

FLOOD RISK ASSESTEMENT

JOB TITLE: REAR EXTENSION

ADDRESS: 2 Charlwood Place, London, SW1V 2LU

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JOB NUMBER: 158

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1. Introduction

This FRA is intended to assess flood risk for no2 Charlwood Place the site from all relevant sources: It has been carried out with advice and guidance from the Environment Agency (EA) and Cityof Westminster's Strategic Flood Risk Assessment 2019.

NPPF states that an appropriate FRA will be required for all development proposals of 1ha or greater in Flood Zone 1, or for any development within Flood Zones 2 or 3. The site is located within Flood Zone 3 according to the EA's flood maps.

Westminster has 4.7 kilometers of tidal Thames frontage, all of which has good protection against flooding by the (partly listed) Embankment wall.

The Thames Barrier, downstream at Woolwich and other tidal defences also provide considerable protection from flooding. The Environment Agency's Flood Map has been drafted assuming that no tidal defences, including the existing Thames Barrier, are in place. Under such circumstances the Environment Agency indicate that Flood Zone 3 has a 1 in 100 or greater annual probability of river flooding or a 1 in 200 or greater annual probability of flooding from the sea. Flood Zone 3 comprises a substantial part of Westminster (14%) including Pimlico and Millbank.

Although Westminster City Council's Authority Area has a significant area located within Flood Zone 2 and 3, this is associated with the River Thames Tidal Floodplain, which is protected to a high standard by the Thames Barrier and associated Thames Tidal Flood Defences. As such the risk of tidal and fluvial flooding within Westminster is assessed as being low.

2. Site Description.



Figure 1 Site view

The site is located on the south side of Charlwood Place SW1V 2LU, close to the junction with Churton Street. It is set within a terrace of 19th century houses of lower ground, ground and three upper floors. The property was constructed as residential.

The proposal involves the extension of the rearinfill well area at lower ground and ground floors.

The River Thames runs in an arc to the south of the site at 870-970m distance (870m² being the closest to the middle line of the river). The property has brick party walls to its neighbours at 2a and 4 Charlwood Place.

