

Flood Emergency Evacuation Plan

J3932 Twickenham Riverside, TWI 3DX

Ref: J3932-C-RP-0003

Revision: 01

Status: S9

Webb Yates Engineers Ltd
48-50 Scrutton Street
London, EC2A 4HH
020 3696 1550
london@webbyates.com
www.webbyates.com

CONTENTS

DOCUMENT CONTROL..... 3

REVISION HISTORY..... 3

1. INTRODUCTION 4

1.1. Scope4

1.2. Aim and Objectives.....4

2. LOCATION..... 4

2.1. Site Location4

2.2. Sources of Flooding5

2.3. Proposed Land Use.....6

2.4. Important Infrastructure and Vulnerable Areas6

3. FLOOD RISK ASSESSMENT SUMMARY 8

4. FLOOD WARNING, ALERT NOTICES AND MITIGATION MEASURES 9

4.1. Flood Warning9

4.2. Flood Alert Notice.....10

4.3. Mitigation Measures10

5. FLOOD MANAGEMENT AND EVACUATION 11

5.1. Flood Management and Evacuation Procedures.....11

5.2. Access and Egress Routes11

5.3. Post Evacuation and Water Level Falling12

5.4. Post Flooding Clean Up Plan13

6. KEY CONTACTS AND INFORMATION 14

6.1. Emergency Services14

6.2. Other Useful Numbers.....15

6.3. Location of Services.....15

7. DANGERS OF FLOOD WATER 16

8. TRAINING 17

9. FLOOD WARNING AND EVACUATION PLAN REVIEW 18

10. APPENDIX A: USEFUL INFORMATION 19

DOCUMENT CONTROL

Document number:	J3932-C-RP-0003		
Status:	S9	Reason for issue:	For Information
Date:	15/06/21	Revision:	01

Author:	Victoria Powell	Signature:	
Reviewer:	Georgia Bertram	Signature:	
Approver:	John Gerrard	Signature	

REVISION HISTORY

Date	Status	Revision
10.06.21	Draft	00
15.06.21	S9	01

© Copyright 2021 Webb Yates Engineers Ltd.

This document has been prepared in accordance with the scope of Webb Yates Engineers appointment and is subject to the terms of that appointment. Webb Yates Engineers accepts no liability or responsibility to any other party in respect of any use or reliance upon this document. Any modification to this document subsequent to issue by Webb Yates Engineers shall not be considered valid.

I. INTRODUCTION

I.1. Scope

Webb Yates Engineers have been commissioned to produce a Flood Evacuation Plan, henceforth referred to as 'The Plan', for the development associated with Twickenham Riverside, TW1 3DX. This Plan contains information on flood emergency response actions. The Plan has been informed by a Flood Risk Assessment (FRA), which demonstrates that the site meets the requirements of the National Planning Policy Framework (NPPF) and the London Borough of Richmond upon Thames' (LBRuT) requirements.

I.2. Aim and Objectives

The key aim of the Plan is to provide clear indicators confirming when the site should be evacuated in the unlikely event of a flood emergency. The Plan also provides key information for planning and responding to an evacuation.

2. LOCATION

2.1. Site Location

The site is located at Twickenham Riverside, TW1 3DX, shown in Figure 1. The site is bound by Water Lane to the north-east and Diamond Jubilee Gardens to the north-west, Wharf Lane to the south-west and The Embankment to the south-east. The total site area is approximately 1.2 ha. Currently, the southwestern portion of the site is occupied by the Diamond Jubilee Gardens. A car park is situated to the south-east of the site and commercial buildings occupy the north-east of the site.

