

whitby wood

4-8 Sedgemere Road

Flood Risk Assessment

Abbey Wood Sedgemere Limited

Date: 28/07/25

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1 INTRODUCTION

This Flood Risk Assessment (FRA) has been prepared in accordance with National Planning Policy Framework (NPPF) to support the proposed development at 4-8 Sedgemere Road, hereby referred to as 'The Site'. This assessment has been undertaken to ascertain the constraints in order to redevelop the site, and to assess the impact of the proposals, with respect to flood risk.

1.1 Purpose of Document

The National Planning Policy Framework (NPPF) says in paragraph 181 that development should only be allowed in areas at risk of flooding where, in the light of a flood risk assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

- a) Within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location.
- b) The development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment.
- c) It incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate.
- d) Any residual risk can be safely managed; and
- e) Safe access and escape routes are included where appropriate, as part of an agreed emergency plan.

This Flood Risk Assessment (FRA) has, therefore, been prepared to address these requirements. The NPPF also says in paragraph 182 that major developments should incorporate sustainable drainage systems (SuDS) unless there is clear evidence that this would be inappropriate. The proposed development is 'major' and, therefore, this flood risk assessment alongside the drainage strategy report have been prepared to address the requirement for SuDS.

1.2 Sources of Information

A review of the relevant information from a range of sources has been undertaken and includes the following:

- Ministry of Housing Communities & Local Government, National Planning Policy Framework (NPPF) (2024);
- Bexley Council, Local Plan (2023);
- Bexley Council, Strategic Flood Risk Assessment (2020);
- British Geology Survey [Accessed February 2024];
- Greenhatch Group GPR survey (2023);
- Thames Water Drainage and Water Enquiry (December 2023); and
- Thames Water DG5 data.

1.3 Environment Agency Data

The following information has been gathered from DEFRA's Spatial Data Catalogue of data.gov.uk [accessed Sep 2024].

- Flood Map for Planning (Rivers and Sea) – Flood Zone 2;
- Flood Map for Planning (Rivers and Sea) – Flood Zone 3;
- Risk of Flooding from Reservoirs – Maximum Flood Extent;
- Risk of Flooding from Surface Water Extent (1%, 3.3% and 0.1% AEP);
- Statutory Main River Map;
- Product 8, Thames Tidal Downriver Breach hazard Mapping; and
- Product 4, Detailed Flood Risk.

2 THE SITE

2.1 Site Location

The Site falls within the Abbey Wood and South Thamesmead Opportunity Area, identified for significant housing and job creation within the London Plan.

The Site extends to approximately 0.272 hectares (ha). The Site is located in the Thamesmead East ward.

The Site is bordered by Harrow Manorway to the west, Overton Road, a BP Garage to the north and Sedgemere Road to the east. To the southern boundary there are a collection of trees and residential buildings, further beyond is the Station Car Park.

The area to the east of the Site is made up of predominantly residential buildings, to the west is a mixture of residential, office, a supermarket and Abbey Wood Station.

The Site is currently being used as a trade counter, car repair garage, workshop and ancillary storage space. The Site is accessed from Sedgemere Road and currently fenced off from Harrow Manorway. The Site is largely level but the Harrow Manorway to the west does begin to incline significantly in front of the Site giving the appearance of the site being sunken. There is an existing footpath between the Site and the wall of the road.

A site location plan has been included in Figure 1, which can also be found in **Appendix A**.



FIGURE 1 - SITE LOCATION PLAN

2.2 Watercourses

The nearest main watercourse is an unnamed river approximately 90m to the south of the site. However, these would not be considered a suitable surface water discharge location as it would involve bypassing third party land.

2.3 Geology and Hydrogeology

Information published by the BGS indicates that the site is directly underlain by Alluvium (clay, silt, sand and peat) superficial deposits, overlying the Thanet Formation (sand) bedrock as shown in Figure 2.

Made Ground is not mapped across the site or wider area however given the developed nature of the site it is likely to be present at varying thicknesses. BGS historical borehole logs in the south west of site (ref: TQ47NE/157) from February 1970 indicates Made Ground of very sandy clay with some stone ash down to 0.60m below ground level (bgl), overlying Alluvium comprising soft brown silty clay to 3.90mbgl, with black peat to 7.00m bgl with brown sand and gravel deposits (likely River Terrace Deposits) to 13.70m bgl. The Thanet Formation recorded as a grey silty fine sand was recorded to a depth of 19.65m bgl with Lewes Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk Formation beneath.

The site is not indicated to be within a source protection zone.