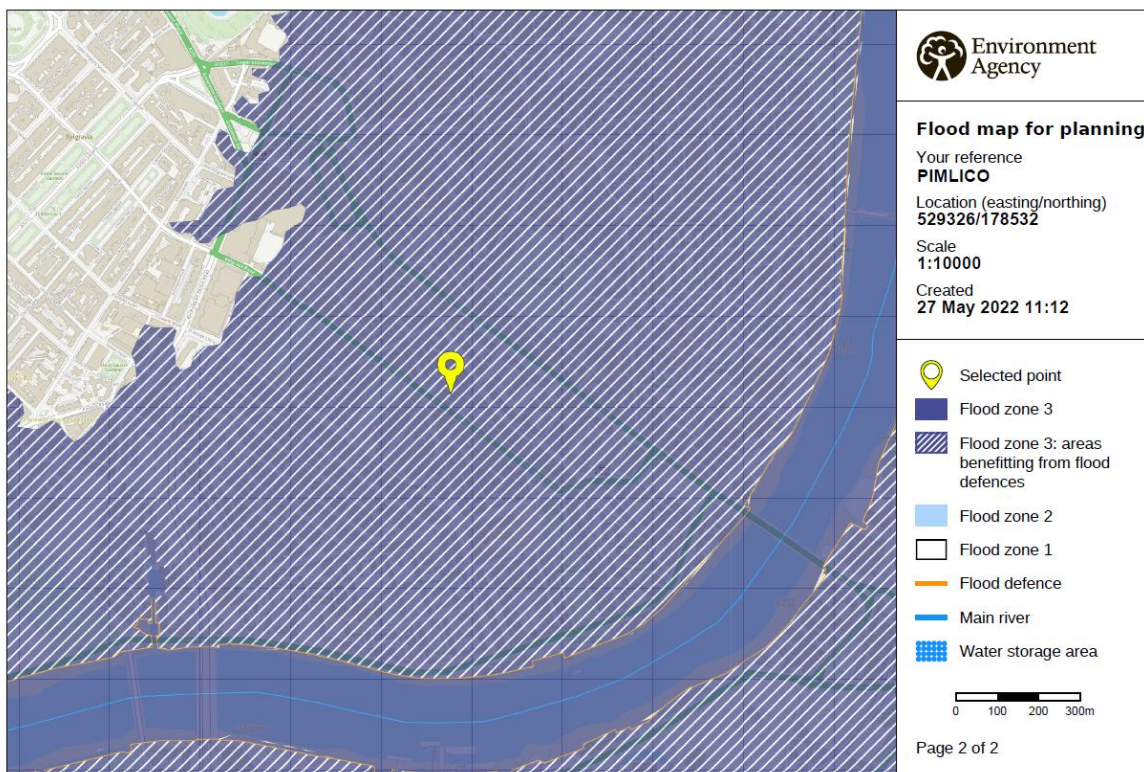
2 Assessment of Flood Risk

Flood Risk from Watercourses/Sea

There is a risk of flooding from watercourses and the sea as identified on the Environment Agency's indicative flood plain map. The map shows that the majority of the site is within flood zone 3. The EA's map also confirms that flood defences benefit the site. Information supplied by the Environment Agency shows that the 1 in 200 and 1 in 1000-year flood levels are 5.03m and 5.04m AOD respectively. These levels will be reduced to 5.00m and 5.01m respectively by 2107

The EA's flood map is indicative and is not based on site specific topographical survey data. The topographical survey for the site confirms that the majority of the site is above the 1:1000 year flood levels at its borders with pavement edges being further protected by raised bases to support railings.

The level of road centres surrounding the site have a level of 5.5 at the junction of Denbigh Street and Belgrave Road and 5.2 in Warwick Way between Denbigh Street and Tachbrook Street. Although the internals of the site are below the level of the flood wall, the site is of sufficient distance from the flood wall to provide several hours of protection in the event of a breach of the wall at 5.41



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Figure 2 Flood map

Strategic Flood Risk Assessment (SFRA)

Westminster's Draft Strategic Flood Risk Assessment 2019, states that *Although Westminster City Council's Authority Area has a significant area located within Flood Zone 2 and 3, this is associated with the River Thames Tidal Floodplain, which is protected to a high standard by the Thames Barrier and associated Thames Tidal Flood Defences. As such the risk of tidal and fluvial flooding within Westminster is assessed as being low"*

The main sources of info on potential tidal flooding of the Thames at Westminster are:

- The Environment Agency's Flood Map for Planning
- Thames Estuary 2100: for in-channel flood levels for the tidal River Thames.
- The Thames Tidal Upriver Breach Inundation Assessment (May 2017):

The current flood defences reduce the "actual" risk in this area from high to low.

The risk which remains is the "residual risk" of a breach or overtopping of flood protection occurs.

The SFRA states that the risk of floodwater overtopping the defences is extremely low.

The SFRA therefore focuses on the residual risk from breach of the flood defences.

This study was not prepared based on detailed site specific topographical survey data. As the site's surrounding ground levels are higher than the maximum tidal level in the river's channel, it is unlikely that the water level that floods the areas outside the main channel would be higher than the maximum water level in the river. An opening in the flood defence wall will allow a restricted volume of water to flow downstream in the borough, but this water will be spread over a very large area and subsequently lower than the ground levels on site. As a result the flood water level in the borough will be lower than the water level in the river. The topographical survey which is based on site specific detailed levels also supersedes the SFRA's defence breach flood map.

Therefore the residual risk from a breach to the flood defences is also low.

In addition, the Thames being tidal, the maximum water level in the river has a short duration and, in the event of an overtopping of the water, the progress of flooding over the flood zone is slowed by basements between the river and the site.

