



Consulting Engineers

• Structural • Civil •

FLOOD RISK and DRAINAGE STATEMENT

for

ELECTIVE THEATRES SCHEME

NOTTINGHAM CITY HOSPITAL

DATE: September 2023

REFERENCE: 6204-R03-A

STATUS: INFORMATION

**KEITH SIMPSON ASSOCIATES LTD**

Unit 7c Colwick Quays Business Park

Colwick

Nottingham

NG4 2JY

Tel: 0115 967 3100

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## Revision History

Revision	Date	Status	Author	Checked	Notes
A	08/09/23		NH	JN	First Issue

## 1. Introduction

### 1.1 Brief

- 1.1.1 Keith Simpson Associates Limited (KSA) have been appointed by Nottingham University Hospitals NHS Trust (NUH) to undertake a Flood Risk Assessment (FRA) in support of a planning application for the Elective Theatres Scheme at Nottingham City Hospital.
- 1.1.2 The site lies within flood zone 1 according to the Environment Agency flood map, which means it is in an area at low risk of flooding. This indicates that the site could be flooded from a river by a flood event that has a less than 0.1 percent (1 in 1000) chance of happening each year.
- 1.1.3 This document details the findings of an FRA carried out in September 2023. In the preparation of this FRA reference has been made to The National Planning Policy Framework.

## 2. Site Location and Proposals

### 2.1 The Site

2.1.1 The site is located centrally off the North Corridor in the purple zone of Nottingham City Hospital, see Fig 1 below. The site comprises of the Former Buildings 58 and 59 and a section of North Corridor and is surround by other hospital buildings to all sides.

### 2.2 Hydrology

2.2.1 The River Leam is located 350m to the south of the site.

### 2.3 Existing Drainage

2.3.1 A CCTV drainage survey has been carried out, this identified the area is served by a network of private combined, foul and surface water drains.

### 2.4 Proposals

2.4.1 It is proposed to refurbish Building 58 (theatres 7 & 8) and demolish Building 59 to form three new operating theatres and ancillary rooms.



Fig 1: Aerial photo of site

### 3. Probability of Flooding

#### 3.1 Environment Agency Flood Map

3.1.1 The Environment Agency (EA) produces Flood Risk Maps which identifies areas that are prone to flooding and what the likelihood and extent of flooding will be. Land area is divided into three zones; Flood Zone 1, 2 and 3. These are defined as below:

Flood Zone	Shading	Risk	Flood Risk Probability
1	Clear	Low	Less than 0.1% (1 in 1000 yrs)
2	Light blue	Medium	River :between 1% (1in100yrs) and 0.1% (1in1000yrs) Sea: between 0.5% (1in200yrs) and 0.1% (1in1000 yrs)
3	Dark Blue	High	River: greater than 1% (1 in 100 yrs) Sea: greater than 0.5% (1 in 200 yrs)

