FLOOD RISK ASSESSMENTS & DRAINAGE STRATEGIES

9 Cambridge Road TW1 2HN

Reference: R0727 FRA-v1

Sep-24

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Introduction 1

Purpose of this report

1.1 RIDA Reports Ltd has been appointed to undertake a Level 2 – Scoping Study Flood Risk Assessment for a development located at TW1 2HN.

Objectives

1.2 The objectives of this FRA are to demonstrate the following:

- Whether the proposed development will likely be affected by current or future flooding.
- Whether the proposed development will increase flood risk elsewhere.
- Whether the flood risks associated with the proposed development can be satisfactorily managed.
- Whether the measures proposed to deal with the flood risk are sustainable.

Documents Consulted

1.3 To achieve these objectives, the following documents have been consulted and referenced:

The National Planning Policy Framework (NPPF)
CIRIA C753 document The SuDS Manual, 2015
Local Flood Risk Management Strategy (LFRMS)
Level 1 Strategic Flood Risk Assessment (SFRA)
Aerial photographs and topographical survey of the site
British Geological Society Records
Local Council flood Maps
Environment Agency flood maps
The CIRIA publication 'C635 Designing for exceedance in urban drainage Good practice'

Development Site and Location

2.1 The site is located at Cambridge Road, Twickenham. The nearest postcode is TW1 2HN. Refer to appendix A for site location plan.

2.2 The current use of the site is a dwelling. The current user vulnerability classification of the site is More vulnerable. The site is located in the River Flood Zone 3. Refer to Appendix B for more details.

Development Proposals

2.3 The proposed development includes the construction of a front and rear extension. Refer to Appendix B for the layout of the proposed development.

2.4 The vulnerability classification of the proposed development is More vulnerable with an estimated lifetime between 50 and 100 years.

Site Hydrology and Hydrogeology

Hydrology

2.5 The River Thames is located approximately 100 m away from the development.

Aquifer

2.6 The development is located within a principal aquifer area. A principal aquifer consists of layers of rock or deposits that provide a high level of water storage. It may support water supply and/or river base flow on a strategic scale. It is likely that principal aquifers are aquifers previously designated as major.

Source Protection Zone

2.7 The site is not located within a Source Protection Zone.

Groundwater Levels

2.8 The ground water levels for this site are unknown.

Site Geology

Bedrock

2.9 The British Geological Survey records of the site show that it is located within the London Clay Formation - Clay and Silt.

Superficial Deposits

2.10 The British Geological Survey records show that the superficial deposits are Alluvium - Clay, Silt and Peat.

National and Local Planning Policy 3

National Planning Policy Framework (NPPF)

3.1 The NPPF and its technical guidance is a set of planning policies with the key objective of contributing to sustainable development. As part of it, they ensure that flood risk and sustainability are considered during the planning process. This ensures that developments are not located in flood risk areas and directs developments to lower risk areas. The NPPF applies a sequential risk-based approach to determining land suitability for development in flood risk areas. The NPPF also encourages developers to seek opportunities to reduce the overall level of flood risk through the development layout and the application of Sustainable Drainage Systems (SuDS).

The Flood and Water Management Act (2010)

3.2 The Flood and Water Management Act aims to reduce the flood risk associated with extreme weather events. It provides robust flood risk management for people, homes and businesses and encourages using SuDS for developments. A robust SuDS strategy should consider the recommendations in this Flood Risk Assessment.

Strategic Flood Risk Assessment (SFRA)

3.3 Planning policy with regard to development and flood risk in the area is detailed in the Strategic Flood Risk Assessment - Level 1 (SFRA - Level 1) which was published in 2021. The proposed development site is located within the administrative boundary of the London Borough of Richmond upon Thames.

3.4 The SFRA commits to direct new development to locations at the lowest flood risk. The SFRA provides information on the levels and flood hazards that could result from flooding. The Environment Agency flood zone maps and the SFRA ignore the presence of existing flood defences when defining the potential extent of flooding.

3.5 This report follows the guidance given in the Strategic Flood Risk Assessment - Level 1 by evaluating the flood risk and providing relevant flood mitigation.

The Sequential and Exception Test 4

4.1 The NPPF guidance states that the sequential test "is designed to ensure that areas at little or no risk of flooding from any source are developed in preference to areas at higher risk. This means avoiding, so far as possible, development in current and future medium and high flood risk areas considering all sources of flooding including areas at risk of surface water flooding."

Applicability of the Sequential Test

4.2 The flood risks were determined by identifying all the sources of flooding and assessing their possible impact and likelihood to development. It is confirmed that the development is:

- In Flood Zone 3, based on the Planning Flood Risk Map
- In Flood Zone 1, based on the Flood Level information Provided by the Environment Agency
- At Very Low risk of surface flooding
- At medium risk of groundwater flooding
- Outside of a critical drainage area
- Potentially within an area of sewer flooding

4.3 This type of development is exempt from applying the sequential test as per the National Planning Policy Framework paragraph 174, footnote 60. The development has been made safe and has not increased the risk to other properties. See copy of note below "(60) This includes householder development, small non-residential extensions (with a footprint of less than 250m2) and changes of use; except for changes of use to a caravan, camping or chalet site, or to a mobile home or park home site, where the sequential and exception tests should be applied as appropriate."

Exception Test

4.4 Fluvial flood risk for this minor development was assessed using the Environment Agency Flood Zone Maps and the standing advice approach recommended in the NPPF guidelines. The standing advice considers the development's size and the flood risk vulnerability of land use.

Step 1
Flood Zone

4.5 The proposed development falls within The Environment Agency (EA) Flood

categorisation

Zone 3. The Flood Zone 3 is considered to have a high probability of flooding with a 200 years or greater annual probability or >0.5%AEP.

Step 2 4.6

The Exception Test

The proposal causes no increase in vulnerability, no accommodation is offered on the ground floor. The proposal will not put at risk its users, nor will it increase flood risk elsewhere. The Exception Test is considered as passed.

5.1 The development has been assessed for the following potential flood risks, river and tidal flood risk, surface water flooding, flooding from groundwater, reservoir flood risk and drainage systems.

Flood Defence and Historic Flooding

5.2 The Environment Agency records show that the site benefits from flood defences. They also show that the area around the site has not been flooded in the past. See Appendix C for details.

Flooding from river and sea

5.3 The site is affected by Tidal Flooding. The proposed development falls within The Environment Agency (EA) Flood Zone 3. The Flood Zone 3 is considered to have a high probability of flooding with a 200 years or greater annual probability or >0.5%AEP.

5.4 The Environment Agency has provided tidal flood level data for the site. Predicted flood levels for a range of flood frequencies can be compared to the elevation of existing coastal defences to establish tidal flood risk. It has been assumed that wave action (overtopping) is unlikely to be at significant risk of flooding due to the distance of the development to the coast.

5.5 The levels provided by the Environment Agency are shown in table 1 below. Further details are provided in Appendix D.

Flood levels in channel

Return Period	Flood Level (m AOD)
1 in 20 (5%)	NIL
1 in 30 (3.3%	NIL
1 in 200 (0.5 %)	NIL
1 in 1000 (0.1%)	NIL
Extreme Water Level (m) (2100 + CC)	6.35

Flood levels at Site

Return Period	Flood Level (m AOD)
1 in 20 (5%)	NIL
1 in 30 (3.3%	NIL
1 in 200 (0.5 %)	NIL
1 in 1000 (0.1%)	NIL
Extreme Water Level (m) (2100 + CC)	6.35

5.6 The life of the development is between 50 and 100 years. The flood risk level

for Sea flooding is 6.35m AOD. The external depth of water is 0.05m.

Surface water (overland flows) flood risk

5.7 The Environment Agency maps show that the flood risk from surface water is very low. A residual risk of localised ponding remains unlikely. The Environment Agency surface water flood risk maps are defined by applying a specific procedure based on digital terrain models and assumptions regarding infiltration and urban drainage losses. The surface water flood maps are determined by the Environment Agency as follows:

5.8 *"The nationally produced surface water flood mapping only indicates where surface water flooding could occur due to local rainfall. It does not fully represent flooding that occurs from:*

- *Ordinary watercourses*
- *Drainage systems or public sewers caused by catchment-wide rainfall events*
- *Rivers*
- *Groundwater*

Due to the modelling techniques, the mapping picks out depressions in the ground surface. It simulates some flow along natural drainage channels, rivers, low areas in floodplains, and flow paths between buildings. Although the maps appear to show flooding from ordinary watercourses, they should not be taken as definitive mapping of flood risk from these as the conveyance effect of ordinary watercourses or drainage channels is not explicitly modelled. Also, structures (such as bridges, culverts and weirs) and flood risk management infrastructure (such as defences) are not represented.

The nationally produced surface water flood mapping does not consider the effect of pumping stations in catchments with pumped drainage. No allowance is made for tide locking, high tidal or fluvial levels where sewers cannot discharge into rivers or the sea."

5.9 The strategic flood risk for the London Borough of Richmond upon Thames confirms that the flood risk for the site is Very Low.

5.10 Based on the Environment Agency and the Strategic flood risk assessment's surface water mapping, together with the presence of surface water drainage systems at the site and surrounding area, it is concluded that the site is at Very Low risk of flooding from surface water sources.

Flooding from drainage systems in adjacent areas

5.11 The area around the development is shown as having sewer incidents within the flood maps of the Strategic Flood Risk Assessment. See appendix C for details.

Reservoirs Risks

5.12 The Reservoir Flood Map (RFM) produced by the Environment Agency do not show the risk to individual properties of dam breach flooding. The maps do not indicate or relate to any particular probability of dam breach flooding. The maps were prepared for emergency planning purposes. They can be used to help reservoir owners produce on-site plans, and the Local Resilience Forum produce off-site plans and to prioritise areas for evacuation/early warning in the event of a potential dam failure. The RFM shows that the development could be within the possible dam breach flooding path. See Appendix C.

Groundwater flood risk

5.13 The British Geological Survey's flood risk susceptibility maps show that the development has the potential for groundwater flooding below ground level. Groundwater levels vary seasonally and are influenced by ground and meteorological conditions and proximity to water features. The groundwater flooding risk for this site is considered to be medium. Refer to Appendix C for record drawings.

Critical Drainage Areas

5.14 The development does not fall within a critical drainage area.

6.1 The Flood hazard assessment has demonstrated that the site is:

- In Flood Zone 3, based on the Planning Flood Risk Map
- In Flood Zone 1, based on the Flood Level information Provided by the Environment Agency
- At Very Low risk of surface flooding
- At medium risk of groundwater flooding
- Outside of a critical drainage area
- Potentially within an area of sewer flooding

6.2 Under the NPPF it is necessary to demonstrate that, for any new development on the site, it is possible to provide an adequate level of flood protection for personnel working or living at the development.

Design Flood Level

6.3 The design flood level is the maximum estimated water level during the design storm event including an allowance for climate change in line with current best practice and the national planning policy guidance.

6.4 The Design Flood Level for this development has been determined by evaluating the levels from the Fluvial/Sea, Surface Water and Groundwater flood levels.

6.5 For this site, the Design Flood Level is 6.35m AOD. This is the highest level and corresponds to the River/Sea Flood Level.

Flood Protection

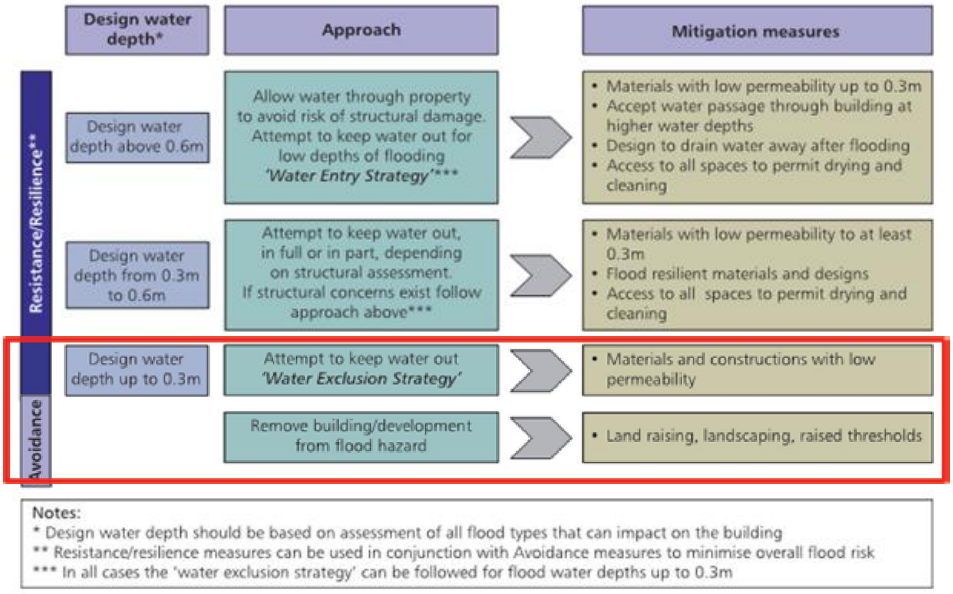
6.6 The National Planning Guidance standing advice and Environment Agency recommends that where possible, flood avoidance is provided by establishing the development's finished floor level 600mm above (freeboard) the design flood level. However, this level can be reduced if there is a high level of certainty about the estimated flood level. For this site the estimated free board has been determined to be 0.6m above the Design Flood Level due to the quality of the flood risk information available and the type of risk. The finished floor should be 6.95m AOD. It would involve a height differential of 0.65m. This is the distance between the average external level (6.3m AOD) and

the potential Finished Floor Level.