Fluvial and Tidal flood risk is effectively managed by the Thames Barrier and associated Thames Tidal Flood Defences; under normal operating conditions, there is only a residual risk of flooding due to a breach or failure of a portion of the flood defences

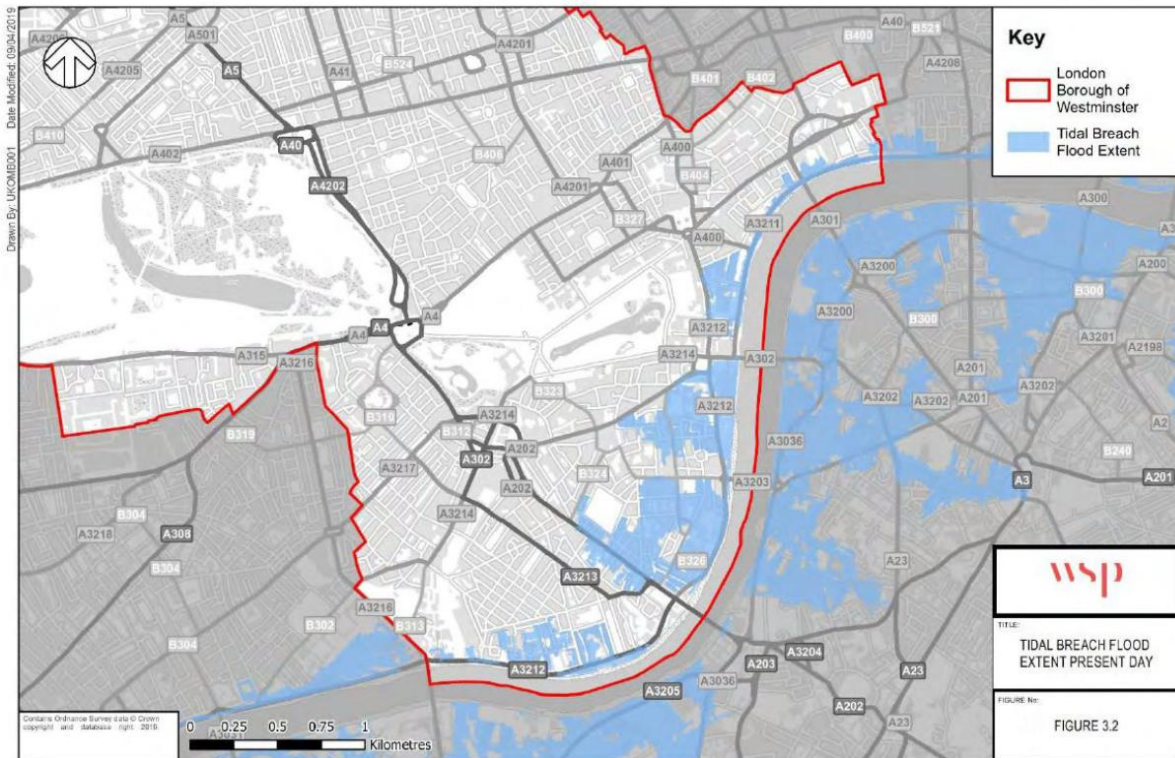


Figure 3 Maximum Tidal Breach Flood Extent Present Day map From SFRA

Flood Risk from Surface Water, Sewers and Burst Mains

The SFRA provides no detailed information about historical surface water flooding within the Westminster area. However, the SFRA states that “*all parts of Westminster may be susceptible to varying degrees of surface water flooding*”. In 2014, Westminster commissioned WSP to undertake enhanced surface water modelling in Westminster using a Thames Water Sewer model. The study identified those areas most at risk from surface water flooding, where resources should be focus in the future.

