Product 4 (Detailed Flood Risk) for: Rear of 127-143 Kingsway, Mortlake, London, SW14
Requested by: Alexandros Tsavdaris
Reference: KSL 141219 KR59
Date: 05/01/2015

Contents

The information provided is based on the best data available as of the date of this letter.

You may feel it is appropriate to contact our office at regular intervals, to check whether any amendments/ improvements to the data for this location have been made. Should you re-contact us after a period of time, please quote the above reference in order to help us deal with your query.

This information is provided subject to the enclosed notice which you should read.

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Flood map for planning (Rivers and Sea)

The Flood Map:

Our Flood Map shows the natural floodplain for areas at risk from river and tidal flooding. The floodplain is specifically mapped ignoring the presence and effect of defences. Although flood defences reduce the risk of flooding they cannot completely remove that risk as they may be over topped or breached during a flood event.

The Flood Map indicates areas with a 1% (0.5% in tidal areas), Annual Exceedance Probability (AEP) - the probability of a flood of a particular magnitude, or greater, occurring in any given year, and a 0.1% AEP of flooding from rivers and/or the sea in any given year. In addition, the map also shows the location of some flood defences and the areas that benefit from them.

The Flood Map is intended to act as a guide to indicate the potential risk of flooding. When producing it we use the best data available to us at the time and also take into account historic flooding and local knowledge. The Flood Map is updated on a quarterly basis to account for any amendments required. These amendments are then displayed on the internet at www.environment-agency.gov.uk.

At this Site:

The Flood Map shows that this site lies mainly within the outline of Flood Zone 2. This zone comprises land assessed as having between a 0.5% (1 in 200) and 0.1% (1 in 1000) annual probability of tidal flooding.

Enclosed is an extract of our Flood Map which shows this information for your area.

Method of production

The Flood Map at this location has been derived using detailed modelling of the Thames Tidal Defences Study completed in March 2006 by Halcrow Ltd.

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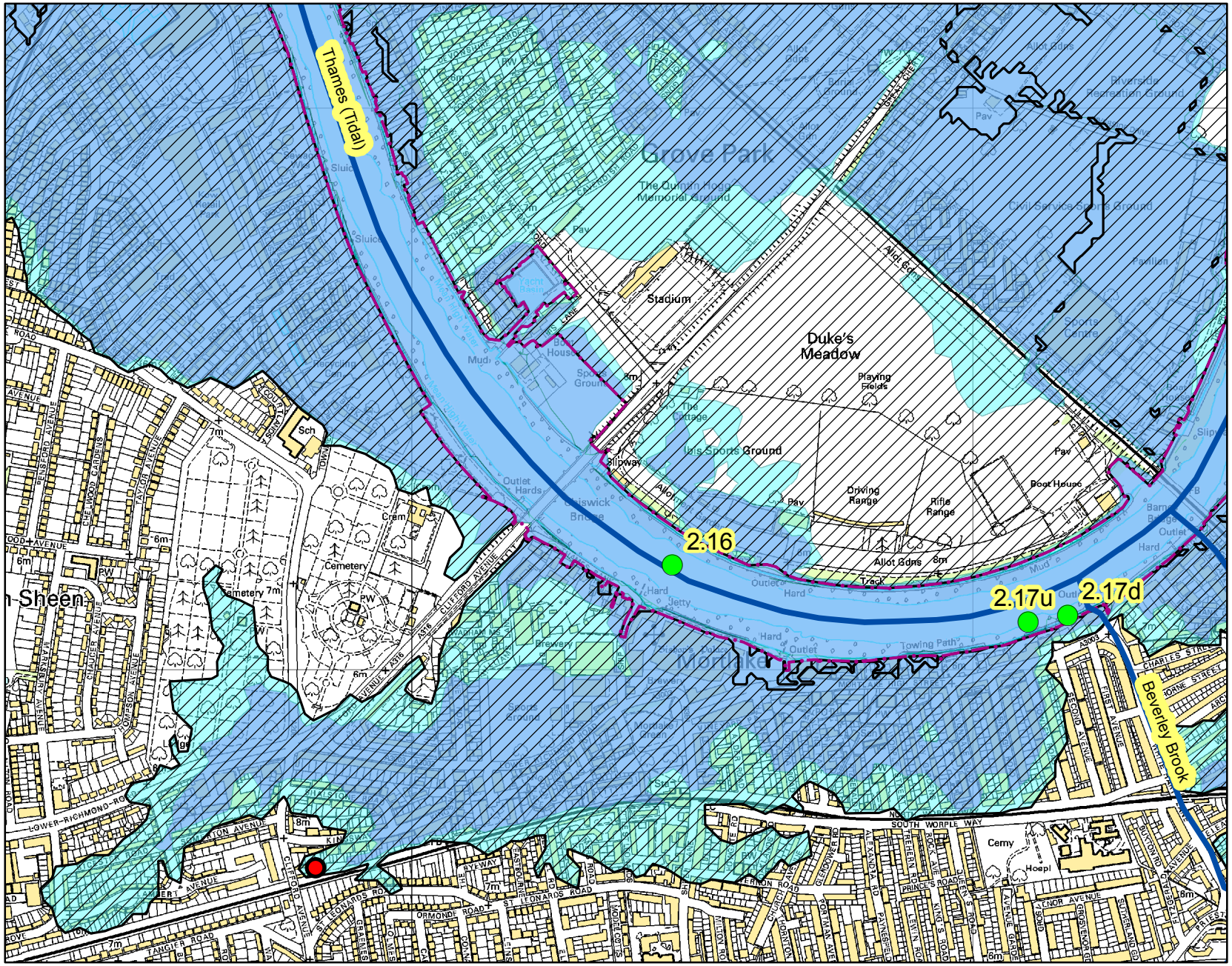
Flood map for planning (Rivers and Sea) Extract centred on land at rear of 127-143 Kingsway, Mortlake, London, SW14
Created 05/01/2015 - ref : KSL141219KR59



