ROY LOBLEY CONSULTING
Specialists in Flood Risk Management

FLOOD RISK ASSESSMENT

NETBALL COURT
SPALDING ACADEMY,
NEVILLE AVENUE, SPALDING

South Lincolnshire Academies Trust
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Author



Roy Lobley
07847 482244
Roy.Lobley@outlook.com
http://www.roylobleyconsulting.com/

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The information in this report is based on statistical data and qualitative analysis which are for guidance purposes only. This study provides no guarantee against flooding or of the absolute accuracy of water levels, flows and associated probabilities.

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1.0 INTRODUCTION

1.1 The FRA has been produced on behalf of South Lincolnshire Academies Trust in respect of a planning application for a netball court at Spalding Academy, Neville Avenue, Spalding.

1.2 It has been based on readily available information.

Existing Site

1.3 The site is located at grid reference TF2570722447 as shown in **Figure 1.1** below.

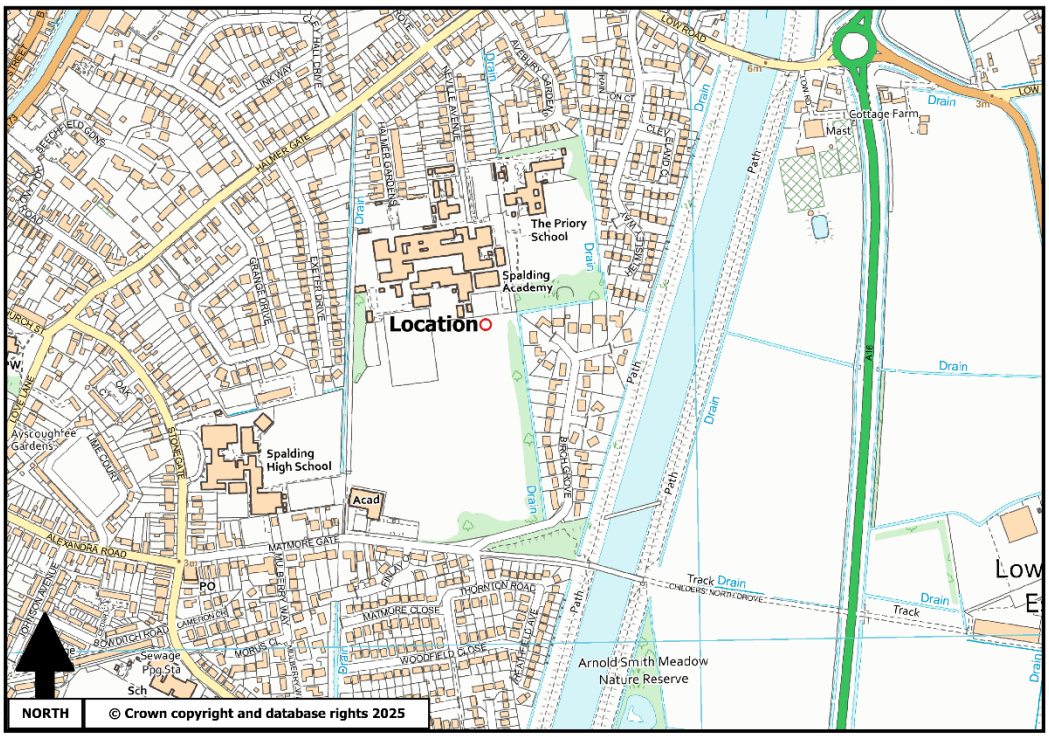


Figure 1.1 Site Location

1.4 LiDAR 2m DTM shows that the existing land level is approximately 2.65m AOD.

Proposed Development

1.5 The proposed development consists of a netball court as shown on the extract of the proposed plan below in **Figure 1.2**