6.7 It is not possible to achieve this FFL due to access and site constraints. A level of 6.4m AOD is achieved. This level is as per the FFL of the existing building. Therefore, the following flood mitigation interventions should be provided.

6.8 The flood mitigation strategies for the development has been based on the CLG 2007 Improving the Flood Performance of New Buildings. See the figure below for the strategy highlighted in red. The strategy is based on the water level within the proximity to the building.

Rationale for flood resilient and/or resistant design strategies



6.9 The design water depth for this site is 0.05m. The development should utilise building materials that are suitable for a 'water exclusion strategy'. Materials classified as "Good" (highlighted in red) in the Figure below shall be used for new construction up to 6.95m AOD.

Flood resilience characteristics of building materials (based on laboratory testing)

Material	Resilience characteristics*		
	Water penetration	Drying ability	Retention of pre-flood dimensions, integrity
Bricks			
Engineering bricks (Classes A and B)	Good	Good	Good
Facing bricks (pressed)	Medium	Medium	Good
Facing bricks (handmade)	Poor	Poor	Poor
Blocks			
Concrete (3.5N, 7N)	Poor	Medium	Good
Aircrete	Medium	Poor	Good
Timber board			
OSB2, 11mm thick	Medium	Poor	Poor
OSB3, 18mm thick	Medium	Poor	Poor
Gypsum plasterboard			
Gypsum Plasterboard, 9mm thick	Poor	Not assessed	Poor
Mortars			
Below d.p.c. 1:3(cement:sand)	Good	Good	Good
Above d.p.c. 1:6(cement:sand)	Good	Good	Good

*Resilience characteristics are related to the testing carried out and exclude aspects such as ability to withstand freeze/thaw cycles, cleanability and mould growth

6.10 New services and fittings (communications wiring, heating systems, electrical services, water, electricity and gas meters) should be placed at above the level of 6.95m AOD. All service entries should be sealed (e.g. with expanding foam or similar closed cell material).

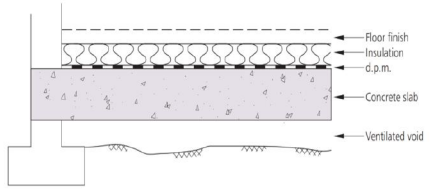
6.11 Closed-cell insulation should be used for pipes. Sealed PVC external framed doors or good fit and sealed wooden frames should be used. Hollow core timber internal doors should not be used unless sufficient flood warning is given, butt hinges, can be used to allow internal doors to be easily removed and stored. Carpets are to be avoided and use of tiles recommended in floor below the predicted design flood level.

6.12 Fittings should be designed to be replaced after a flood, it is advisable to specify durable fittings that are not appreciably affected by water and can be easily cleaned (e.g. use of plastic materials, or stainless steel). The cost of these units may need to be balanced against the predicted frequency of flooding. Avoid wood fiber based carcases and use easily removable solid wood doors and drawers.

6.13 On new foundations or where they are being replaced: Suspended concrete floor slab at least 150mm thick is preferred. Beam and Block slabs with geomembrane and 75mm min screed can also be used. There should be a

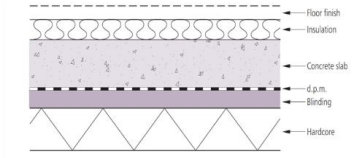
minimum space of 150mm ventilated void between the ground level and the bottom of the floor slab. Damp-proof membranes should be included in the design. Floor insulation should be of the closed-cell type. Underfloor services using ferrous materials should be avoided. Ceramic/concrete-based floor tiles, sitting on a bed of sand, cement render and water-resistant grout can be used. Ground bearing slabs are also an option. See the figures below.

Suspended Concrete Slab detail



- Reinforced concrete slab at least 150mm thick and complying with structural requirements for uplift forces
- Damp proof membrane of polythene at least 1200 gauge
- Insulation as rigid closed-cell material
- Ceramic tiles or stone floor finishes and including skirting boards.

Ground bearing Concrete Slab detail

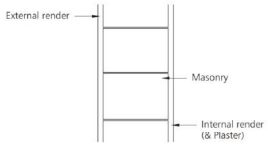


- Hardcore bed at least 100mm thick of well compacted inert material, blinded with fine inert material to provide a smooth base
- Damp proof membrane of polythene at least 1200 gauge
- Concrete slab at least 150mm thick
- Insulation as rigid closed-cell material
- Ceramic tiles or stone floor finishes and skirting boards.

6.14 Concrete blocks used in foundations should be sealed with an impermeable material or encased in concrete to prevent water movement from the ground to the wall construction. In new walls use extended periscope subfloor ventilators or fit removable airbrick covers; fix plasterboard sheets horizontally rather than vertically, or split sheets mid-height with a dado rail, to reduce the extent of replacement; specify lime- or cement-based renovating plasters or renders rather than gypsum-based, with water-resistant paint finishes. The use of water-proof, water-resistant or micro-porous surface coatings on masonry should be avoided as they can inhibit the drying-out of the building fabric.

6.15 Good quality facing bricks or external renders with water-repellent properties can be used for the external face. See the examples below of external walls that can be used.

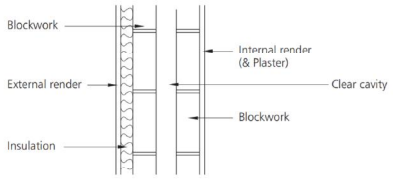
Solid External Wall



- External cement based render, preferably with lime content. Composition depends on masonry. The following mixes have good resilient properties:
  - 1 cement : 6 sand on bricks;
  - 1 cement : 4 sand: ½ lime on concrete blockwork or bricks;
  - 1 cement : 6 sand: 1 lime on Aircrete blocks.
- Masonry with minimum thickness of 300mm (thin mortar joint construction using Aircrete blocks is effective as demonstrated in laboratory tests) or alternatively reinforced concrete wall
- Internal cement-based render, preferably with lime content. Composition depends on masonry; the following mix is effective for flood resilience:
  - 1 cement : 6 sand: 1 lime on Aircrete.

  Apply external and internal renders, following good practice guidance, ensuring minimum total thickness of 20mm and at least two coats.
- Use external insulation in preference to internal insulation.

Cavity External Walls – Clear cavity

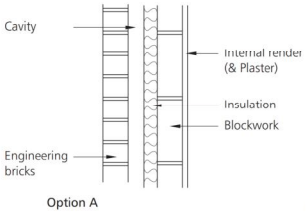


Clear cavity

- External cement based render, preferably with lime content. Composition depends on masonry; the following mixes are effective for flood resilience:
  - 1 cement: 4 sand: ½ lime on concrete blockwork (or bricks);
  - 1 cement: 6 sand: 1 lime on Aircrete.

  Apply render following good practice guidance, ensuring minimum total thickness of 20mm and two coats.
- Internal cement based render, preferably with lime content. Composition depends on masonry. The following mix works well:
  - 1 cement: 6 sand: 1 lime on Aircrete.
- Stainless steel wall ties should be used to minimise corrosion and consequent staining.

Cavity External Walls- Part fill Option A

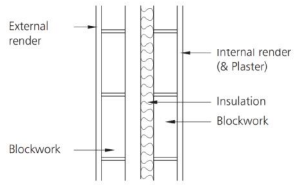


Option A Part-filled cavity

Part-filled cavity – Option A

- External face consisting of engineering bricks up to required level for flood protection (up to 0.6m maximum above floor level plus one course). Other external facing materials can be used above this level, but ensure interface is watertight.
- Rigid insulation.
- Internal face consisting of blocks.
- Internal cement based render, preferably with lime content. Composition depends on masonry; the following mix is effective:
  - 1 cement : 6 sand: 1 lime on Aircrete.
- Ensure stainless steel wall ties are used to minimise corrosion and consequent staining.
- Sacrificial plasterboard can be used, but it needs to be removed between ground floor and flood level. The board should be fitted horizontally to make removal easier. In some cases a dado rail can be used to cover the joints.

Cavity External Walls- Part fill Option B



Option B

Part filled cavity Option B

- External cement based render, preferably with lime content. Composition depends on masonry; the following mixes are effective:
  - 1 cement : 4 sand: ½ lime on concrete blockwork
  - 1 cement : 6 sand: 1 lime on Aircrete.
- External face consisting of blocks.
- Rigid insulation.
- Internal face consisting of blocks.
- Internal cement based render, preferably with lime content. Composition depends on masonry; the following mix is effective for flood resilience:
  - 1 cement : 6 sand: 1 lime on Aircrete.
- Ensure stainless steel wall ties are used to minimise corrosion and consequent staining.

6.16 The general precautionary measures to mitigate the risk of groundwater flooding in this development, which is potentially below ground, are:

- Flow paths are provided around the proposed development, which groundwater will take in the event of groundwater emergence.

- It is proposed to add a tanking membrane up to 300mm above the ground level.

6.17 The site is within an area of sewer flooding. The following recommendation should be followed:

- All new connections to the sewer network should have non-return valves.

6.18 The Development Management Procedure Order (2015) requires that the Environment Agency is consulted on developments within Areas with Critical Drainage Problems (ACDPs). The Strategic Flood Risk Assessment does not show the development within a Critical Drainage Area.

7.1 The NPPF specifically stipulates that consideration should be given to potential off-site flood impacts of any proposed development. These off-site impacts are in relation to the following:

- Surface water management
- Flood flow conveyance, storage and climate change

Surface Water Management

7.2 The surface water run-off will be disposed of using SuDS techniques. The aim is to provide a sustainable design that accommodates the proposed attenuation volume and replicates the existing drainage regime using the SuDS hierarchy, is shown in the figure below.

7.3 The Landis Top Soil classification is naturally wet. The SuDS techniques highlighted in red below could be used on-site. This assessment is based on the LANDIS Top Soil infiltration, ground conditions and available potential discharge points.

The SuDS Hierarchy (Source:EA Thames region, SuDS a practical guide)

	SUDS technique	*Flood Reduction*	*Pollution Reduction*	*Landscape & Wildlife Benefit*
Most Sustainable	**Living roofs**	✔	✔	✔
	Basins and ponds - Constructed wetlands - Balancing ponds - Detention basins - Retention ponds	✔	✔	✔
	Filter strips and swales	✔	✔	✔
	Infiltration devices - soakaways - infiltration trenches and basins	✔	✔	✔
	Permeable surfaces and filter drains - gravelled areas - solid paving blocks - porous paviors	✔	✔	
Least Sustainable	**Tanked systems** - over-sized pipes/tanks - storms cells	✔		

7.4 With no increase in the rate of surface water discharge from the site, compared to the site in its current configuration, the proposed development would have no adverse impact on surface water flood risk at the site or surrounding area. The SuDS should be designed at the detailed project stage.

Flood Flow conveyance and storage

7.5 In tidal flooding environments, the volume of available on-shore flood storage is usually not a material consideration as the flood water volume is too large to be attenuated.

7.6 The proposed development will not affect flood flow conveyance through the site or the surrounding area in relation to either defence overtopping or a defence breach. Similarly, although the development would reduce the volume of flood storage available, as the flooding mechanism is tidal, there will be no impact on flood risk in the surrounding area.

Residual Risk 8

8.1 This flood risk assessment has identified the potential flooding mechanisms that could affect the site. As part of this, the following residual risks have been evaluated.

Public safety and Site Access

8.2 This assessment has demonstrated that the proposed development will have no adverse impact on flood risk in the area surrounding the site. Available evidence indicates that the development would not change surface water generation. Therefore, there is no basis to indicate that, with respect to flood risk, the proposed development would adversely impact public safety.

8.3 It will be necessary to ensure that all building users are fully informed of procedures to be implemented during the threat of imminent flooding.

Flood Warning and evacuation

8.4 The site is located within an area covered by the Environment Agency Flood Alert service. It is recommended that the users of the proposed development are registered with this service to receive early warning of imminent flooding.