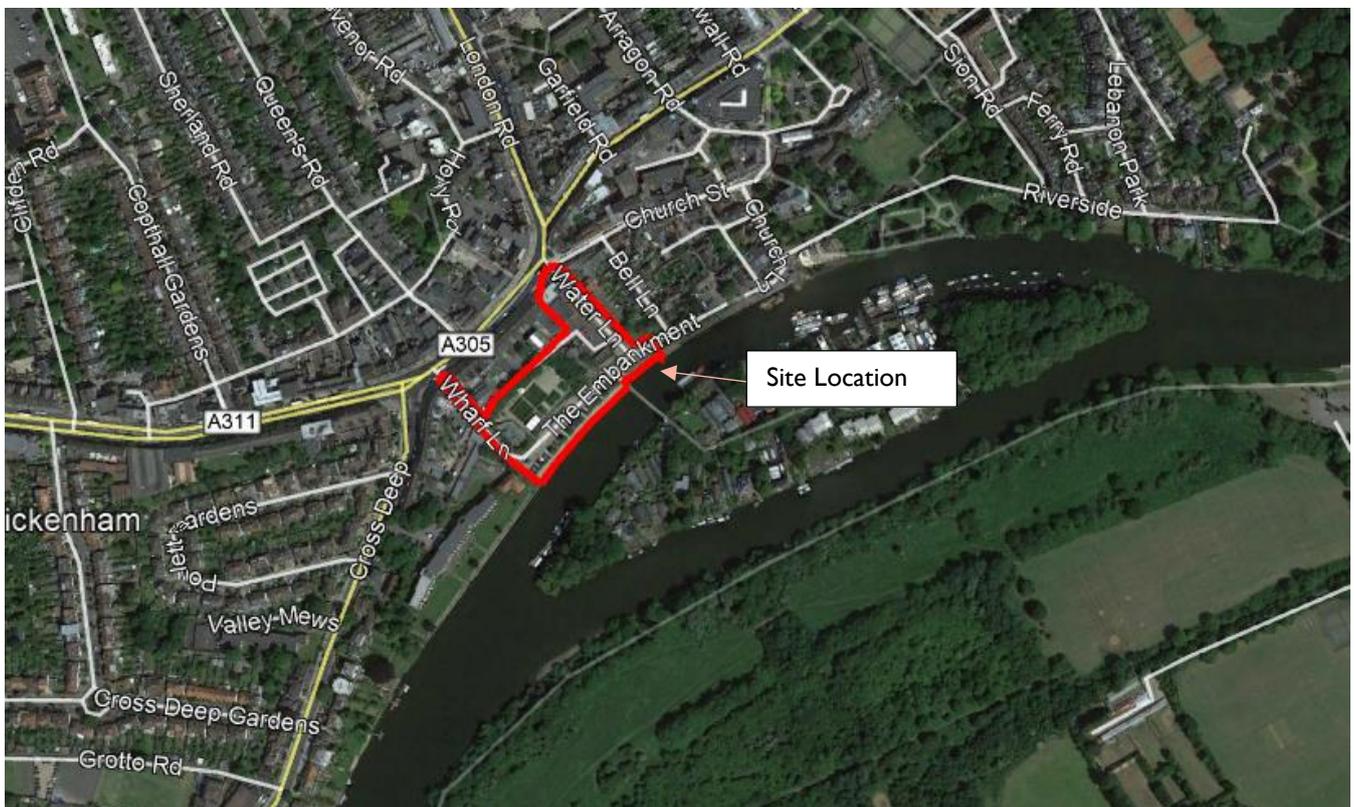


Figure 1: Satellite image showing site location (Source: <https://www.google.co.uk/maps>).

2.2. Sources of Flooding

Based on the flood map (Figure 2), which is informed by Environment Agency Data, the site is partially situated in Flood Zone 3, however benefits from flood defence structures along the River Thames.

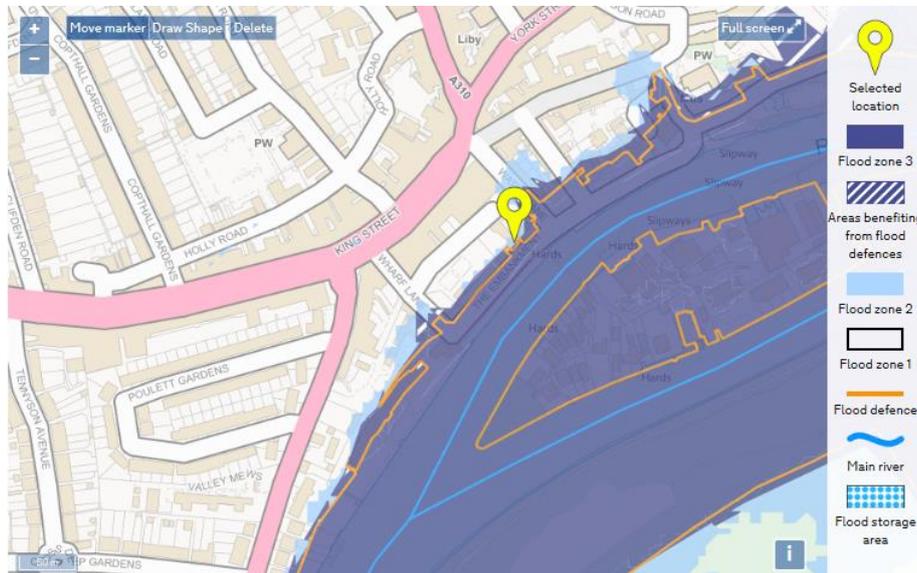


Figure 2: Government flood map for planning, showing site location and flood zones (Source: <https://flood-map-for-planning.service.gov.uk/>).

