

Osney Mead

Ref	SPCW7
Primary Flood Zone	Flood Zone 3
Vulnerability Classification	Mixed (More vulnerable and Less vulnerable)

Site Details

Site Location:	X:	450224	Address: Osney Mead Industrial Estate, OX2 0ES
	Y:	205749	
Site Area:	17.8 ha		Additional Information: The site is an existing development- Osney Mead Industrial estate. Land use is predominantly impermeable with warehouses interspersed with a road network and car parking facilities.
Proposed Function:	Mixed		
Ground Level Range (m AOD):	55.281m-56.930m		

Fluvial Flood Risk

	1 in 100 Yr (+26%)	1 in 100 Yr (+84% CC)
Percentage Inundated (%)	78%	95%
Average Flood Depth (m)	0.26m (Max – 1.48m)	0.48m (Max – 1.82m)
Average Velocity (m/s)	0.11m/s (Max – 1.09m/s)	0.15 m/s (Max – 1.19m/s)
Speed of Onset (hrs)	36 hrs	18 hrs

Summary: The site is at high risk of fluvial flooding. The majority of the site is in Flood Zone 2 and 3a with a significant proportion in Flood Zone 3b also (see fluvial flood map overpage). When accounting for climate change, for the design 100-year (+26% climate change) event, 78% of the site is modelled to be inundated. The hazard map for this event (see hazard maps) shows the hazard rating to be mostly low in the east of the site, however moving westwards the hazard rating increases showing *Danger for most* in many areas. This indicates significant flood depths and velocities onsite. The extent and hazard are even greater for the extreme climate change scenario, however given the proposed development type this scenario should not be relevant. The majority of the site lies within the historical flood map, the site has been inundated during flood events in 1947, 1977, 1979, 1992, 2000, 2002, 2007, 2008 and 2013.

Defence Infrastructure

Description:	Retaining wall and raised embankment upstream of the site. Bank protection also present. Asset locations mean they are unlikely to have impact on flooding at the site.
Owner:	Retaining Wall- Unknown Embankment- Local Authority
Standard of Protection:	Retaining Wall- Unknown Embankment- 5-years
Condition:	Retaining Wall- Unknown Embankment- 3 (Fair)

Potential Access & Egress Route: The proposed access and egress route is to head north via the Ferry Hinksey Rd, before heading east along the Botley Rd (A420) towards the city centre. Travel from this point would likely be towards low-risk areas in North Oxford (see access/egress map overpage).

Flood Risk: The start of the route is at significant flood risk, with parts of the route in Flood Zone 3b. Flood hazard is mixed but, in some locations, indicates *Danger for most*. Approximately 1.2km from the site, the route becomes flood free and onward travel is at minimal flood risk. Given that very little of the site lies in Flood Zone 1, opportunities for safe refuge are limited.

For these reasons early warning will be essential at the site to ensuring that the access route can be utilised before floodwater inundates the site and wider Botley area. It should be noted, that the River Thames catchment which the site falls within is dominated by chalk, it has relatively slow river response times to storm events, being groundwater, rather than surface water dominated. This increases the time taken for inundation and for adequate warnings and preparation in an extreme flood event.

Pluvial & Other Sources of Flood Risk

The risk of surface water flooding has been assessed using the EA surface water flood maps (see pluvial flood map overpage). The majority of the site is not at risk from surface water flooding. At risk areas on site are mainly low risk areas isolated to the existing road network, which acts to channelise rainfall (see pluvial flood map below).

The underlying geology at the site comprises loamy and clayey floodplain soils with naturally high groundwater underlain by sedimentary bedrock in the form of Mudstone. In this regard, groundwater flood risk is considered to be moderate.

The EA's Flood Risk from Reservoirs Map shows the entire site to be at risk in the wet-day scenario and partially at risk in the dry-day scenario. Reservoir failure is a rare event with a very low probability of occurrence, so this risk is not considered a significant barrier to development at the site. Based on the LLFA's flood incident data, there have been no recent historical flood incidents recorded close to the site.

