development site is located is West Sussex. The West Sussex Local Flood Risk Management Strategy is available at: https://www.westsussex.gov.uk/media/zxfdrox1/westsussex_lfrms.pdf and the development site is in the Teville operational catchment.

The report notes that in the Worthing area, surface water is the most frequent cause of flooding. In the urban areas the impermeable land cover limits the ability of surfaces to absorb heavy rainfall, while underground drainage systems may also reach capacity, or be unable to convey heavy rainfall, during storm events. In settlements on the coastal plain, localised flooding can be increased because of tide locking, whereby surface water drainage system outfalls become blocked by high tide levels and rainwater is unable to drain to the sea and backs up to the surface. Highway flooding, which results from the capacity of the drainage system being exceeded during heavy rainfall events, is also prevalent across West Sussex. This can be exacerbated by blocked or collapsed gullies, pipes, sewers or ditches. Surface water flooding can also be influenced by the interconnectivity of flood sources, such as ground water interaction, sewer flooding, and overtopping or failure of the banks of ordinary watercourses.

Using the National Coastal Erosion Risk Mapping, published by the Environment Agency, the majority of West Sussex has the Shoreline Management Plan approach of 'hold the line' deployed, with small areas of no active intervention. Wave conditions can be significant during storm events and where storm events coincide with high tides, West Sussex is particularly at risks of coastal flooding, whether from overtopping of defences, or storm surge overtopping.

The report mentions groundwater flooding in areas where the underlying geology is Chalk. Although the development site isn't underlain by Chalk, groundwater levels can be influenced by a variety of factors.

There are no recorded incidents of flooding at the development site in the report; however, in the Teville operational catchment reported incidents of flooding are in the urbanised areas of Worthing. Many are attributed to surface water and sewer surcharge and may be influenced by tidal locking of the drainage system.

3.2 2024 Adur and Worthing Level 1 Strategic Flood Risk Assessment

The key objectives of this report were to:

- To provide up to date information and guidance on flood risk in Adur and Worthing, taking into account the latest flood risk information (including the probable impacts of climate change), the current state of national planning policy and legislation and relevant studies
- To provide the basis for applying the flood risk Sequential Test, and if necessary the Exception Test.



- To provide a comprehensive set of maps presenting flood risk from all sources that can be used as part of the evidence base for the Local Plan Review and to support the preparation of Neighbourhood Plans.
- To inform decisions on the location of future development and the preparation of sustainable policies for the long-term management of flood risk.
- To identify and provide recommendations on opportunities to reduce the causes and impacts of flooding to existing communities and developments.

The Adur and Worthing Level 1 Strategic Flood Risk Assessment (2024) identifies surface water flooding as the most frequent source of flooding within the study area, including Worthing Borough. Historical flood events, including significant flooding in 1980, 2000, 2007, 2012 and 2013/14, were largely attributed to intense and prolonged rainfall overwhelming drainage systems, resulting in widespread surface water flooding. Surface water flood risk is influenced by urbanisation, capacity constraints within drainage infrastructure, and coastal processes such as tide-locking, which can restrict outfall during high tide conditions. The SFRA requires that site-specific Flood Risk Assessments demonstrate that development is safe for its lifetime, manages surface water runoff through the use of Sustainable Drainage Systems (SuDS), and does not increase flood risk elsewhere. The proposed Homefield Primary school development incorporates a drainage strategy including attenuation and controlled discharge to manage surface water runoff in line with these requirements.

Appendix A of the report includes a map of historical flood events. There are West Sussex County Council (WSCC) recorded incidents of flooding near to the development site, but no recorded events within the school boundary.



4. Assessment of flood risk to the development

4.1 Fluvial flood and tidal flood risk

The Environment Agency were contacted for flood risk information for the site and provided fluvial and tidal modelled flood outlines. They stated that the development site is within Flood Zone 1.

The fluvial flood maps show the undefended flood outlines for the present day and with climate change for the 5%, 1%, 1% +CC and 0.1% AEPs events and the tidal flood maps show the undefended flood outlines for the present day and with climate change for the 0.5% AEP (2012), 0.5% AEP (2070), 0.5% AEP (2115) and 0.1% AEP (2012) events.

The maps are presented in Appendix B and show that the site is not at risk of fluvial or tidal flooding.

4.2 Risk of flooding from surface water

The Environment Agency's Risk of Flooding from Surface Water with climate change dataset can be viewed at [Risk of Flooding from Surface Water - Climate Change 1](#).

The surface water flood risk represents the present-day risk of flooding from surface water, as follows:

- Areas with a **high** chance of flooding from surface water (more than 3.33% chance each year).
- Areas with a **medium** chance of flooding from surface water (3.33% to 1% chance of flooding each year).
- Areas with a **low** chance of flooding from surface water (1% to 0.1% chance of flooding each year).

A plan showing the surface water flood map is shown in Figure 4-1.

