TECHNICAL NOTE

Job Name:	**5A Kings Road, Twickenham**
Job No:	**332612048**
Note No:	**001**
Date:	October 2024
Prepared By:	M Lingham
Reviewed By:	R Fisher **Approved By:** R Fisher
Subject:	**Flood Risk Assessment**

This Flood Risk Assessment (FRA) Technical Note has been prepared by Stantec to provide an overview of flood risk for the proposed change of use under Permitted Development (PD) of Unit 5A on Kings Road, from the existing storage space to residential use (a single 4-bed apartment), and demonstrate compliance with national and local flood risk policy. The site lies within the administrative area of the London Borough of Richmond (LBR).

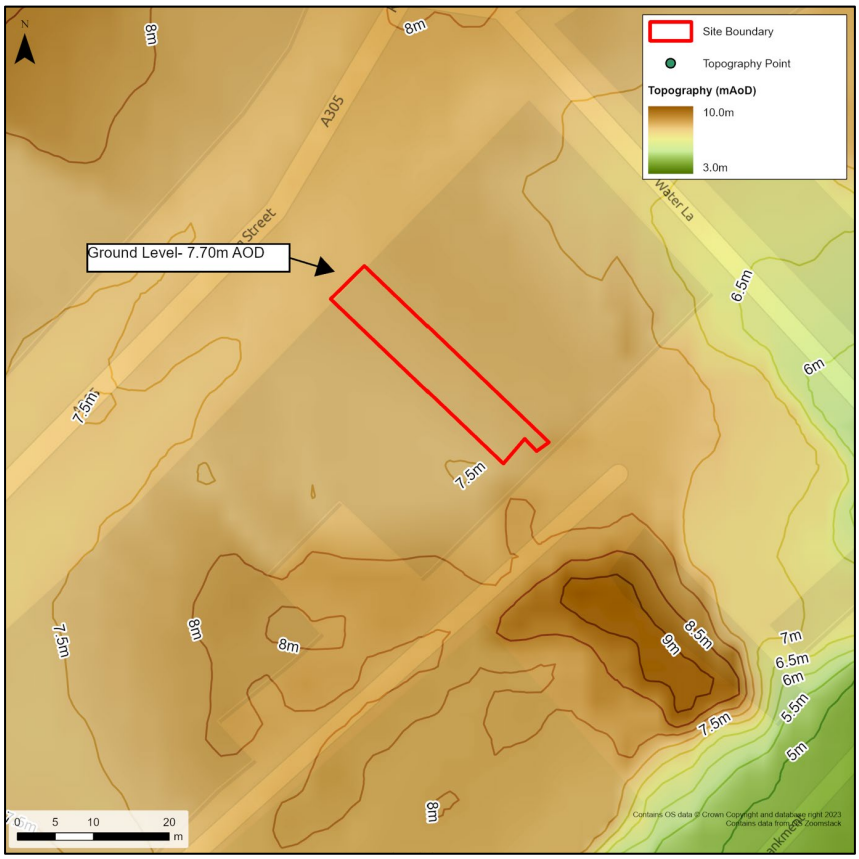
1. Site Description

1.1. The site consists of the first and second floor of Unit 5A Kings Road, Twickenham (postcode TW1 3SD, OS grid reference 516,280m E, 173,220m N) - see **Figure 1.1**. The site consists of the first and second floor levels of the building. The ground floor level (Unit 5) is currently occupied by a Boots pharmacy and the site is used as back of house for the pharmacy and for storage.

Figure 1.1: Site Location

1.2. Environment Agency (EA) LIDAR remote ground survey data indicates that the area has a typical ground level between 7.5m AOD and 8.0m AOD- see **Figure 1.2**. The point adjacent to the northern site boundary is at a ground level of 7.70m AOD, and this has been used an indicative ground level for the building throughout this assessment.

Figure 1.2: LiDAR Topographic Data



1.3. The River Thames is located approximately 80m south of the site, where it flows either side of Eel Pie Island. While there is a tidal element to the behaviour of the watercourse, as it is downstream of the tidal limit at Teddington Lock, at this point the fluvial aspect is dominant and is the main source of flood risk to the area.

1.4. The land either side of the River Thames up to Teddington Lock is protected by the River Thames Tidal Defences, an extensive flood defence network across London of which the Thames Barrier is an integral part. The design standard of protection of the flood defences in this area of the Thames is 1 in 1000 (0.1% annual probability). It is the riparian owners' responsibility to ensure that they are maintained to the applicable Statutory Defence Level (SDL) in each reach of the Thames. However, at this location this defence line is formed by the naturally rising ground as it rises from the edge of the river channel, rather than any raised wall structure.

2. Relevant Planning Policy

2.1. This FRA has been prepared in accordance with the relevant national, regional and local planning policy and statutory authority guidance as follows:

- **National policy contained within the National Planning Policy Framework (NPPF),** updated December 2023, issued by Communities and Local Government, with reference to Section 14 'Meeting the challenge of climate change, flooding and coastal change';

- The **Planning Practice Guidance (PPG)** released in March 2014 ('Flood Risk and Coastal Change' section) updated in August 2022, and the EA '**Flood Risk Assessments: Climate Change Allowances'** guidance.

- The EA's **Thames Estuary 2100 Plan** (TE2100) released in November 2012, which sets out the recommendations for flood risk management for London and the Thames estuary to the end of the century;

- **Regional policy contained within the Greater London Authority's 'The London Plan'** (March 2021), with reference to Policy SI 12 'Flood risk management'.

- **London Borough of Richmond Upon Thames Local Plan,** adopted July 2018.

- The **London Borough of Richmond Upon Thames Strategic Flood Risk Assessment (SFRA)**, released in March 2021.

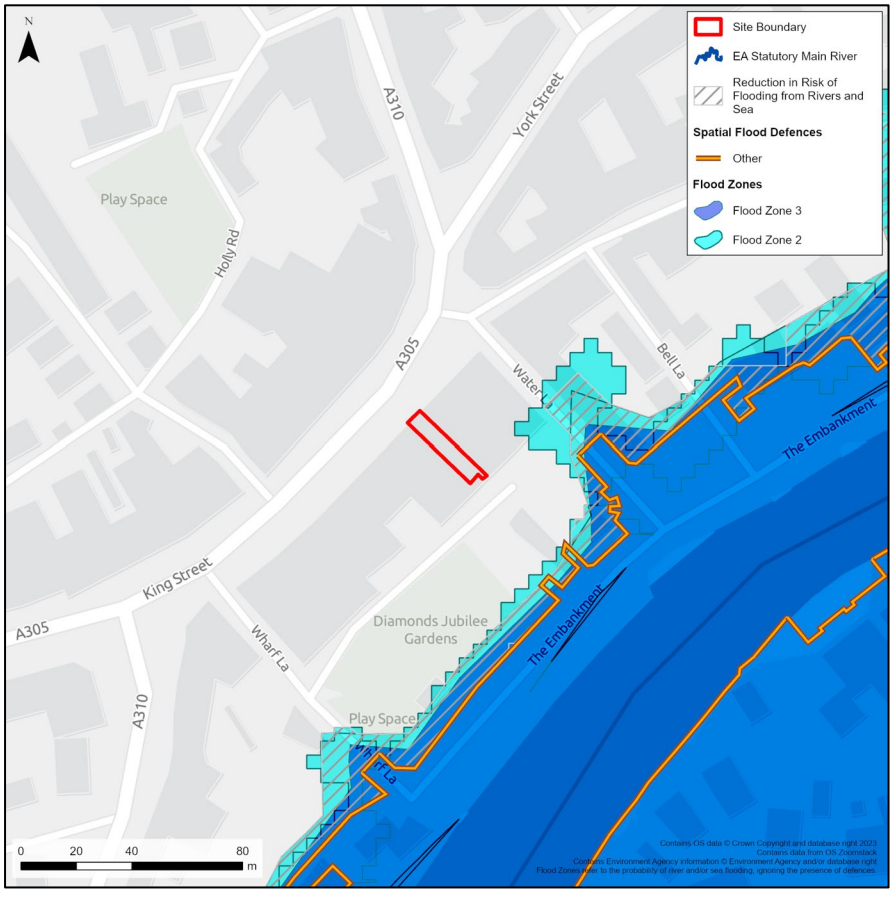
3. EA Open Data Flood Maps

3.1. The following section provides an overview of the GIS Flood Maps provided in **Appendix A**. These are based on the EA Opendata datasets and reproduced with OS mapping under licence to Stantec.

