RIDA
FLOOD RISK ASSESSMENTS & DRAINAGE STRATEGIES

102 Berwick Avenue, Hayes, UB4 0NH

Reference: 555 FRA- 001

FLOOD RISK ASSESSMENT

Aug-23

www.rida-reports.co.uk

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DRAFT --FOR COMMENT ONLY-- DRAFT

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The study provides no guarantee against flooding of the study site or elsewhere, nor of the absolute accuracy of water levels, flow rates and associated probabilities.

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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 UB4 0NH.

Objectives

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

* Whether the proposed development is likely to 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/or 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 Berwick Avenue, London. The nearest post code is UB4 0NH. Refer to appendix A for site location plan.

2.2 The current use of the site is the garden of the building. The current use vulnerability clasification of the site is Water compatible. The site is located in the River Flood Zone 2. Refer to Appendix B for more details.

Development Proposals

2.3 The proposed development includes the extension of the current house. Refer to Appendix B for 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 Yeading Brook is located approximately 180 m away from the development.

Aquifer 2.6 The development is located within an unproductive strata. These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

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 Society records of the site show that it is located within the London Clay Formation - Clay, Silt and Sand.

Superficial Deposits 2.10 The British Geological Society records show that the superficial deposits are Langley Silt Member - Clay and Silt.

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 to contribute to the achievement of sustainable development. As part of it, they ensure that flood risk and sustainability are taken into account 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 the suitability of land for development in flood risk areas. The NPPF also encourages developers to seek opportunities to reduce the overall level of flood risk through the layout of the development 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 a robust management of flood risk for people, homes and businesses and also encourages the use of SuDS for developments. A robust SuDS strategy should take into account the recommendations given 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 Local Flood Risk Management Strategy (LFRMS) which was published in 2015. The proposed development site is located within the administrative boundary of the London Borough of Hillingdon.

3.4 The SFRA commits to direct new development to locations at 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 Local Flood Risk Management Strategy 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 the development. It is confirmed that the development is:

- In Flood Zone 2
- At Medium risk of surface flooding
- At very low risk of groundwater flooding
- Outside of a critical drainage area
- Outside of an area with sewer flooding

4.3 The planning policy framework exempts this type of development from applying the sequential test. The development has been made safe and has not increased the risk to other properties.

Exception Test

4.2 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 takes into account the size of the development and the flood risk vulnerability of land uses.

Step 1
Flood Zone categorisation

4.3 The proposed development falls within The Environment Agency Flood Zone 2. The Flood Zone 2 is considered to have a medium probability of flooding with a 1000 to 100 years annual probability or 0.1-1.0%AEP.

Step 2
The Exception Test

4.4 The Exception Test is not required for this development.

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

Historic Flooding

5.2 The site does not benefit from flood defences. The Environment Agency records show that the area around the site has not been flooded in the past.

Flooding from river and sea

5.3 The proposed development falls within The Environment Agency Flood Zone 2. The Flood Zone 2 is considered to have a medium probability of flooding with a 1000 to 100 years annual probability or 0.1-1.0%AEP.

5.4 The climate change allowances are as per the vulnerability of the development , the design life of the building , and the flood zone classification. The climate change allowance for this development is 17%. As the levels are not available it has been assumed a depth of 600mm for climate change allowance.

5.5 The levels for this site has been requested from the Environment Agency.

5.6 It has been assumed that the water depth for this site is above the existing ground level.

5.7 The assumed flood depth for this site is 0.6m. This depth of water will be used for the purpose of this assessment.

Surface water (overland flows) flood risk

5.8 The Environment Agency maps show that the flood risk from surface water is medium. The residual risk of localised ponding remains likely. The Environment Agency surface water flood risk maps are defined through application of a specific procedure based on digital terrain models and assumptions regarding losses to infiltration and/or urban drainage. The surface water flood maps is defined by the Environment Agency as follows.

5.9 *"The nationally produced surface water flood mapping only indicates where surface water flooding could occur as a result of 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 used, the mapping picks out depressions in the ground surface and 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 take account of 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 in to rivers or the sea."

5.10 The strategic flood risk for the London Borough of Hillingdon confirms that the flood risk for the site is Medium.

5.11 On the basis of 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 Medium risk of flooding from surface water sources. The depth of water is potentially below 300mm. For the purpose of this assessment a depth of water of 0.3m has been taken as the most relevant depth to the site.

Flooding from drainage systems in adjacent areas

5.12 The council records have been reviewed. The flooding from drainage incidents maps were not found in the Strategic Flood Risk Assessment. Therefore, for the purpose of this report, it has been assumed that the risk of flooding from drainage systems is low.

Reservoirs Risks

5.13 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 and 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

5.14 The British Geological Survey's flood risk susceptibility maps show that the development has limited susceptibility to ground water flooding. The risk from groundwater flood to the site is considered very low. Refer to appendix C for record drawings.

Critical Drainage Areas

5.15 The Strategic Flood Risk Assessment was reviewed as part of this assessment. However, it does not show the critical drainage areas within the council. For the purpose of this report, it has been assumed that the site is outside of a notified critical drainage area.

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

- In Flood Zone 2
- At Medium risk of surface flooding
- At very low risk of groundwater flooding
- Outside of a critical drainage area
- Outside of an area with 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.

Flood Protection

6.3 Where possible, flood protection for this development is typically provided by establishing the development's floor levels 300mm above the 1:100 year flood level, including allowance for climate change.

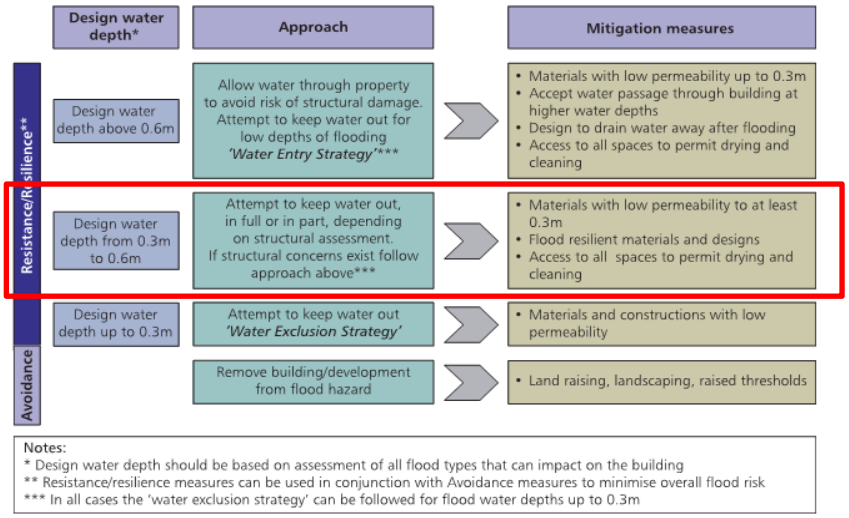
6.4 The flood levels have been requested from the Environment Agency. This assessment has been made on an assumed depth of water.

6.5 Since the design water depth is unknown. It has been assumed that it is 0.6m above the level of the external ground level of the building. The water entry strategy approach has been used with a water exclusion strategy for up to 300mm depth flows.

6.6 As a depth of flood level has been assumed. The following flood protection interventions should be provided.

6.7 The flood resilience strategy for the development has been based on the CLG 2007 Improving the Flood Performance of New Buildings. See figure below. The strategy is based on the water level within the proximity to the building.

Rationale for flood resilient and/or resistant design strategies.



6.8 The design water depth for this site is 0.6m. 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 construction upto the water depth.

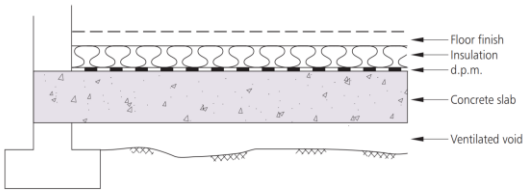
Figure 2: Flood resilience characteristics of building materials (based on laboratory testing)

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

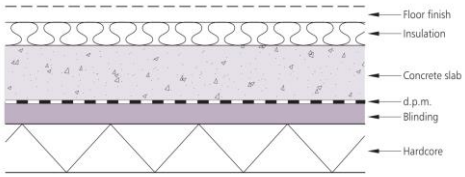
6.9 Foundations: Suspended concrete floor slabs at least 150mm thick is the preferred option. Suspended slabs can also be used. There should be a minimum space of 150mm ventilated void between the ground level and the bottom of the floor slab. Damp proof membranes should be included in the design. Floor insulation should be of the closed-cell type. Under floor 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. See 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

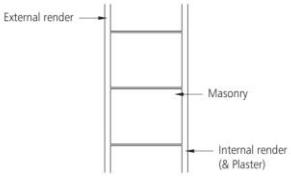


- Hardcore bed at least 100mm thick of well compacted inert material, blinded with fine inert material to provide a smooth base
- Damp proof membrane of polythene at least 1200 gauge
- Concrete slab at least 150mm thick
- Insulation as rigid closed-cell material
- Ceramic tiles or stone floor finishes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

6.10 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.

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

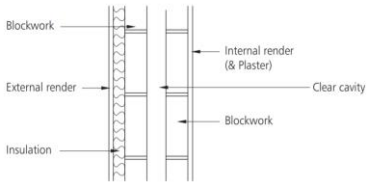
Solid External Wall



- 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

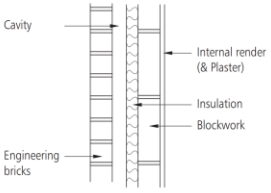


Clear cavity

- 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

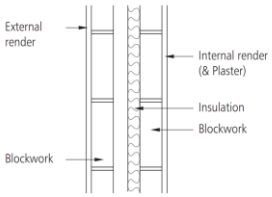


Option A

Part-filled cavity – 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.

6.12 Services and fittings (communications wiring, heating systems, electrical services, water, electricity and gas meters) should be placed at above the flood level. Where possible, all service entries should be sealed (e.g. with expanding foam or similar closed cell material). Closed cell insulation should be used for pipes which are below the predicted flood levels. Sealed PVC external framed doors should be used. Should wooden doors be used then a good fit and sealed to the frames must be obtained. 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.

6.13 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 fibre based carcases and use easily removable solid wood doors and drawers.

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:

- Surface water management

- Flood flow conveyance, storage and climate change

Surface Water Management

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

7.3 The SuDS techniques highlighted in red below could be used on site. This assessment is based on the ground conditions and the potential discharge points available.

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

Most Sustainable	SUDS technique	Flood Reduction	Pollution Reduction	Landscape & Wildlife Benefit
	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 detailed project stage.

Flood Flow conveyance and storage

7.5 Due to the size of the development and its location on the flood zone, flood compensation for this development is not required.

Residual Risk 8

8.1 This flood risk assessment has identified the potential flooding mechanisms that could affect the site. This assessment has concluded that the development site requires additional flood risk mitigation strategies so all the flood risk can addressed.

Site access and public safety

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 result in no change in surface water generation. There is therefore no basis to indicate that, with respect to flood risk, the proposed development would have adverse impact on public safety.