Environment Agency

Scale 1:10,000

Legend

- Site Location
- Model Nodes
- Main Rivers
- Flood Map - Defences
- Areas Benefiting from Flood Defences
- Flood Map - Flood Zone 3
- Flood Map - Flood Zone 2

Flood Map Areas (assuming no defences)

Flood Zone 3 shows the area that could be affected by flooding:
- from the sea with a 0.5% or greater chance of occurring each year
- or from a river with a 1% or greater chance of occurring each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 0.1% chance of occurring each year.

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Model Output Data – Thames Estuary 2100

You have requested in-channel flood levels for the tidal river Thames. These have been taken from the Thames Estuary 2100 study completed by HR Wallingford in 2008. The modelled node closest to your site is **2.16**; the locations of nearby nodes are also shown on the enclosed map.

Why have the levels changed?
The TE2100 plan is now live and within it are a set of levels on which the flood risk management strategy is based. The plan is the overarching flood management strategy for the Thames Estuary and therefore any development planning should be based on the same underlying data.

What is the difference between the TE2100 levels and the 2008 Joint Probability levels that have previously been provided?
The values of the two sets of levels are very similar for the present day scenario. However, the TE2100 takes into account operation of the Thames Barrier when considering future levels. The Thames Barrier requires regular maintenance and with additional closures the opportunity for maintenance will be reduced. When this happens, river levels – for which we would normally shut the barrier – will have to be allowed through to ensure that the barrier is not shut too often. For this reason, levels upstream of the barrier will increase and the tidal walls will need to be heightened to match. The levels previously provided do not take this scenario into consideration.

Why is there no return period for levels upstream of the barrier?
The levels upstream of the barrier are the highest levels permitted by the operation of the Thames Barrier. If levels and flows are forecast to be any higher, the Thames Barrier would shut, ensuring that the tide is blocked and the river maintained to a low level. For this reason the probability of any given water level upstream of the Barrier is controlled and therefore any associated return period becomes irrelevant. The Thames Barrier and associated defence system has a 1 in 1000 year standard which means it ensures that flood risk is managed up to an event that has a 0.1% annual probability. The probability of water levels upriver is ultimately controlled by the staff at the Thames Barrier.