EA Flood Zone Map

3.2. A review of the EA online Flood Map for Planning shows that the area lies entirely within Flood Zone 1 'Low Probability' (defined as land at less than 1 in 1000 (0.1%) or annual probability of river or sea flooding). The map also indicates the presence of flood defences along both the banks of the River Thames (although, as noted above there is no physical defence along this line).

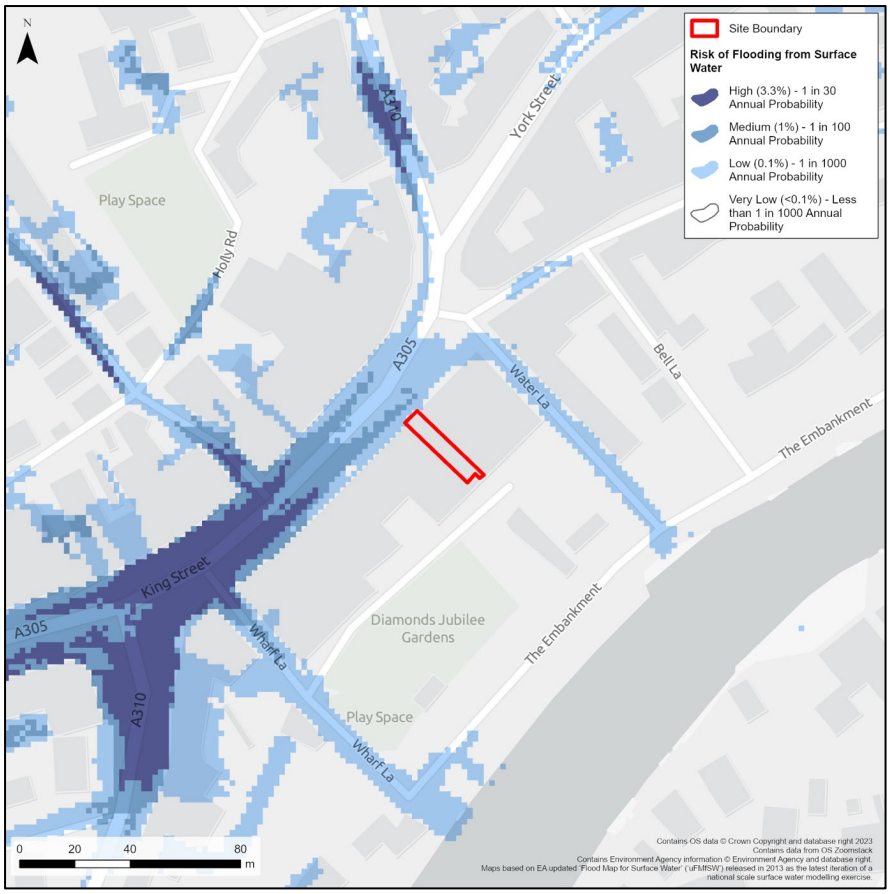
Figure 3.1: EA Flood Zone Map



Risk of Flooding from Surface Water

3.3. The EA 'Risk of Flooding from Surface Water' (RoFSW) map indicates that the site is in an area of 'Very Low' flood risk. There is an area of 'Low' to 'Medium' risk shown immediately north of the site, along King Street, and 'High' risk further west along the road, suggesting a localised depression.

Figure 3.2: Risk of Surface Water Flood Map



Risk of Flooding from Reservoirs

3.4. The EA provides maps showing the risk of flooding in the event of a breach from reservoirs both when river levels are normal (dry-day scenario) and when there is also flooding from rivers (wet-day scenario). **Figure 012** in **Appendix A** indicates that the site and surrounding area are only at risk of reservoir flooding when there is also flooding from rivers. However, the risk of flooding from a reservoir breach is very small in any case; the EA is the enforcement authority for the Reservoirs Act (1975) and all large, raised reservoirs are inspected and supervised by reservoir panel engineers. On this basis, the risk of reservoir flooding to the site is considered to be 'Very Low'.

Historic Flooding

3.5. The EA 'Recorded Historic Flood Extents' map indicates there is no record that the site has been impacted by historic flood events - see **Figure 014** in **Appendix A**. This is consistent with the historic flood extents shown in the London Borough of Richmond Upon Thames SFRA.

4. Strategic Flood Risk Assessment

4.1. The current London Borough of Richmond Upon Thames Strategic Flood Risk Assessment (SFRA) was released in 2021 to provide advice of flood risk issues within the Borough. Interactive maps have been developed to accompany the SFRA. These have been reviewed and key information of relevance to the site has been extracted.

- **Flood Zone:** The Fluvial and Tidal Flood Risk interactive map indicates that the site is not located within either Flood Zone 2 or Flood Zone 3, which is consistent with the EA Flood Zones displayed in **Figure 3.1**.

- **Historic Flood Extents:** The 'Fluvial and Tidal Flood Risk' interactive map indicates that the site has not been impacted by historic flood events, consistent with the Historic Flood Map included in **Appendix A**.

- **Modelled Extents:** The interactive map provides a tidal breach inundation outline and a tidal defence breach outline. The exact source of this data is unclear, but the site is located outside of both flood scenarios.

- **Surface Water Flood Risk:** The Surface Water Flood Risk interactive map indicates that the site is not impacted by surface water flooding, consistent with the EA Surface Water Flood Risk Mapping shown in **Figure 3.2**.

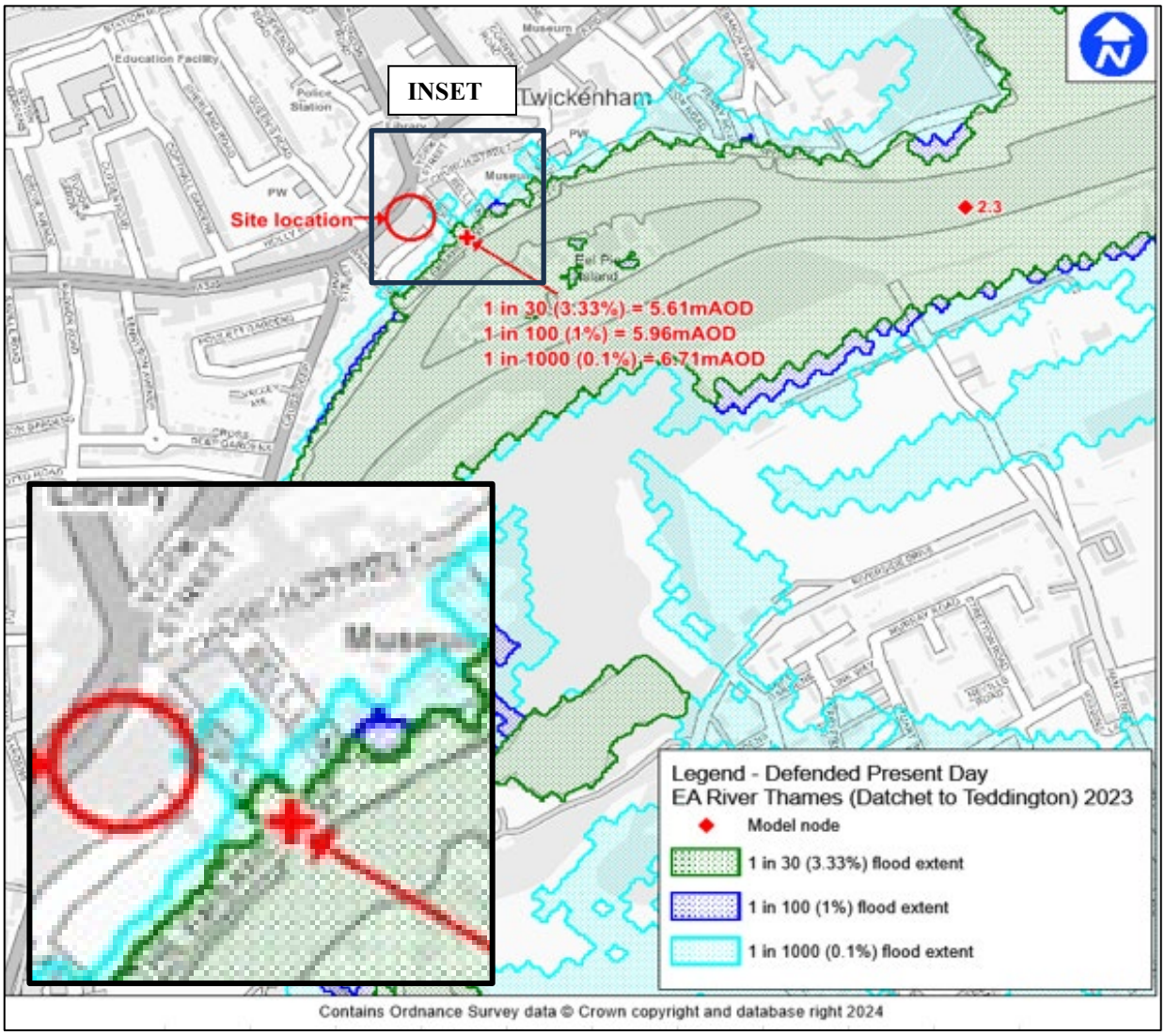
- **Groundwater Flood Risk:** The Groundwater, Sewer, Artificial Flood Risk interactive map provides a strategic scale map indicating the groundwater flood areas on a 1km square grid. The map indicates the proportion of each 1km square grid where geological and hydrogeological conditions show that groundwater might emerge. The site is shown to lie in an area at less than 25% susceptibility to groundwater flooding (i.e. 'low risk'). It should be noted that this analysis is not based on any detailed modelling, or on any records of groundwater flooding; it is annotated to show what percentage of the 1km area could be susceptible to groundwater flooding, thus providing an indication of the degree of probability of groundwater flooding that is present within a broad area.