The areas at risk of surface water flooding within the school site are localised areas representing isolated low spots within the topography resulting in ponding as water is unable to drain away.





Figure 4-1 – Surface water flood risk

In summary, the proposed building footprint, an area to the north of the main school building, the southern car park, and an area to the east of the site are identified as being at risk of surface water flooding. The depth of flooding of the surface water identified within the school site is shallow (<300mm).

At the proposed building, the extent of the medium chance (up to 1 in 100 year including climate change) surface water flooding corresponds to a maximum ground level of approximately 5.28 m AOD, based on LiDAR data.

4.3 Risk of flooding from reservoirs

The Environment Agency's [Long Term Flood Risk Information](#) service shows that the development site is unlikely to be affected by reservoir flooding (see Figure 4-2) and from a search of OS mapping, there are no reservoirs upstream of the site.

Flooding from reservoirs is unlikely in this area.

What a reservoir is

A reservoir is a large natural or artificial lake that is designed to collect and store water.

They are usually formed by building a dam across a river, or by building a large tank or surrounding embankment. If one of these dams or embankments fails, then water could escape from the reservoir. This would result in land or properties being flooded.

Figure 4-2 – Reservoir water flood risk

4.4 Risk of groundwater flooding

The Environment Agency's [Long Term Flood Risk Information](#) service shows that the development site is outside of a groundwater flood alert area (see Figure 4-3). In addition, there is no recorded incident of groundwater flooding at or within the proximity of the proposed development site.

We use groundwater flood alert areas to check the risk of flooding from groundwater.

This location is outside of a groundwater flood alert area.

► [What this means](#)

What groundwater is

Groundwater is the water that is usually held in rocks and soil underground.

Groundwater flooding happens when this water rises and flows above the surface.

Flooding from rivers is more likely when groundwater levels are high.

Figure 4-3 – Groundwater flood risk

However, this does not mean there is no risk of groundwater flooding. The geotechnical report discussed in Section 2 states that groundwater levels across the site are high. Prolonged periods of rainfall in the surrounding catchment can lead to an increase in groundwater levels and cause groundwater flooding. It is difficult to confirm the possible extent of groundwater flooding within the development site. However, the extent of flooding from groundwater is likely to be masked by surface water flooding, which is the primary source of flood risk. Therefore, further assessment is not required.

4.5 Risk of sewer flooding

A desktop review of Southern Water asset records was undertaken in March 2024, with the identified sewer network presented in Appendix C. Public surface water and foul sewers are located within Chesswood Road. In particular, a 600 mm diameter public sewer crosses the site from north to south, situated to the west of the main school building and to the east of the proposed SSC. The hardstanding area forming the footprint of the proposed SSC currently drains to this sewer via a private connection.

Artificial drainage infrastructure within and in the vicinity of the site may pose a potential source of flood risk where system capacity is exceeded or through structural, hydraulic, geotechnical, mechanical or operational failure. The risk of flooding from surcharged sewers is considered to be low; however, a residual risk remains during extreme rainfall events or in the event of blockage. In addition, no historical incidents of sewer flooding have been identified at the site.

4.6 Climate change

Climate change is expected to have a major influence on future flood risk. The expectations are that winter floods will occur more often, and in urban areas, flooding from thunderstorms will be more frequent and of increased magnitude.

The life expectancy of the development building and roof is 50 years. Following the climate change guidance available at: [Flood risk assessments: climate change allowances - GOV.UK](https://www.gov.uk/government/publications/flood-risk-assessments-climate-change-allowances), the peak rainfall intensity allowance for developments with a lifetime of between 2061 and 2100 years is the central allowance for the 2070s epoch (2061 to 2075).

The Environment Agency Risk of Flooding from Surface Water Maps with Climate Change utilise the 'upper end' allowance for the 2070s epoch (2061 to 2125). Therefore, the Environment Agency maps provide a conservative estimate of flood extent and depth for a 50 year design life.

The development site is located within the Environment Agency's "Adur and Ouse" management catchment. The rainfall allowance for the 1% annual exceedance rainfall event, central allowance and 2070s epoch is 25%. The rainfall allowance for the 1% annual exceedance, upper end allowance and 2070s epoch is 45%.

5. Sequential test

A feasibility study for Homefield Primary School was undertaken and a report issued in May 2024. The aim of the study was to undertake a feasibility study to assess the most cost effective and compliant means of creating an all-through primary provision including the provision of a Special Support Centre (SSC) on the school site. Two costed options were prepared for consideration:

1. Option 1B – an extension to the north of the of the school to provide accommodation for the Special Support Centre (SSC) and 2no reception classrooms with associated learning resource spaces, admin spaces, toilet and storage facilities
2. Option 4 - A standalone block for the Special Support Centre (SSC) and an extension to the back (north) of the school to accommodate 2no reception classrooms. Both the SSC block and Reception Block are designed to provide accommodation for the classrooms as well as associated learning resources spaces, admin spaces, toilet and storage facilities.