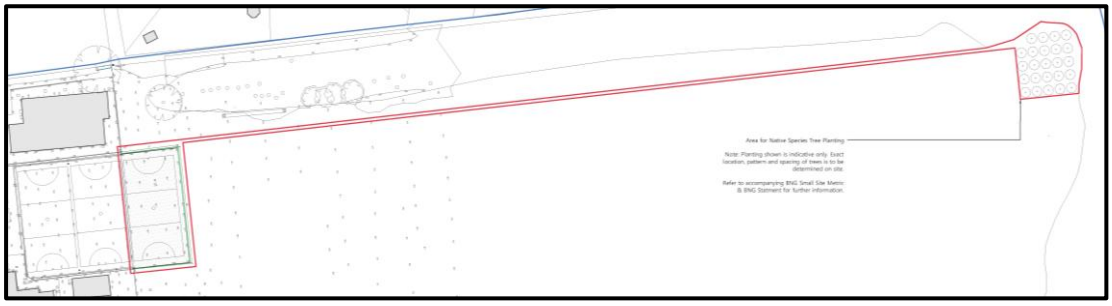


Figure 1.2 Proposed Plan

2.0 FLOOD RISK PLANNING POLICY

National Planning Policy Framework

2.1 The NPPF sets out the Government's national policies on different aspects of land use planning in England in relation to flood risk. A supporting web-based Planning Practice Guidance is also available.

Sequential Test

2.2 The NPPF requires a sequential risk-based approach to be undertaken to individual applications in areas known to be at risk now or in the future from any form of flooding. Within this context the aim of a Sequential Test is to steer new development to areas with the lowest risk of flooding from any source.

2.3 The sequential test should be used in areas known to be at risk now or in the future from any form of flooding, except in situations where a site-specific flood risk assessment demonstrates that no built development within the site boundary, including access or escape routes, land raising or other potentially vulnerable elements, would be located on an area that would be at risk of flooding from any source, now and in the future (having regard to potential changes in flood risk).

Flood Zone Definition

Flood Zone 1	Low probability (1 in 1000 annual probability of river or sea flooding (<0.1%)).
Flood Zone 2	Medium probability (between 1 in 100 and 1 in 1000 annual probability of river flooding (1.0%.-.0.1%) or between 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5%.-.0.1%) in any given year).
Flood Zone 3a	High probability (1 in 100 or great annual probability of river flooding (>1.0%) or 1 in 200 or greater annual probability of sea flooding (>0.5%) in any given year).
Flood Zone 3b	This zone comprises land where water must flow or be stored in times of flood. Land which would flood with an annual probability of 1 in 30 (3.3%), or is designed to flood in an extreme flood (0.1%) should provide a starting point for discussions to identify functional floodplain.

2.4 The aim is to steer new development to Flood Zone 1 and where there are no reasonably available sites in Flood Zone 1, local planning authorities in their decision making should consider the flood risk vulnerability of land uses and consider reasonably available sites in Flood Zone 2, applying the Exception Test if required. Only where there are no reasonably available sites in Flood Zones 1 or 2 should the suitability of sites in Flood Zone 3 be considered.

2.5 The guidance also sets out the vulnerability to flooding of different land uses and this land use is highlighted below.

Flood Risk Vulnerability Classification

Essential Infrastructure

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

Highly Vulnerable

- Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding.
- Emergency dispersal points.
- Basement dwellings.
- Caravans, mobile homes and park homes intended for permanent residential use.
- Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure'.)

More Vulnerable

- Hospitals
- Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.
- Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.
- Non–residential uses for health services, nurseries and educational establishments.
- Landfill and sites used for waste management facilities for hazardous waste.
- Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

Less Vulnerable

- Police, ambulance and fire stations which are not required to be operational during flooding.
- Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'more vulnerable' class; and assembly and leisure.
- Land and buildings used for agriculture and forestry.
- Waste treatment (except landfill and hazardous waste facilities).
- Minerals working and processing (except for sand and gravel working).
- Water treatment works which do not need to remain operational during times of flood.
- Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place.
- Car parks.