- **Sewer Flooding:** The Groundwater, Sewer, Artificial Flood Risk interactive map shows the number of sewer flood incidents. This data shows where Thames Water have received reports of sewer flooding and indicates that the site lies in an area that has received 0-10 incident reports (i.e. the lowest end of the scale). It should be noted that this data was provided in partial postcode format and therefore does not specify where the flooding is occurring at property level.

5. EA River Thames (Datchet to Teddington) 2023 Modelling

5.1. Modelled flood data has been extracted from the EA 'River Thames (Datchet to Teddington) 2023 hydraulic modelling, which is held on the Stantec system. Present day modelled flood extents are provided in **Figure 5.1**.

Figure 5.1: Modelled Flood Extents - Present Day



5.2. This confirms that the site is outside all modelled flood extents. The 1 in 30 and 1 in 100 annual probability floods are contained to the land immediately adjacent to the river channel and, while the extreme 1 in 1000 annual probability flood encroaches further north up Water Lane it does not reach the site.

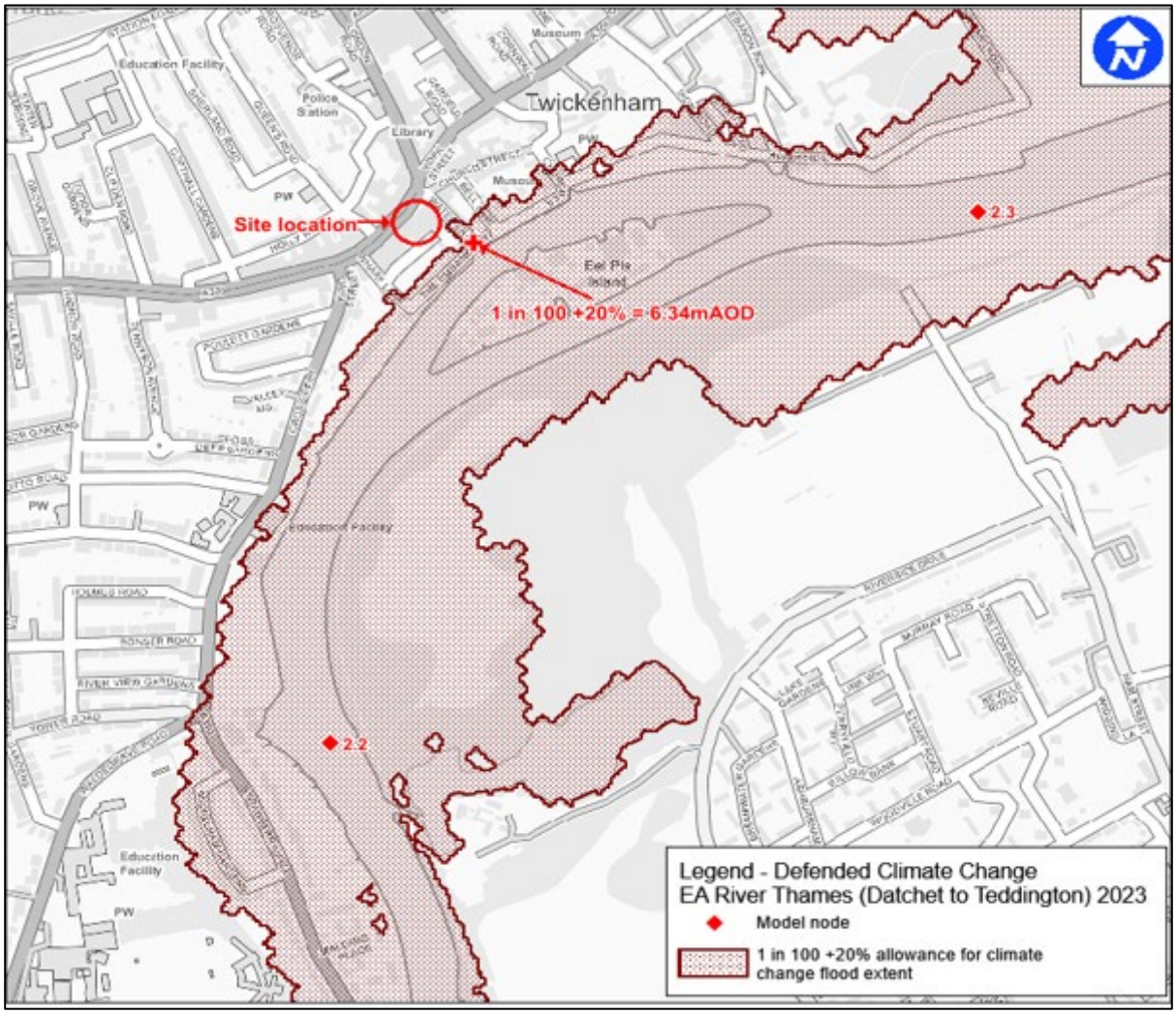
5.3. Comparison of the above modelled flood levels with the typical site ground level of approximately 7.70 AOD indicates:

- **The 1 in 30 annual probability event** flood level is 5.61m AOD, and therefore the site lies at least 2m above the 1 in 30 annual probability flood extent.
- **The 1 in 100 annual probability event** flood level is at 5.96m AOD and therefore the site lies over 1.7m above the 1 in 100 annual probability flood extent.
- **The 1 in 1000 annual probability event** flood level lies at 6.71m AOD, and therefore the site lies approximately 1m above the 1 in 1000 annual probability flood extent.

5.4. In considering flood risk to the site, it is necessary to fully consider the potential impacts of climate change for the lifetime of the development within the mitigation measures. The applicable peak river flow allowance to be considered for development at the site is a +17% 'Central' allowance scenario (London Management Catchment).

5.5. In the absence of a modelled +17% scenario, the modelled **+20% allowance** is used as a baseline for climate change impacts and the 1 in 100 annual probability +20% flood level over the site is therefore the 'design event'. The EA-modelled 1 in 100 annual probability +20% climate change flood extent is provided in Figure 5.2.