The River Thames is the main potential source of flooding, running along the southern site boundary. Flood defences are in place, shown in Figure 3, but do not protect The Embankment area along the edge of the River Thames.. In addition, the presence of flood defences does not entirely remove the potential flood risk. Therefore, to manage the residual flood risk, this Flood Evacuation Plan has been developed to ensure the preparedness, in the event of a flood emergency, of site occupants.

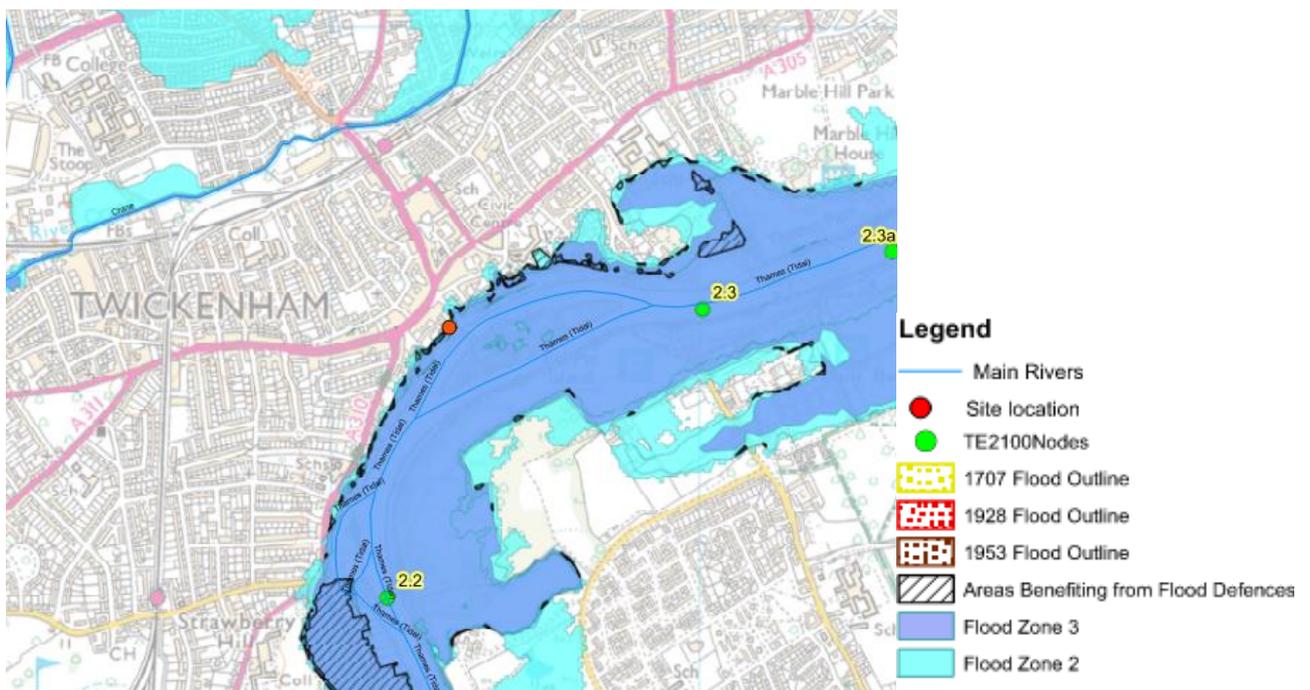


Figure 3 Flood defences and areas benefitting (Flood Map for Planning – Environment Agency)