Note that the reception extension has now been removed from the plans.

Option 4 was the preferred option because it offers minimal disruption to school operations during construction, a standalone SSC building provides more flexibility in terms of learning and stakeholders expressed a clear preference for this option.

The proposed Special Support Centre (SSC) is required to be located within the existing Homefield Primary School site in order to provide integrated educational provision alongside the current school facilities. The SSC is intended to support pupils with additional needs who benefit from direct access to mainstream teaching resources, staff, and shared facilities. The requirement for proximity to the main school building, including safeguarding considerations, necessitates that the SSC is delivered within the established school boundary. As such, the SSC building development is linked to the existing school and cannot be reasonably located on an alternative site without compromising its operational function and educational objectives.



In this context, the Sequential Test is considered to be satisfied, as there are no reasonably available alternative sites at a lower risk of flooding that would be capable of accommodating the development while meeting the functional requirements of the school.

6. Exception test

Not required.

7. Mitigation of flood risk

7.1 Introduction

Section 4 identifies the potential flood risks to the proposed development. This section sets out the principles of how these risks will be mitigated through appropriate design and operation.

7.2 Surface water

The NPPF requires that new developments do not exacerbate flood risk by reducing the current flood storage capacity of a site or by increasing the runoff from the site.

A drainage strategy has been developed for the site. For the purposes of this FRA, the relevant area is the proposed building.

The strategy incorporates yard gullies, drainage channels, and filter trenches to collect surface water runoff, together with an attenuation tank, a Hydrobrake flow control chamber, and a silt filtration system, forming a SuDS treatment train for the management of surface water.

The system has been designed to accommodate the 1 in 100-year rainfall event, including a 45% allowance for climate change, with discharge restricted to a greenfield runoff rate of 3 l/s. This approach also helps to minimise the risk of blockage within the flow control chamber.

Surface water will discharge via the existing private drainage outfall serving the area, which connects to the Southern Water public surface water network crossing the site, tying into an existing manhole serving a 600 mm diameter sewer.

Any potential overland flows from the western boundary would be collected by the proposed drainage network.

It is recommended that the building FFL is set at 5.28 m AOD, with an additional 300 mm freeboard allowance, resulting in a design FFL of 5.58 m AOD. Electrical equipment should be set at a minimum of 5.28 m AOD, with a 600 mm freeboard allowance, resulting in a level of 5.88 m AOD.

7.3 Flooding from other sources

Based on Environment Agency information, the site is not at risk of flooding from rivers or the sea, either now or in the future due to climate change. Environment Agency data also shows the site to be not at risk from reservoir flooding.



There are no records of any groundwater flooding at the development site, and the site is outside an Environment Agency groundwater flood alert area. The geotechnical report found high groundwater levels across the site; however, mitigation measures proposed for the surface water flood risk will also be sufficient to manage any risk from elevated groundwater flooding.

Flood risk associated with sewer failure at the development site is considered to be low. The proposed Finished Floor Level (FFL) of the SSC building (5.58 m AOD) provides an appropriate resilience measure, reducing the likelihood of internal flooding in the event of drainage infrastructure failure.

7.4 Access and egress

The school pedestrian entrance, vehicle entrance to the car park and the main school building entrance all sit outside an area of flood risk from surface water. The pavement and covered walkway from the SSC building to the main school building is also outside a flood risk area, as does a route to the west of the school building to the entrance, which is outside a flood risk area. Therefore, there is safe access and egress from the development site in the event of a flood. This is shown in Figure 7-1.



Figure 7-1 – Access and egress

8. Conclusions

This FRA assesses the potential flood risks to and from the proposed development at the Homefield Primary School site. The primary source of flood risk to the proposed development is surface water; based on the flood maps received from the Environment Agency, the development site is not at risk of fluvial or tidal flooding (including climate change). There are no records of historical flooding at the site.

It is recommended that the building FFL be set at 5.58 mAOD, which is the 1 in 100-year climate change surface water flooding level plus a 300mm freeboard, with any electrics be raised to a minimum 5.88 mAOD (600 mm freeboard).

A drainage strategy has been produced which incorporates drainage channels, filter trenches and an attenuation tank to manage surface water runoff. The system has been designed to accommodate the 1 in 100-year rainfall event, including a 45% allowance for climate change, with discharge restricted to a greenfield runoff rate of 3 l/s.



APPENDICES

Appendix A. Development plan



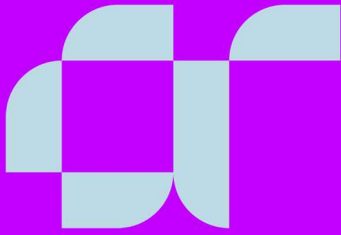
Appendix B. Fluvial and tidal flood maps



Appendix C. Existing sewer plans



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