FRA Implications, SuDS & Exception Test

Hydraulic modelling of the River Thames and its associated tributaries has indicated that the site is at high risk of fluvial flooding. Most of the site lies in Flood Zone 2 and 3a with a significant proportion in Flood Zone 3b. A mixed development with both housing (more vulnerable) and employment (less vulnerable) infrastructure is proposed. The latter is permissible within Flood Zones 2 and 3a, more vulnerable infrastructure is permissible in Flood Zone 2, but must pass an Exception Test as specified in the latest NPPF if located in Flood Zone 3a. Neither is permissible in Flood Zone 3b under any circumstances. When accounting for climate change, 78% of the site is at risk during the design 100-year (+26% Climate change) event.

The start of the proposed access route to/from the site is at significant flood risk lying predominantly in Flood Zone 3. Approximately 1.2km from the site the route becomes flood free and onward travel is at minimal flood risk. For these reasons early warning will be essential at the site will be vital to ensuring that the route can be utilised before floodwater inundates the site and wider area. A site-specific FRA should look into this in more detail and consider provision of a flood evacuation plan.

The pluvial flood risk at the site is low, being mainly isolated to the existing road network in the site. The drainage strategy for the proposed development should be suitably designed to manage additional runoff arising from the development and ensure that pluvial flood risk at the site and to third party land is not increased.

In assessing and demonstrating the viability of any SuDS solution for the site, a site-specific FRA should follow the Non-statutory technical standards for SuDS. The geology at the site consists of loamy and clayey floodplain soils with naturally high groundwater in this regard the use of infiltration SuDS solutions is likely to be limited. It is recommended that a geotechnical investigation is undertaken at this site to obtain further information relating to infiltration rates, this will confirm whether infiltration could be viable in some areas. Attenuated discharge to a watercourse or sewer will also need considering as part of a site-specific FRA.

Overall, a new mixed-use development at the site does face significant barriers. The site is at high risk of fluvial flooding and access and egress are heavily reliant on early flood warning systems. Furthermore, whilst development is already established in the area, this is in the form of offices which are classed as less vulnerable infrastructure. The proposed development includes more vulnerable infrastructure. In this regard, it is essential that a sequential approach is implemented prioritising more vulnerable residential development in Flood Zone 1 and Flood Zone 2 where possible. Less vulnerable employment development is also preferred in these zones however can be located in Flood Zone 3a (without the need for the Exception Test) if more space is required for residential uses. No development (unless water compatible development) is permissible in Flood Zone 3b.

Development may need to be set at a floor level to provide an appropriate freeboard above the flood level for the 100-year (+26% climate change) design event, estimated at 57.02 m AOD. A large amount of the site is sited below this level, so ground raising may be significant. A site-specific FRA should confirm any requirements with the EA including the need to provide compensatory storage and assess 3rd party impacts if ground raising is implemented.