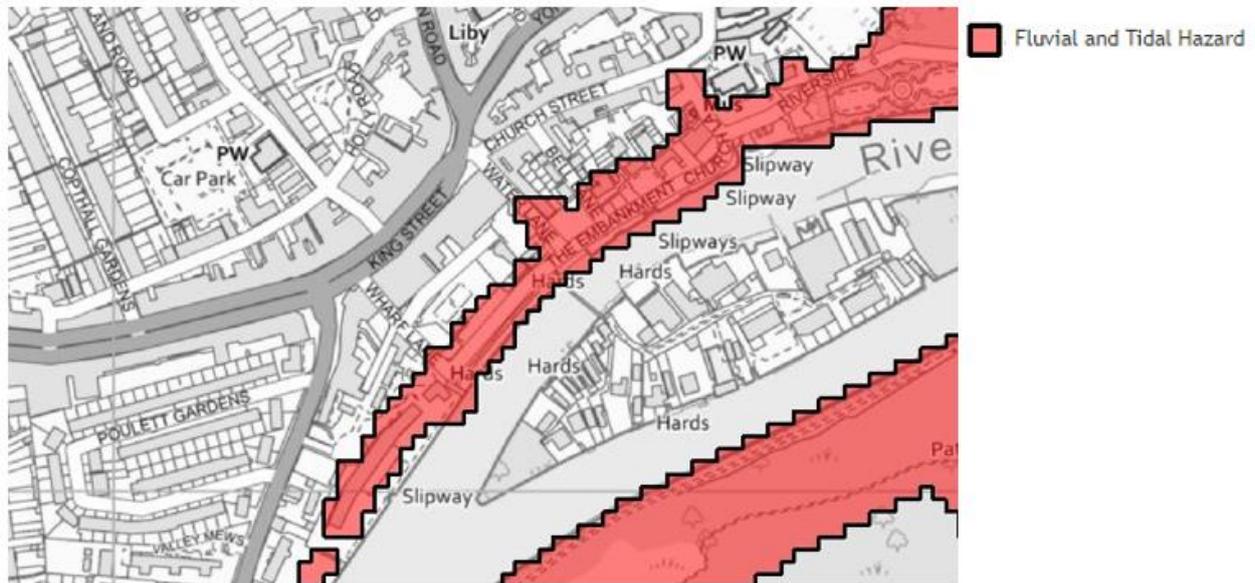


Figure 4 Fluvial and Tidal Hazard zones (Strategic Flood Risk Assessment – Fluvial and Tidal Flood Risk map, LBRuT)

2.3. Proposed Land Use

The development will comprise of a number of different units, including:

- Boat storage is located on the Embankment within flood zone 3b, this is classified as ‘Water Compatible’ development
- Restaurants and cafes at ground floor level;
- Business and retail units at ground floor level;
- Residential units, on first, second and third floors; and
- A new public square and areas of public realm throughout.

2.4. Important Infrastructure and Vulnerable Areas

Figure 5 shows the location of the most hazardous areas of the site if a breach event occurred. Within the areas not raised above the flood defence walls, only ‘Water Compatible’ areas are proposed. ‘More Vulnerable’ uses of the development (residential) have been confined to the upper levels of the developments (1st floor and above), providing even greater flood security.