Water Compatible

- Flood control infrastructure.
- Water transmission infrastructure and pumping stations.
- Sewage transmission infrastructure and pumping stations.
- Sand and gravel working.
- Docks, marinas and wharves.
- Navigation facilities.
- Ministry of Defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, **outdoor sports** and recreation and essential facilities such as changing rooms.
- Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan

Exception Test

2.6 Having applied the sequential test, if it is not possible for development to be located in areas with a lower risk of flooding (taking into account wider sustainable development objectives), the exception test may have to be applied. The need for the exception test will depend on the potential vulnerability of the site and of the development proposed. The first part of the Exception Test is to show that the proposed development will provide wider sustainability benefits to the community that outweigh flood risk. The second part is the requirement for a FRA to demonstrate that it will be safe for its lifetime, without increasing flood risk elsewhere and where possible reduce flood risk overall. The guidance states when the application of the Exception Test is required and this is summarised below.

Flood Zone 1	Exception Test is not required	All.
Flood Zone 2	Exception Test is not required	Essential Infrastructure; More Vulnerable; Less Vulnerable; Water Compatible;
	Exception Test required	Highly Vulnerable.
Flood Zone 3a	Exception Test is not required	Less vulnerable; Water Compatible.
	Exception Test required	Essential Infrastructure; More Vulnerable.
	Should not be permitted	Highly vulnerable.
Flood Zone 3b	Exception Test is not required	Water Compatible.
	Exception Test required	Essential Infrastructure;
	Should not be permitted	Highly vulnerable; More vulnerable; Less vulnerable.

Development Proposals

2.7 The proposed development consists of outdoor sports.

Flood Zones

2.8 The Flood Zones are shown on **Figure 2.1** below which shows the site to be in Flood Zone 3.

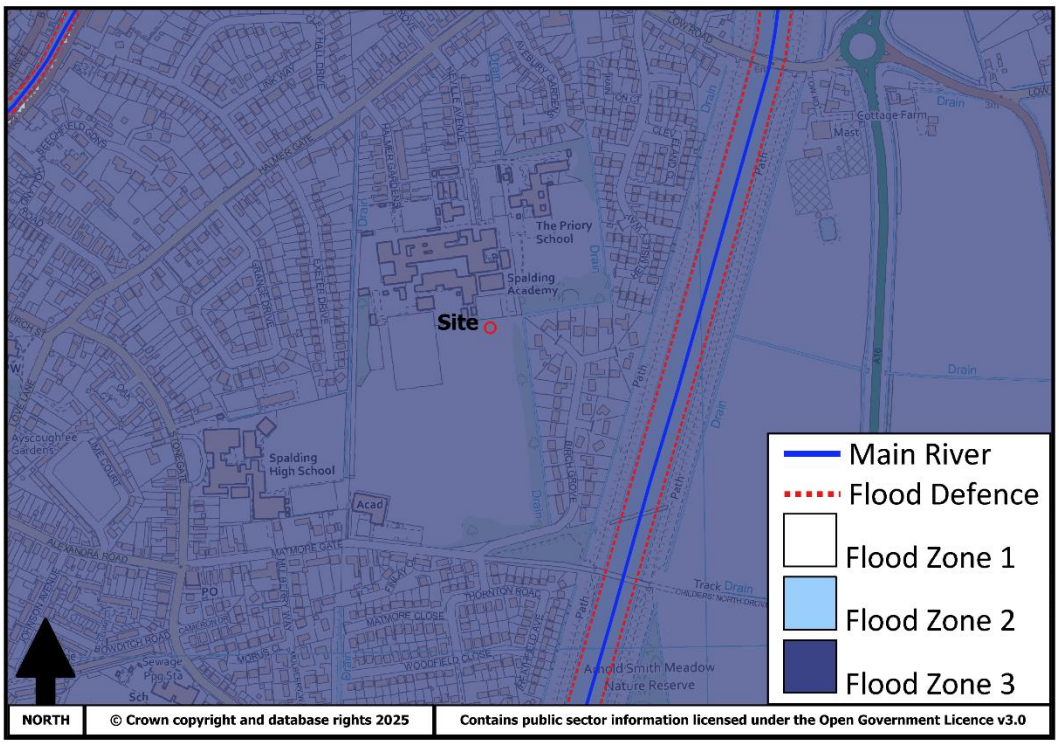


Figure 2.1 Flood Zones

Development Vulnerability

2.9 Outdoor sports are water compatible and therefore appropriate in Flood Zone 3.

3.0 FLOOD RISK SOURCES

3.1 The following flood risk sources have been identified and where mitigation is required to reduce the flood risk this is discussed in **Section 4**.