8.5 The occupants of the site are encouraged to sign up for the alerts. The Table 4 below shows the actions that must be taken for each flood warning.

8.6 Action to be taken in the event of an Alarm being Raised or a Flood Warning Received:

a. Raise the alarm and evacuate the site following the established Fire Drill procedures. The main assembly is as per the main house fire drill assembly point.

b. Contact Emergency Fire Services (999) if necessary and Environment Agency Floodline: (0845 988 1188) if the event is unexpected.

c. If safe to do so, locate and turn off critical services, e.g. water, gas & electricity.

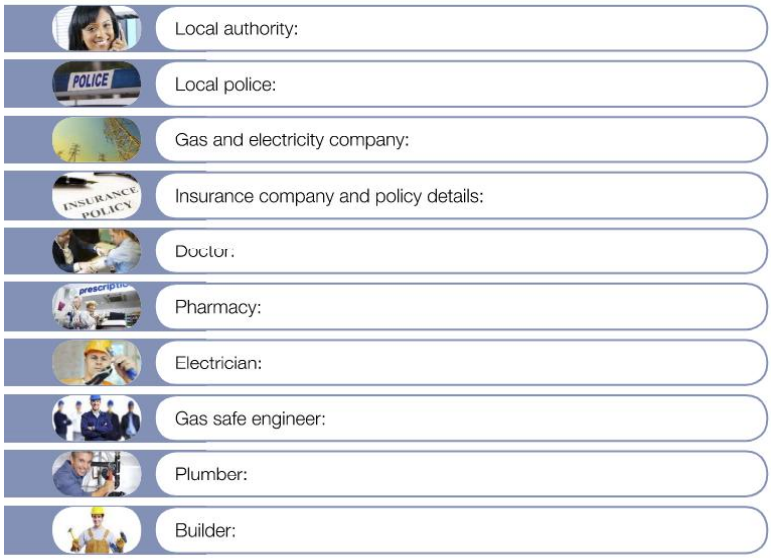
d. Follow the routes below to evacuate the site altogether.

Actions that will be taken for each flood warning

Warning	Message	Timing	Action
 FLOOD ALERT	Flooding is possible. Be prepared.	2 hours to 2 days in advance of flooding.	- Be prepared for flooding. - Prepare a flood kit.
 FLOOD WARNING	Flooding is expected. Immediate action required.	Half an hour to 1 day in advance of flooding.	- Act now to protect your property. - Block doors with flood boards or sandbags and cover airbricks and other ventilation holes. - Move pets and valuables to a safe place. - Keep a flood kit ready. - Move any critical equipment and information to a safe location
 SEVERE FLOOD WARNING	Severe flooding. Danger to life.	When flooding poses a significant threat to life and different actions are required.	- Be ready should you need to evacuate from the property. - Co-operate with the emergency services and call 999 if you are in immediate danger.
Warning Removed	No further flooding is currently expected for your area.	Issued when a flood warning is no longer in force.	- Flood water may still be around and could be contaminated. - If you've been flooded, ring your buildings and contents insurance company as soon as possible.

Useful local phone numbers

Please write your local phone numbers in the space provided below.
Make sure they are easy to find in the event of a flood.



8.7 The proposed evacuation route below shows how the development could be evacuated before the 1 in 1000 or 0.1% annual probability of flooding extreme flood occurs. Safe egress is achievable by following Cambridge Road southbound until reaching Denton Road which is shown to be beyond the extent of flooding. See figure below for details.

Evacuation Route

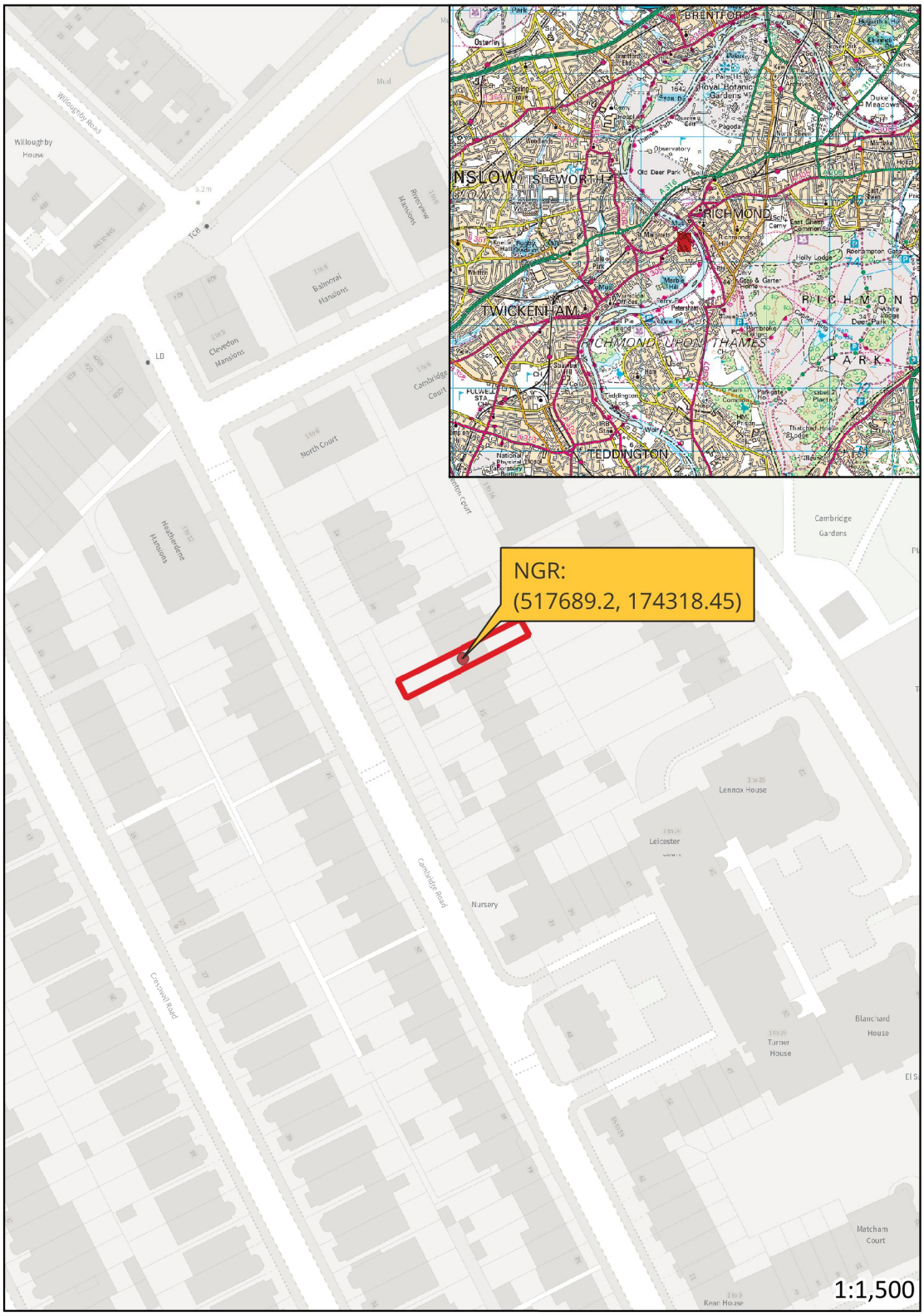
Conclusions 9

9.1 It is concluded that subject to the proposed mitigation measures, the site can be developed in accordance with the provisions of the NPPF and the requirements of the Environment Agency and the local planning authority.

9.2 This report demonstrates that the proposal will be safe, in terms of flood risk, for its design life and will not increase the flood risk elsewhere.

9.3 It is proposed that a formal Flood Warning and Emergency Response Plan is developed for the proposed development to communicate flood emergency response procedures to all the occupants of the site.

Appendix A


NGR:
(517689.2, 174318.45)
1:1,500
BRENTFORD
NSLOW
ISLEWORTH
RICHMOND
TWICKENHAM
RICHMOND UPON THAMES
PARK
TEDDINGTON
Willoughby House
Willoughby Road
Riverview Mansions
Balmoral Mansions
Clevedon Mansions
Cambridge Court
North Court
Heathendene Mansions
Cambridge Gardens
Lennox House
Leicester
Nursery
Cambridge Road
Crewood Road
Blanchard House
Turner House
Matcham Court
Kean House

Appendix B

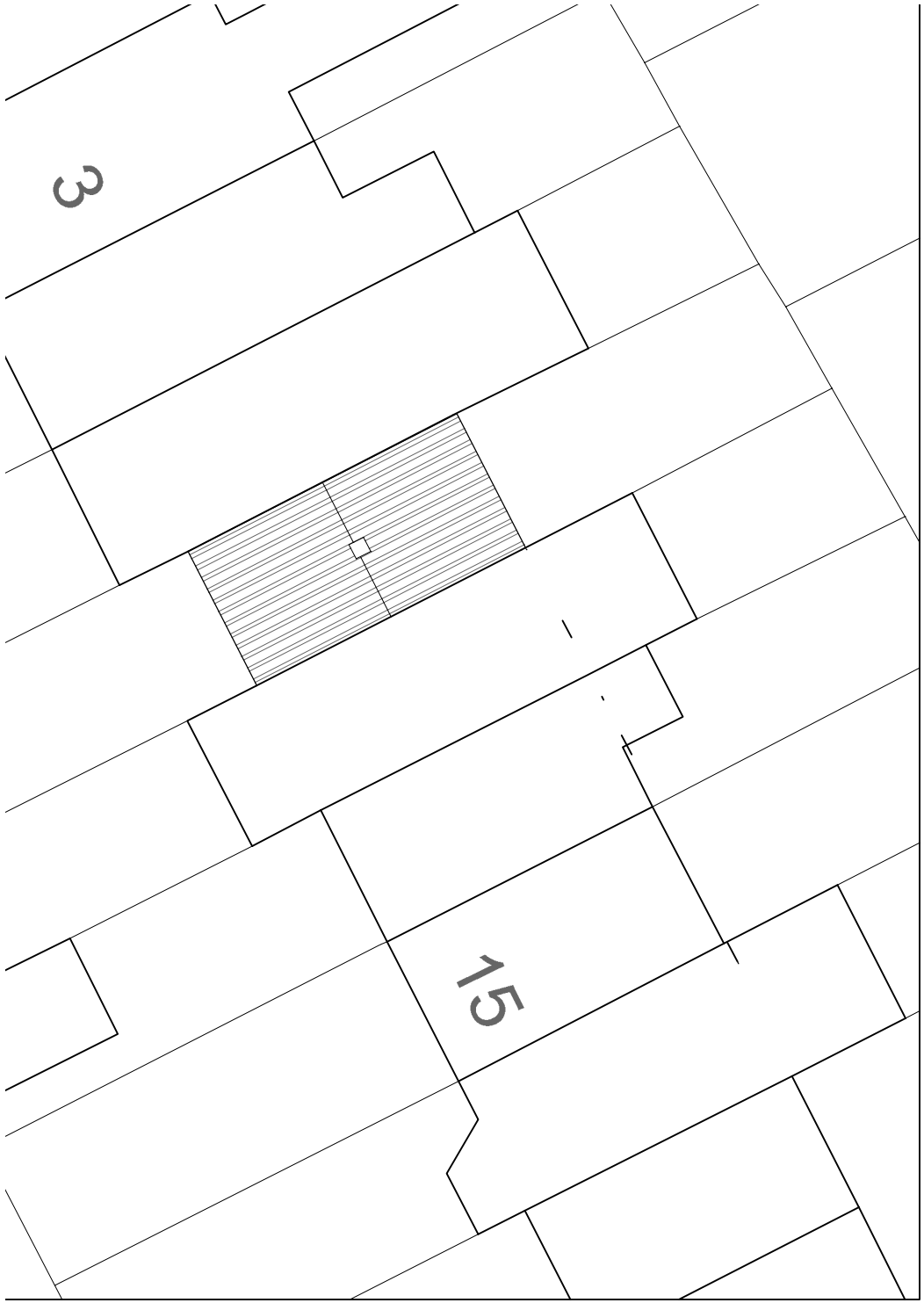
0 10 20 30 40 50 60
Scale (metres)