Why are the levels in west London higher than the defence crest levels?
In west London there is a heavy influence from upstream flows (fluvial flows). The flood defences are built to manage tidal flood risk only. With very high fluvial flows, the river levels in west London could be above the 0.1% annual probability tidal level.

Why are the climate change/future west London levels lower than the present day levels?
The climate change levels are assessed to determine the future tidal defence levels. For this reason they only account for extreme tidal events and not extreme fluvial flow events. The present day levels include extreme flows from upstream (fluvial events) as well as extreme tidal events.

For further information about the Thames Barrier please visit our website at:
https://www.gov.uk/the-thames-barrier

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TE2100 present day levels:

Levels downstream of the Thames Barrier are 0.1% AEP (1 in1000) and levels upstream are the highest levels permitted by the Thames Barrier. The defence levels (left defence, right defence) are the minimum levels to which the defences should be built.

The defence levels near Teddington are lower than the extreme water levels because they take into account high fluvial events. The defences are tidal only.

Location	Node	Easting	Northing	Extreme water level (m)	Left defence (m)	Right defence (m)	Allow for future defence raising to a level of...	
							Left Bank (m)	Right Bank (m)
Mortlake	2.16	520464	176185	5.23	5.94	5.94	6.70	6.70
	2.17u	521099	176083	5.17	5.94	5.94	6.70	6.70
	2.17d	521169	176094	5.17	5.94	5.94	6.70	6.70

TE2100 climate change levels:
The water levels in west London are lower than the current day extreme levels because they do not take into account extreme fluvial events; they are tidal only levels.

				2065 to 2100		**2100**	
Location	Node	Easting	Northing	Design water level	Defence level (both banks)	Design water level	Defence level (both banks)
Mortlake	2.16	520464	176185	5.59	6.25	6.03	6.70
	2.17u	521099	176083	5.55	6.25	6.00	6.70
	2.17d	521169	176094	5.55	6.25	6.00	6.70

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Breach Modelling

We have undertaken breach modelling through the Tidal Thames Breach modelling study completed by Halcrow in March 2012. However this site is not located within the outlines of the models due to the positions of the modelled breaches **and/or** considerable distance of the site from the Thames. Therefore no data from the breach models is available for this site.

Please note that we have produced only a finite number of breach models for the Tidal Thames, based on a number of key locations. Although this site is outside of the extents of all of the breach models that we hold, we cannot state categorically that no breach model could be created that is shown to affect this site. As such, you may need to consider carrying out additional modelling to simulate the breaching of defences in a suitable alternative location.

This modelling simulates tidal breaches along the Thames from Teddington to the Mar Dyke and River Darent. A series of approximately 100 tidal models were developed for the Environment Agency at pre-determined breach locations. These were chosen using a risk-based approach by examining critical locations based on low floodplain topography. For hard defences breaches are set at 20 m wide; for soft defences, breaches are 50 m wide. In both cases, defences are assumed to breach down to the ground level behind the defence.

Based on the 2008 Extreme Water Level Modelling, the 0.5% probability of annual exceedance (1 in 200 year joint probability – Thames Barrier Operational) tidal event was modelled for all breach locations with a current year baseline of 2005. In addition, for breaches downstream of the Thames Barrier, the 1 in 200 year plus climate change event (2107 epoch) was also modelled.