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

Flood Warning and evacuation

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

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

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

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

b. Contact Emergency Fire Services (999) if necessary and/or Environment Agency Floodline: (0845 988 1188) if event was not expected.

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

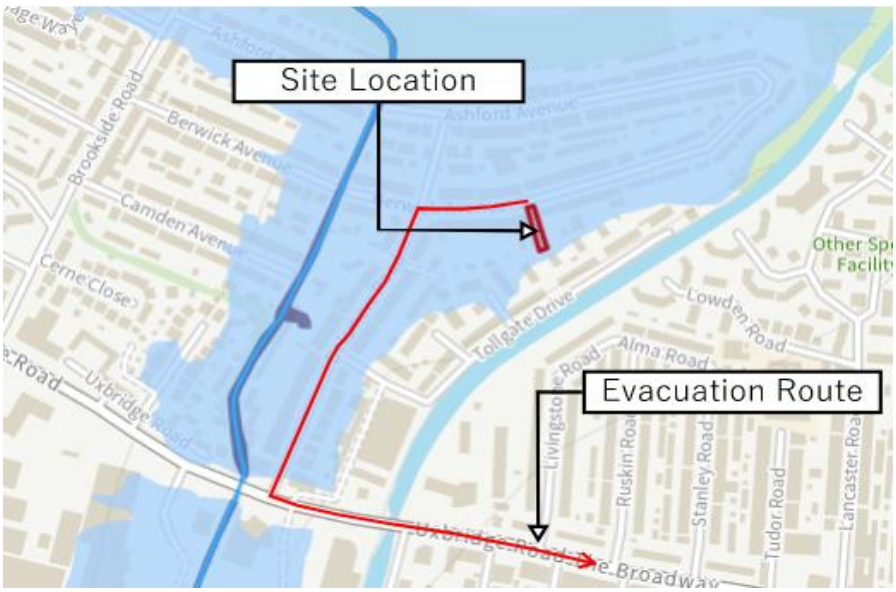
d. Follow the routes below to evacuate the site completely.

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 further action is 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.

8.8 Safe egress is achievable by following Berwick Avenue up to Delamere Road, then follow Uxbridge Road, which is shown to be beyond the extent of flooding. See figure below for details.

Evacuation Route

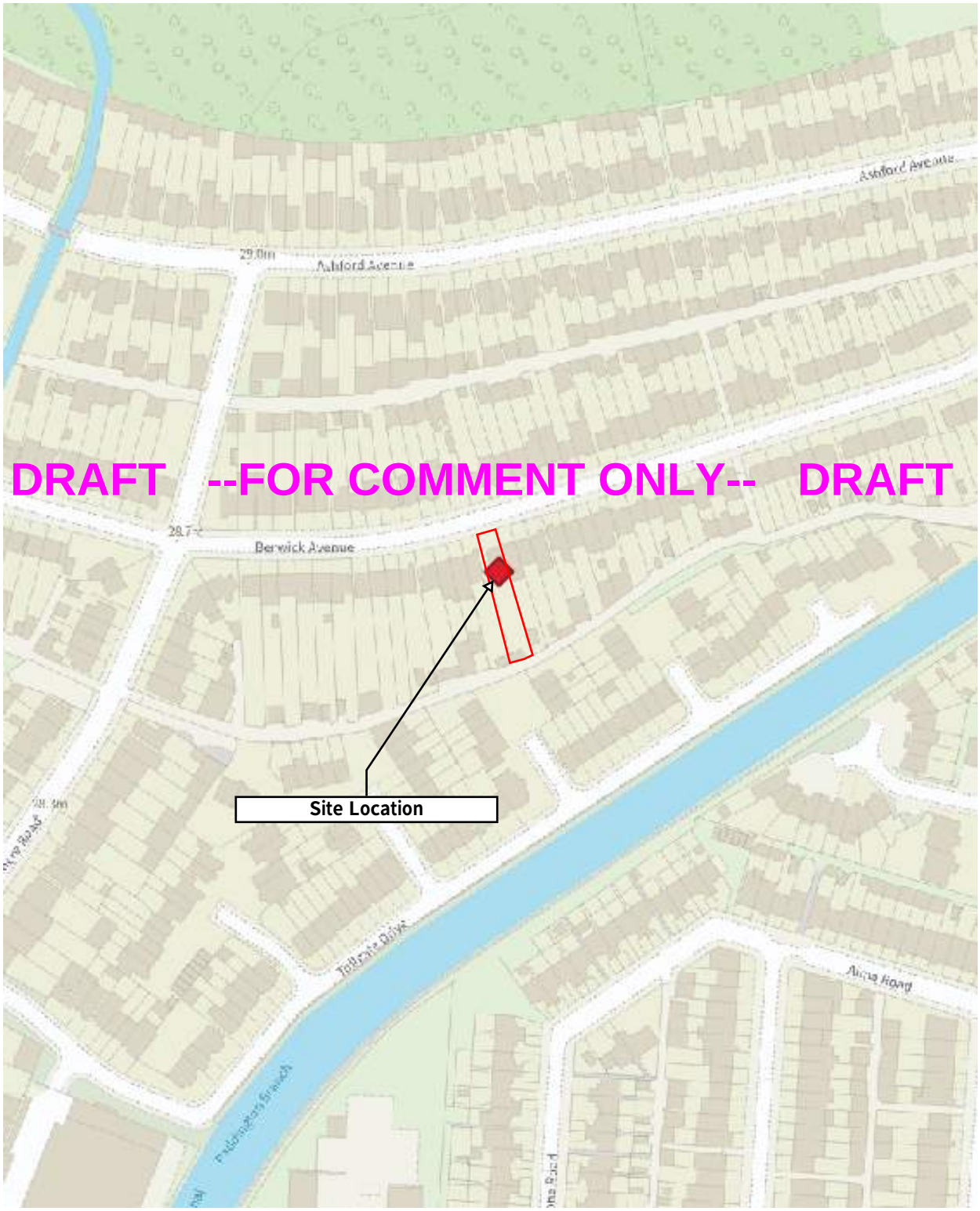


Conclusions 9

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.

Appendix A


DRAFT --FOR COMMENT ONLY-- DRAFT
Ashford Avenue
29.8m
Ashford Avenue
28.7m
Berwick Avenue
Site Location
Tollgate Drive
Aurora Road

Appendix B

PARTY WALL NOTICES:

PLEASE NOTE THAT BEFORE BUILDING WORKS COMMENCES IT IS THE RESPONSIBILITY OF BUILDER OR OWNER TO SERVE PARTY WALL NOTICES TO ALL NEIGHBOURS

NOTE:

DIMENSIONS:
ALL DIMENSIONS TO BE CHECKED ON SITE.
CONTRACTOR TO CHECK SITE THOROUGHLY BEFORE WORK STARTS & REPORT ANY DISCREPANCIES.

DIMENSIONS STATED ARE FOR GUIDANCE ONLY, CONTRACTOR TO VERIFY ALL BOUNDARY POSITIONS AND DIMENSIONS ON SITE PRIOR TO COMMENCING ANY WORKS,MAKING WORKSHOP DRAWINGS OR OBTAINING ANY MATERIALS.

NOTE: NO CHECK DIMENSIONS OF THE SITE HAVE BEEN TAKEN AND ALL INFORMATION AND DETAILS HAVE BEEN PROVIDED BY THE CLIENT.

NO SITE SUPERVISION IS IMPLIED OR UNDERTAKEN UNLESS OTHERWISE SEPARATELY ARRANGED.
THE DRAWING DOES NO INDICATE THE EXTENT OF ANY EXCAVATION WORKS AND THE CONTRACTOR IS TO DETERMINE THIS PRIOR TO SUBMITTING A QUOTATION FOR THE WORKS OR COMMENCING ANY WORKS.

THE DRAWING DOES NOT INDICATE OR IMPLY THE STRUCTURAL CONDITION OF THE EXISTING PROPERTY.THE DRAWINGS HAVE BEEN PREPARED FOR ASSISTANCE IN THE PREPARATION OF DETAILS FOR PLANNING AND BUILDING REGULATIONS PURPOSES ONLY.NO CHECK DIMENSIONS HAVE BEEN TAKEN,ALL DETAILS HAVE BEEN PROVIDED BY THE CLIENT.

THE USE OF PERMITTED DEVELOPMENT RIGHTS PROPERTY IS SUBJECT TO INFORMATION PROVIDED BY OWNER REGARDING THE STATUS OF PROPERTY AS A DWELLING HOUSE AND THE DWELLING NOT BEING IN A CONSERVATION AREA. ANY DEVELOPMENT WITH OUT A CERTIFICATE OF LAWFULNESS OR PLANNING PERMISSION IS SOLELY AT OWNER'S RISK.

LEGEND

- (SE) = SMOKE DETECTOR WITH SOUNDER
- (E) = EMERGENCY LIGHTING TO BS5266: Part 1 1988
- (HD) = HEAT DETECTOR
- FD30 = 30 MINUTE FIRE RESISTING DOOR AND FRAME

0 1 2 3 4 5
Metres

ISSUE	DATE	INITIALS	GRID REF	DESCRIPTION
A	160623	AT		FIRST ISSUE

STUDIO 21
DESIGN
TRICON
497 SUNLEIGH ROAD HA0 4LY [020 8252 3233]