Figure 5.2: Modelled Flood Extent – Climate Change



5.6. Figure 5.2 confirms that the climate change flood extent is contained to the south of the site and while it does encroach up Water Lane, it does not impact the site.

5.7. Comparison of the 1 in 100 annual probability +20% climate change flood level of 6.34m AOD, with the typical ground level at the site of approximately 7.70 AOD indicates that the site lies approximately 1.4m above the climate change flood extent.

6. Mitigation Measures

Floor Levels

6.1. Residential floor levels should be set a minimum of 300mm freeboard above the maximum 1 in 100 annual probability +20% allowance for climate change flood level of 6.34m AOD.

6.2. However, as the proposal is for the conversion of the first and second floor levels, this will be at least 2m above ground level of 7.70m AOD, and therefore at a level of at least 9.7m AOD, which provides approximately 3.3m freeboard above the reference 1 in 100 annual probability +20% climate change event.

Safe Access

6.3. It is necessary to consider and incorporate safe access arrangements as part of the mitigation measures of any new development, to ensure the occupants of the development are safe in times of flooding and can achieve access/egress to/from the wider area safely.

6.4. Continuous safe and dry access is available for all modelled flood events, including the 1 in 1000 annual probability event and the 1 in 100 annual probability +20% allowance for climate change.

Floodplain Storage

6.5. Any new development located within the vicinity of a watercourse should be constructed such that it does not detrimentally impact on flow routes or reduce the available floodplain storage over the site; either of which could potentially cause an increase in flood levels on-site or elsewhere. This is considered up to the benchmark of the 1 in 100 annual probability +20% climate change allowance flood event.

6.6. As shown in **Figure 5.2**, the site lies outside of the modelled 1 in 100 annual probability +20% climate change event, and therefore there will be no impact to floodplain storage.

Surface Water Drainage

6.7. Given the form of development, which involves the conversion of the existing storage space on the first and second floors of Unit 5A King Street to residential development, there will be no change to the existing drainage arrangements.

7. Summary

7.1. The site lies within Flood Zone 1 ‘Low Probability’ (land at less than 1 in 1000 (0.1%) annual probability of river or sea flooding). The site is at low risk of flooding from other sources of flooding.

7.2. As the site lies outside of all modelled flood extents there will be no impact to floodplain storage, and continuous safe dry access is available.

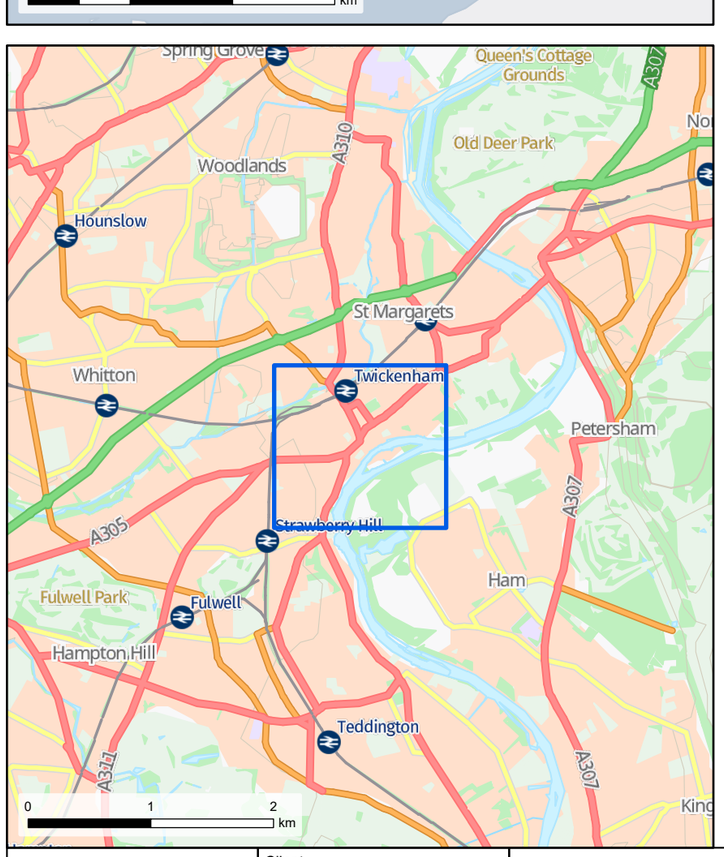
7.3. As the proposed works involve the conversion of storage space to residential use at the first and second floor, there works will be at least 2m above the typical ground level, which provides approximately 3.3m freeboard above the reference 1 in 100 annual probability +20% allowance for climate change.

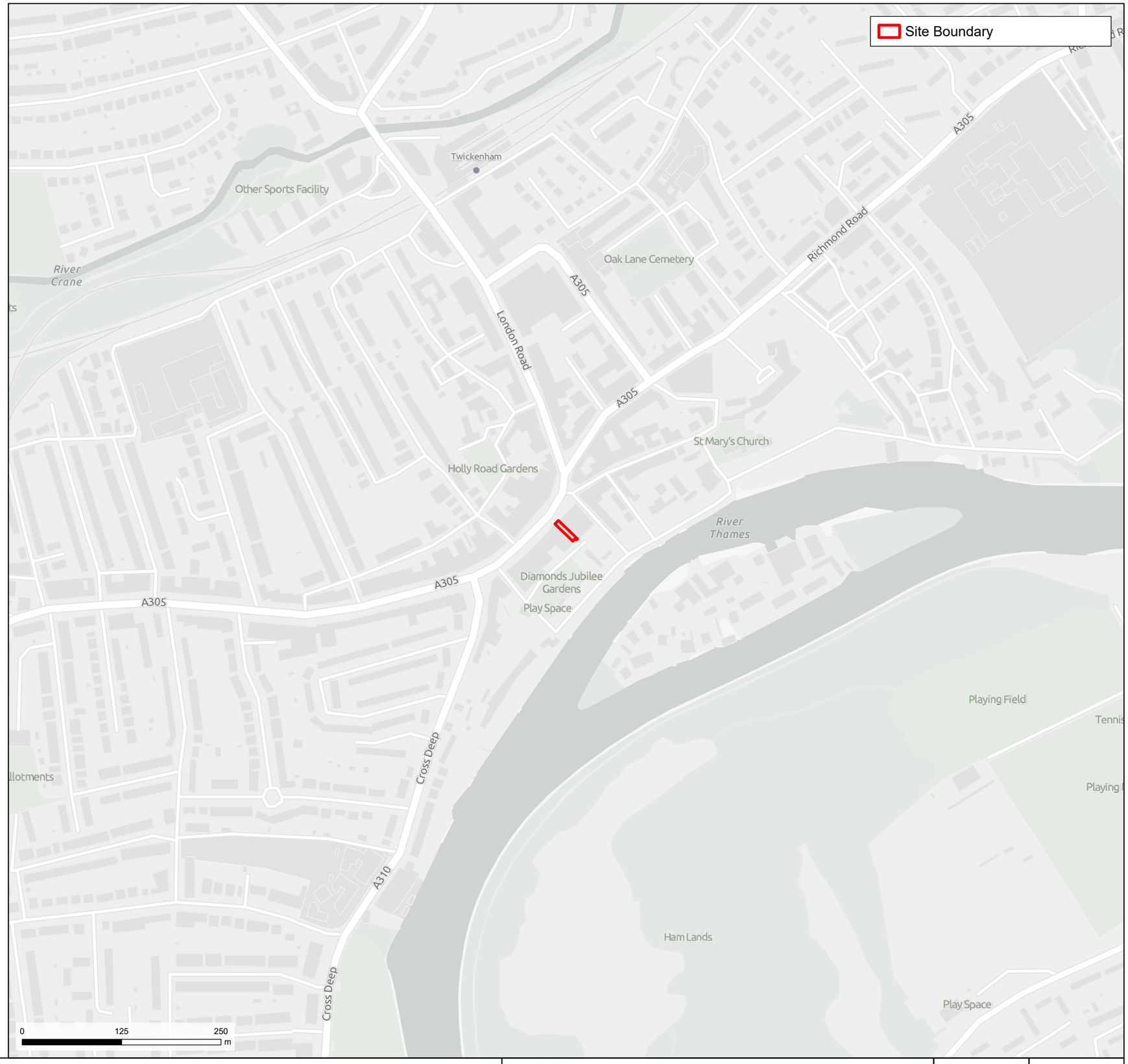
7.4. As a proposed change of use, the works do not require a Sequential Test or Exception Test to be undertaken, and no changes are proposed to the surface water drainage arrangements.