Tidal and Fluvial

South East Lincolnshire Strategic Flood Risk Assessment (March 2017)

3.2 The South East Lincolnshire Strategic Flood Risk Assessment, (SFRA), includes a map showing the residual peak flood depths for both fluvial and tidal flooding. An extract of that map is shown below in **Figure 3.1** which shows the site to be at residual risk from fluvial sources.

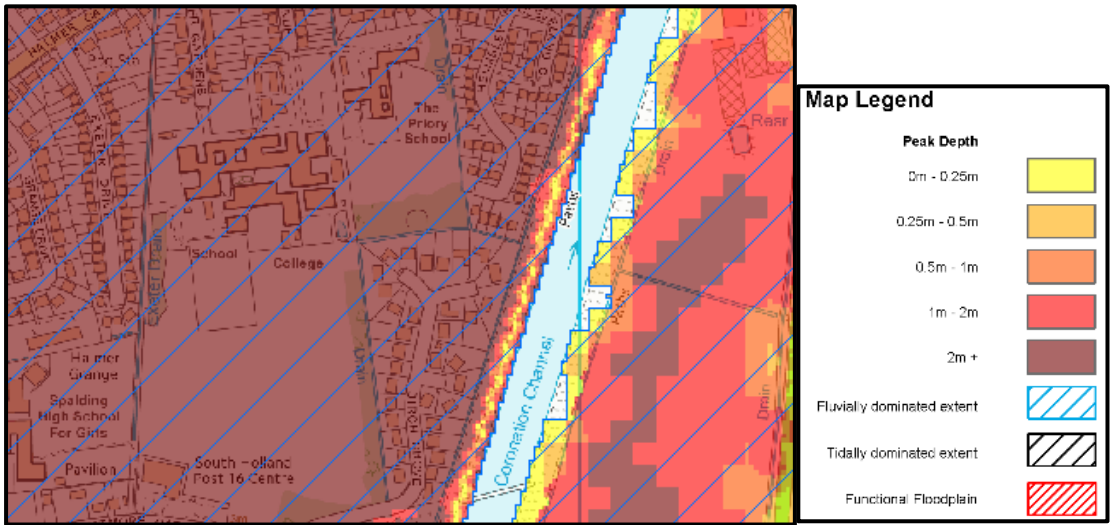


Figure 3.1 Residual Peak Flood Depths

Pluvial

3.3 The EA have produced maps that show the chance of flooding from surface water to areas of land. Climate change scenarios have been produced to indicate the predicted impacts of climate change on future flood risk between 2040 and 2060.

3.4 The flood Risk is displayed as one of three likelihood categories:

- High Greater than or equal to 1 in 30 (3.3%) chance of flooding in any year.
- Medium Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year.
- Low Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year.