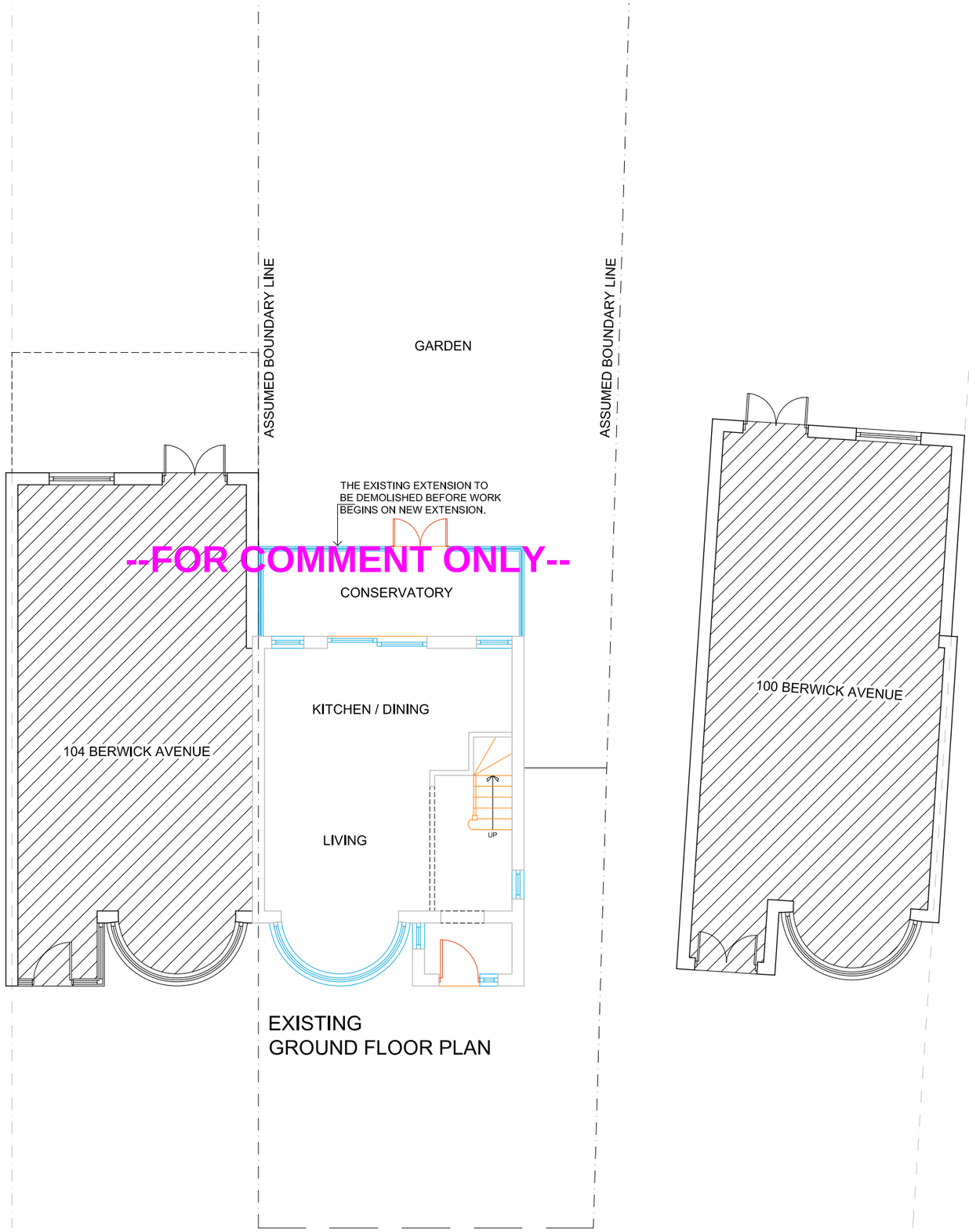
PROJECT
102 BERWICK AVENUE
HAYES
UB4 0NH

DWG TITLE
PLANS

CLIENT
MR. KULJINDER SINGH

DWG NO:	ISSUE
TRICON/102BA/101	A

SCALE	DATE	DRAWN BY
1:100@A3	16 JUNE	AT



EXISTING
GROUND FLOOR PLAN

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0 1 2 3 4 5
Metres

ISSUE	DATE	INITIALS	GRID REF	DESCRIPTION
A	160623	AT		FIRST ISSUE

STUDIO 21
TRICON DESIGN
497 SUNLEIGH ROAD HA0 4LY [020 8252 3233]

PROJECT
102 BERWICK AVENUE
HAYES
UB4 0NH

DWG TITLE
PLANS

CLIENT
MR. KULJINDER SINGH

DWG NO:	ISSUE
TRICON/102BA/102	A

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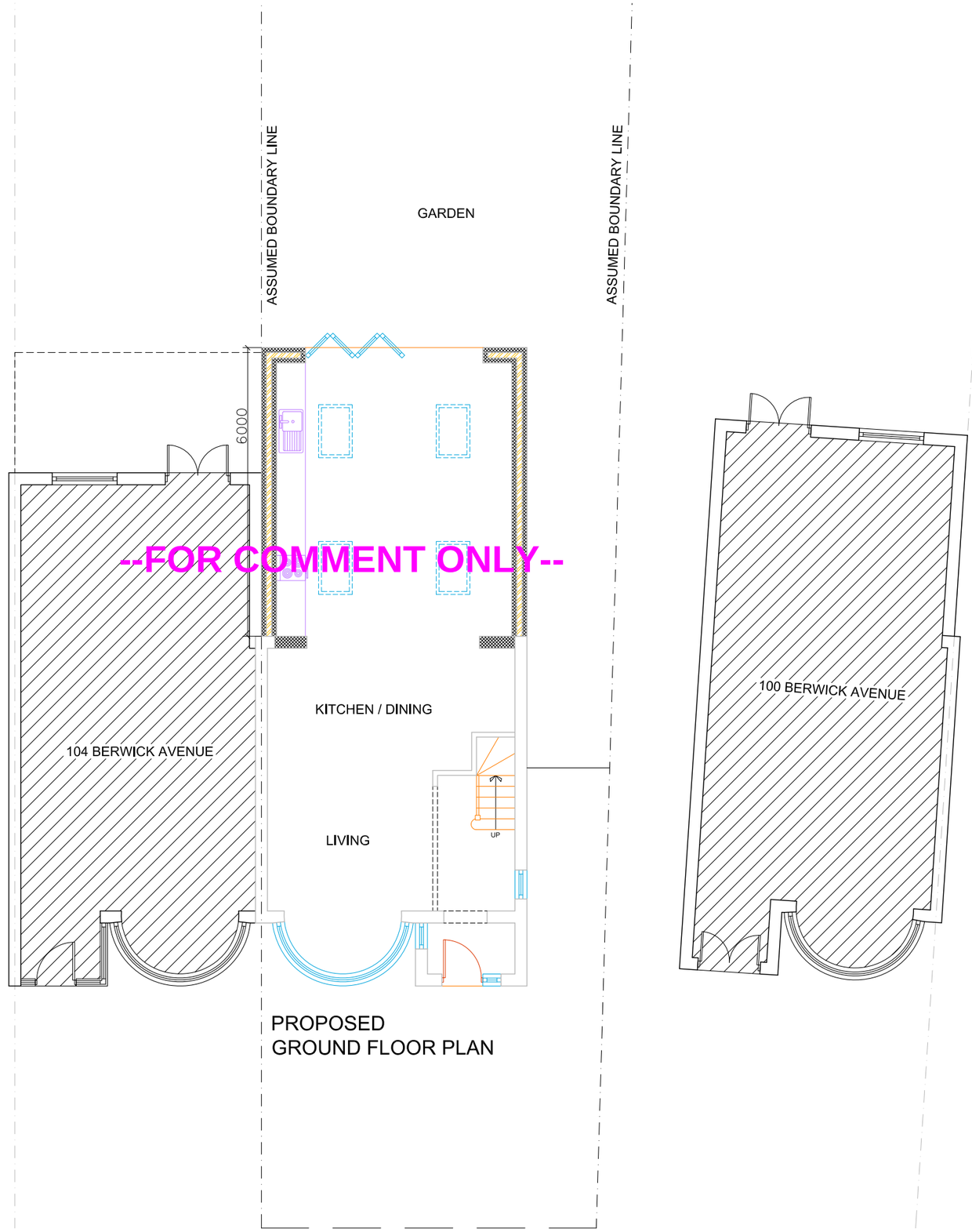

PROPOSED
GROUND FLOOR PLAN

DRAFT

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TRICON
497 SUNLEIGH ROAD HA0 4LY [020 8252 3233]

PROJECT
102 BERWICK AVENUE
HAYES
UB4 0NH

DWG TITLE
ELEVATIONS

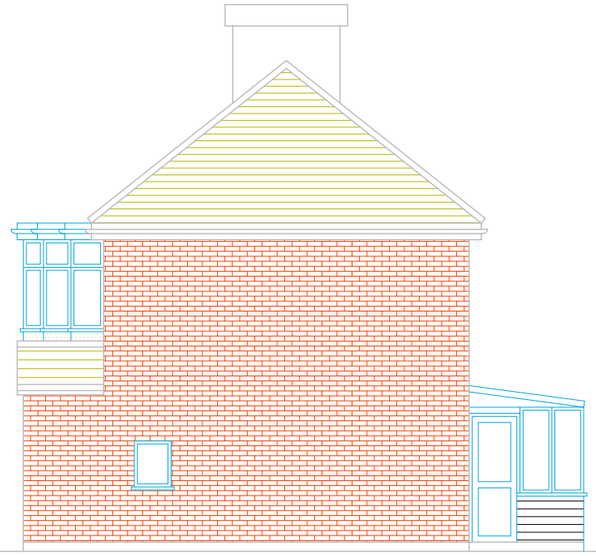
CLIENT
MR. KULJINDER SINGH

DWG NO: TRICON/102BA/103

ISSUE A

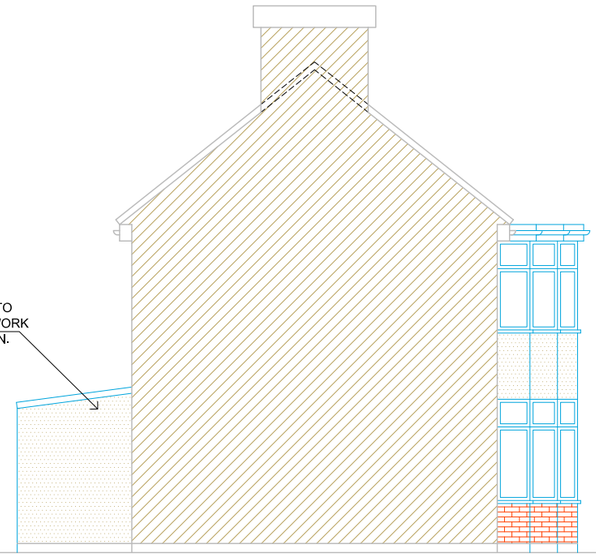
SCALE	DATE	DRAWN BY
1:100@A3	16 JUNE	AT

EXISTING
FRONT ELEVATION



EXISTING
SIDE ELEVATION-1

EXISTING
REAR ELEVATION



EXISTING
SIDE ELEVATION-2

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STUDIO 21
DESIGN TRICON
497 SUNLEIGH ROAD HA0 4LY [020 8252 3233]