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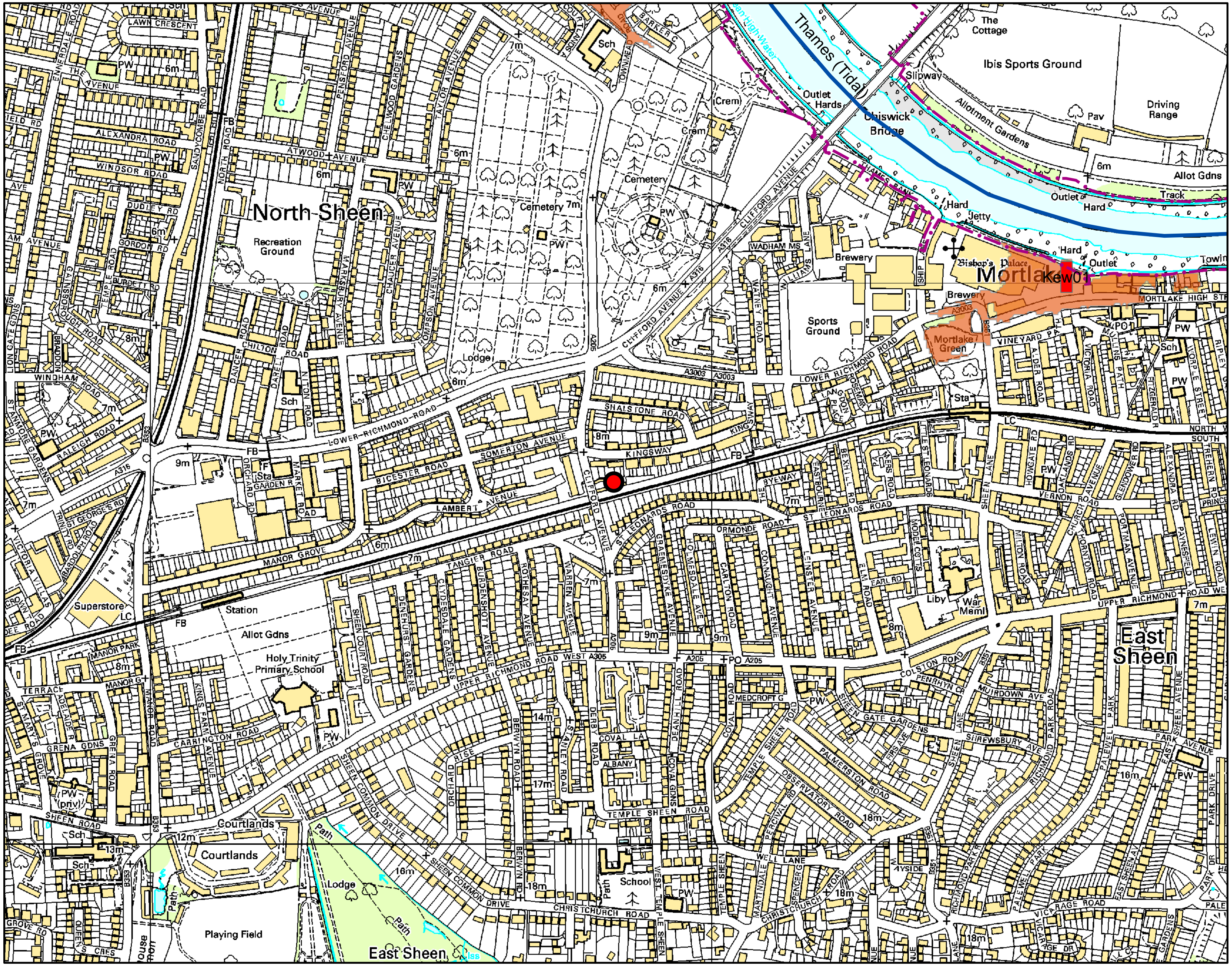
Breach Model Map centred on land at rear of 127-143 Kingsway, Mortlake, London, SW14
Created 05/01/2015 - ref : KSL141219KR59



Environment Agency

Scale 1:10,000

N
E
S
W

Legend

- Site Level Node
- Site Location
- Flood Map - Defences
- Breach Locations
- Main Rivers
- 0.5% AEP (1 in 200 year) 2005 Max Flood Extent
- 0.5% AEP (1 in 200 year) 2107 Max Flood Extent

Thames Tidal Breach Modelling 2012

A modelled representation of tidal breaches along the Thames from Teddington to the Mar Dyke and River Darent, based on low floodplain topography. For hard defences breaches are set at 20 m wide; for soft defences, breaches are 50 m wide. In both cases, defences are assumed to breach down to the ground level behind the defence.
The modelling is based on the Extreme Water Levels 2008 (current year 2005), and includes 0.5% (1 in 200) chance in any year. In the case of breaches downstream of the Thames Barrier, the 1 in 200 year plus climate change event (2107 epoch) was also modelled.