FIGURE 2 – BRITISH GEOLOGY SURVEY MAP

2.4 Proposed Development

The demolition of the existing commercial buildings and phased redevelopment for residential use (Use Class C3) and ancillary amenity, including basement, ground floor non-residential unit (Use Class E(a), E(b), E(c), E(c)i, E(c)ii, E(c)iii, E(e), E(g)i, E(g)ii, F2(b), boundary treatment, soft and hard landscaping, public realm improvements, highways works, cycle and car parking infrastructure and associated works.

The proposed accommodation schedule can be located in **Appendix B**.

3 FLOOD RISK

3.1 Fluvial

The Environment Agency’s Flood Risk Data shows the entire site is situated within Flood Zone 3 but also within an area that is benefiting from flood defence. Land within this Flood Zone is defined as land with a 0.1% or less annual probability of river or sea flooding. Therefore, the risk of flooding from Fluvial can be deemed as very low. Figure 3 shows the site overlaid by the flood zone map, which can also be found in **Appendix C**. It demonstrates that the nearest area situated outside of Flood Zone 1 is approximately 1.0 km away. The definition of each flood zone can be found below.

- Land in **Flood Zone 1** has a 0.1% or less annual probability of river or sea flooding;
- Land in **Flood Zone 2** has between 0.1% and 1% annual probability of river flooding and between 0.1% and 0.5% annual probability of sea flooding; and
- Land in **Flood Zone 3** has a 1% or greater annual probability of river flooding and a 0.5% or greater annual probability of sea flooding.

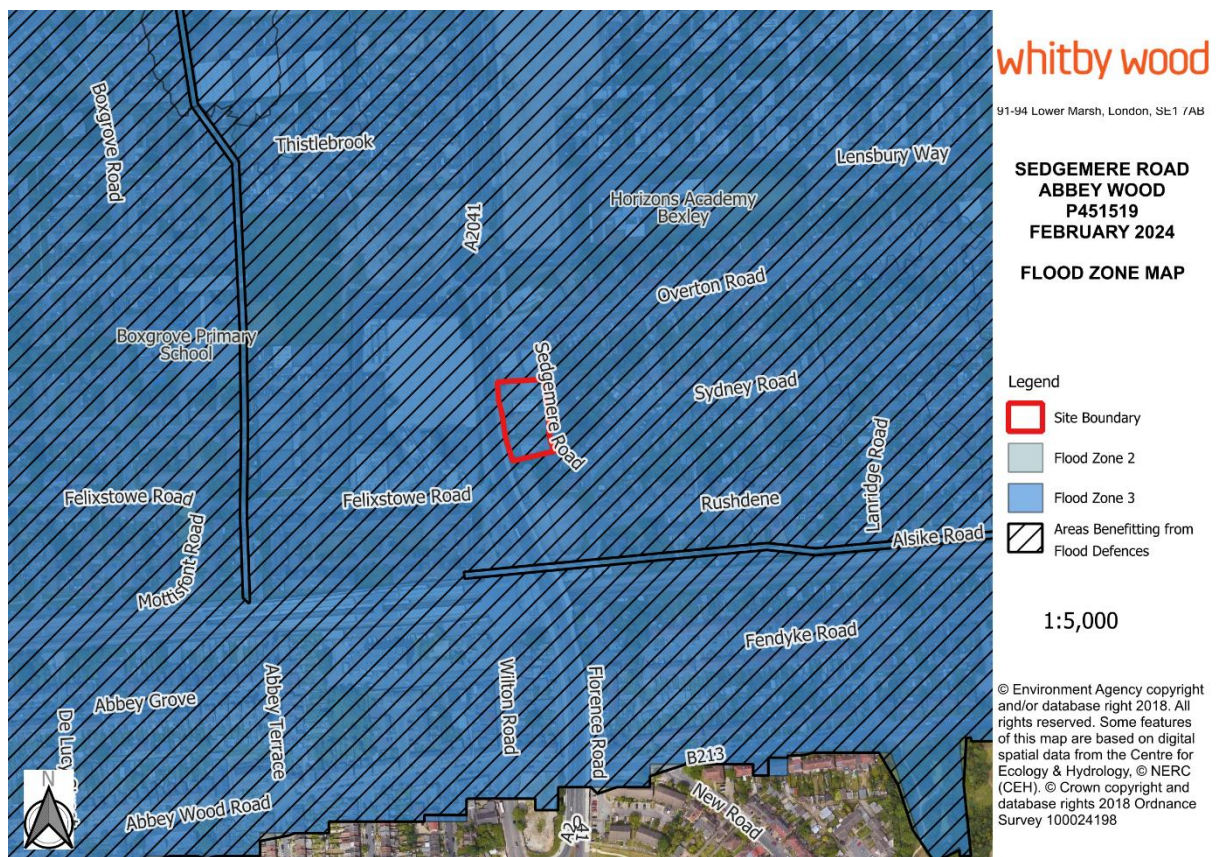


FIGURE 3 - FLOOD ZONE MAP

3.2 Tidal Breach Data

As shown in Table 1 and **Appendix D**, product 4 and 8 data was received from the Environmental Agency which demonstrates that the site is situated within an area that is within a Thames tidal downriver Breach Hazard Area. This shows that that during a tidal breach of the Thames, the maximum depth and velocity is 1.5 m and 0.3 m/s respectively for both analysed return periods. This correlates to ‘danger for most’,

however as the likelihood of a breach occurring is very rare, and therefore deemed a residual risk, this will be mitigated within the managing flood risk section of this FRA. The modelled data for nodes location points on site and their respective tidal breach level can be shown in table 2.