PROJECT
102 BERWICK AVENUE
HAYES
UB4 0NH

DWG TITLE
ELEVATIONS

CLIENT
MR. KULJINDER SINGH

DWG NO: TRICON/102BA/104
ISSUE A

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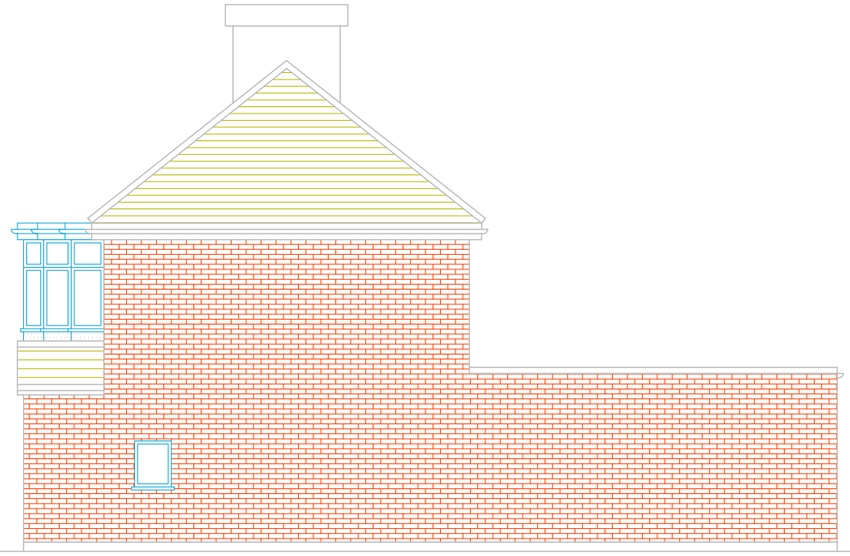
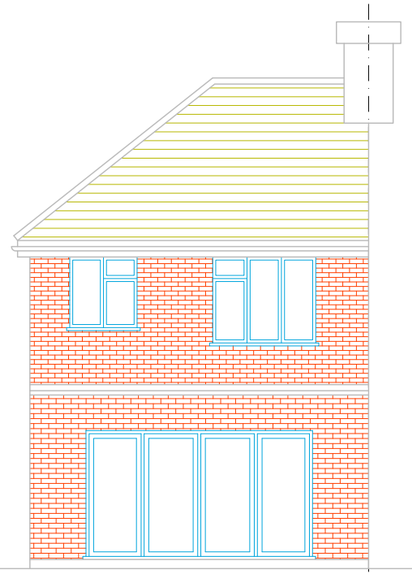
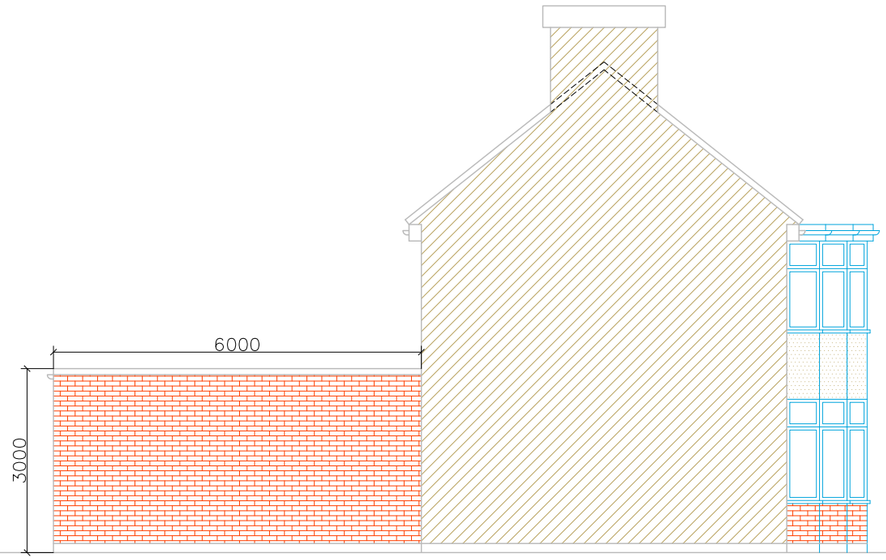
PROPOSED
FRONT ELEVATION



PROPOSED
SIDE ELEVATION-1



PROPOSED
REAR ELEVATION



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TRICON
497 SUNLEIGH ROAD HA0 4LY [020 8252 3233]

PROJECT
102 BERWICK AVENUE
HAYES
UB4 0NH

DWG TITLE
ROOF PLANS

CLIENT
MR. KULJINDER SINGH

DWG NO:	ISSUE
TRICON/102BA/105	A

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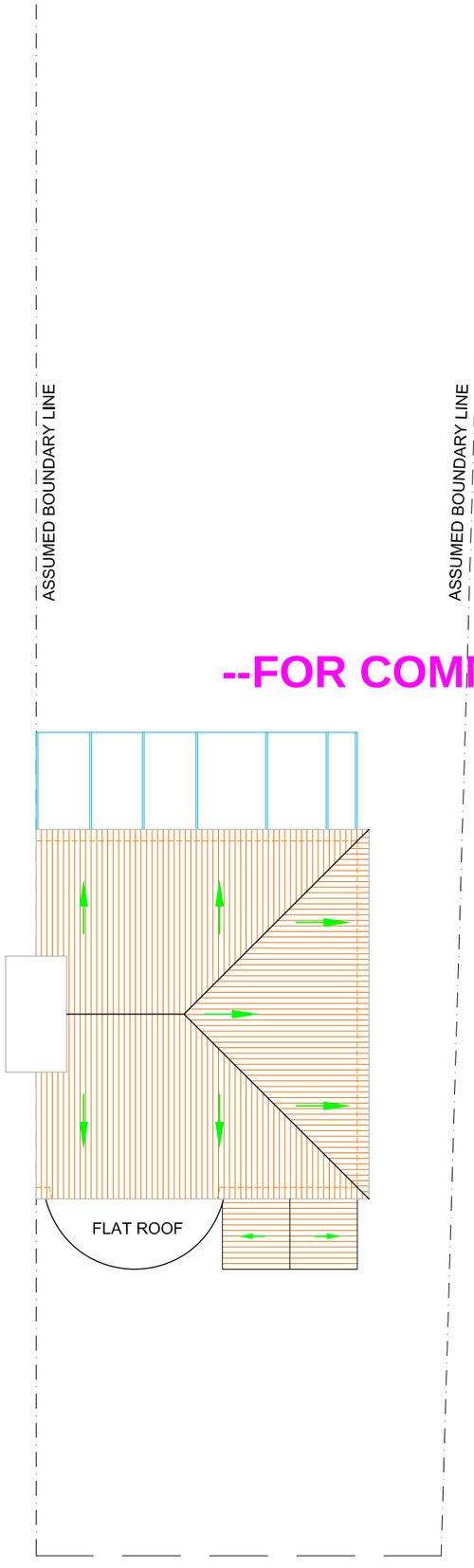

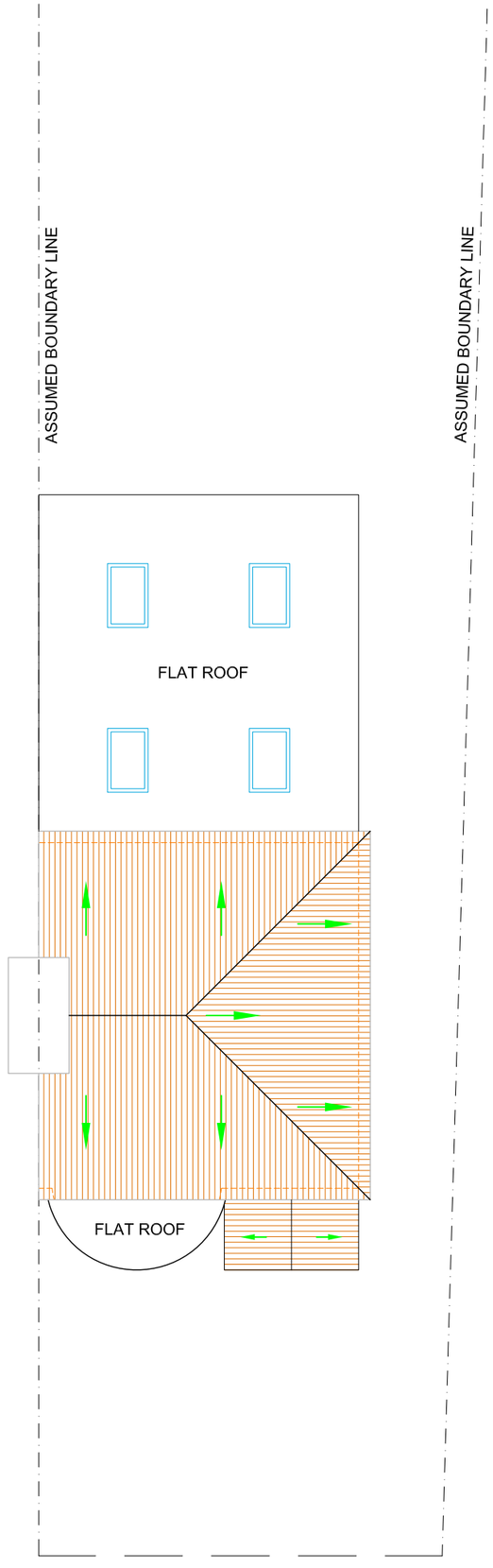

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497 SUNLEIGH ROAD HA0 4LY [020 8252 3233]

PROJECT
102 BERWICK AVENUE
HAYES
UB4 0NH

DWG TITLE
EXISTING SITE PLAN

CLIENT
MR. KULJINDER SINGH

DWG NO:	ISSUE
TRICON/102BA/106	A

SCALE	DATE	DRAWN BY
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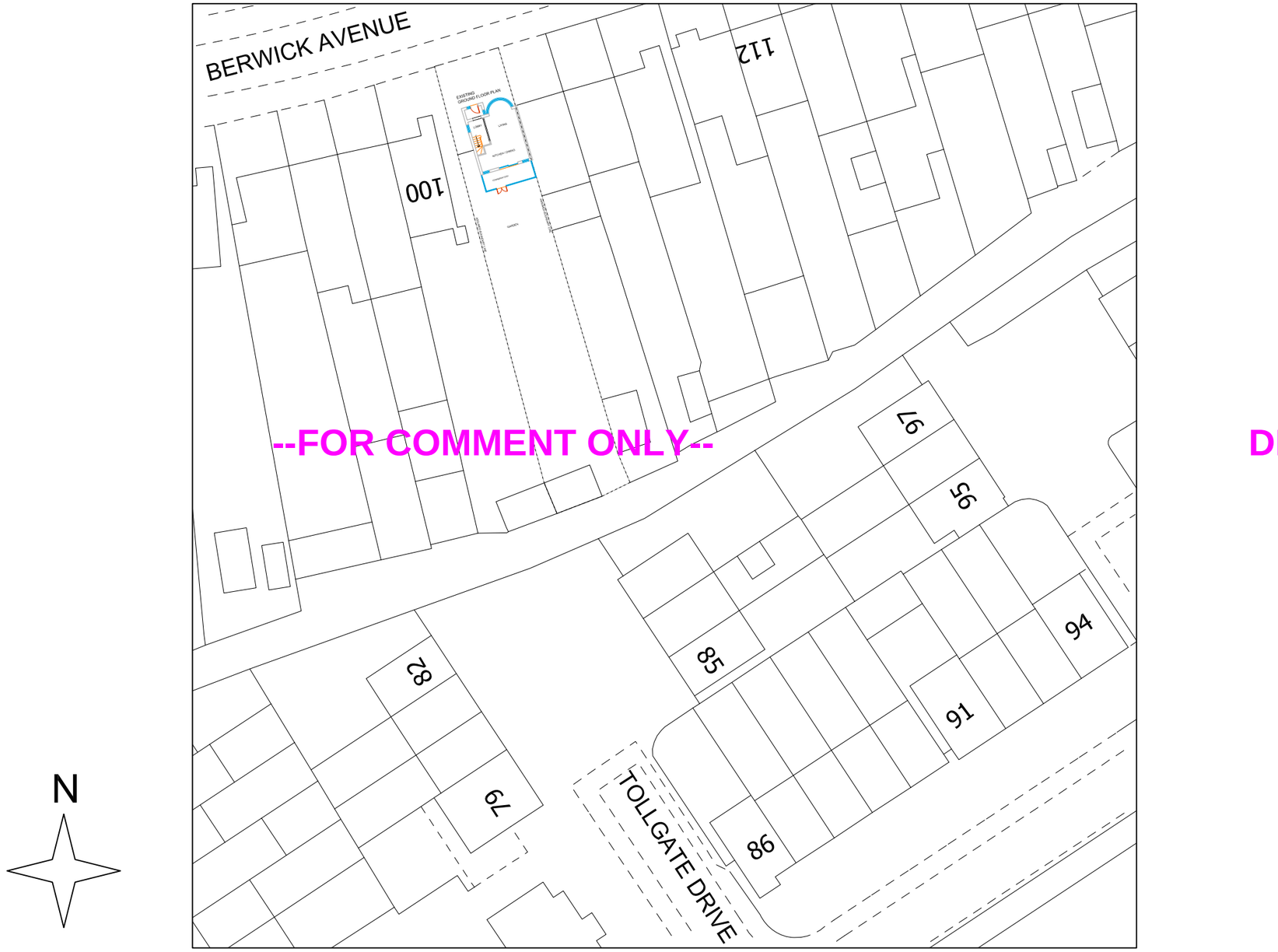