7.5. In conclusion, the site is at a low risk of flooding and the proposals will not increase flood risk elsewhere. It is demonstrated that the proposal complies with the National Planning Policy Framework (NPPF), PPG and the local planning policy with respect to flood risk and is an appropriate development at this location.

Appendix A – EA Open Data Maps

- Site Location
- Site Location Detailed
- Site Location (Aerial Photography)
- EA Flood Map for Planning
- Watercourse Location
- EA Surface Water Flood Risk
- EA Surface Water Flood Risk- Depth 3.3 Percent Chance
- EA Surface Water Flood Risk- Depth 1.0 Percent Chance
- EA Surface Water Flood Risk- Depth 0.1 Percent Chance
- Reservoir Flood Risk and Flood Extents
- EA Ground Water Source Protection Zones
- EA Historic Flood Map





Stantec

Client: Essential Living

5A KING STREET TWICKENHAM

Site Location

Date: 29/10/2024	
Drawn: ML	Checked: RMF
Figure: 01	Rev: A

Document Path: \\Bgl-vfps-001\bgl\Projects\332612048 - 5A King Street Twickenham\4000 - Hydrology\GIS\5a Kings Street FRA Maps\5a Kings Street FRA Maps.aprx

Stantec

Client: Essential Living

5A KING STREET TWICKENHAM

Site Location (Detailed)

0 50 100 m

1:1,000 @ A3	Date: 29/10/2024
Drawn: ML	Checked: RMF
Figure: 01.1	Rev: A

Document Path: \\Bgl-vfps-001\bgl\Projects\332612048 - 5A King Street Twickenham\4000 - Hydrology\GIS\5a Kings Street FRA Maps\5a Kings Street FRA Maps.aprx

Stantec

Client: Essential Living

5A KING STREET TWICKENHAM

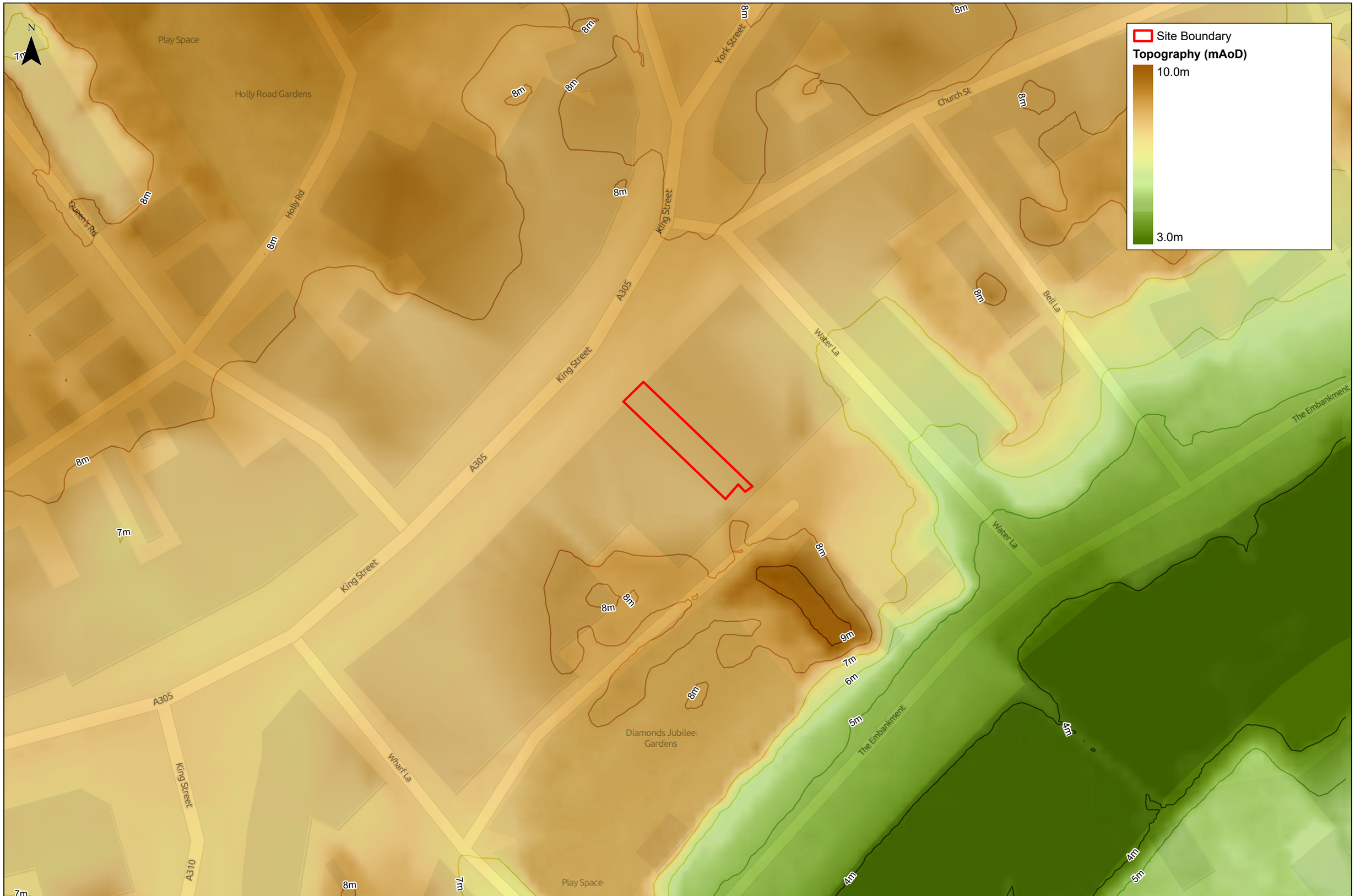
Site Location - Aerial

0 50 100 m

Esri Community Maps Contributors, Esri UK, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS, Maxar, Microsoft