3.5 The climate change, (2040 – 2060), risk of flooding map is shown below in **Figure 3.2**.

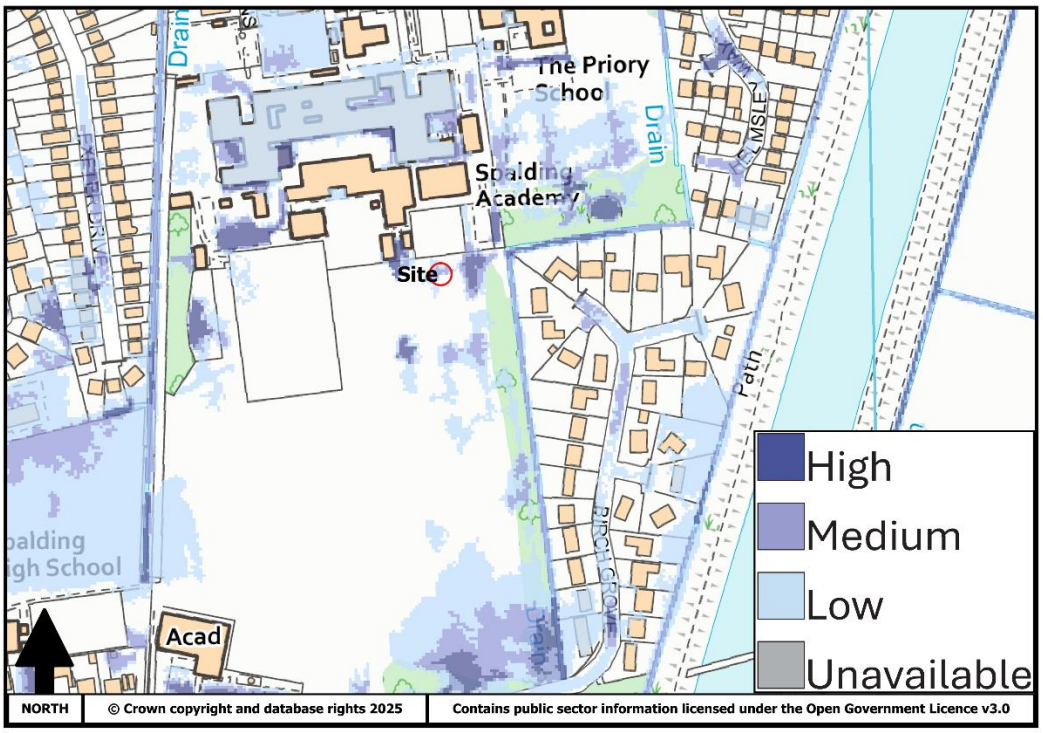


Figure 3.2 Risk of Flooding from Surface Water (2040 – 2060)

3.6 The risk of flooding from surface water 2040 - 2060 is medium.

Groundwater

3.7 The site is located on rocks with essentially no groundwater and there are no known instances of groundwater flooding in the area.

3.8 The risk of flooding from groundwater is low.

Sewers

3.9 Public maintained sewers are unlikely to pose a significant flood risk as they are well maintained.

3.10 The risk of flooding from existing sewers is low.

Reservoirs

3.11 The EA has prepared reservoir failure flood risk mapping to show the largest area that might be flooded if a reservoir were to fail and release the water it holds.

3.12 The site is not at risk of flooding from reservoirs.

Canals and Artificial Water Bodies

3.13 The site is not at risk of flooding from canals.

4.0 MITIGATION

4.1 Section 4.0 has identified the sources of flooding which could potentially pose a risk to the site and the proposed development. This section of the FRA sets out the mitigation measures which are to be incorporated within the proposed development to address and reduce the risk of flooding to within acceptable levels.

Site Layout

4.2 The proposed development is at a high residual risk of flooding from fluvial sources.

4.3 Given the nature of the proposed development it is not possible to raise the level of the netball court.

4.4 It is recommended that the management of the site sign up to the EA flood warning service and a flood emergency plan be the subject of a condition which includes as a minimum;

- Potential sources of flooding and severity;
- Flood warning trigger level;
- Actions to be taken by staff on receipt of warning;
- Identification of escape routes and potential flood depths, (see below);
- Deploying flood protection and safe refuge;
- Reoccupation of the Site;
- Training and Exercising.

Surface Water Drainage

4.5 The surface water from the proposed court will drain to new channel either side of the court which will then discharge to new soakaway(s) under the new surface.

5.0 CONCLUSIONS

5.1 This FRA is compliant with the requirements set out in the NPPF and the associated online Planning Practice Guidance.

5.2 The FRA has been produced on behalf of South Lincolnshire Academies Trust.

5.3 This report demonstrates that the proposed development is not at significant flood risk, and will not increase flood risk to others, subject to the recommended flood mitigation strategies being implemented.

5.4 The identified risks and mitigation measures are summarised below;

Flood Risk Source	Level of Risk Without Mitigation	Proposed Mitigation
Fluvial, (Residual)	High	Flood emergency plan
Pluvial	Medium	
Tidal Groundwater Sewers	Low	
Reservoir Canal/Artificial	None	

Table 5.1 Summary of Risk and Mitigation

ROY LOBLEY CONSULTING

Roy.Lobley@outlook.com
07847482244