--FOR COMMENT ONLY--

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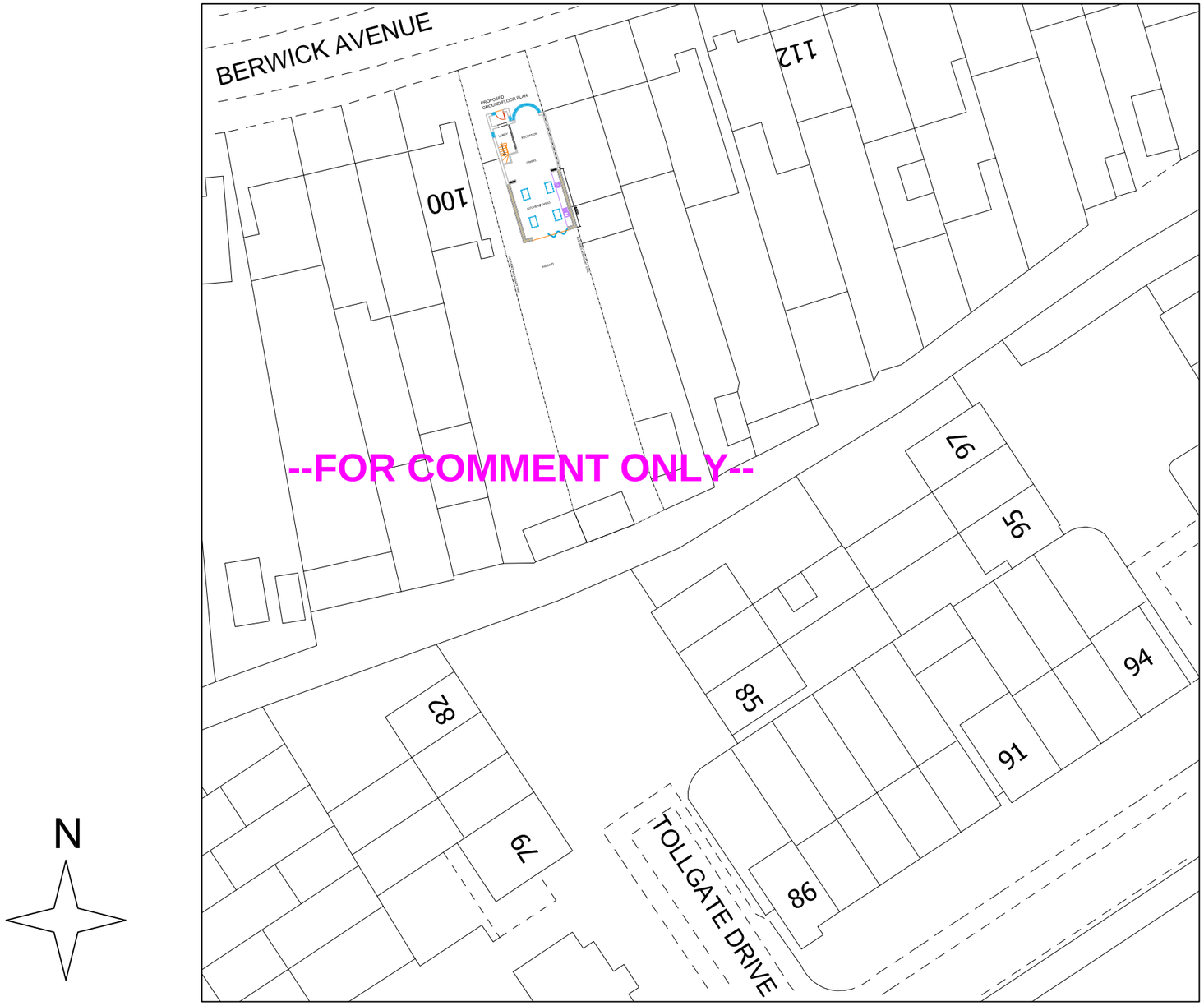

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STUDIO 21
TRICON DESIGN
497 SUNLEIGH ROAD HA0 4LY [020 8252 3233]