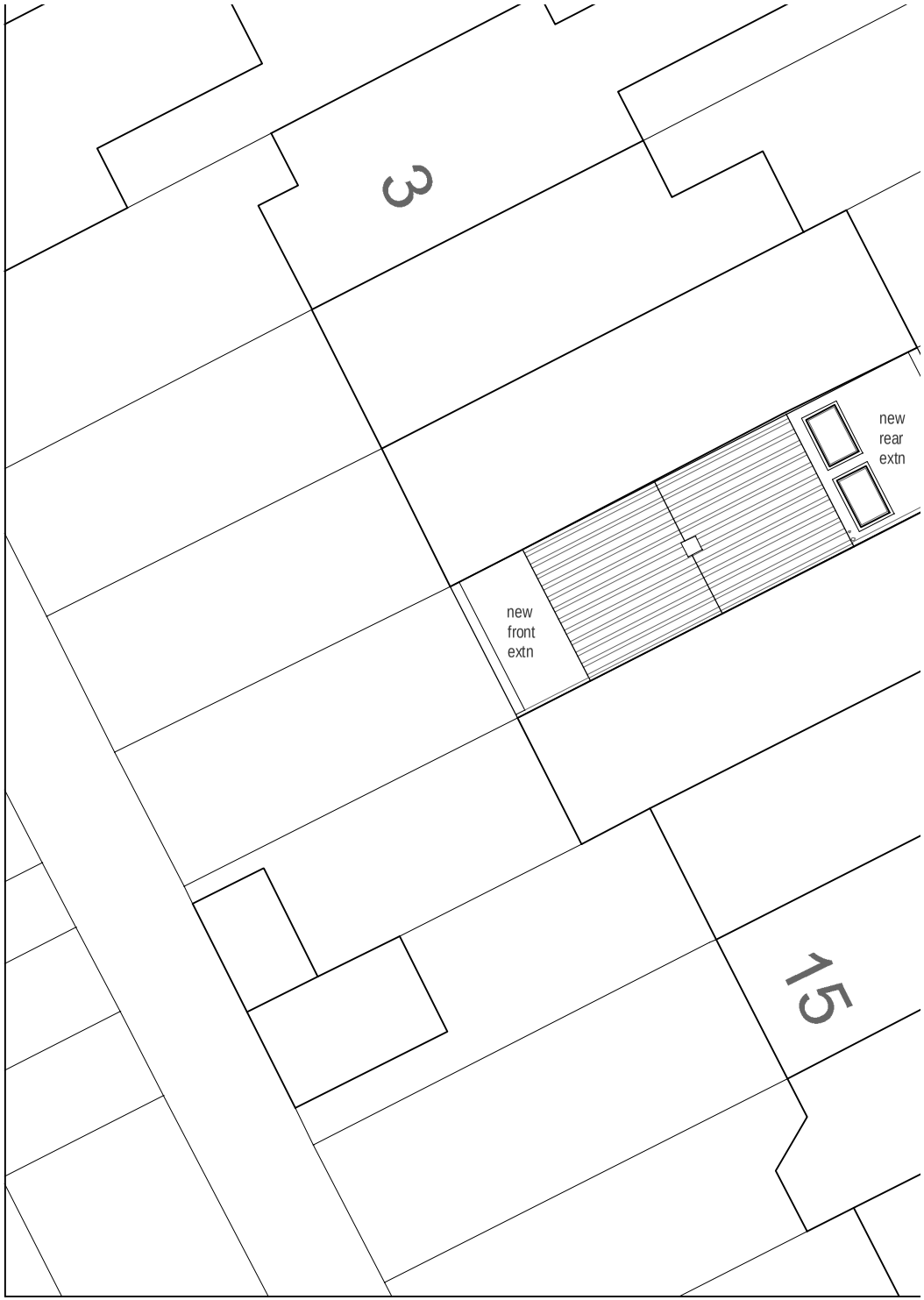
N

SITE LOCATION
scale 1:1250

SCHEDULE OF DRAWINGS

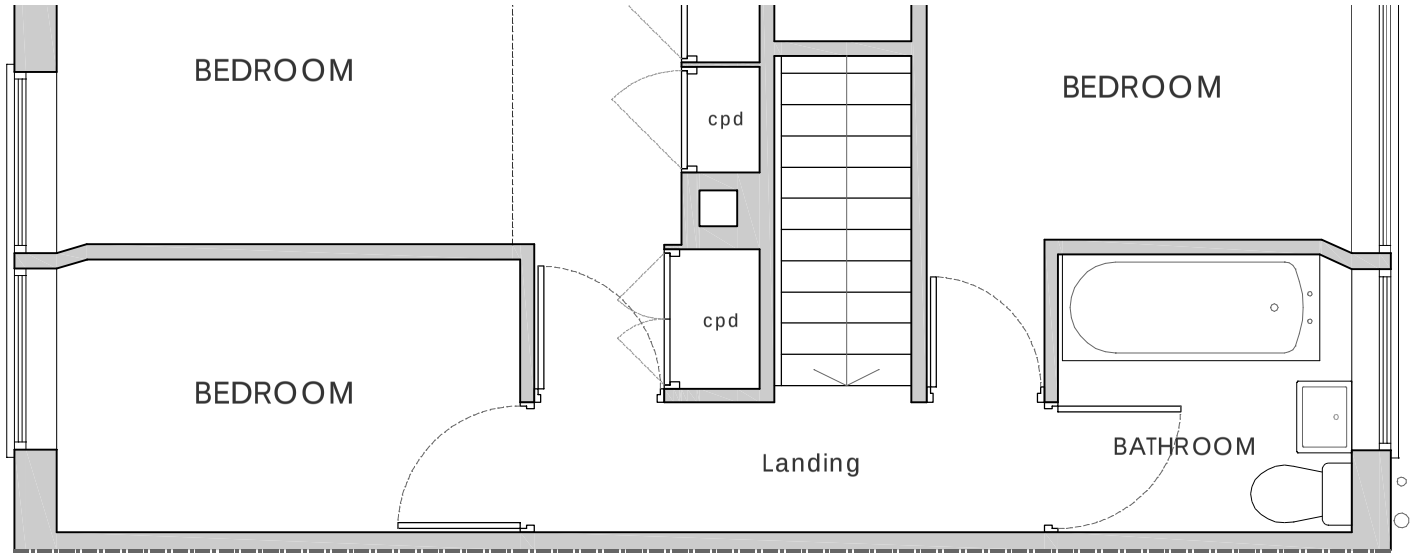
number	drawing
23/C/**00**	Location plan
23/C/**01**	Site & roof plan - as existing & propos
23/C/**02**	Ground & first floor plans - as existing
23/C/**05**	Front & rear elevations - as existing
23/C/**07**	Cross sections - as existing
23/C/**12**	Ground & first floor plans - as propose
23/C/**15**	Front & rear elevations - as proposed
23/C/**17**	Cross sections - as proposed
23/C/**PH**	Site photographs