TABLE 1 – THAMES WATER DOWNRIVER BREACH HAZARD DATA

	Scenario Annual Chance	
	1 in 200 year	1 in 1000 year
Max Hazard	Danger for Most	Danger for Most
Max Depth (m)	1.00-1.50	1.00-1.50
Max Velocity (m/s)	0-0.3	0-0.3

TABLE 2 – THAMES WATER DOWNRIVER BREACH INUNDATION MODELLING

Nodes	Modelled Levels in mAODN for 0.5% AEP	
	2014	2115
1	1.86	2.50
2	1.86	2.50
4	1.86	2.50
5	1.86	2.50
8	1.86	2.50
9	1.86	2.50
12	1.85	2.50

3.3 Surface Water

The risk of surface water flooding has been assessed by viewing the Updated Flood Maps for Surface Water (uFMfSW), which have been replicated in Figure 4 and included in **Appendix B**. This shows for the entire building footprint, the risk is 'very low' with only a minor section of the site at the east being 'low' risk, and therefore won't be analysed further. The definitions for each surface water flood risk category have been detailed below:

- **Very low** risk means that each year this area has a chance of flooding of less than 0.1%.
- **Low** risk means that each year this area has a chance of flooding of between 0.1% and 1%.
- **Medium** risk means that each year this area has a chance of flooding of between 1% and 3.3%. 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.
- **High** risk means that each year this area has a chance of flooding of greater than 3.3%.



FIGURE 4 - RISK OF SURFACE WATER FLOODING EXTENT MAP

3.4 Groundwater

According to the Bexley Strategic Flood Risk Assessment, the site is within an area that is classified as having a minor susceptibility to groundwater flooding. This is shown in the figure below.

However, historic groundwater flooding is reported in the SFRA at Thamesmead only, where issues with standing water are thought to be caused by the interaction of high groundwater levels and limited capacity sewers. Where, groundwater flooding occurs it can also reduce the capacity in sewers as such exacerbating flooding.

Based on the historical BGS logs, groundwater was encountered at depth of 0.60m and 1.50m, on both logs groundwater was recorded between the interface of the Made Ground and Alluvium which suggest that there is presence of groundwater locally near the site.

Given the contradiction of available information and historical records indicating high water levels the groundwater flooding is deemed to be a 'medium' risk and will be assessed further within the Managing Flood Risk section of this report.