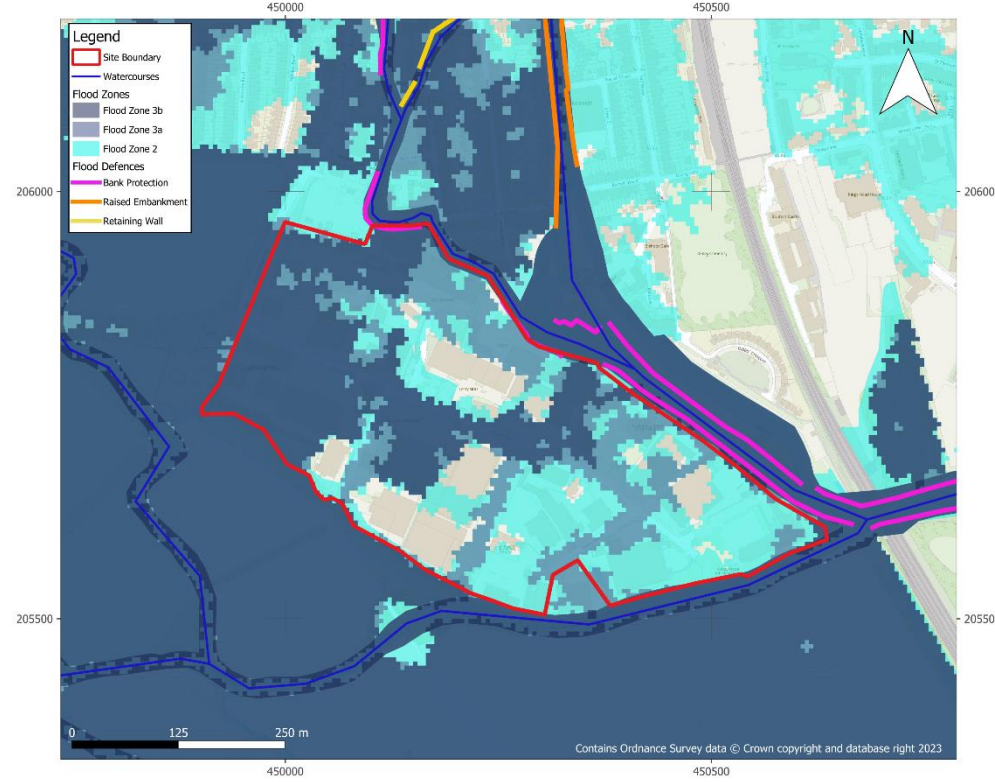
Fluvial Hazard	High Risk
Pluvial Hazard	Low Risk
Developable	Proposed development is possible in some of the site, however there are barriers regarding flood risk, access and ground raising