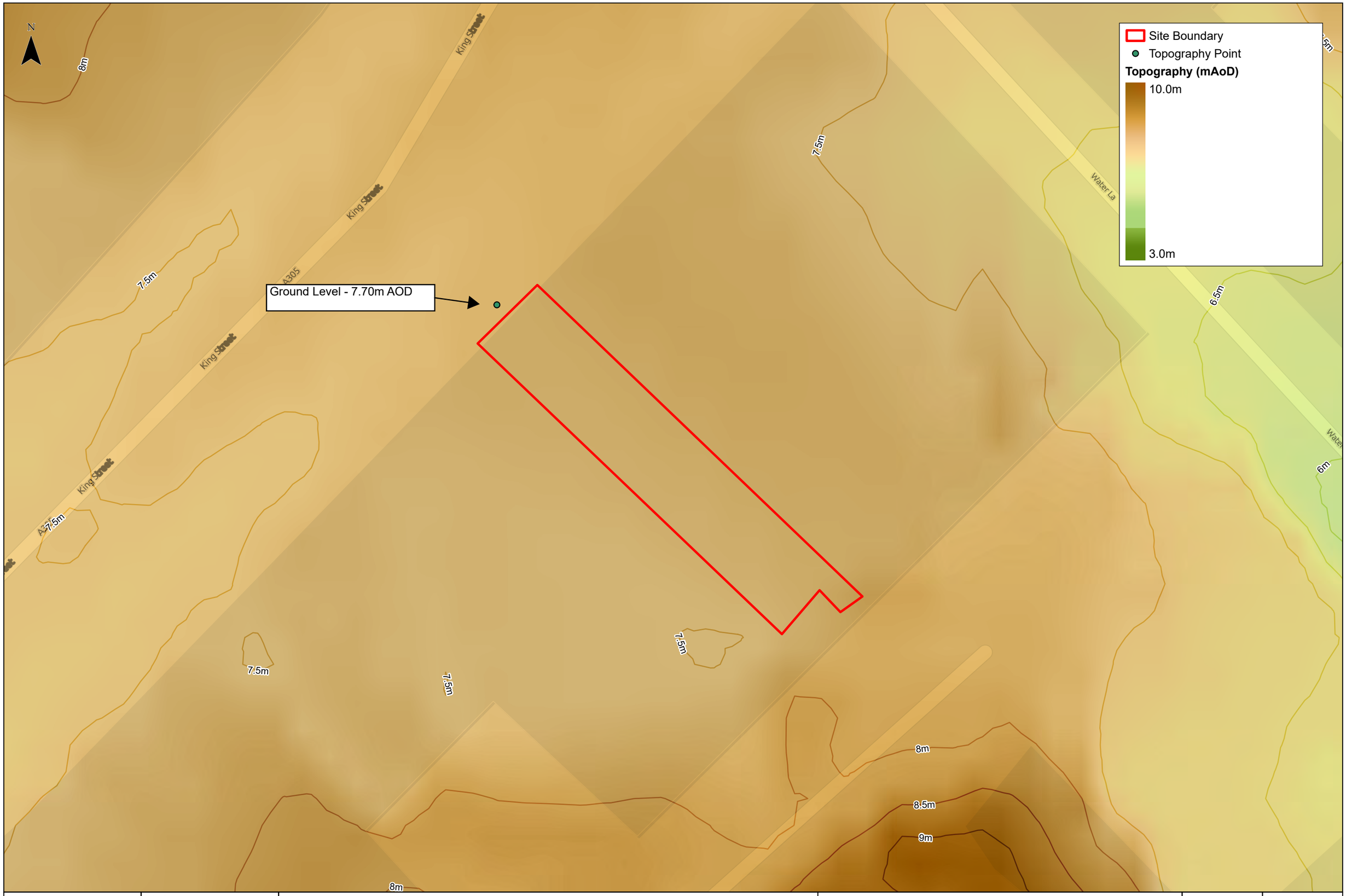
1:1,000 @ A3	Date: 29/10/2024
Drawn: ML	Checked: RMF
Figure: 02	Rev: A

Document Path: \\Bgl-vfps-001\bgl\Projects\332612048 - 5A King Street Twickenham\4000 - Hydrology\GIS\5a Kings Street FRA Maps\5a Kings Street FRA Maps.aprx



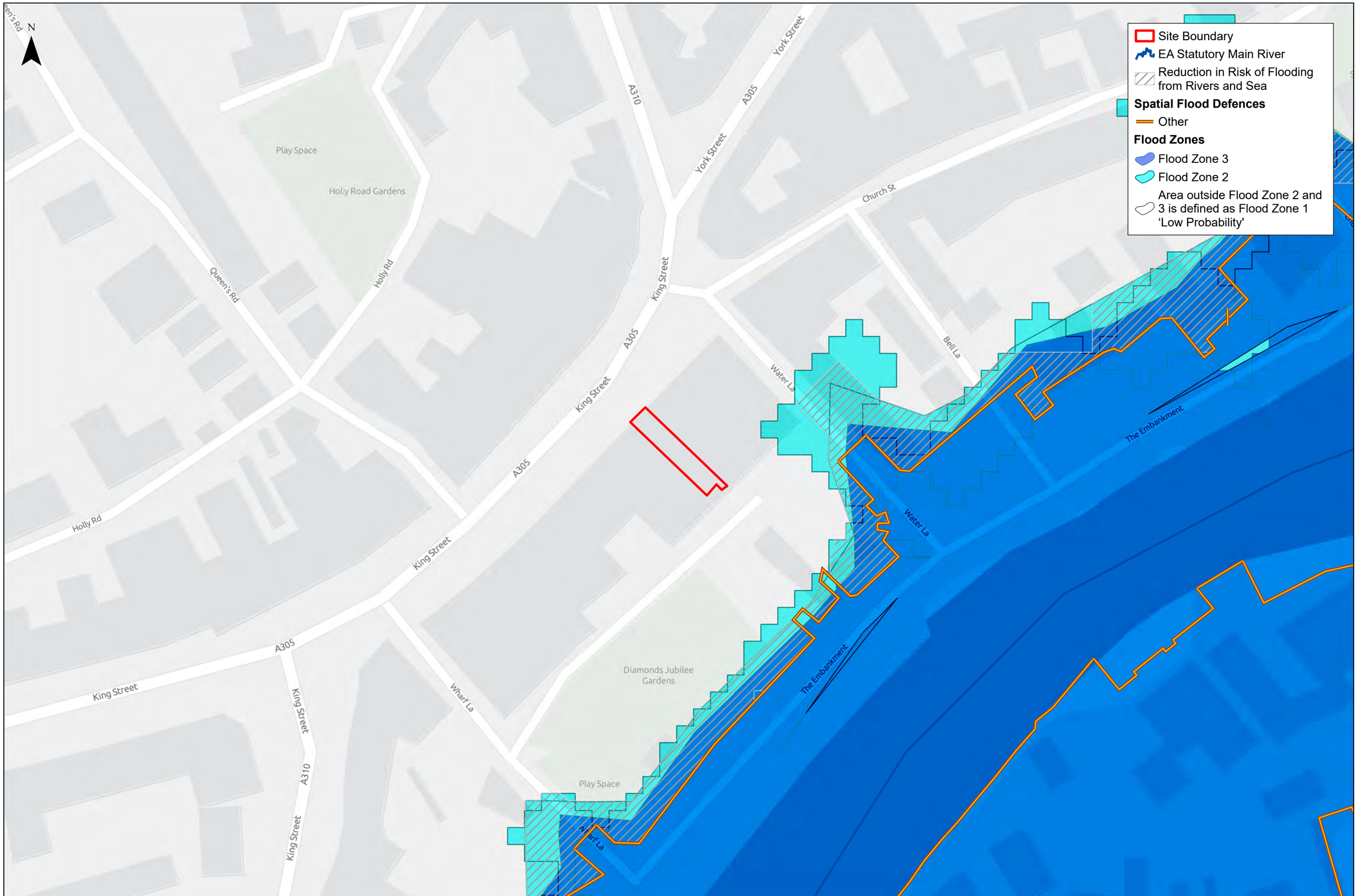
Stantec	Client: Essential Living	**5A KING STREET TWICKENHAM** Topography	0 37.5 75 m Contains OS data © Crown Copyright and database right 2023 Contains data from OS Zoomstack	1:750 @ A3 · Date: 29/10/2024 Drawn: ML · Checked: RMF Figure: 03 · Rev: A

Document Path: \\Bgl-vfps-001\bgl\Projects\332612048 - 5A King Street Twickenham\4000 - Hydrology\GIS\5a Kings Street FRA Maps\5a Kings Street FRA Maps.aprx



Stantec	Client: Essential Living	**5A KING STREET TWICKENHAM** Topography - Detailed	0 12.5 25 m Contains OS data © Crown Copyright and database right 2023 Contains data from OS Zoomstack	1:250 @ A3 | Date: 29/10/2024 Drawn: ML | Checked: RMF Figure: 03.1 | Rev: A

Document Path: \\Bgl-vfps-001\bgl\Projects\332612048 - 5A King Street Twickenham\4000 - Hydrology\GIS\5a Kings Street FRA Maps\5a Kings Street FRA Maps.aprx