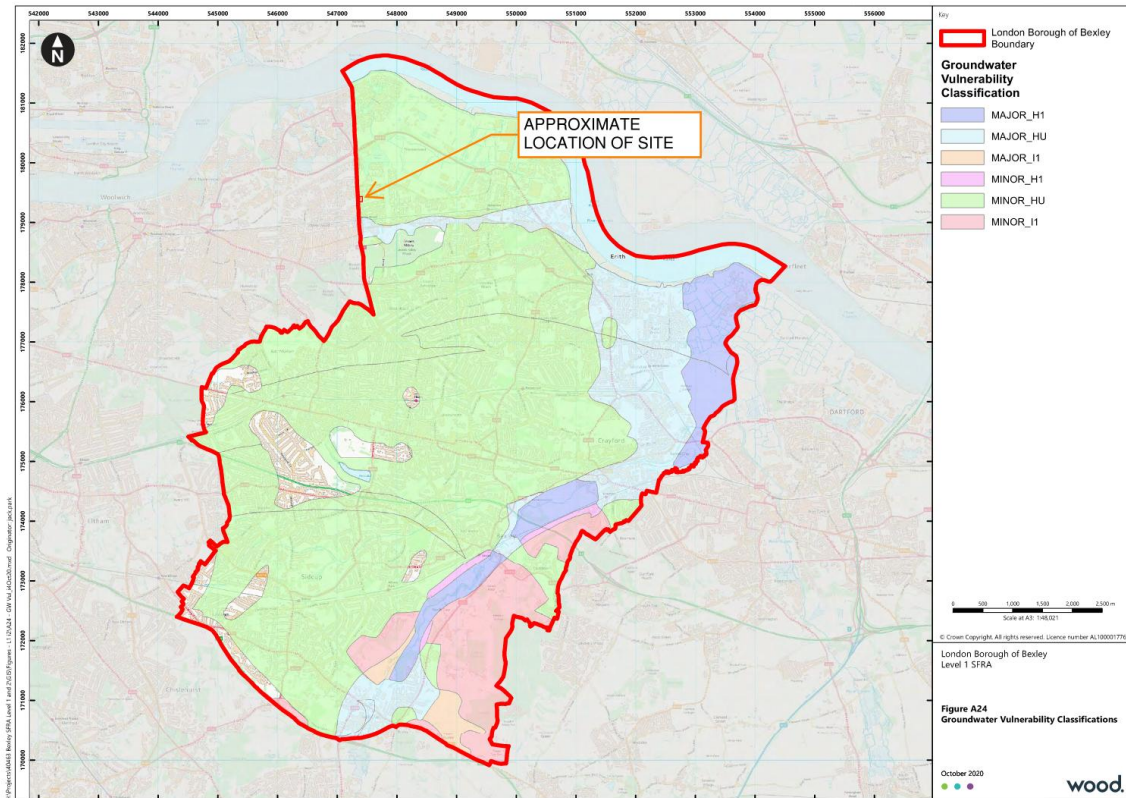


FIGURE 5 – GROUNDWATER VULNERABILITY CLASSIFICATION

3.5 Sewer Flooding

Extracted from Thames Water DG5 flood risk register, the site falls within a postcode section that has experienced 2 internal and 9 external sewer flood in the last 20 years as shown in table 3 below. With the consideration that the SE2 9 area that the site is located in which covers an area of circa 2.75 square kilometres contains approximately 15,066 residents according to 2021 census, the risk of sewer flooding can be established as very low.

TABLE 3 – THAMES WATER DG5 DATA

Post Code Area	Internal Flooding	External Flooding	Total flooding incidence
SE2 9	2	9	11

3.6 Artificial Sources

The Environment Agency mapping shows that when river levels are normal there is no risk of reservoir flooding. The map has been shown in Figure 6 below. As the site is approximately 1.0 km from an area within artificial flooding extents, the risk of artificial sources is considered to be low.



FIGURE 6 - RISK OF FLOODING FROM ARTIFICIAL SOURCES

3.7 Summary

Table 4 provides a summary of the 6 sources of flood risk. Overall, the site is considered at low risk of flooding from all sources with Groundwater considered a medium risk. Methods of limiting the risk of groundwater flooding will be addressed within the Managing Flood Risk section of this report.

TABLE 4 - FLOOD RISK SUMMARY

Flood Type	Risk		
	Low	Medium	High
Fluvial	✓		
Tidal	✓		
Pluvial	✓		
Groundwater		✓	
Sewer	✓		
Artificial	✓		

4 PLANNING POLICY AND GUIDANCE

4.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) provides the planning framework on which this FRA has been based. The NPPF states that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk. Where development is necessary, the development should be made safe and not increase flood risk elsewhere.

4.1.1 Sequential Test

The aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding. Development should not be permitted if there are reasonably available sites appropriate for development in areas at a lower risk of flooding.

It is necessary to undertake a Sequential Test for a planning application if both of the following apply.

- The proposed development is in Flood Zone 2 or 3; and
- A Sequential Test hasn't already been completed for a development of the type you plan to carry out on your proposed site.

As the development is within the Flood Zone 3 (defended), the Sequential Test should be passed by the planning authority.

4.1.2 Flood Vulnerability Classification

Any proposed development on the site will be subject to the planning requirements of the Bexley Council, the lead local flood authority (LLFA), and the NPPF.

Flood risk vulnerability classification for all flood zones has been reproduced in Table 5 below. This has been extracted from Table 3 of the NPPF Planning Practice Guidance. Building types are classified depending on their use and are placed in a higher vulnerability class depending on flood risk sensitivity. Examples of typical building uses for each vulnerability classification have been included in Table 6.

The NPPF guidance states that 'offices and shops' would fall under the category of 'less vulnerable'. The proposed development will contain 'dwellings', therefore changing the category to 'more vulnerable'.