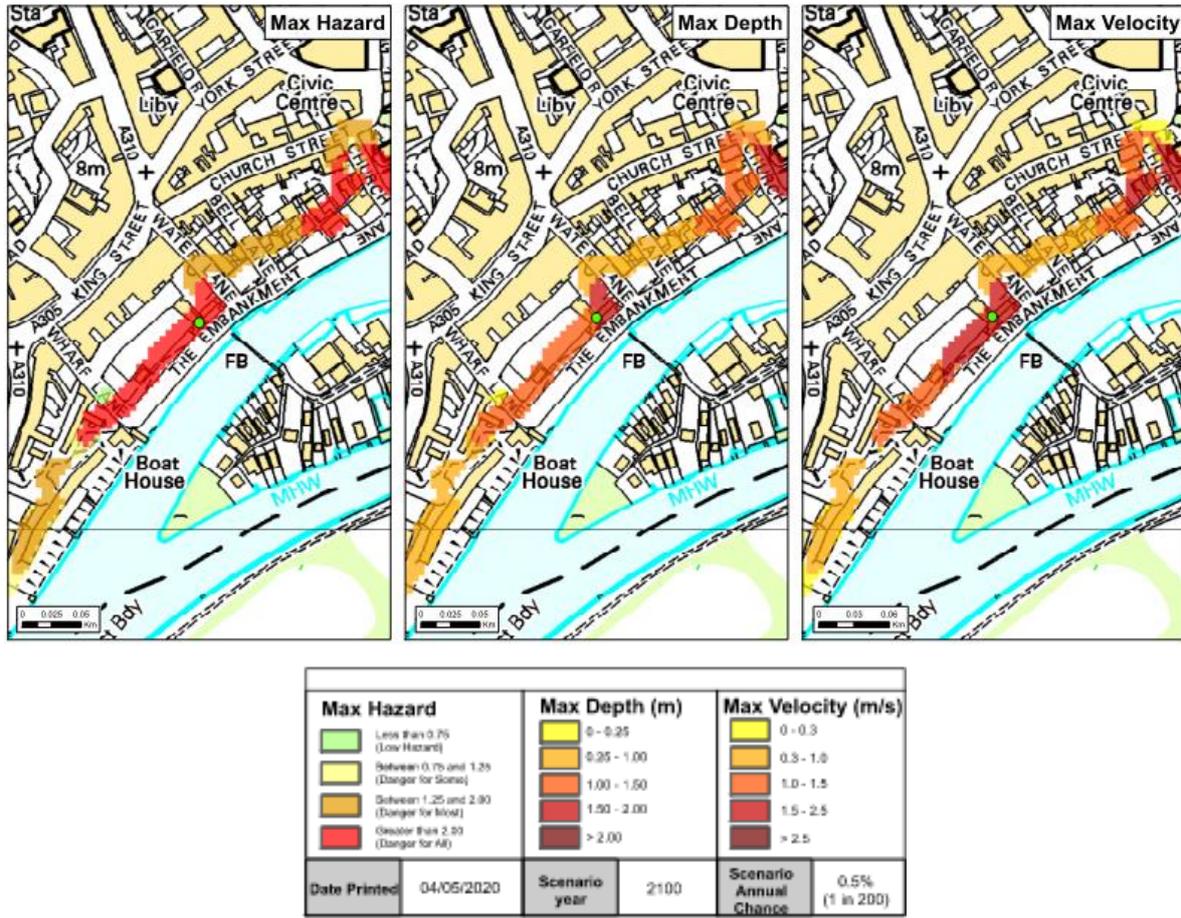


Figure 5 Thames Tidal Breach Hazard Mapping (Environment Agency)

3. FLOOD RISK ASSESSMENT SUMMARY

The site is partially within Flood Zone 3b and Flood Zone 1. The proposed development is “water compatible” within Flood Zone 3b and all other proposed buildings are located in Flood Zone 1 protected by the flood defence structures. This is compatible with the sequential test, NPPF guidance and the LBRuT Local Plan LP21.

This report assessed the risk of flooding from a variety of sources. A summary of these risks is included in the table below:

Table 1: Flood Risk Summary Table

Source of flooding	Risk summary and mitigations
Rivers and the Sea (Raised land FZ1)	Very Low risk of flooding including in a breach scenario.
Rivers and the Sea, the Embankment and areas of the site lower than 6.94m	High Risk of flooding. Flood evacuation plan has been developed and only Water Compatible development is within the high-risk area.
Groundwater	Based on the SFRA information and the Site Investigation report the risk of groundwater flooding is Low.
Sewers	Low risk based on historic data available in the SFRA.
Surface Water	Low risk of surface water flooding for Water Lane, Wharf Lane and The Embankment. Very Low risk of surface water flooding for the raised residential area of the site. The runoff rate to the surface water network has been reduced and new site attenuation is proposed. Therefore, the risk of surface water flooding has been reduced.
Reservoirs, Canals	There is some risk of flooding from reservoirs and canals, however this flood risk is contained to areas with Water Compatible infrastructure. The remainder of the proposed development is at a topographic level above this flood risk.

The proposed design includes the relocation of flood defence structures. In accordance with LBRuT and Environment Agency requirements the proposed flood defence structures have been designed to a level greater than the minimum prescribed by the TE2100 level. The design allows essential maintenance and upgrading to be carried out in the future.

4. FLOOD WARNING, ALERT NOTICES AND MITIGATION MEASURES

4.1. Flood Warning

It is recommended that LBRuT’s property management team sign up to the Environment Agency’s flood warning service, so that when the Environment Agency issues a flood alert or warning the service will send an automated warning message.

It should be noted that the site is also situated in a larger geographical area where the Environment Agency provides a general early Flood Alert notification for possible flooding. Therefore, the Flood Alert may not specifically apply to the application site itself and its immediate peripheries. The EA flood warnings are outlined in Table 2.

Table 2 Environment Agency Flood Warnings

EA Flood Warning	Explanation	What to do
 <p>FLOOD ALERT FLOODING IS POSSIBLE. BE PREPARED</p>	<p>Flooding of low laying land and roads is expected.</p> <p>Be alert, be prepared, and watch out.</p>	<ul style="list-style-type: none"> ➤ Monitor local news and weather forecasts ➤ Be aware of water levels near you. ➤ Be prepared to act on your flood plan ➤ Check on the safety of pets and livestock ➤ Prepare a flood kit of essential items ➤ Charge your mobile phone
 <p>FLOOD WARNING FLOODING IS EXPECTED. IMMEDIATE ACTION REQUIRED.</p>	<p>Flooding of homes and businesses is expected.</p> <p>Act now!</p>	<ul style="list-style-type: none"> ➤ Move cars, pets, food, valuables and important documents to safety. ➤ Get flood protection equipment in place. ➤ Turn off gas, electricity and water supplies if safe to do so ➤ Put flood protection equipment in place ➤ Be prepared to evacuate your home. ➤ Protect yourself, your family and help others. ➤ Act on your flood plan
 <p>SEVERE FLOOD WARNING SEVERE FLOODING. DANGER TO LIFE</p>	<p>Severe flooding is expected.</p> <p>There is extreme danger to life and property.</p> <p>Act now!</p>	<ul style="list-style-type: none"> ➤ Stay in a safe place with a means of escape ➤ Be ready should you need to evacuate ➤ Co-operate with the emergency services ➤ Call 999 if you are in immediate danger

4.2. Flood Alert Notice

A Flood Alert Notice should be displayed in a prominent, clearly visible place, or places, on the site to indicate the current flood alert status issued by the Environment Agency. Figure 6 is an example of a Flood Alert Notice.