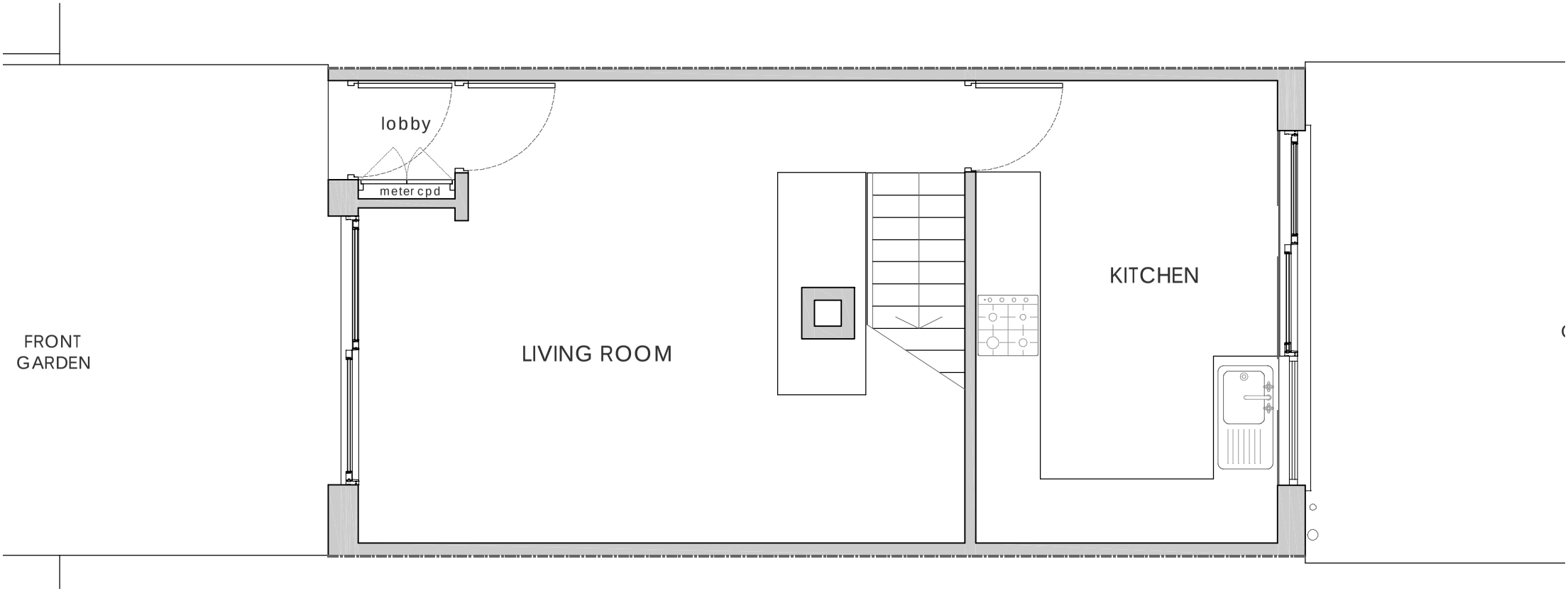


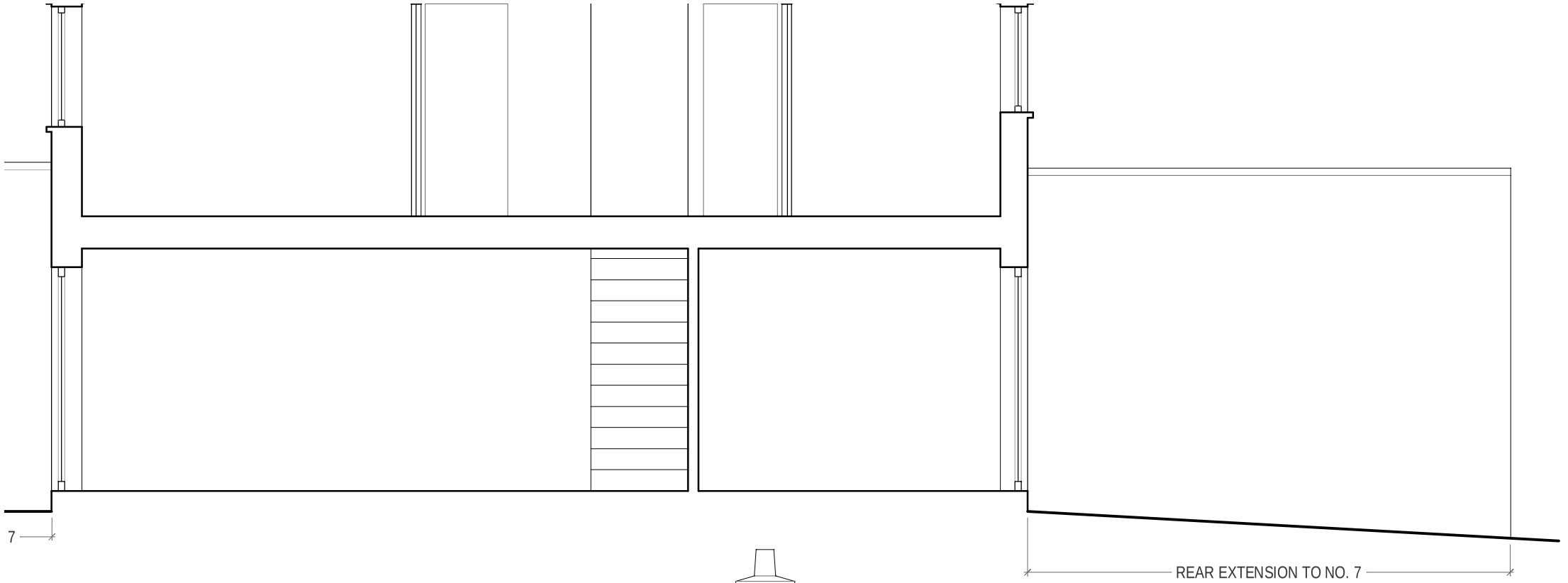
N

SITE & ROOF PLAN

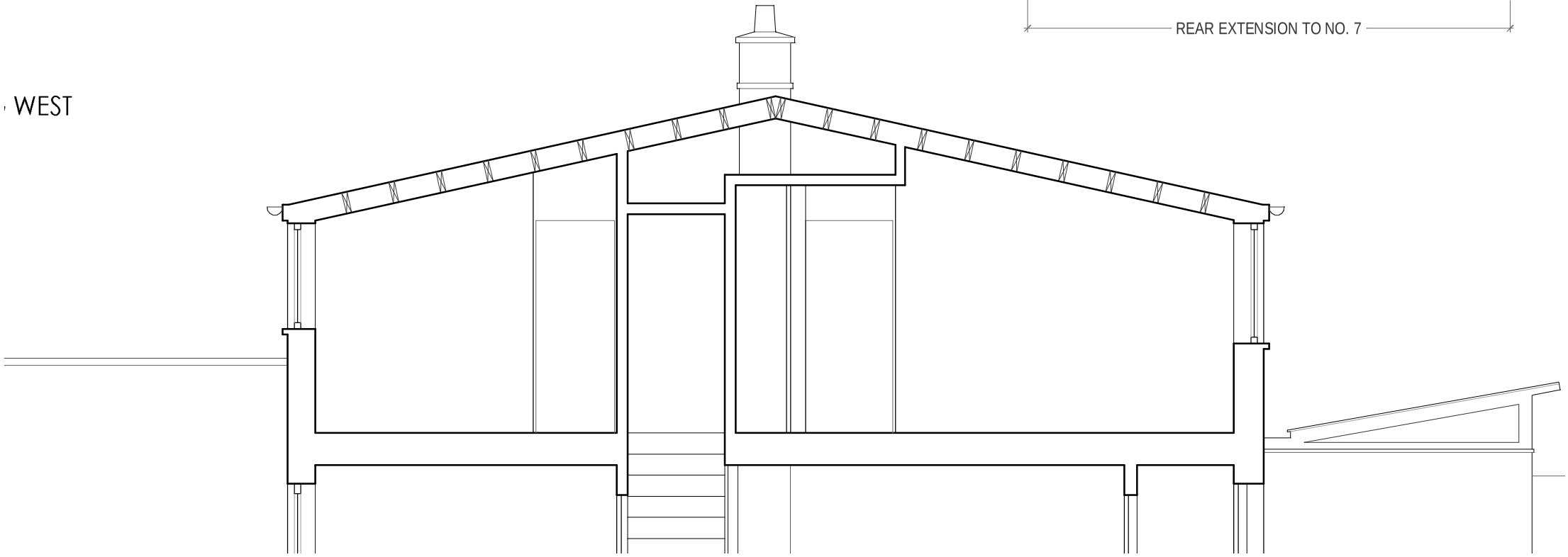

BEDROOM
cpd
BEDROOM
cpd
BEDROOM
Landing
BATHROOM

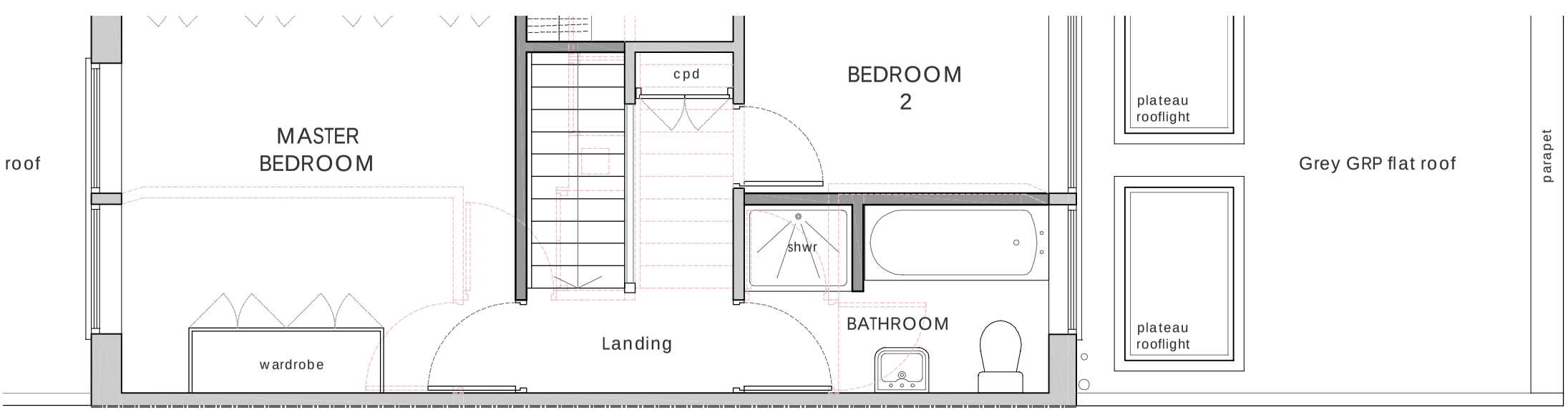
FIRST FLOOR


lobby
meter cpd
FRONT
GARDEN
LIVING ROOM
KITCHEN

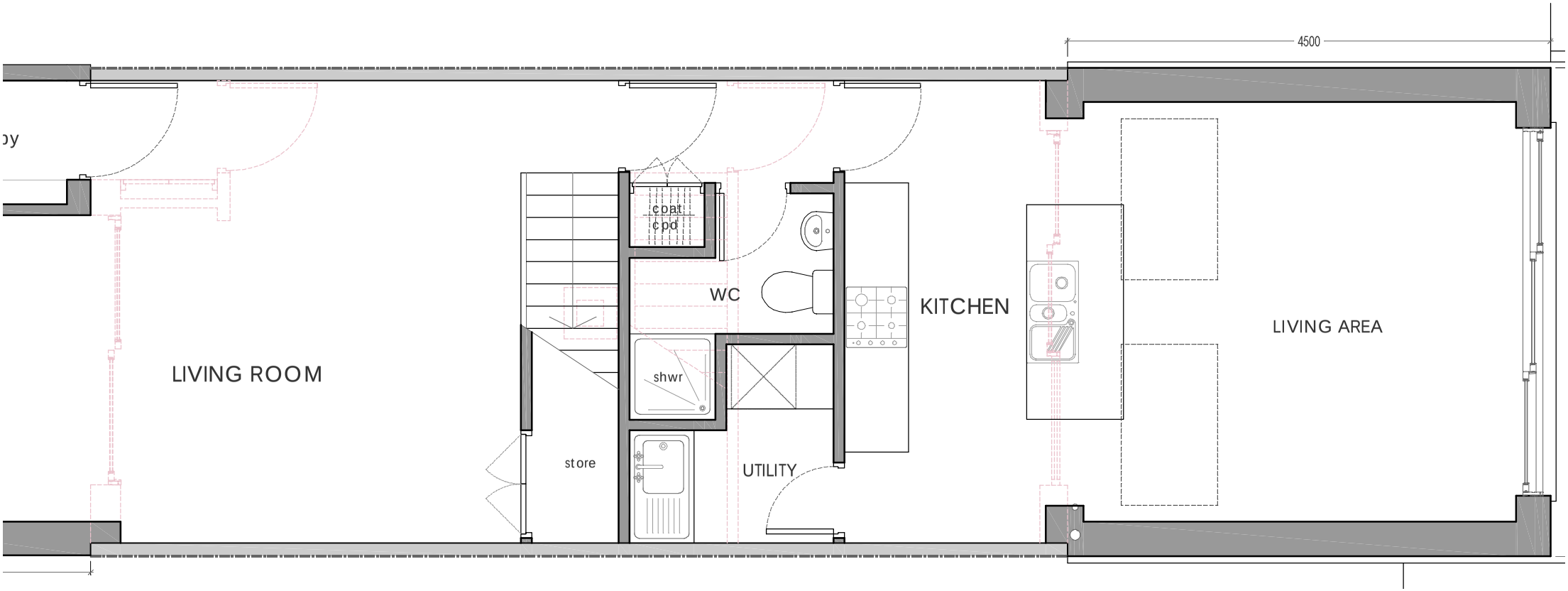


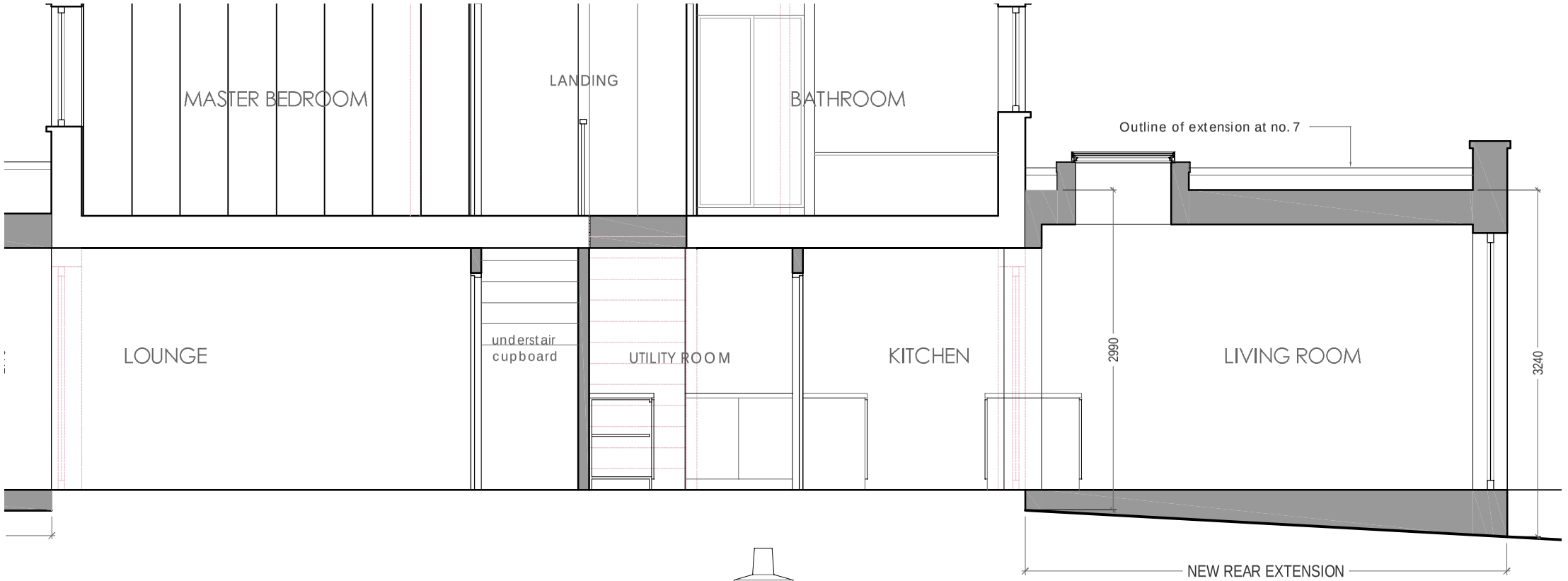
WEST



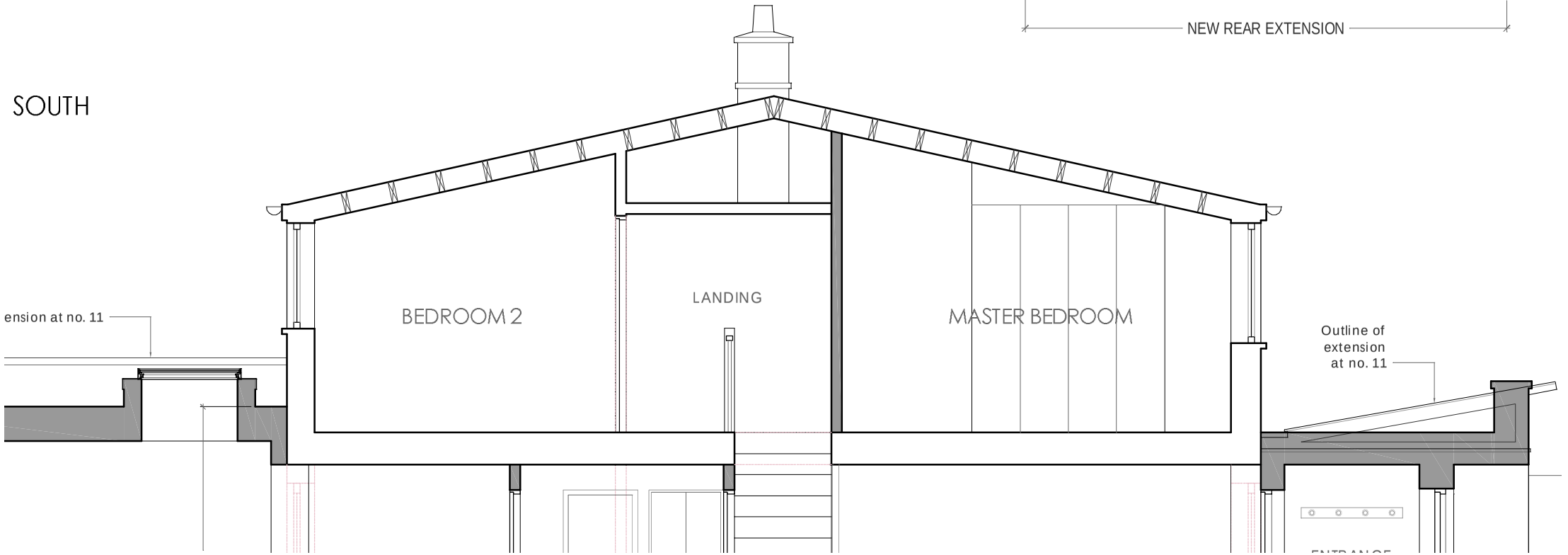

roof
MASTER
BEDROOM
wardrobe
cpd
Landing
BEDROOM
2
shwr
BATHROOM
plateau
rooflight
plateau
rooflight
Grey GRP flat roof
parapet