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Upstream Inundation Modelling

The enclosed map shows the extent of the 0.5 % AEP (1 in 200) and 0.1% AEP (1 in 1000) results for the Tidal Thames Upstream Inundation modelling study completed by Halcrow Group Ltd. in 2011.

Based on the 2008 Extreme Water Level Modelling, the 0.5% and 0.1% probability of annual exceedance (1 in 200 and 1 in 1000 year joint probability respectively – Thames Barrier Operational) tidal event was modelled with a current year baseline of 2005.

Using the domains created as part of the Flood Zones Improvements modelling completed by Halcrow Group Ltd. in 2006, the project generated outputs for water depths, velocity, levels and hazard. However the scenario modelled is that the Thames Barrier is operational but all linear defences have been removed. It uses the joint probability levels calculated in 2008 and only provides data for embayments upstream of the Thames Barrier.

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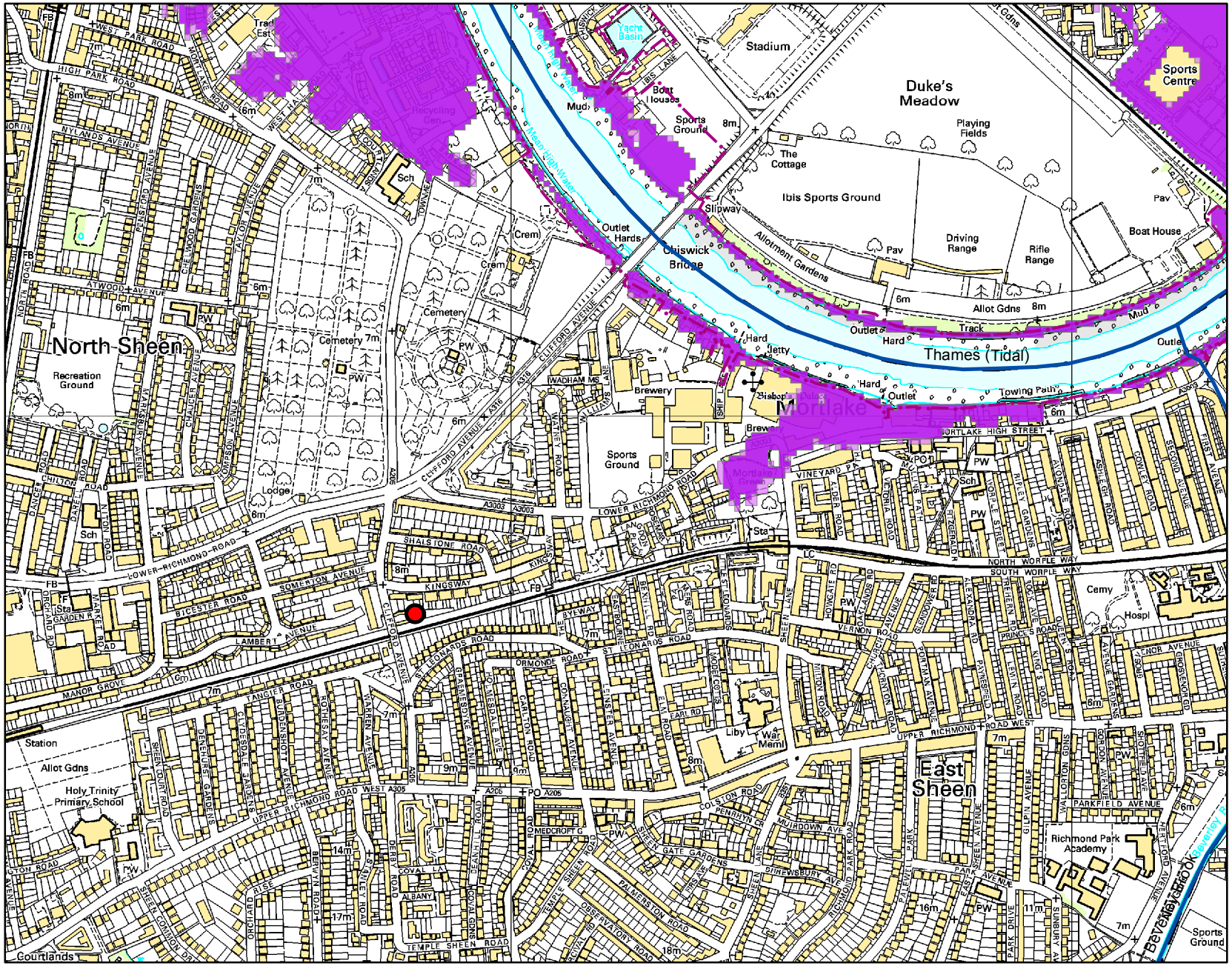
Upstream Inundation Modelling Map centred on 127-143 Kingsway, Mortlake, London, SW14
Created 05/01/2015 - ref : KSL141219KR59