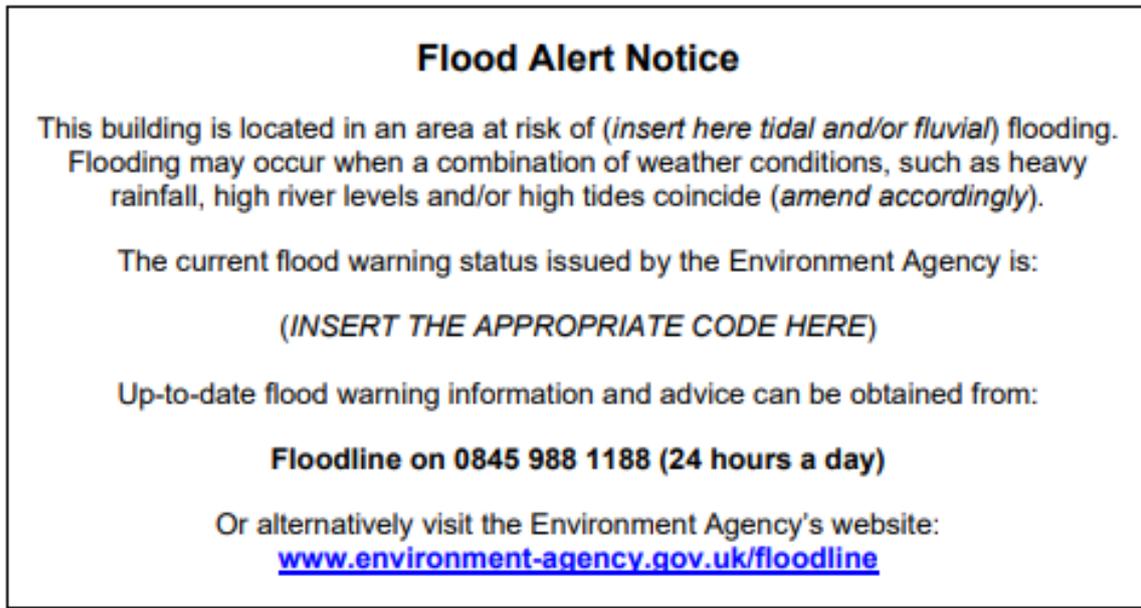


Figure 6: Flood Alert Notice Example

4.3. Mitigation Measures

The site has been designed to ensure that the areas most at risk of flooding are 'Water Compatible' and mitigation measures have been introduced to minimise possible damage that could arise due to a rapid inundation event. A boathouse and public space, including seating, is located in the flood risk zone of the site. The boathouse has a caged interior to prevent internal items from being washed away, whilst public use items (such as seating and bins) have been fixed to the ground to reduce the likelihood of becoming a hazard in flood waters.

5. FLOOD MANAGEMENT AND EVACUATION

5.1. Flood Management and Evacuation Procedures

The flood evacuation procedures are outlined in Table 3.

Table 3: Flood Evacuation Procedures

Warning Trigger		Procedures
1	Environment Agency Flood Alert	Review Flood Warning and Evacuation Plan Procedures
2	Environment Agency Flood Warning	Issue Flood Warning, representing a state of readiness ahead of a potential flood situation. Move any critical equipment and information to a safe location. Encourage site occupants to evacuate via Water Lane.
3	Environment Agency Severe Flood Warning	Immediately start evacuation of site. Use allocated evacuation route to facilitate/direct the safe evacuation of all personnel. Contact the Emergency Services and EA to confirm that the site is being closed due to possible risk of flooding.

5.2. Access and Egress Routes

As the Environment Agency does not perform a flood evacuation role during a flood incident, it is for the council to define acceptable access and egress routes. LBRuT states that there should be safe access to and from the development, and depending on the safe access and egress routes, on-site and/or temporary refuge may be required.