FIRST FLOOR


4500
LIVING ROOM
coat
cpd
WC
KITCHEN
shwr
store
UTILITY
LIVING AREA


MASTER BEDROOM
LANDING
BATHROOM
Outline of extension at no. 7
LOUNGE
understair cupboard
UTILITY ROOM
KITCHEN
2990
LIVING ROOM
3240
NEW REAR EXTENSION

SOUTH


ension at no. 11
BEDROOM 2
LANDING
MASTER BEDROOM
Outline of extension at no. 11

HMOND ROAD

REAR OF 9 RICHMOND ROAD

N OF NO. 7

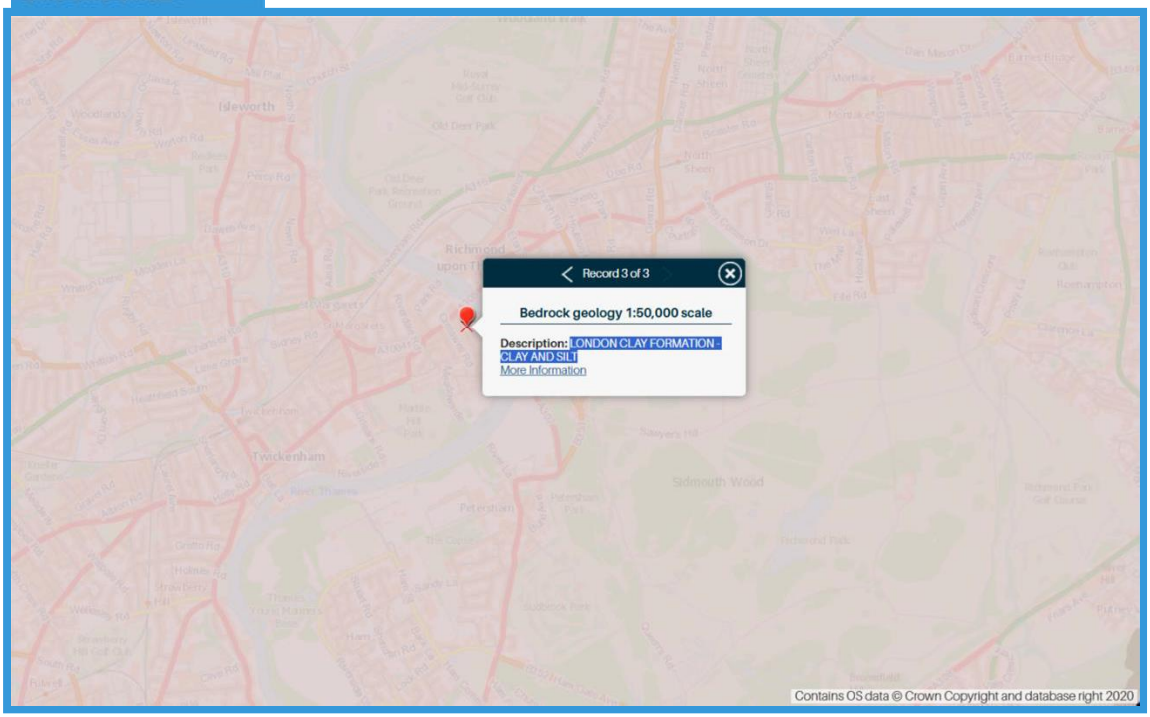
FRONT EXTENSION OF NO. 11

Appendix C

SITE GEOLOGY

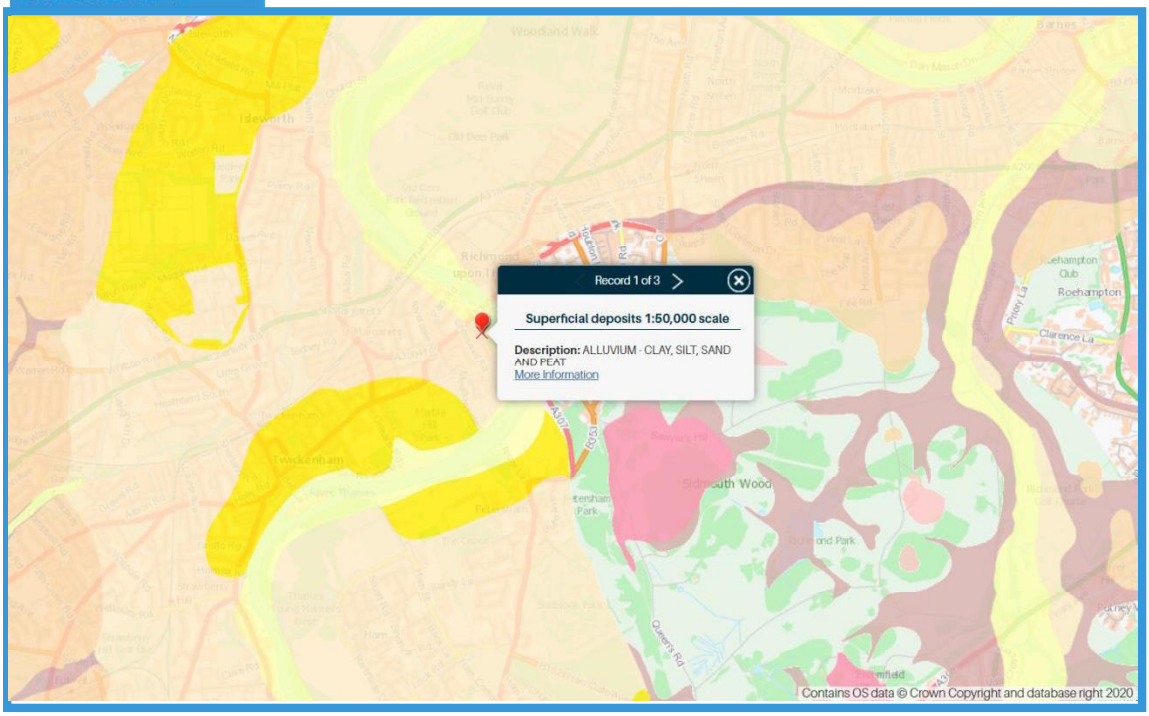
GEOINDEX ONSHORE

GEOLOGY - BEDROCK - LONDON CLAY



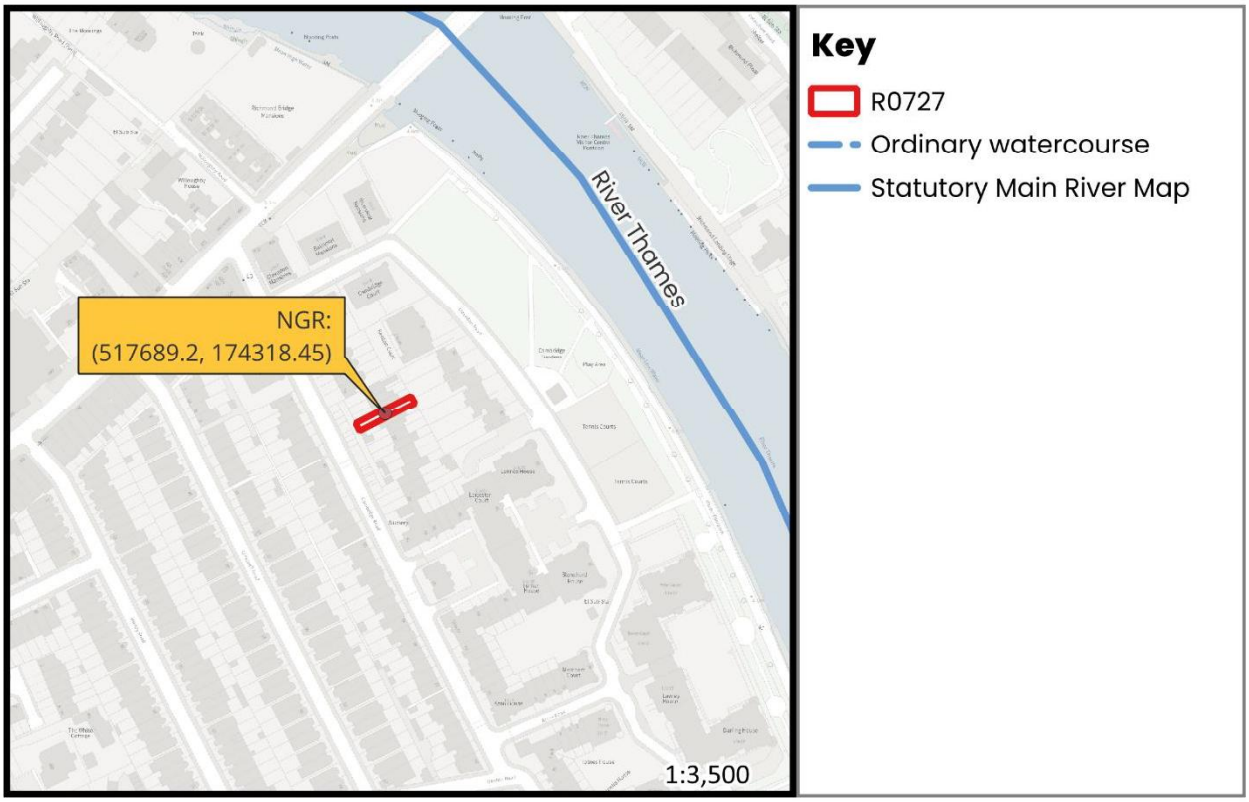
GEOINDEX ONSHORE

GEOLOGY - SUPERFICIAL DEPOSITS - SAND AND GRAVEL