TABLE 5 - FLOOD RISK VULNERABILITY AND FLOOD ZONE COMPATABILITY

Flood Zones	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a	Exception Test required	X	Exception Test required	✓	✓
Zone 3b	Exception Test required	X	X	X	✓

TABLE 6 - FLOOD RISK VULNERABILITY CLASSIFICATION

Vulnerability Classification	Building Use Example
Essential infrastructure	<ul style="list-style-type: none"> • Essential transport infrastructure (including mass evacuation routes) which must cross the area at risk. • Essential utility infrastructure which must be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. • Wind turbines.
Highly vulnerable	<ul style="list-style-type: none"> • Police stations, ambulance stations and fire stations and command centres and telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent.
More vulnerable	<ul style="list-style-type: none"> • Hospitals. • Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non-residential uses for health services, nurseries and educational establishments. • Landfill and sites used for waste management facilities for hazardous waste. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less vulnerable	<ul style="list-style-type: none"> • Police, ambulance and fire stations which are not required to be operational during flooding. • Buildings used for shops, restaurants and cafes, offices, general industry, storage and distribution, non-residential institutions not included in "more vulnerable", and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment works which do not need to remain operational during times of flood. • Sewage treatment works (if adequate measures to control pollution and manage sewage during flooding events are in place). • Car Parks
Water compatible	<ul style="list-style-type: none"> • Flood control infrastructure. • Water and sewage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves. • Navigation facilities. • Ministry of Defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

4.1.3 Exception Test

If after undertaking the Sequential Test, it is not feasible for the development to be in a zone at lower risk of flooding, the Exception Test can be applied as appropriate.

There are two steps which must be fulfilled for the Exception Test to be passed:

- It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk; and

- A site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and where possible, will reduce flood risk overall.

As the proposed development is mostly within the Flood Zone 3, the conditions of the Exception Test must be fulfilled by meeting the above criteria. The points below outline how the exception test will be met by the current proposals:

1. The development at Sedgemere Road will provide new homes and commercial space which will benefit the local community whilst also creating job opportunities.

2. This Flood Risk Assessment has been carefully produced to ensure the prolonged safety of the residents. A Flood Warning Evacuation Plan (FWEP) has also been produced to further ensure safety of building occupants through ensuring safe access and egress during a flood emergency. Which is shown in Appendix J. Flood mitigation measures have been identified in later sections of this report, and when implemented, they will further increase the safety for residents.

4.2 Climate Change

In May 2022, climate change allowances were published by the Environment Agency. These allowances are based upon predicted changes in fluvial flows and rainfall intensities due to climate change.

4.2.1 Peak Rainfall Intensity

The peak rainfall intensity is expected to increase as a result of climate change. Table 7 below has been extracted from Table 2 within the climate change allowance guidance and applies across all of England. Both the upper end and central allowances of the associated epoch should be reviewed for a proposed development.

TABLE 7 - PEAK RAINFALL INTENSITY ALLOWANCES

Allowance category	Total potential change anticipated for the '2050s'		Total potential change anticipated for the '2070s'	
	3.3% rainfall event	1% rainfall event	3.3% rainfall event	1% rainfall event
Central	20%	20%	20%	25%
Upper	35%	40%	35%	40%

4.3 London Plan

The London Plan is a framework which should be used for all developments within London. Policy SI 13 of the London Plan 2021 is specific to flood risk management and all development proposals should adhere to; the policy has been reproduced below.

- A. Current and expected flood risk from all sources (as defined in paragraph 9.2.12) across London should be managed in a sustainable and cost-effective way in collaboration with the Environment Agency, the Lead Local Flood Authorities, developers and infrastructure providers.

- B. Development Plans should use the Mayor's Regional Flood Risk Appraisal and their Strategic Flood Risk Assessment as well as Local Flood Risk Management Strategies, where necessary, to identify areas where particular and cumulative flood risk issues exist and develop actions and policy approaches aimed at reducing these risks. Boroughs should cooperate and jointly address cross-boundary flood risk issues including with authorities outside London.
- C. Development proposals should ensure that flood risk is minimised and mitigated, and that residual risk is addressed. This should include, where possible, making space for water and aiming for development to be set back from the banks of watercourses.
- D. Developments Plans and development proposals should contribute to the delivery of the measures set out in Thames Estuary 2100 Plan. The Mayor will work with the Environment Agency and relevant local planning authorities, including authorities outside London, to safeguard an appropriate location for a new Thames Barrier.
- E. Development proposals for utility services should be designed to remain operational under flood conditions and buildings should be designed for quick recovery following a flood.
- F. Development proposals adjacent to flood defences will be required to protect the integrity of flood defences and allow access for future maintenance and upgrading. Unless exceptional circumstances are demonstrated for not doing so, development proposals should be set back from flood defences to allow for any foreseeable future maintenance and upgrades in a sustainable and cost-effective way.
- G. Natural flood management methods should be employed in development proposals due to their multiple benefits including increasing flood storage and creating recreational areas and habitat.

4.4 Local Plan

Within the Bexley Local Plan are relevant sections that are associated with Flood Risk and Drainage.