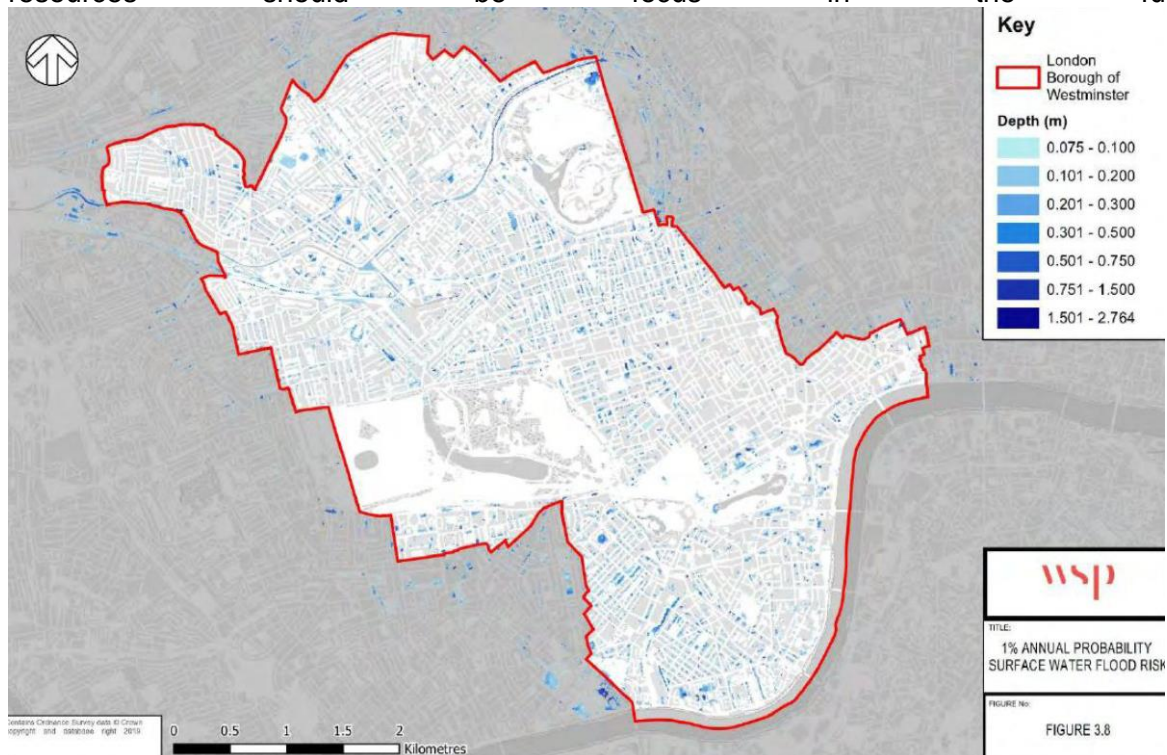


Figure 4 1% Annual Expected Probability Surface Water Flood Risk map From SFRA

Flooding from burst mains

Considerable work has been carried out by Thames Water replacing defective mains so the potential for flooding from this has reduced.

Flood Risk from Groundwater

The SFRA states that the risk of groundwater flooding in Westminster is considered to be low. However Westminster sits above a regional chalk aquifer covered with gravels and clay. Chalk shows some of the largest seasonal variations in groundwater levels, and it is the most extensive source of groundwater.

3 Conclusions

The level of pavement at the frontage of the property is of the order of 5.3-5.4m. Although part of the site is below this level it is surrounded by similar levels.

Modeled in-channel levels of the Thames at location node 2.29 (closest to the site) shows the 0.1% level for 2005 at 5.04m decreasing to 5.01m by 2107.

The Thames flood wall defence crest level is 5.41m

Flooding as a result of overtopping of the flood wall can reasonably be expected to be well within 0.1%. A breach of the flood wall would also not necessarily lead to flooding of the site as there is a time lag between over topping and inundation of the site, as well a reduction in the water level due to tidal levels. The site specific topographical information supersedes the map confirming that the ground levels will prevent flood water from flooding the site. Therefore, in accordance with NFFP, we would categorise the risk as low and well within 1:1000.

The area of the site is generally higher than surrounding properties and, particularly, Vauxhall Bridge Road. In a surface water flood situation water would drain away from the site. Despite this, the light well in the front pavement to Charlwood Place has an upstand which would further protect from the possibility of flooding to the lower ground floor.

Ground water is not considered to be problematic as the lower ground floor is of concrete with damp proof membrane, and the walls are tanked.

We conclude that the proposed development has an acceptable flood risk under NPPF