Table 2: Flood Zones – Risk and Probability

3.1.2 The map below shows the Flood Zones to the area of the proposed development:

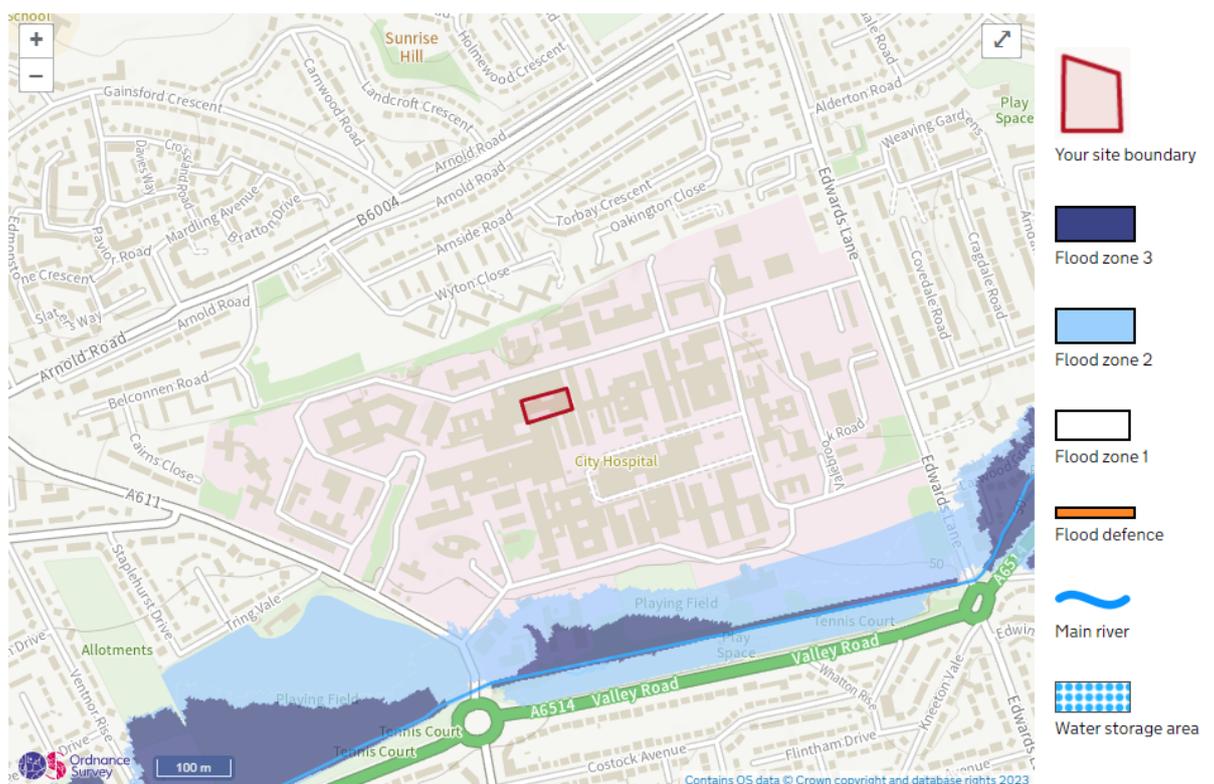


Fig 2: EA Flood Map

3.1.3 The site lies within flood zone 1 according to the Environment Agency flood map, which means it is in an area at low risk of flooding.

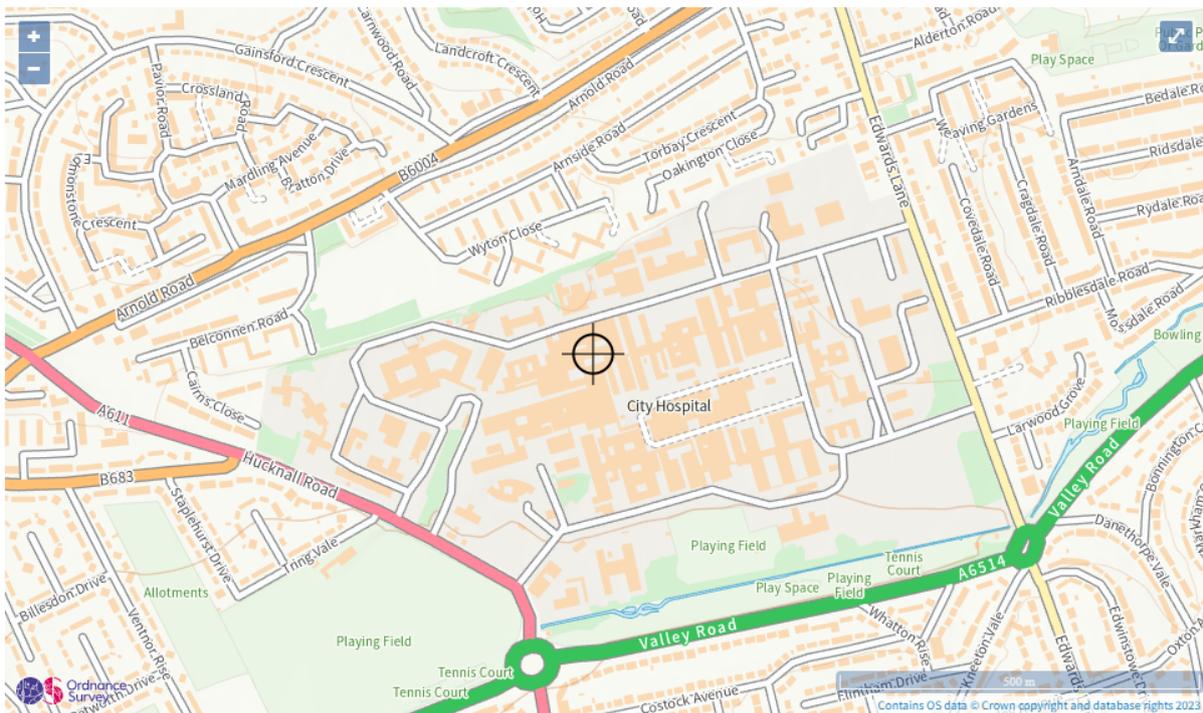
### 3.2 Environment Agency Surface Water Flood Map