Stantec

Client: Essential Living

5A KING STREET TWICKENHAM

Environment Agency Flood Map for Planning

0 50 100 m

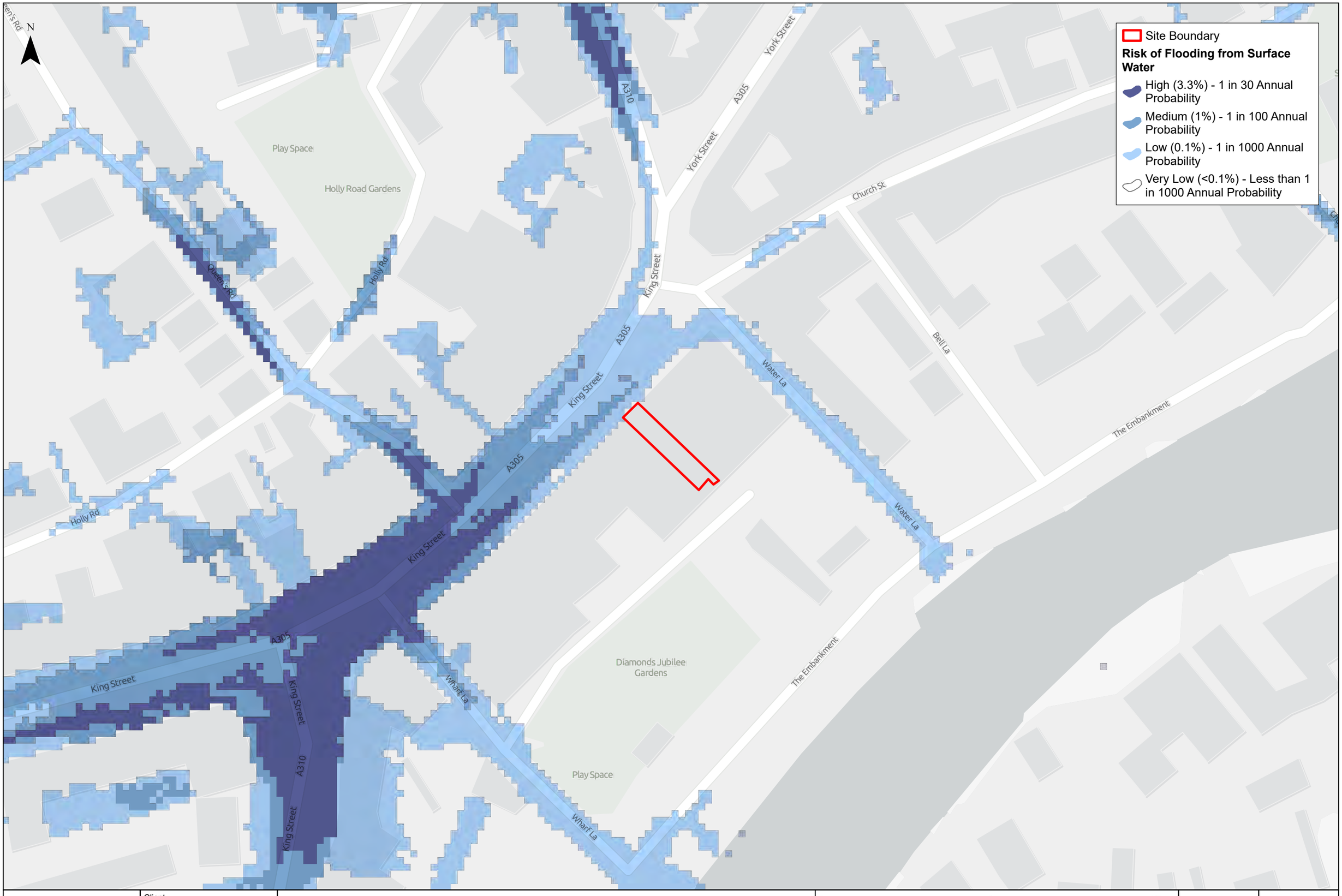
Flood Zones refer to the probability of river and/or sea flooding, ignoring the presence of defences.

1:1,000 @ A3	Date: 29/10/2024
Drawn: ML	Checked: RMF
Figure: 04	Rev: A

Document Path: \\Bgl-vfps-001\bgl\Projects\332612048 - 5A King Street Twickenham\4000 - Hydrology\GIS\5a Kings Street FRA Maps\5a Kings Street FRA Maps.aprx

Stantec	Client: Essential Living	**5A KING STREET TWICKENHAM** Watercourse Location	0 200 400 m 	1:4,000 @ A3 | Date: 29/10/2024 Drawn: ML | Checked: RMF Figure: 04.1 | Rev: A

Document Path: \\Bgl-vfps-001\bgl\Projects\332612048 - 5A King Street Twickenham\4000 - Hydrology\GIS\5a Kings Street FRA Maps\5a Kings Street FRA Maps.aprx



Stantec

Client: Essential Living

5A KING STREET TWICKENHAM

EA Surface Water Flood Risk

0 50 100 m

Contains OS data © Crown Copyright and database right 2023
Contains data from OS Zoomstack
Contains Environment Agency information © Environment Agency and database right.
Maps based on EA updated 'Flood Map for Surface Water' ('uFMfSW') released in 2013 as the latest iteration of a national scale surface water modelling exercise.

1:1,000 @ A3	Date: 29/10/2024
Drawn: ML	Checked: RMF
Figure: 05	Rev: A

Document Path: \\Bgl-vfps-001\bgl\Projects\332612048 - 5A King Street Twickenham\4000 - Hydrology\GIS\5a Kings Street FRA Maps\5a Kings Street FRA Maps.aprx

Stantec

Client: Essential Living

5A KING STREET TWICKENHAM

EA Surface Water Flood Risk - Depth
3.3 Percent Chance

0 50 100 m

1:1,000 @ A3	Date: 29/10/2024
Drawn: ML	Checked: RMF
Figure: 05.1	Rev: A

Document Path: \\Bgl-vfps-001\bgl\Projects\332612048 - 5A King Street Twickenham\4000 - Hydrology\GIS\5a Kings Street FRA Maps\5a Kings Street FRA Maps.aprx

N

Site Boundary

Risk of Flooding from Surface Water - Depth

- Below 150mm
- 150 - 300mm
- 300 - 600mm
- 600 - 900mm
- 900 - 1200mm
- Over 1200mm

Play Space
Holly Road Gardens
Queen's Rd
Holly Rd
A3110
York Street
A305
Church St
King Street
Bell La
Water La
The Embankment
Diamonds Jubilee Gardens
Wharf La