Legend

- Site Location
- Main Rivers
- Flood Map - Defences
- 0.5% AEP (1 in 200 year) Maximum Flood Extent
- 0.1% AEP (1 in 1000 year) Maximum Flood Extent

Upstream Inundation Modelling 2011

A modelled representation of at-risk areas, assuming no defences, based on the upstream levels from the Thames Barrier operational scenarios. These are the levels that are providers to developers to include in flood risk assessments.
The modelling is based on the Extreme Water Levels 2008 (current year 2005), and includes 0.5% (1 in 200) and 0.1% (1 in 1000) chance in any year.

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Defence Details

The design standard of protection of the flood defences in this area of the Thames is 0.1% AEP; they are designed to defend London up to a 1 in 1000 year **tidal only** flood event. The defences are all raised, man-made and privately owned. It is the riparian owners' responsibility to ensure that they are maintained to a crest level of 5.94 m AODN (the Statutory Flood Defence Level in this reach of the Thames). We inspect them twice a year to ensure that they remain fit for purpose. The current condition grade for defences in the area is 2 (good), on a scale of 1 (very good) to 5 (very poor). For more information on your rights and responsibilities as a riparian owner, please see our document 'Living on the edge' found on our website at:

https://www.gov.uk/government/publications/riverside-ownership-rights-and-responsibilities

There are no planned improvements in this area. Please see the 'Thames Estuary 2100' document on our website for the short, medium and long term Flood Risk Management strategy for London:

https://www.gov.uk/government/publications/thames-estuary-2100-te2100

Areas Benefiting from Flood Defences

This site is within an area benefiting from flood defences, as shown on the enclosed extract of our Flood Map. Areas benefiting from flood defences are defined as those areas which benefit from formal flood defences specifically in the event of flooding from rivers with a 1% (1 in 100) chance in any given year, or flooding from the sea with a 0.5% (1 in 200) chance in any given year.

If the defences were not there, these areas would be flooded. An area of land may benefit from the presence of a flood defence even if the defence has overtopped, if the presence of the defence means that the flood water does not extend as far as it would if the defence were not there.

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Recorded Flood Events Data

We hold records of historic flood events from rivers and the sea. Information on the floods that may have affected the area local to your site is provided below and in the enclosed map (if relevant).

Flood Event Data

We do not hold records of historic flood events from rivers and/or the sea affecting the area local to this site. However, please be aware that this does not necessarily mean that flooding has not occurred here in the past, as our records are not comprehensive.