Figure 7 Map of site showing safe zone and recommended access and egress routes

Figure 7 shows a map of the site, showing the ground elevation increasing towards the north of the site. Multiple access and egress routes are suggested, due to the nature of the site. A safe zone is highlighted, which is the area of the site that is raised above the flood defence walls. Access routes to the safe zone from the flood risk area of the site are highlighted. If a rapid inundation event occurs, occupants of the site should egress to the safe zone and, if needed, along the suggested safe egress routes.

5.2.1. Safe Refuge

If safe refuge is required, the more vulnerable locations of the site are located on the upper floors only and can be utilised as a place of safe refuge. However, the safe refuge will be an isolated safe zone and should only be considered if the access and egress routes are inaccessible. In addition, it is suggested that a Flood Kit should be stored and kept at the on-site refuge to support a short-term stay. The EA has a suggested flood kit list, however depending on the personal needs of the occupants, additional items not suggested in the EA's list may be required.

5.2.1.1. Environment Agency Flood Alert/Warning

In the event of a Flood Alert or Flood Warning, it is recommended that occupants are evacuated from site, without utilising the safe zone to reduce the possibility of being stranded. Access and Egress to the site can be granted via the suggested routes shown in Figure 7.

5.2.1.2. Environment Agency Severe Flood Warning

It is recommended that an evacuation route to the Safe Zone is devised by the Building Construction Manager. This Zone should be used in the event of a Severe Flood Warning or if flood water has already started to enter the site. If sufficient time and preparedness has been accomplished, then all site occupants should be able to leave the site along the suggested egress routes before the Flood Waters approach.

Access and egress to the site, for emergency services during a breaching event, to the site can be granted via the suggested access and egress routes in Figure 7.

Once the site has been built the evacuation route should be reviewed by LBRuT's Management Team and revised if deemed necessary.

5.3. Post Evacuation and Water Level Falling

As detailed, the Environment Agency Flood Warnings identify a 'potential' rather than 'actual' threat. It should be noted that not all events would result in an automatic progression from one warning to another with the result being flooding and evacuation of the site. It is possible for smaller events to trigger initial warnings with water levels subsequently falling before flooding of the application site occurs.

Should water levels within the River Thames exhibit a sustained fall at any point during the event, this would be identified by the River Level monitors and an automatic notification sent to LBRuT's team manager. With notification that the river level is falling, LBRuT's team manager can downgrade the response to at the site.

5.4. Post Flooding Clean Up Plan

Depending on the severity of the flooding, LBRuT's team manager should coordinate with the relevant authorities to implement a Post Flooding Clean Up Plan. The structures within the area most at risk of flooding are deemed 'Water Compatible' and have been designed to allow for water to flow through, alongside having easily accessible points to aid with clean up.

6. KEY CONTACTS AND INFORMATION

Table 4 lists contact numbers for personnel and agencies that have key roles during a flood emergency. This table should be completed by the Building Contractor.

Table 4: Key Personnel and their Contact Numbers

Name	Role	Contact Number
LBRuT's Team Manager		
Building Contractor Manager		
Environment Agency Floodline	The Environment Agency will issue a flood warning to LBRuT's Team Manager and the Building Contractor Manager	0345 988 1188

6.1. Emergency Services

Table 5 provides contact numbers for relevant Emergency Services.

In an emergency where there is real and immediate threat to life or property always dial 999.

Table 5: Contact Numbers for Emergency Services.

Body	Contact Numbers
Twickenham Fire Station	020 8555 1200
Twickenham Police Station	020 8607 9199 or 101
Environment Agency	0345 988 1188

If medical attention is required within the workplace First Aiders should be in attendance and a record of the individual affected and the circumstances relating to the incident should be kept.

The closest hospital with an Accident and Emergency Department to the Site, is West Middlesex University Hospital. The Hospital can be contacted on 020 8560 2121, the address is: Twickenham Road, Isleworth, TW7 6AF.

6.2. Other Useful Numbers

Table 6 provides a list of other useful numbers for the Site. This table should be completed by the Building Contractor Manager. Once construction of the site is complete this table should be periodically reviewed, and if necessary updated, by LBRuT’s Management Team during the lifetime of the site.

Table 6: Other Useful Contact Numbers

Body	Name	Contact Number
Electricity Provider		
Gas Provider		
Water Company		
Telephone Provider		
Local Authority	London Borough of Richmond upon Thames	020 8831 6108

6.3. Location of Services

Table 7 lists the location of key service cut-off switches and valves. If it is safe to do so, it is recommended that these services are turned off by the Building Construction Manager when the application site is being evacuated. This table should be completed by the Building Contractor during the construction of the site. Once the site has been built this table should be reviewed and if necessary updated by LBRuT’s Management Team for the lifetime of the site.