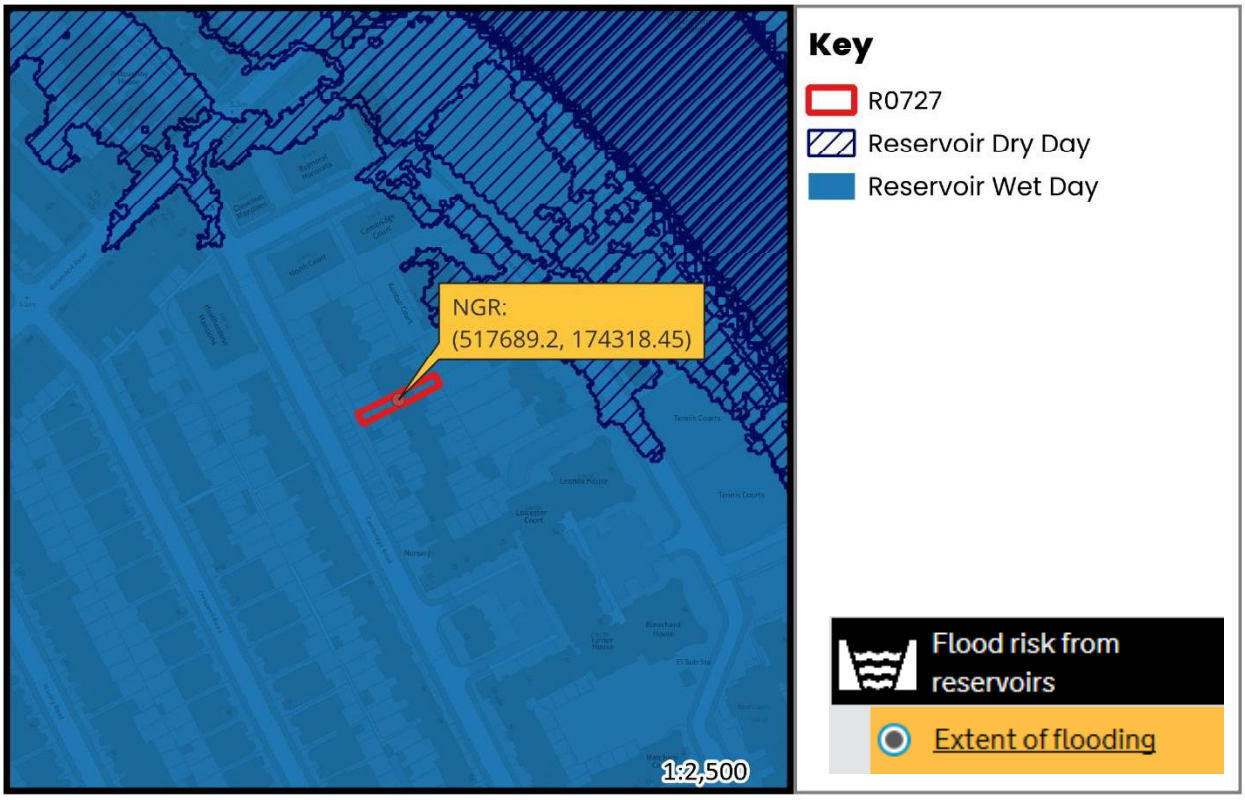


SITE HYDROGEOLOGY

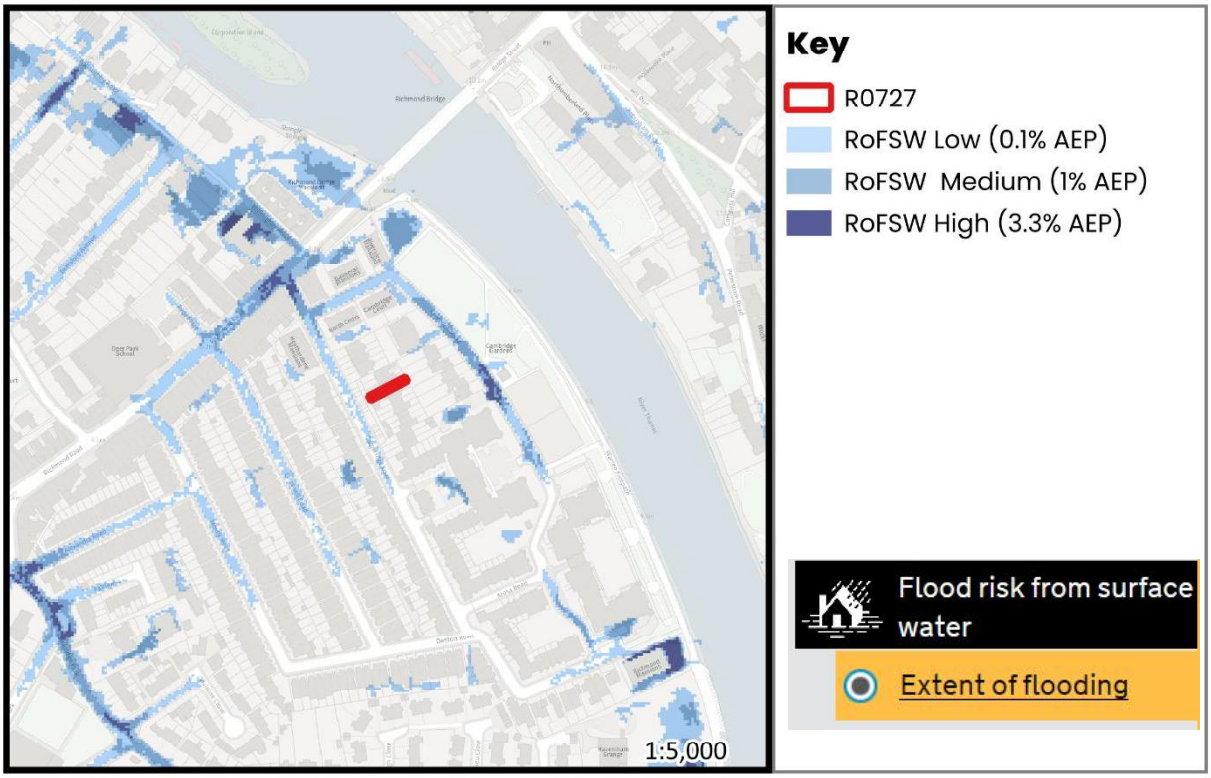
Environment Agency Main River Map



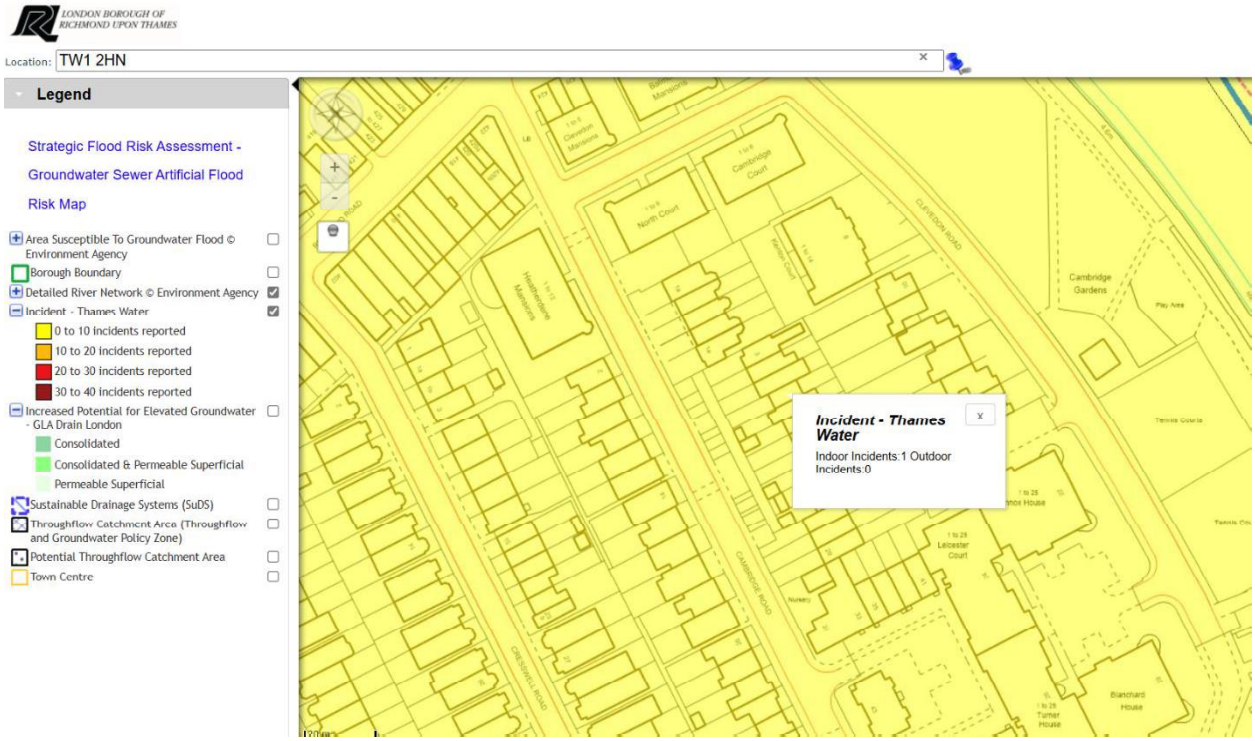
RESERVOIR FLOOD RISK



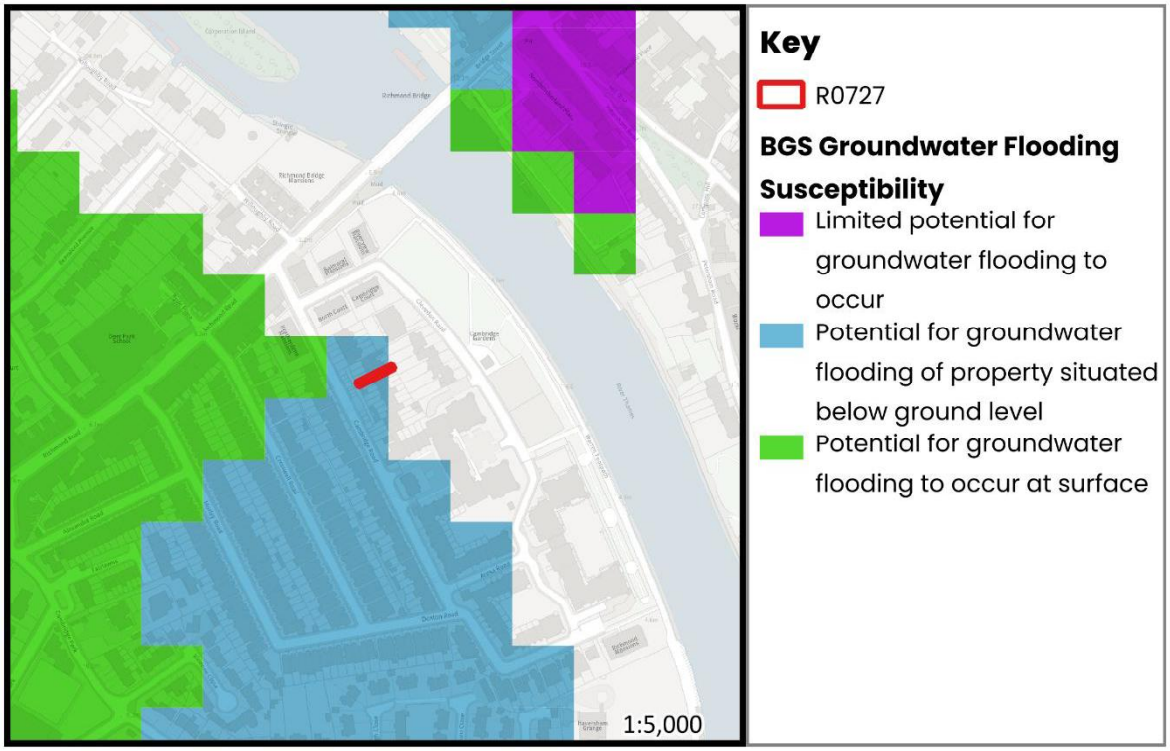
SITE SURFACE WATER FLOOD RISK



SITE SEWER FLOODING



GROUND WATER FLOOD RISK



MAGIC RESULTS

Site Check Results

Site Check Report Report generated on Fri Sep 27 2024
You selected the location: Centroid Grid Ref: TQ17687431
The following features have been found in your search area:

Aquifer Designation Map (Bedrock) (England)

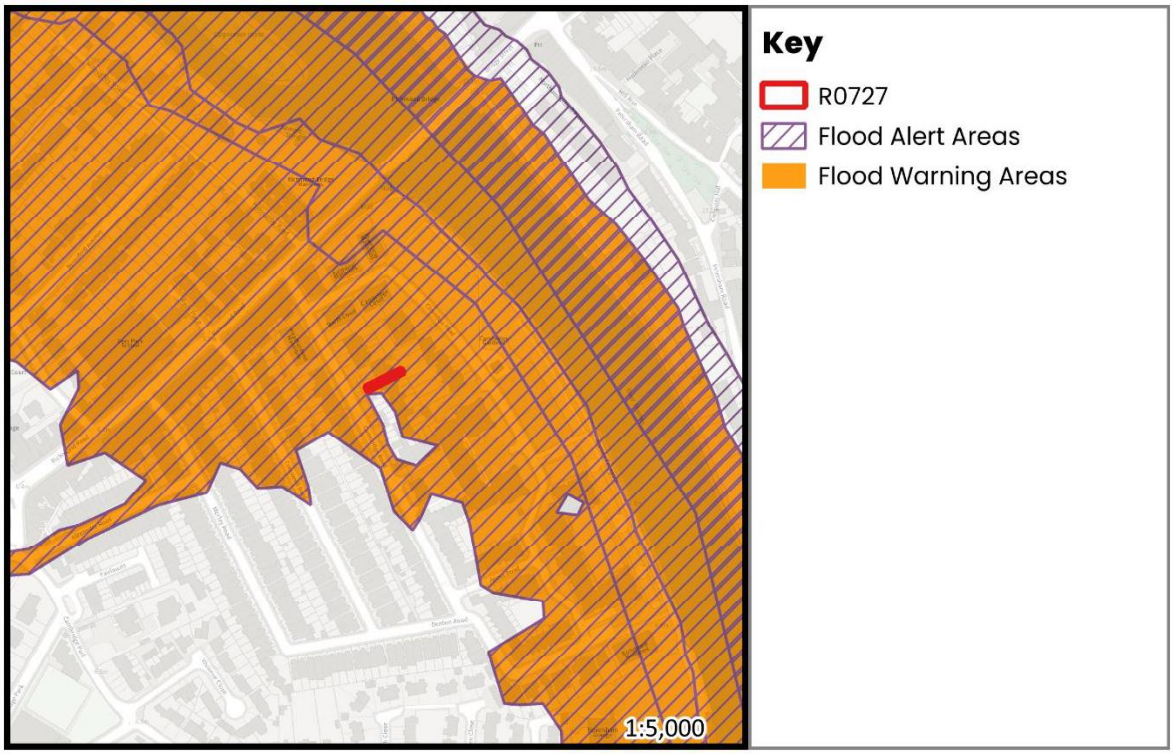
Typology	Unproductive

Aquifer Designation Map (Superficial Drift) (England)