Due to the fact that our records are not comprehensive, we would advise that you make further enquiries locally with specific reference to flooding at this location. You should consider contacting the relevant Local Planning Authority and/or water/sewerage undertaker for the area.

We map flooding to land, not individual properties. Our historic flood event record outlines are an indication of the geographical extent of an observed flood event. Our historic flood event outlines do not give any indication of flood levels for individual properties. They also do not imply that any property within the outline has flooded internally.

Please be aware that flooding can come from different sources. Examples of these are:

- from rivers or the sea;
- surface water (i.e. rainwater flowing over or accumulating on the ground before it is able to enter rivers or the drainage system);
- overflowing or backing up of sewer or drainage systems which have been overwhelmed,
- groundwater rising up from underground aquifers

Currently the Environment Agency can only supply flood risk data relating to the chance of flooding from rivers or the sea. However you should be aware that in recent years, there has been an increase in flood damage caused by surface water flooding or drainage systems that have been overwhelmed.

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Additional Information

Use of Environment Agency Information for Flood Risk / Flood Consequence Assessments

Important
If you have requested this information to help inform a development proposal, then we recommend that you undertake a formal pre-application enquiry using the form available from our website:

https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion

Depending on the enquiry, we may also provide advice on other issues related to our responsibilities including flooding, waste, land contamination, water quality, biodiversity, navigation, pollution, water resources, foul drainage or Environmental Impact Assessment.

In **England**, you should refer to the Environment Agency's Flood Risk Standing Advice, the National Planning Policy Framework and the technical guidance to the National Planning Policy Framework for information about what flood risk assessment is needed for new development in the different Flood Zones. These documents can be accessed via:

https://www.gov.uk/flood-risk-standing-advice-frsa-for-local-planning-authorities
http://planningguidance.planningportal.gov.uk/

You should also consult the Strategic Flood Risk Assessment produced by your local planning authority.

You should note that:

1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk / Consequence Assessment (FRA / FCA) where one is required, but does not constitute such an assessment on its own.

2. This information covers flood risk from main rivers and the sea, and you will need to consider other potential sources of flooding, such as groundwater or overland runoff. The information produced by the local planning authority referred to above may assist here.

3. Where a planning application requires a FRA / FCA and this is not submitted or deficient, the Environment Agency may well raise an objection.

4. For more significant proposals in higher flood risk areas, we would be pleased to discuss details with you ahead of making any planning application, and you should also discuss the matter with your local planning authority.

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Development and Flood Risk

Finished floor levels using TE2100 design levels:

We have recently moved to issuing design water levels from the TE2100 project as part of data requests. Developers should use these levels as part of their flood risk assessments for elements impacted by in-river levels, for example defence crest heights etc. We are in the process of carrying out revised breach modelling for the floodplains based on these new in-river levels. Until this new breach modelling is available, developers may continue to use our existing (2008) breach modelling levels to inform their flood risk assessments and to set finished floor levels in developments at residual risk (where this data is available). Developers should be aware that these levels will be changing in the future and are likely to result in recommended finished floor levels being set at a higher level to that currently used. Developers may wish to undertake their own updated breach modelling using our TE2100 data, which we can supply on request where available.

Surface Water

We have provided two national Surface Water maps, under our Strategic Overview for flooding, to your Lead Local Flood Authority – London Borough of Richmond upon Thames – who are responsible for local flood risk (i.e. surface runoff, ground water and ordinary watercourse), which alongside their existing local information will help them in determining what best represents surface water flood risk in your area.

London Borough of Richmond upon Thames have reviewed these and determined what it believes best represents surface water flood risk. You should therefore contact this authority so they can provide you with the most up to date information about surface water flood risk in your area.

You may also wish to consider contacting the appropriate relevant Local Planning Authority and/or water/sewerage undertaker for the area. They may be able to provide some knowledge on the risk of flooding from other sources. We are working with these organisations to improve knowledge and understanding of surface water flooding.

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