Table 7: Location of Service Cut-Off Switches and Valves

Service	Location of Cut-off Switches and Valves
Electricity	
Gas	
Water	

7. DANGERS OF FLOOD WATER

Following a flood, a reminder of the dangers associated with flood water should be issued, as shown in Figure 8.

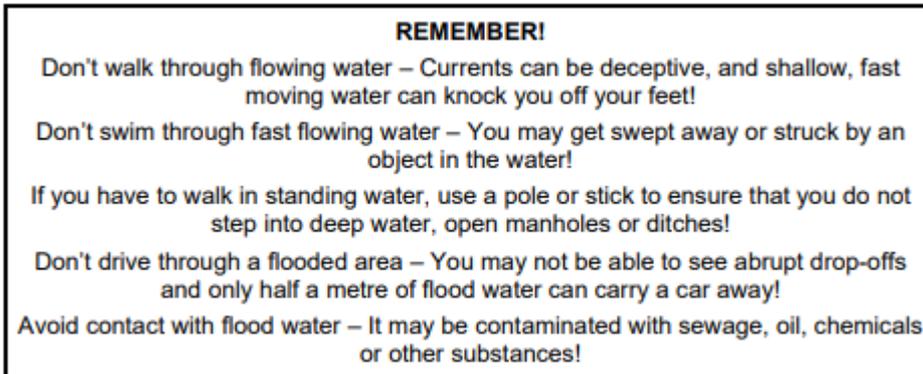


Figure 8 Reminder of the dangers of flood water

8. TRAINING

During the construction phase a Flood Manager would be appointed by the building contractor and during the lifetime of the site LBRuT's Management Team would appoint a Flood Manager. These Flood Managers would ensure that all construction personnel and future occupants of the site respectively are aware of the potential flood risk and of how to respond in the event of a flooding emergency. The training for construction personnel and post construction operatives would, as a minimum, cover:

- Requirements of the Flood Warning and Evacuation Plan;
- confirmation of Key Roles, clearly identifying positions held, responsibilities, communication and chain of command;
- staff duties;
- evacuation routes;
- staff safety during a flood event;
- electrical systems emergency shut off procedures;
- operation of the communications / public address system, signage and traffic management systems; and
- training drills.
- All construction staff shall be trained as part of the site induction process and all staff shall be re-trained annually.

9. FLOOD WARNING AND EVACUATION PLAN REVIEW

The Flood Warning and Evacuation Plan would be subject to update/ review:

- whenever there are changes to any of the contact numbers, names or roles held within the Plan;
- all updates / reviews shall be documented and recorded;
- the building construction manager shall ensure an up-to-date version of the Plan is available at all times during the construction phase; and
- during the lifetime of the development LBRuT’s Management Team shall ensure an up-to-date version of the Plan is available at all times.

When the Emergency Plan is updated Table 8 should be completed for document control and to understand why changes were needed.

Table 8: Flood Evacuation Procedures Document Control

Version	Date	Prepared by	Checked by	Approved by	Reason for Revision

10. APPENDIX A: USEFUL INFORMATION

General advice:

- Find out if your property is at risk of flooding - <http://www.environmentagency.gov.uk/homeandleisure/floods>
- Sign up to receive flood warnings - <https://www.gov.uk/sign-up-for-flood-warnings>
- Monitoring flood warnings and river levels- <https://www.gov.uk/check-if-youre-at-risk-of-flooding>
- Make a personal flood plan <https://www.gov.uk/prepare-for-a-flood/make-a-flood-plan>
- Preparing your property for flooding - <https://www.gov.uk/government/publications/prepare-yourproperty-for-flooding>
- What to do before, during and after a flood - <https://www.gov.uk/government/publications/floodingwhat-to-do-before-during-and-after-a-flood>
- Advice on obtaining home insurance - <https://www.gov.uk/prepare-for-a-flood/get-insurance>

Improving the resistance and resilience of your property:

- Improving your property's flood protection - <https://www.gov.uk/prepare-for-a-flood/improve-yourpropertys-flood-protection>
- Blue Pages - directory of businesses providing flood resistance and resilience products - <http://www.bluepages.org.uk/>

Business/commercial premises specific advice:

- Prepare your business for flooding - <https://www.gov.uk/government/publications/preparing-your-business-for-flooding>
- London Borough of Richmond on Thames Flood Risk Strategy - https://www.richmond.gov.uk/flood_risk_assessment
- Direct Government Preparing for Emergencies - <https://www.gov.uk/government/policies/reducing-the-threats-of-flooding-and-coastal-change/supporting-pages/planning-for-and-dealing-with-floodemergencies>
- UK Resilience - <http://www.cabinetoffice.gov.uk/ukresilience.aspx>