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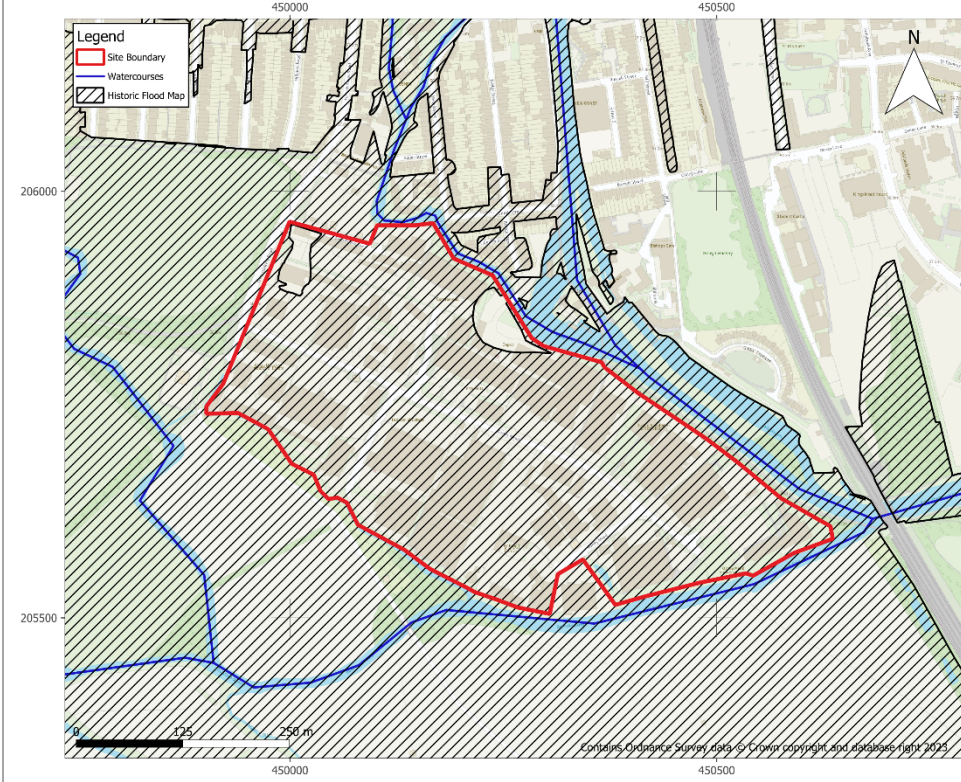
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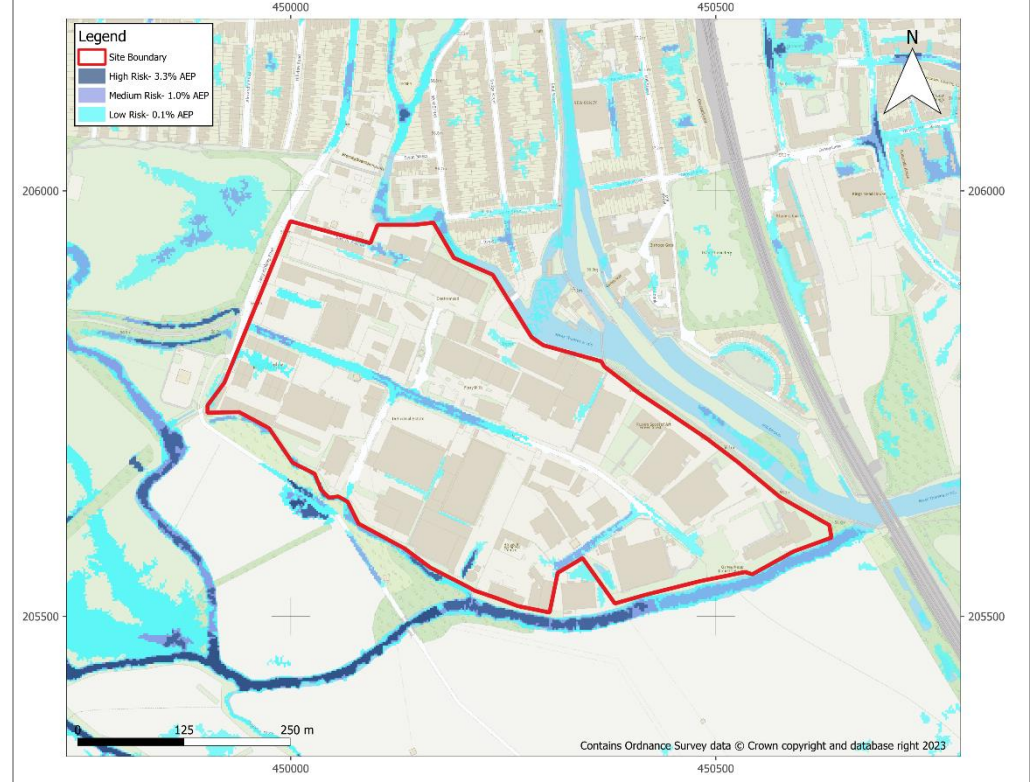
Fluvial Flood Map