Stantec

Client: Essential Living

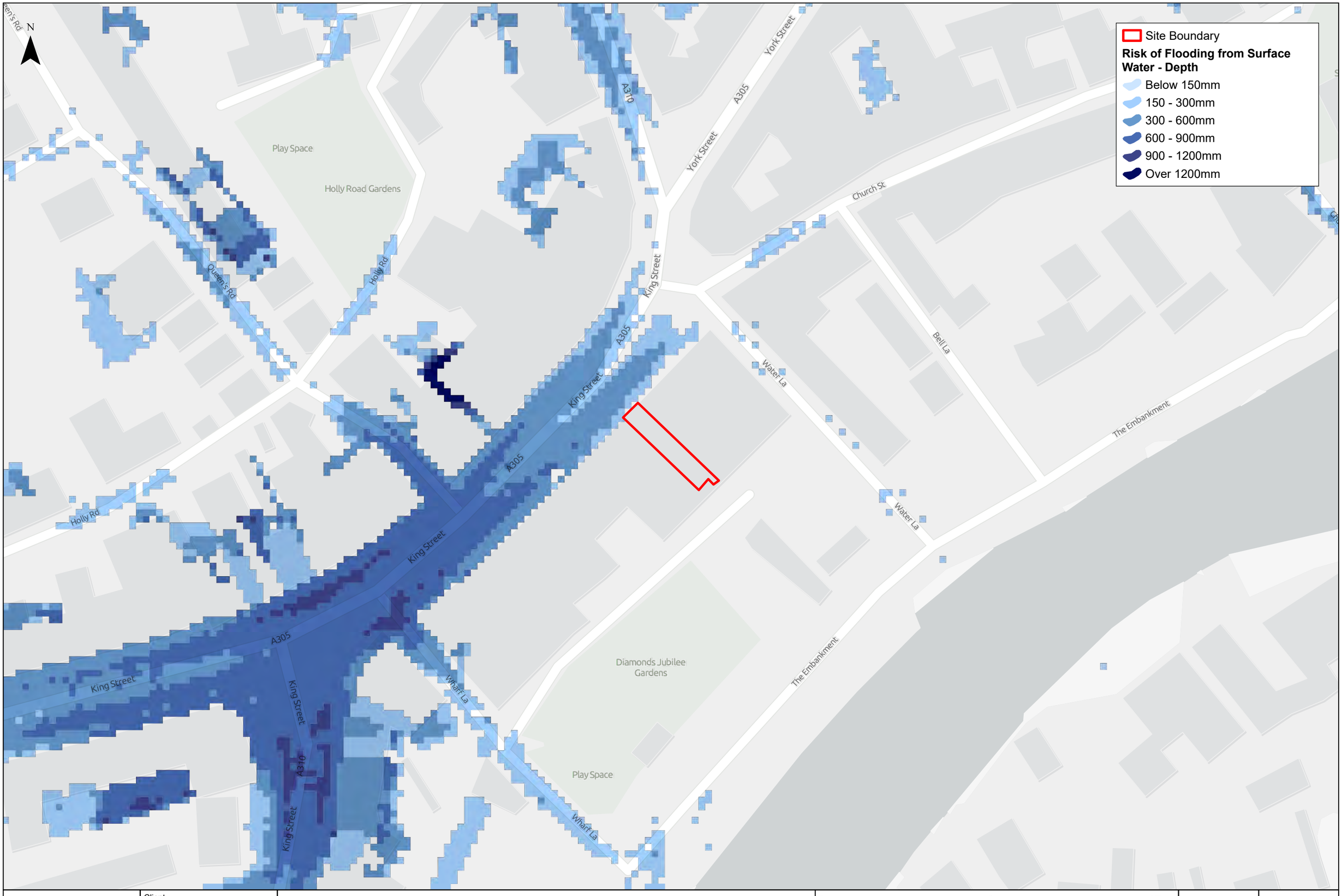
5A KING STREET TWICKENHAM

EA Surface Water Flood Risk - Depth
1.0 Percent Chance

0 50 100 m

1:1,000 @ A3	Date: 29/10/2024
Drawn: ML	Checked: RMF
Figure: 05.2	Rev: A

Document Path: \\Bgl-vfps-001\bgl\Projects\332612048 - 5A King Street Twickenham\4000 - Hydrology\GIS\5a Kings Street FRA Maps\5a Kings Street FRA Maps.aprx



Stantec

Client: Essential Living

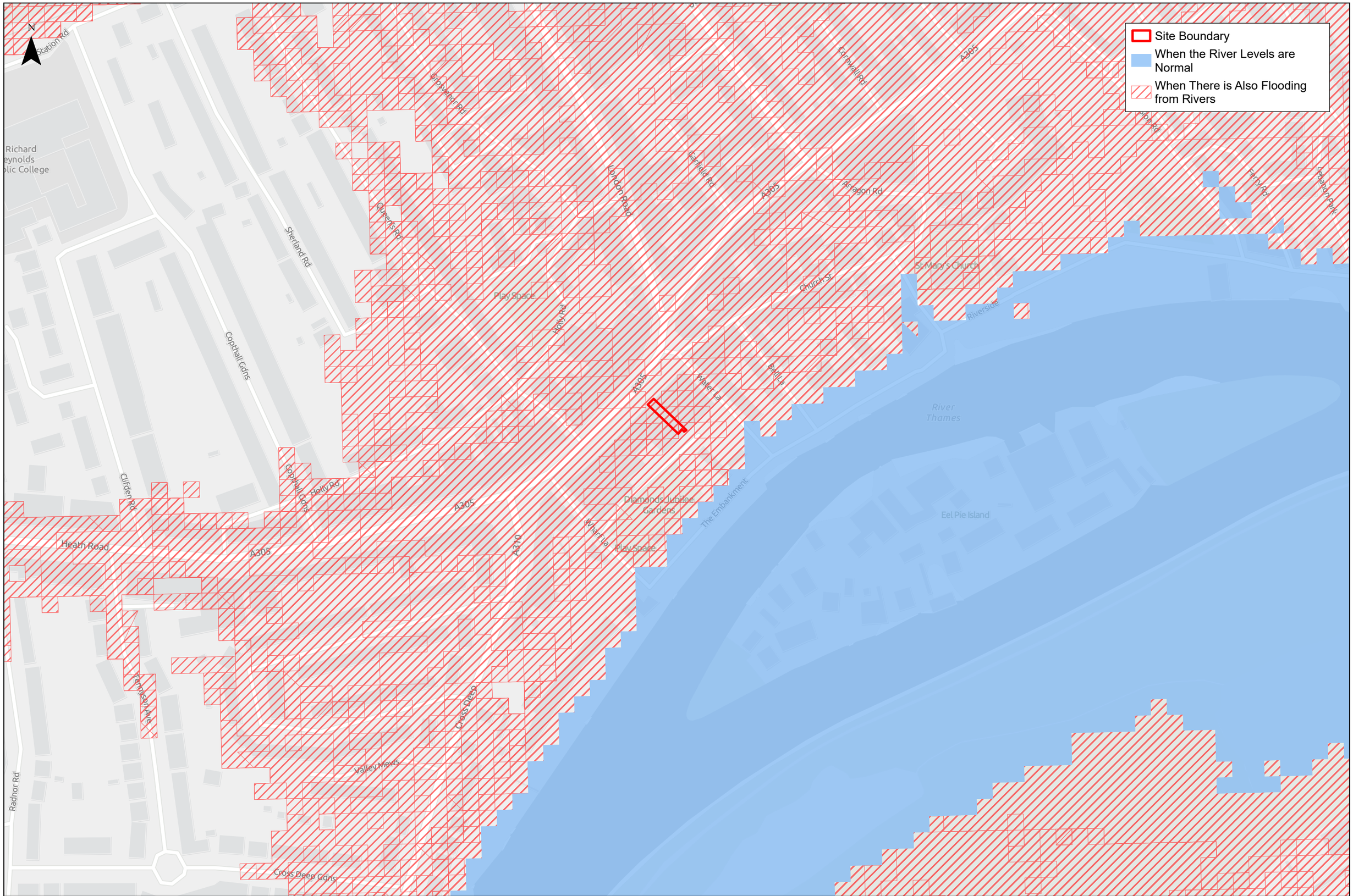
5A KING STREET TWICKENHAM

EA Surface Water Flood Risk - Depth
0.1 Percent Chance

0 50 100 m

1:1,000 @ A3	Date: 29/10/2024
Drawn: ML	Checked: RMF
Figure: 05.3	Rev: A

Document Path: \\Bgl-vfps-001\bgl\Projects\332612048 - 5A King Street Twickenham\4000 - Hydrology\GIS\5a Kings Street FRA Maps\5a Kings Street FRA Maps.aprx



Stantec

Client: Essential Living

5A KING STREET TWICKENHAM

Risk of Flooding from Reservoirs - Maximum Flood Extent

0 125 250 m

1:2,500 @ A3	Date: 29/10/2024
Drawn: ML	Checked: RMF
Figure: 06	Rev: A

Document Path: \\Bgl-vfps-001\bgl\Projects\332612048 - 5A King Street Twickenham\4000 - Hydrology\GIS\5a Kings Street FRA Maps\5a Kings Street FRA Maps.aprx

Stantec

Client: Essential Living

5A KING STREET TWICKENHAM

EA Ground Water Source Protection Zones

0 125 250 m

1:2,500 @ A3	Date: 29/10/2024
Drawn: ML	Checked: RMF
Figure: 07	Rev: A

Document Path: \\Bgl-vfps-001\bgl\Projects\332612048 - 5A King Street Twickenham\4000 - Hydrology\GIS\5a Kings Street FRA Maps\5a Kings Street FRA Maps.aprx

Stantec

Client: Essential Living

5A KING STREET TWICKENHAM

EA Recorded Historic Flood Extents

0 125 250 m

Historic Flood Map shows the maximum extent of all individual Recorded Flood Outlines from river, the sea and groundwater springs and shows areas of land that have previously been subject to flooding in England.
Recorded Flood Outlines shows all EA records of historic flooding from rivers, the sea, groundwater and surface water

1:2,500 @ A3	Date: 29/10/2024
Drawn: ML	Checked: RMF
Figure: 08	Rev: A

Document Path: \\Bgl-vfps-001\bgl\Projects\332612048 - 5A King Street Twickenham\4000 - Hydrology\GIS\5a Kings Street FRA Maps\5a Kings Street FRA Maps.aprx