PROJECT
102 BERWICK AVENUE
HAYES
UB4 0NH

DWG TITLE
PROPOSED SITE PLAN

CLIENT
MR. KULJINDER SINGH

DWG NO:	ISSUE
TRICON/102BA/107	A

SCALE	DATE	DRAWN BY
1:500@A3	16 JUNE	AT

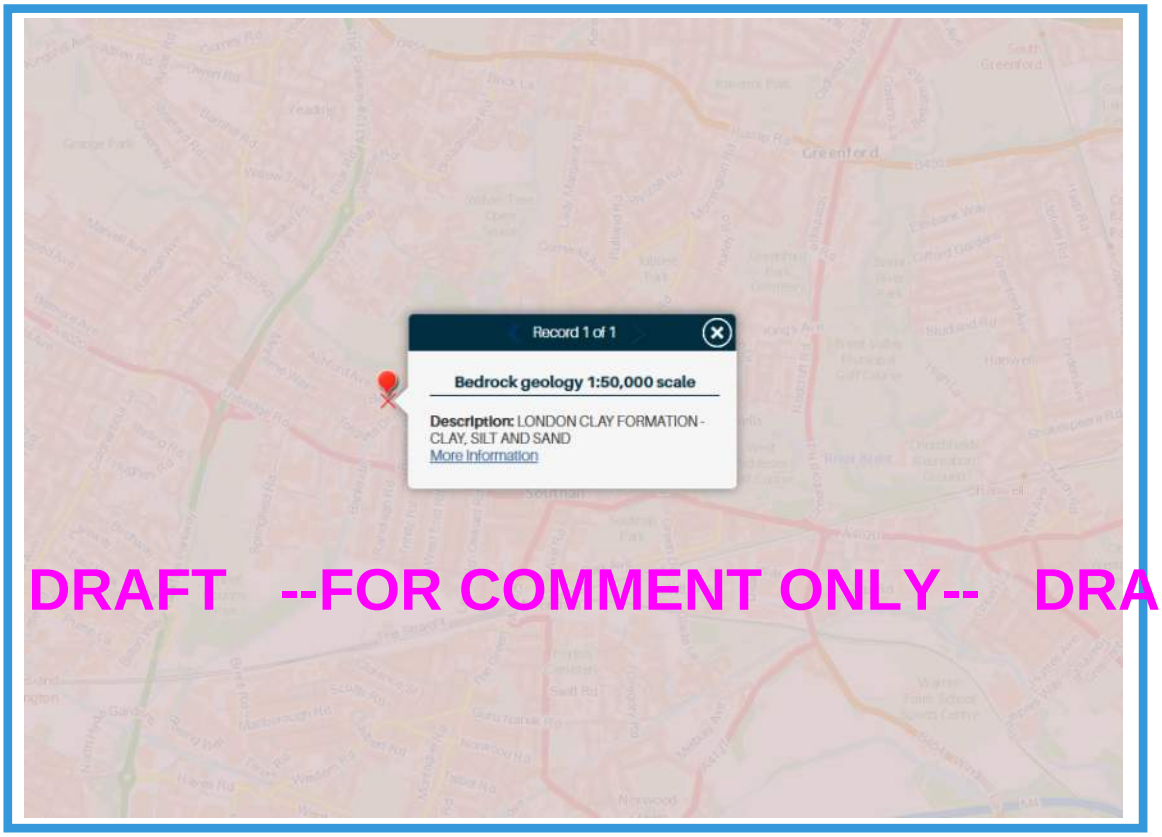
Appendix C

DRAFT --FOR COMMENT ONLY-- DRAFT

SITE GEOLOGY

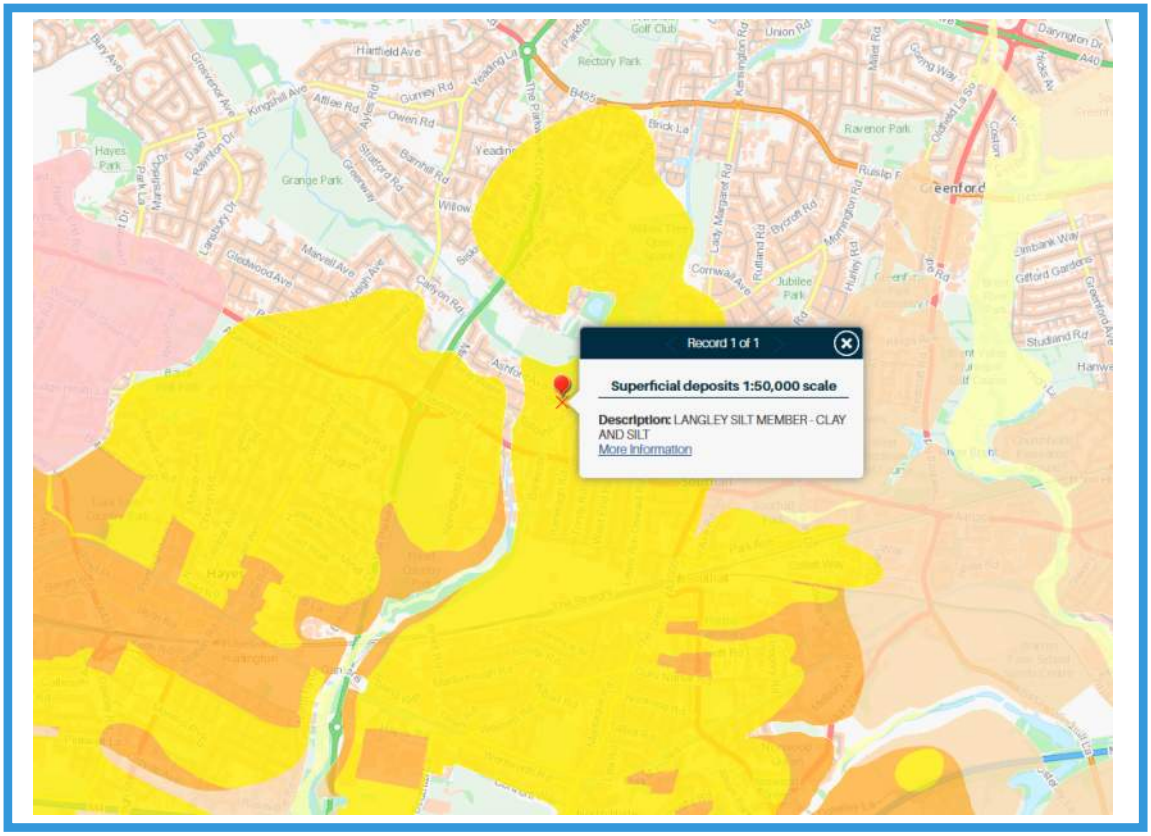
GEOINDEX ONSHORE

GEOLOGY - BEDROCK - LONDON CLAY FORMATION - CLAY, SILT AND SAND



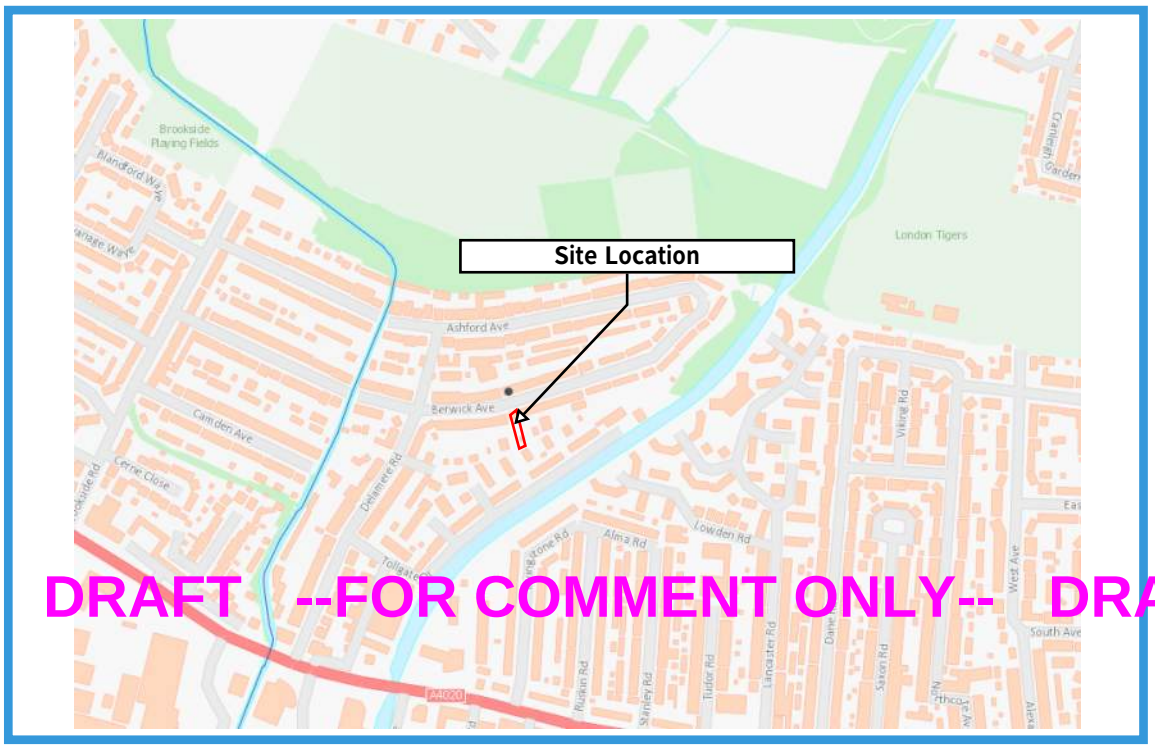
GEOINDEX ONSHORE

GEOLOGY - SUPERFICIAL DEPOSITS - LANGLEY SILT MEMBER - CLAY AND SILT



SITE HYDROGEOLOGY

Environment Agency Main River Map



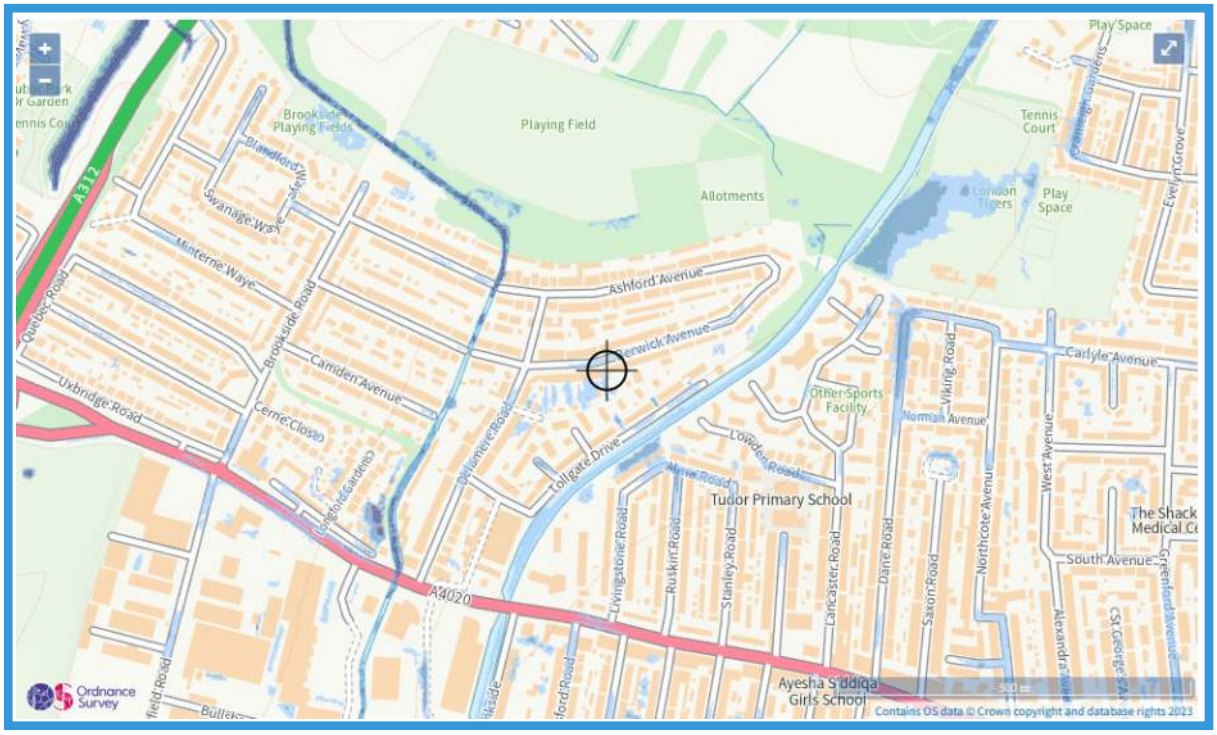
when river levels are normal when there is also flooding from rivers

SITE SURFACE WATER FLOOD RISK

Flood risk from surface water

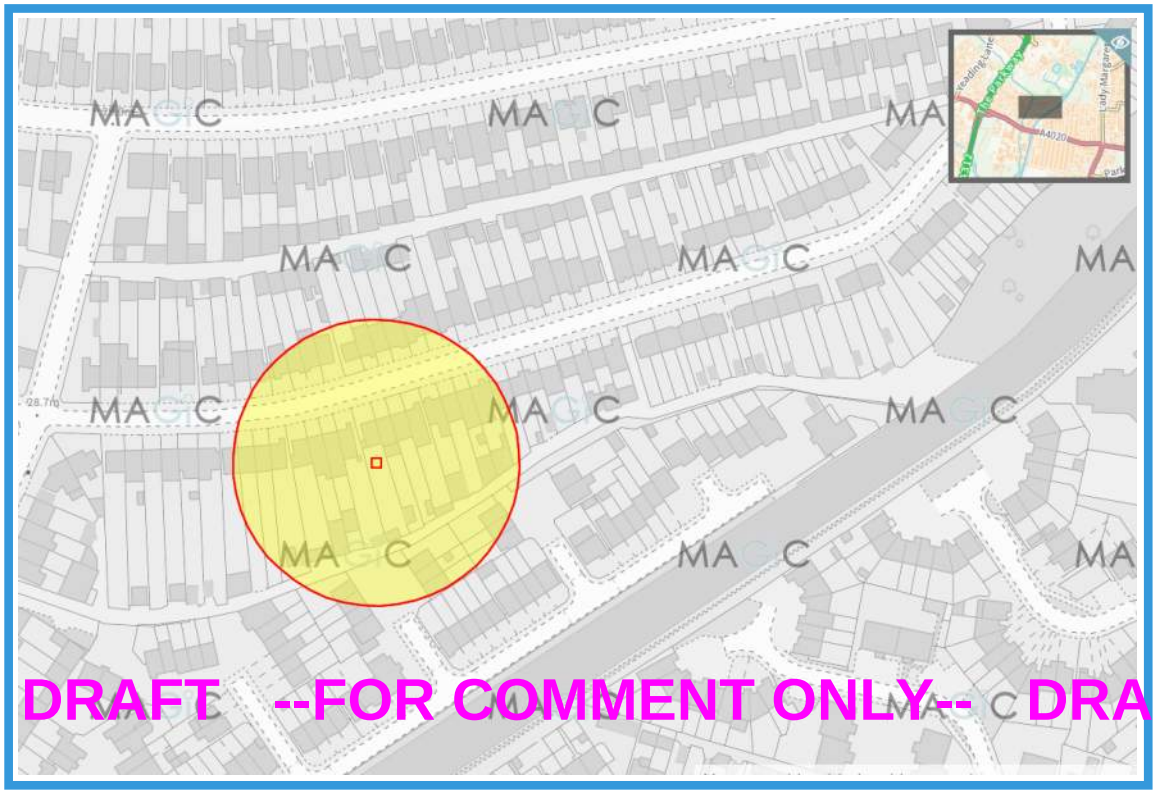
Extent of flooding

High risk means a chance of flooding greater than 3.3% (1:30)
Medium risk means a chance of flooding of btw 1% (1:100) and 3.3%
Low risk means a chance of flooding of btw 0.1% (1:1000) and 1%
Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding



Over 900mm 300 to 900mm Below 300mm

MAGIC RESULTS



Site Check Results

Site Check Report Report generated on Thu Aug 10 2023
You selected the location: Centroid Grid Ref: TQ11938091
The following features have been found in your search area:

Aquifer Designation Map (Bedrock) (England)