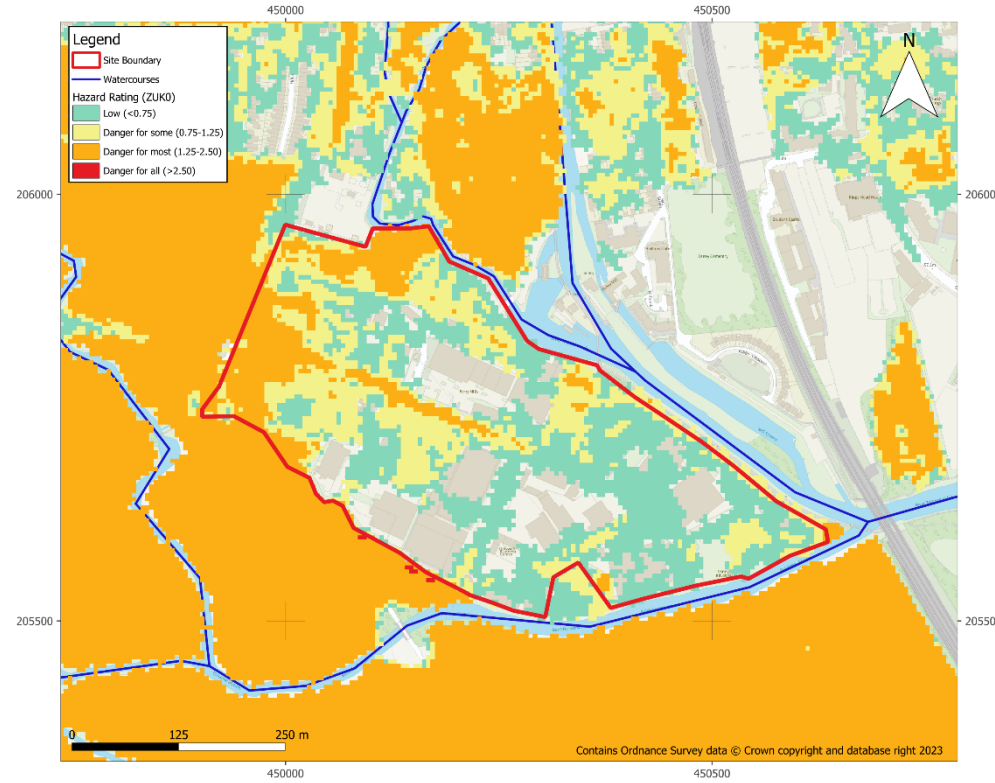
Historical Flood Map



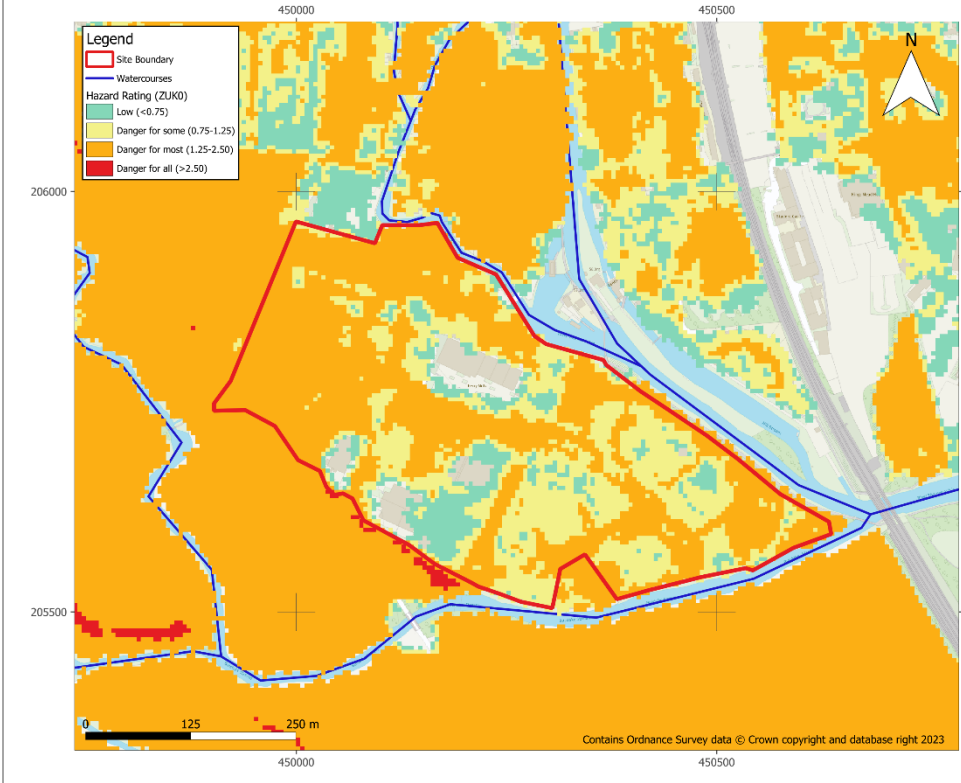
Pluvial Flood Map



Hazard Map (100 Yr + 26% Climate Change)



Hazard Map (100 Yr + 84% Climate Change)



Access/Egress Routes