4.4.1 Policy DP32 Flood Risk Management

1. In areas at risk of flooding, as identified in the Bexley Strategic Flood Risk Assessment (SFRA), development proposals must:
 - A. Be within a Sustainable Development Location, designated industrial location or the Thamesmead and Abbey Wood Opportunity Area if the site is within Flood Zones 2 and 3a, except for householder development above defined flood levels, and the development type is acceptable within the flood zone, as only these locations have passed the Local Plan sequential test;
 - B. Apply the exception test, where required, to sites within Flood Zones 2 and 3a that have met the requirements of part 1a;
 - C. Comply with the guidance and recommendations set out in the Bexley SFRA Level 1 and Level 2;
 - D. Apply the sequential approach advocated in the NPPF to all sources of flooding, not just tidal and fluvial;
 - E. Be used as an opportunity to reduce the causes and impact of flooding;
 - F. Make as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management); and,

- G. Provide floodplain storage capacity as close to the development as possible, where the proposed development will reduce this capacity.
2. Habitable rooms in residential development within the fluvial flood zones, should be set 300mm above the predicted 1 in 100 year plus climate change peak flood water level, and within the tidal flood zones, should be set at the predicted 1 in 200 year annual probability.
 3. Development in areas designated as Functional Floodplain (as identified in the SFRA Level 1 and the Policies Map) will not be permitted outside of water-compatible development, as defined in the NPPF.
 4. All proposals for development in Flood Zones 2 and 3, and all proposals on sites of 0.25 hectares or larger regardless of what flood zone the site is in, must include a site-specific flood risk assessment (FRA), including a drainage impact assessment.
 5. New developments in riverside locations are required to help reduce flood risk now and into the future.
 6. Development proposals located within 100 metres of the Thames tidal flood defences should demonstrate consideration of and act on the recommendations of the TE2100 Plan and be designed in such a way as to easily facilitate the raising and re-engineering of the tidal flood defences.
 7. Basements will not be permitted in Flood Zones 2 or 3.
 8. Development must not increase flood risk on-site or off-site, and exceedance flows must be considered and appropriately managed.
 9. All basement developments should include, within their proposal, protection to the property by installing, for example, a non-return valve or other suitable device to avoid the risk of backflow at a later date, on the assumption that the sewerage network may surcharge to ground level during storm conditions.
 10. New developments below the predicted flood water level should include a detailed evacuation plan that clearly outlines how people can easily leave to safety or move upwards from the lower floors to safety.
 11. Site design in floodplains must facilitate safe escape, access and egress. Only in exceptional circumstances where this cannot be demonstrated should the emergency plan be to reside in situ and escape upwards in a building.
 12. All development that is intended to be occupied below the predicted flood water level must provide internal safe refuge above the design flood level.

4.4.2 Policy DP33 Sustainable drainage systems

1. All development proposals, whether increasing or decreasing the impermeable area of the site, will be required to manage surface water through sustainable drainage systems (SuDS) in line with all national, regional and local policies and related guidance, in order to minimise flood risk, improve water quality and enhance biodiversity and amenity.
2. In addition, all development proposals will be required to demonstrate that:
 - A. The drainage for the site achieves greenfield runoff rates for flood events up to and including 1 in 100 years plus 40% climate change;
 - B. Surface water run-off has been reduced by sustainably managing run-off on site;

- C. Permeable paving has been used for hardstanding areas (e.g. car parks);
 - D. The nature of water flow (both surface water and groundwater) across a steeply sloping site has been considered in order to provide suitable SuDS; and, e. water reuse mechanisms have been included for either indoor or outdoor purposes.
3. Development proposals on sites of 0.25 hectares or greater require a drainage strategy, which must be accompanied by a suitable maintenance management plan.

5 MANAGING FLOOD RISK

5.1 Detailed Design

It is recommended that during the progression of the detailed design, the proposed development is continued to be designed with flood risk and drainage implications in mind. Whilst most risks are deemed low, groundwater flooding was highlighted to be within the Flood Risk section and therefore mitigation measures will be assessed to reduce this risk. An exceedance flow path can be shown in **Appendix I**.

All sleeping accommodation will be set at 6.850 mAOD or higher which is above the 1 in 200-year annual probability of tidal breach level of 2.50 mAOD. The proposed development plans showing the FFL's can be seen in **Appendix B**.

5.2 Flood Compensation

As the site is located within Flood Zone 3 defended, no flood compensation is deemed required.

5.3 Flood Warning Service and Flood Action Plan

As the site is within a tidal breach area. A flood warning and evacuation plan (FWEP) has been produced to guide residents to their nearest safe refuge.

5.4 Safe Access and Egress

As the site is situated in an area that is defended from fluvial and tidal flooding safe access and egress is deemed sufficient. However, in extreme events a tidal breach, safe refuge can be sought in the upper levels of the building. This has been discussed further in the FWEP included in **Appendix J**.