Typology	Unproductive

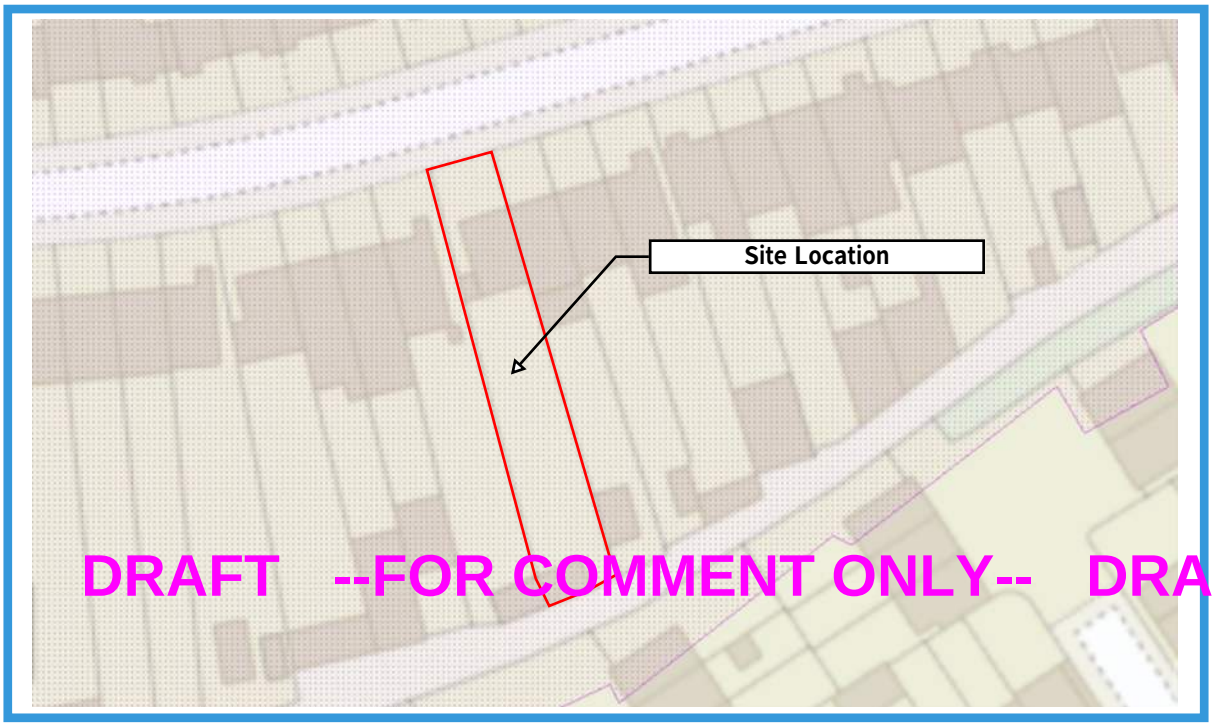
Aquifer Designation Map (Superficial Drift) (England)