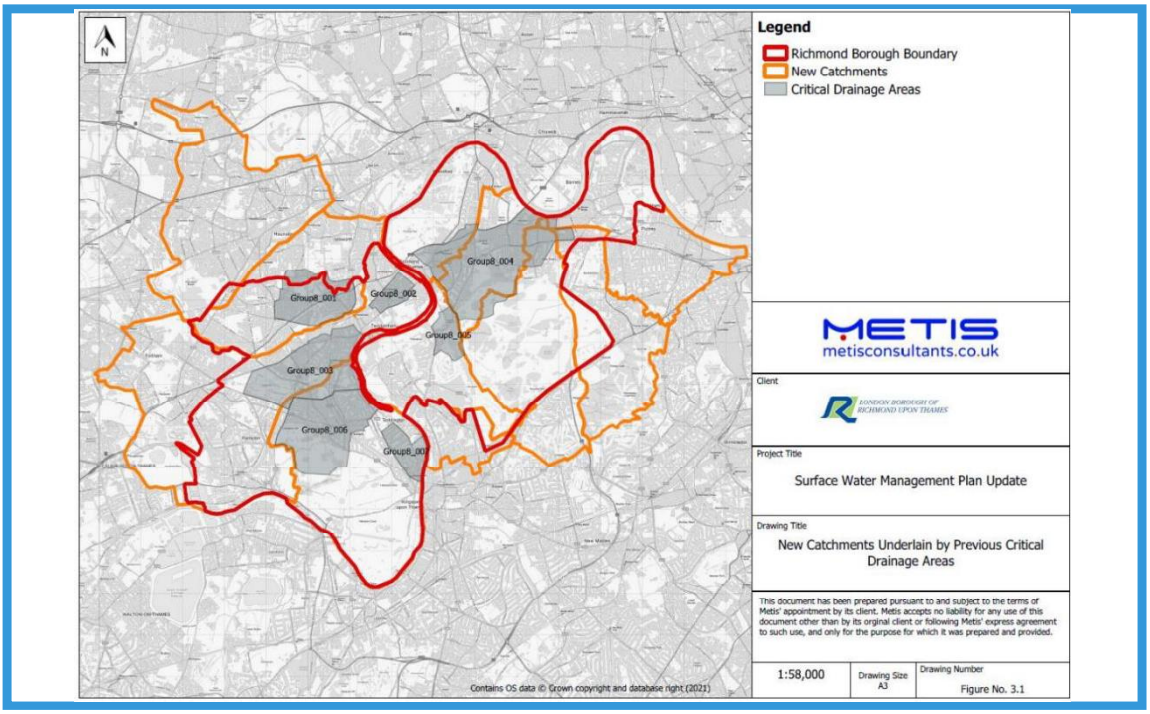
Typology	Principal
Typology	Secondary (undifferentiated)

Source Protection Zones merged (England)
No Features found

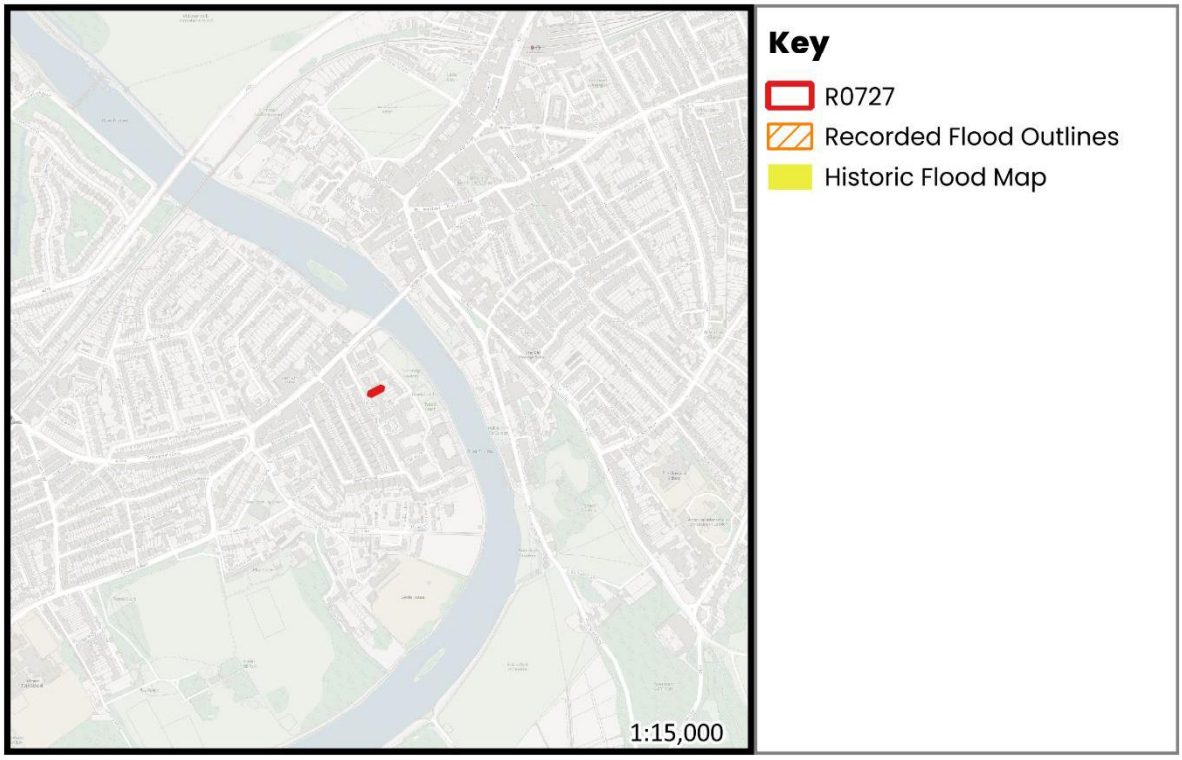
FLOOD WARNING AREA



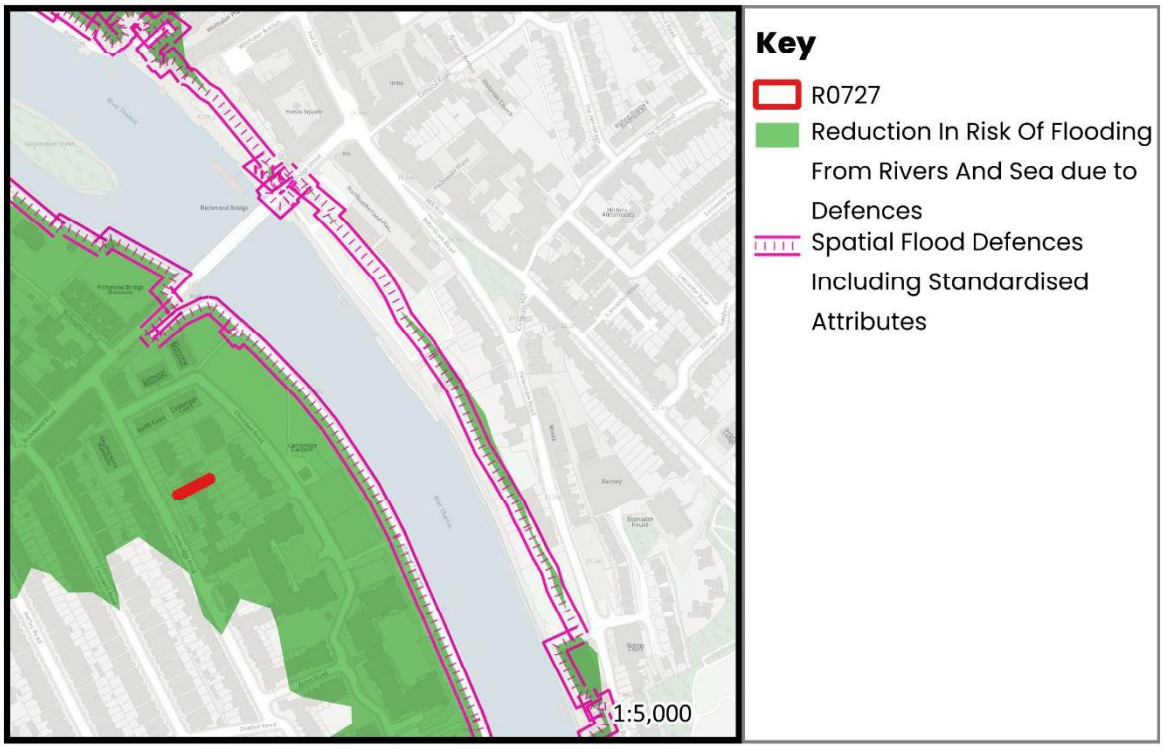
CRITICAL DRAINAGE AREA



HISTORIC FLOOD MAP

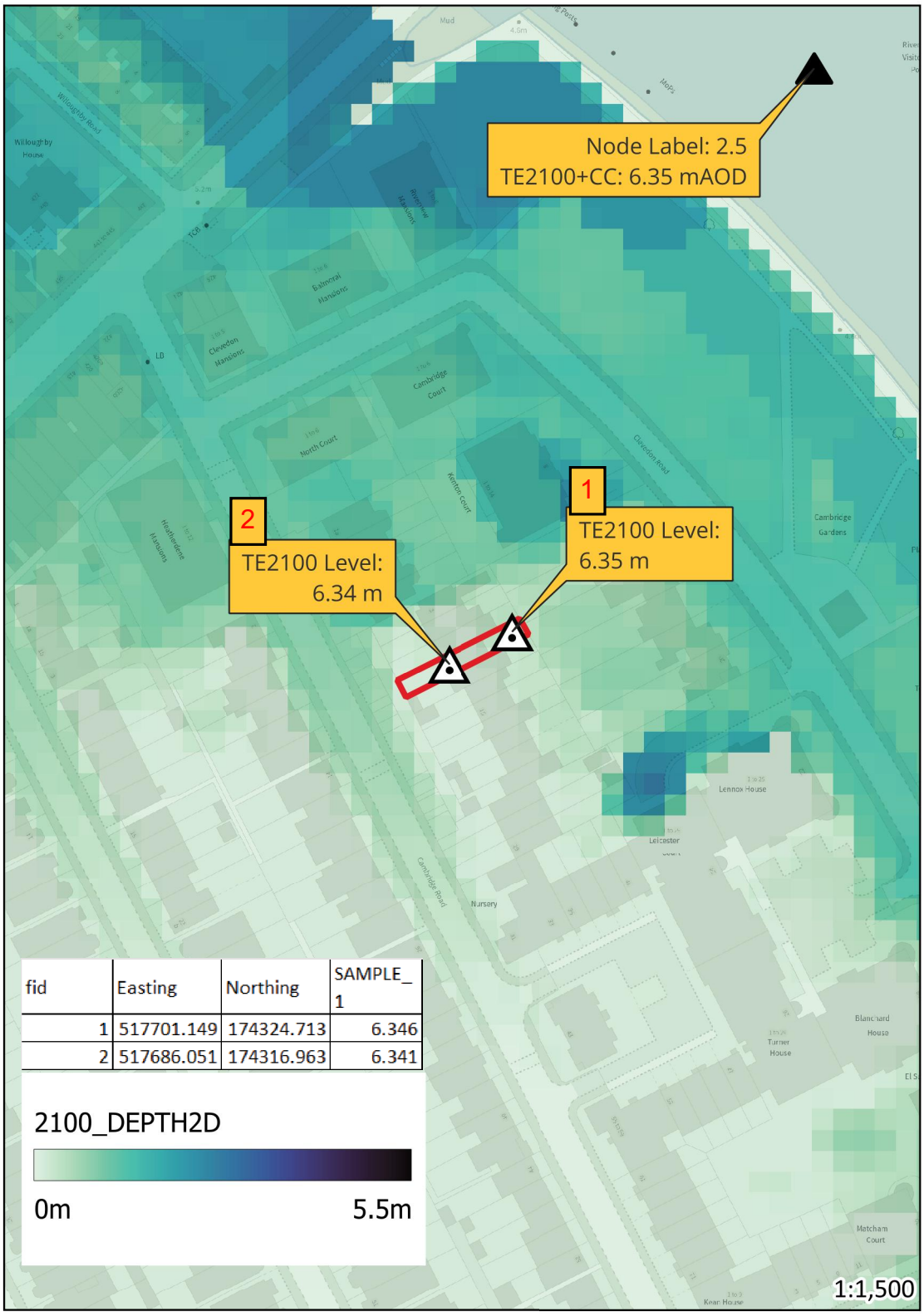


RISK REDUCTION FROM FLOOD DEFENCES



Appendix D

PRODUCT 6 LEVELS



fid	Easting	Northing	SAMPLE_1
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2	517686.051	174316.963	6.341