5.5 Mitigating Measures

Additional measures can be implemented to minimise the likelihood or severity of flooding. As the site has low flood risk from most sources expect groundwater flooding, the following measures will be considered:

- Non-return valves will be implemented on the final drainage run to the outfall connection to prevent a sewer surcharge causing flooding.
- Surface Water discharge rates will be restricted down to as close to greenfield as possible.
- Water resistant materials – internal walls and floors can be constructed using materials with water resistant quality so that long lasting damage is reduced.
- Concrete floor slabs – installing concrete floor slabs on ground floor levels will minimise damages compared to finished floors such as carpet.
- Appropriate waterproofing to be detailed by specialist.

6 SURFACE WATER MANAGEMENT

6.1 Existing Site Drainage

An initial measured survey has been conducted to establish the scope of the existing drainage on site as shown in **Appendix E**.

A Thames Water Asset Map has been obtained and indicates that there are foul water networks within the surrounding roads that currently have public surface water assets discharging into them as shown in **Appendix F**.

At a later stage a diversion or abandonment application will be made to ensure that all Thames Water Assets onsite are not being impeded or obstructed with the proposed development. A further CCTV survey will be conducted to determine the onsite Thames Water network at the next stage.

6.2 Greenfield Runoff Rates and Volumes

Greenfield runoff rates have been calculated using FEH-22 method and a 6-hour rainfall event, these can be found in **Appendix G**. The table below shows the greenfield runoff rates the whole site and factored to provide a runoff rate per hectare. The table also illustrates the current discharge rates based on existing site conditions. The existing discharge rates have been calculated using the Modified Rational Method. A percentage of impermeable area (PIMP) of 100% and a time of concentration of 5 minutes were assumed. A runoff coefficient of 1 has been used as the existing site is almost entirely impermeable.

TABLE 8 - GREENFIELD RUNOFF AND EXISTING DISCHARGE RATES

Return Period	Greenfield runoff rates		Existing Discharge Rates (l/s)
	Drained Area [0.272 ha] (l/s)	Per hectare (l/s/ha)	
QBAR	0.2	0.74	-
1-year	-	-	53.8
2-year	0.2	0.74	69.1
30-year	0.6	2.21	127.1
100-year	0.8	2.94	161.1

6.3 Proposed Discharge Rates

As shown in the table above, the existing discharge rates for the site area have been calculated for the specified return periods. The proposed development should aim to achieve discharge rates as close to greenfield as possible. A discharge rate of 1l/s will be the proposed discharge rate for surface water which is greater than a 98% betterment from the existing 1-year discharge rate as shown in the figure below.

These rates have been coordinated with Thames Water through a pre-planning enquiry, and they have confirmed sufficient capacity within the sewer located within Harrow Manorway.