Fig 3: EA Surface Water Flood Map

3.2.1 The surface water flood map above shows that the site is at very low risk of surface water flooding.

### 3.3 Environment Agency Reservoir Flood Map



Maximum extent of flooding from reservoirs:

● when river levels are normal   ● when there is also flooding from rivers   ⊕ Location you selected

*Fig 4: EA Reservoir Flood Map*

3.3.1 The reservoir flood map above shows that the site is not at risk of flooding from a reservoir.

## 4. Planning Context

### 4.1 Flood Risk Vulnerability

4.1.1 Planning Practice Guidance provides guidance on the classification of vulnerability of development types:

Classification	Definition
<b>Essential Infrastructure</b>	Essential transport & utility infrastructure. Water treatment works. Wind turbines. Solar farms.
<b>Highly Vulnerable</b>	Police, ambulance & fire stations 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.
<b>More Vulnerable</b>	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.
<b>Less Vulnerable</b>	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.
<b>Water Compatible Development</b>	Flood control infrastructure. Water transmission/sewage infrastructure. Sand and gravel working. Docks, marinas and wharves. Navigation facilities. Ministry of Defence installations. Ship building, repairing and dismantling. Water-based recreation. 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 accommodation for staff required by uses in this category.

*Table 3: Flood Risk Vulnerability Classification (reproduced from Planning Practice Guidance)*

## 4.2 Flood Zone Compatibility

Flood Zones	Flood Risk Vulnerability Classification				
	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test Req'd	✓	✓	✓
Zone 3a	Exception Test Req'd	✗	Exception Test Req'd	✓	✓
Zone 3b	Exception Test Req'd	✗	✗	✗	✓

*Table 4: Flood Risk Vulnerability and Flood Zone 'Compatibility'*

4.2.1 The site is located in zone 1 and the proposed development is classified as 'More Vulnerable', therefore, the proposals are considered appropriate according to the planning practice guidance.

## 5. Proposed Drainage

### 5.1 Foul Water

5.1.1 It is proposed to connect the foul water from the theatres to the existing private drainage on site.

### 5.2 Surface Water

5.2.1 It is proposed to maintain the existing private surface water drainage system on site.

5.2.2 The impermeable area of the site will not be altered, therefore, surface water flood risk downstream will not be affected.

5.2.3 SUDS features including green roofs have been considered in the design, but are not considered viable due to the tightly land-locked nature of the site, the intention to re-use the existing surface water drains and lack of access to the roof areas for regular maintenance.

## 6. Conclusion & Recommendations

### 6.1 Conclusion

- 6.1.1 This FRA demonstrates that the site is not at risk of flooding from rivers, surface water or reservoirs.
- 6.1.2 The impermeable area will remain as existing and it is proposed to re-use the existing drains on site, therefore, therefore flood risk downstream is not affected.
- 6.1.3 We conclude that the proposed development can proceed without causing a risk to users or neighbouring properties.