Typology	Unproductive

Source Protection Zones merged (England)
No Features found

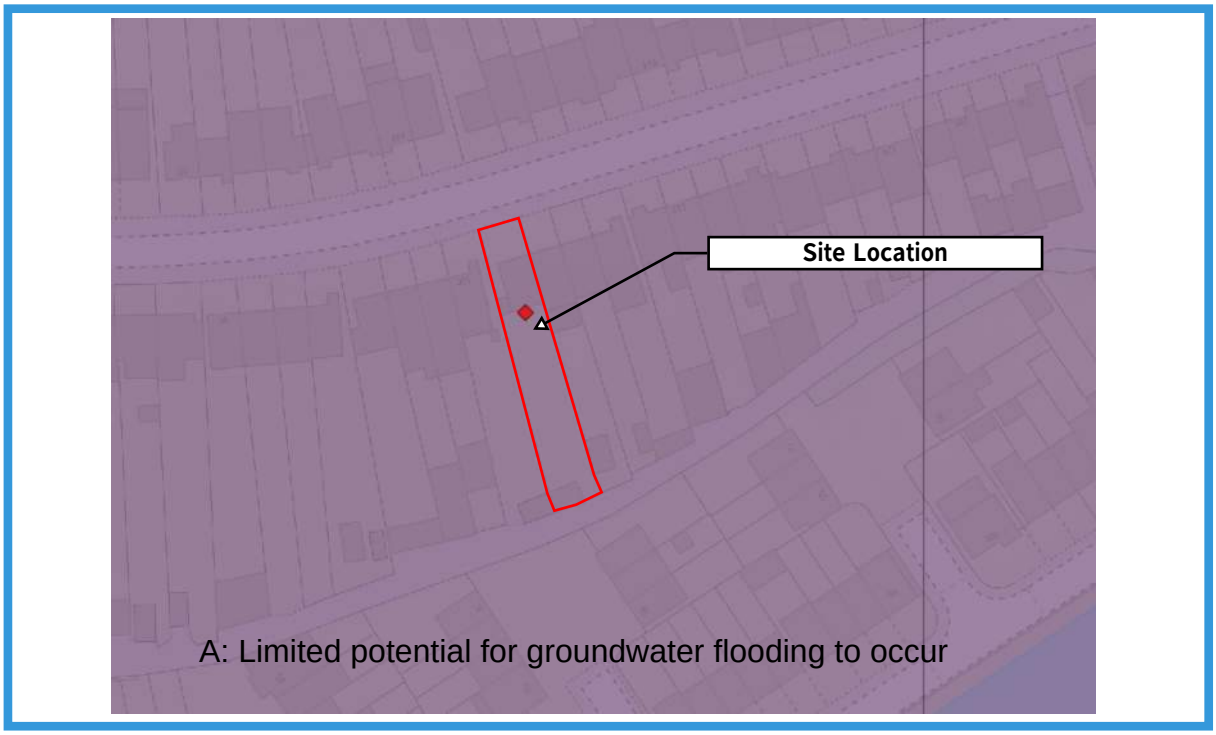
OK Cancel Export to CSV Print

FLOOD WARNING AREA

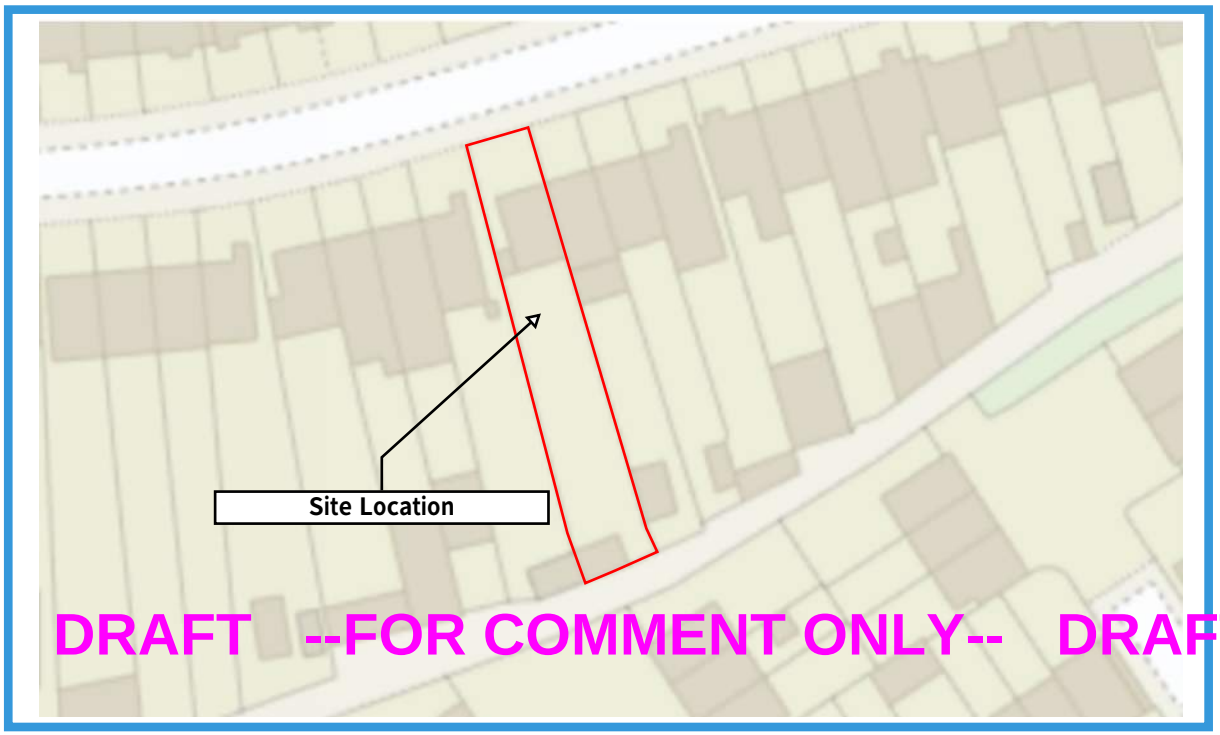


Flood Warning areas

GROUND WATER FLOOD RISK

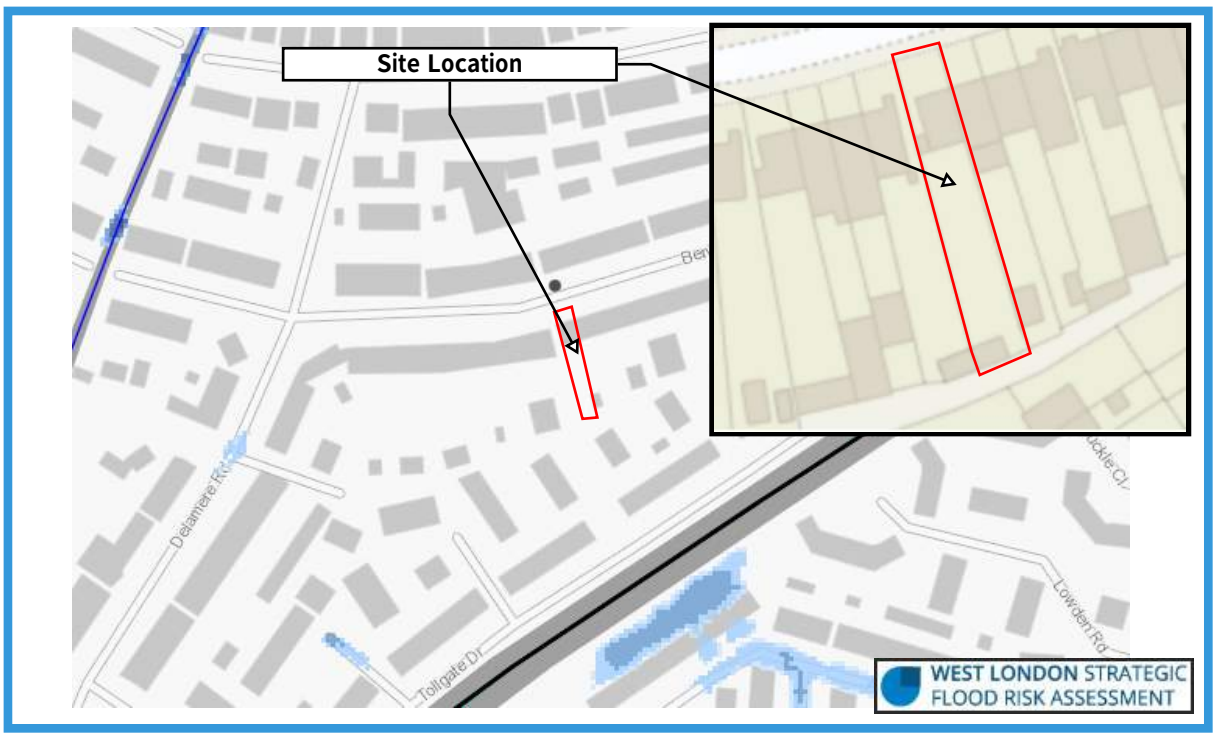


HISTORIC FLOOD MAP

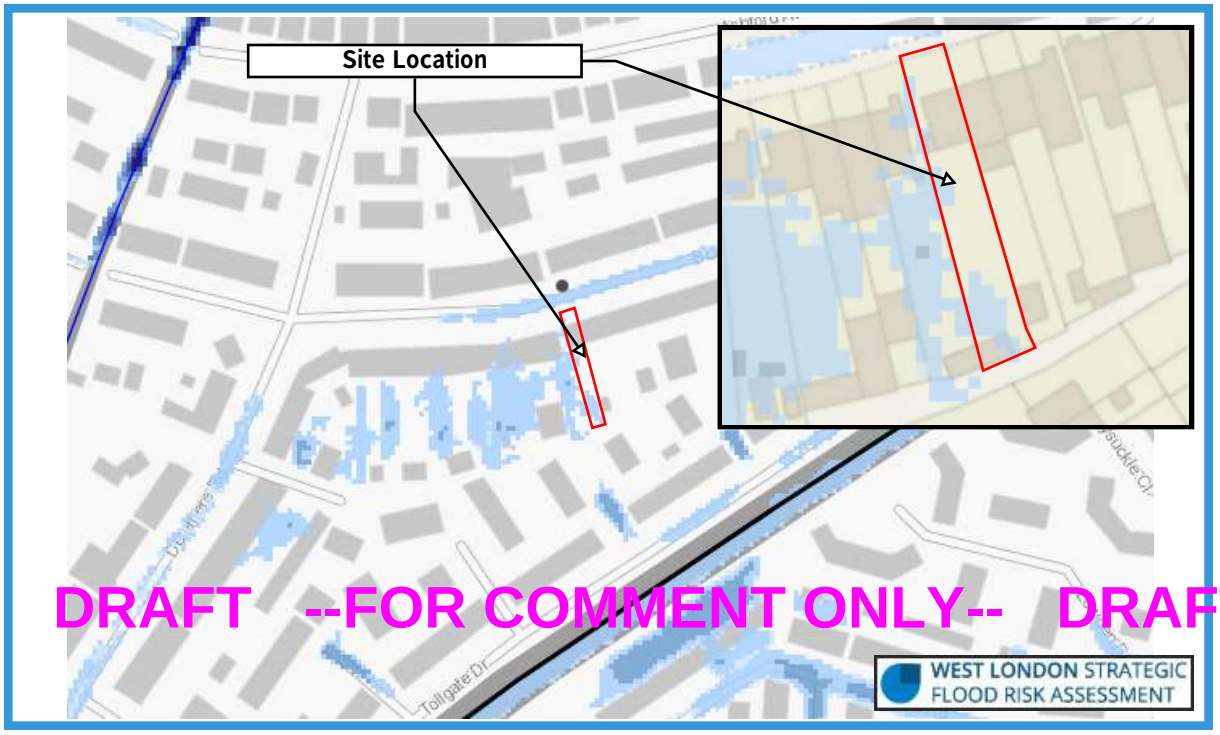


Historic Flood Outline

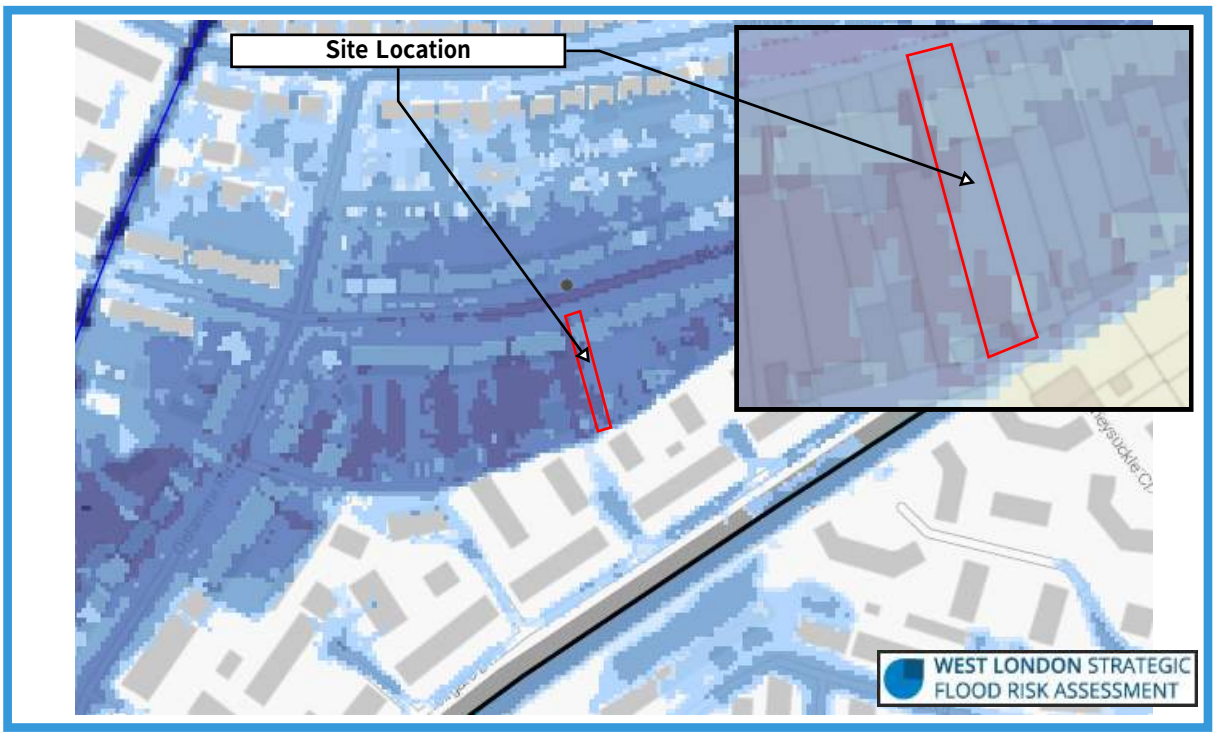
EA - RISK OF FLOODING FROM SURFACE WATER DEPTH: 3.3 PORCENT ANNUAL CHANCE



EA - RISK OF FLOODING FROM SURFACE WATER DEPTH: 1.0 PORCENT ANNUAL CHANCE



EA - RISK OF FLOODING FROM SURFACE WATER DEPTH: 0.1 PORCENT ANNUAL CHANCE



Flood map for planning

Your reference	Location (easting/northing)	Created
<Unspecified>	**511936/180913**	**10 Aug 2023 17:27**

Your selected location is in flood zone 2, an area with a medium probability of flooding.

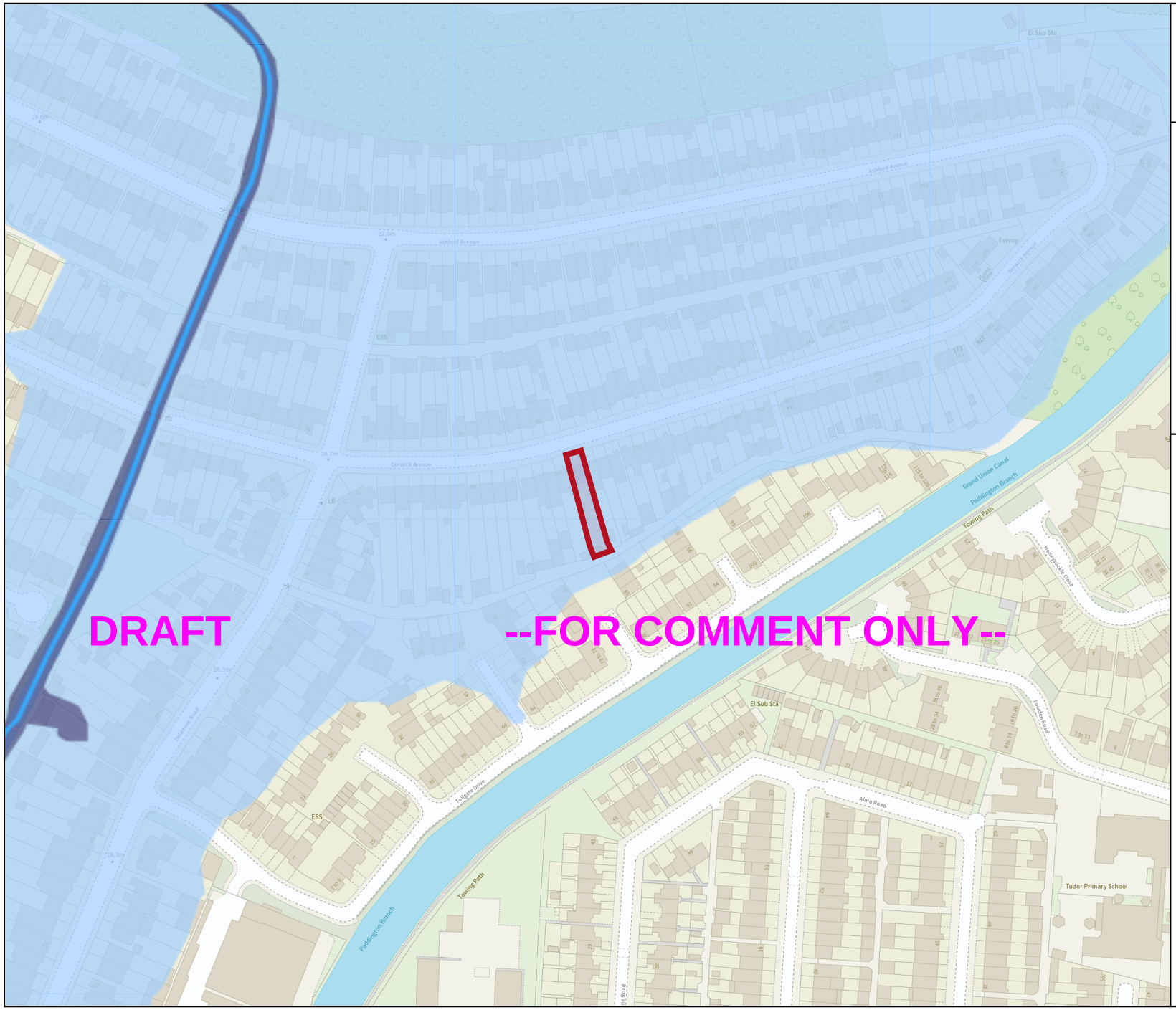
This means:

- you must complete a flood risk assessment for development in this area
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (see www.gov.uk/guidance/flood-risk-assessment-standing-advice)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.



Environment Agency

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
511936/180913

Scale
1:2500

Created
10 Aug 2023 17:27

- Selected area
- Flood zone 3
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Water storage area

0 20 40 60m