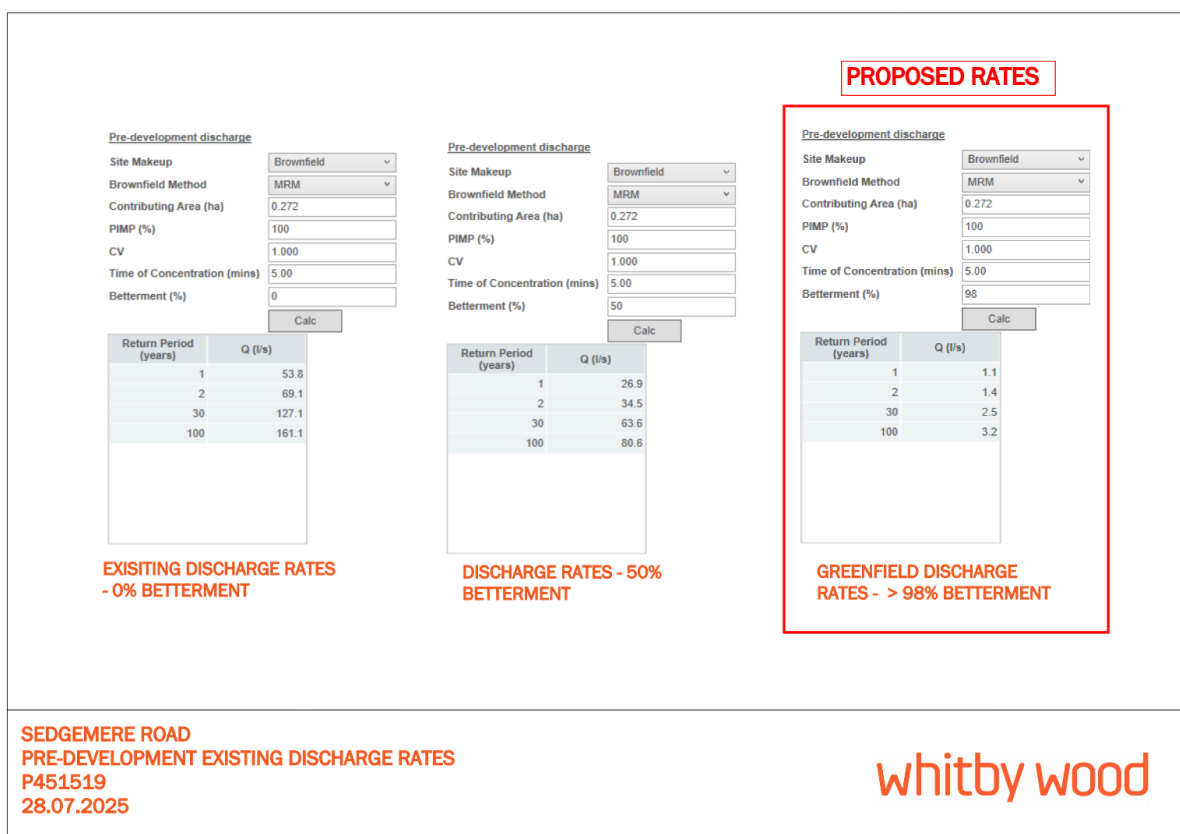


FIGURE 7 – PRE-DEVELOPMENT EXISTING DISCHARGE RATES AND BETTERMENT CALCULATIONS

6.4 Storage Volumes

It is proposed that surface water is discharged at 1 l/s. Using a preliminary storage calculation tool within Causeway Flow simulations as shown in **Appendix H** the output value estimates that between 279-324 m³ of attenuation will be required. This is based on no flooding of the network or site up to and including the 1 in 100-year storm event plus a 40% allowance for climate change. The storage requirements are subject to change upon development of the design and impermeable areas. The drainage strategy report presents the attenuation proposals in more detail.

6.5 Delivering a SuDS Scheme

The ‘four pillars’ of SuDS design as described by the SuDS Manual are;

- Water Quantity;
- Water Quality;
- Amenity; and
- Biodiversity.

The philosophy of SuDS is about maximising the benefits and minimising the negative impacts of surface water runoff from developed areas throughout its life cycle. This is known as the treatment train philosophy and uses drainage techniques to systematically control the three elements of runoff; pollution, flow rates and volumes. This is presented in the Figure below.

SuDS can improve the quality of life in developments by making them more vibrant, visually attractive, sustainable and more resilient to change, by improving urban air quality, regulating building temperatures, reducing noise and delivering recreation and education opportunities. The SuDS design should therefore as much as possible, be based around the following;

- Using surface water runoff as a resource;
- Managing rainwater close to where it falls;
- Managing runoff on the surface;
- Allowing rainfall to soak into the ground;
- Promoting evapotranspiration;
- Slowing and storing runoff to mimic natural runoff characteristics;
- Reducing contamination of runoff through pollution prevention and controlling the runoff at source; and
- Treating runoff to reduce the risk of urban contaminants causing environmental pollution.

By following the above the proposed development has the potential to maximise SuDS and conform to SuDS best practice. Ultimately a well designed and constructed SuDS scheme will provide a robust and reliable surface water drainage network, whilst providing increased amenity and biodiversity.

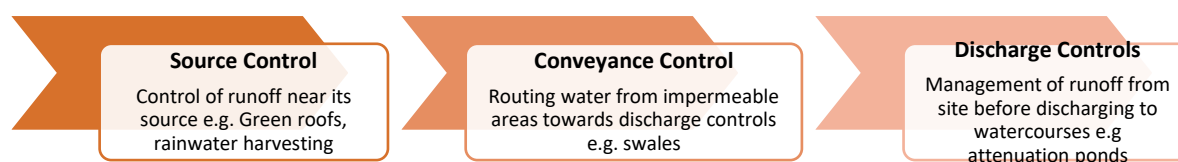


FIGURE 8 - TREATMENT TRAIN

6.6 Drainage Hierarchy

As stated in the National Planning Practice Guidance, the aim should be to discharge surface water run-off as high up the drainage hierarchy, as reasonably practicable. Local Authorities and Water Boards often require proof that each option is not feasible before considering the next.

The drainage hierarchy is as follows:

1. Discharge into the ground (infiltration);
2. Discharge to a surface water body;
3. Discharge to a surface water sewer, highway drain, or another drainage system;
4. Discharge to a combined sewer.

For this site, infiltration will not be feasible due the presence of London Clay and high-water levels as demonstrated in section 3.4. Discharging to a surface water body will not be practicable as any drainage would need to pass via large areas of third-party land. There is a surface water sewer approximately 300 meters to the north of the site..

7 CONCLUSIONS AND RECOMMENDATIONS

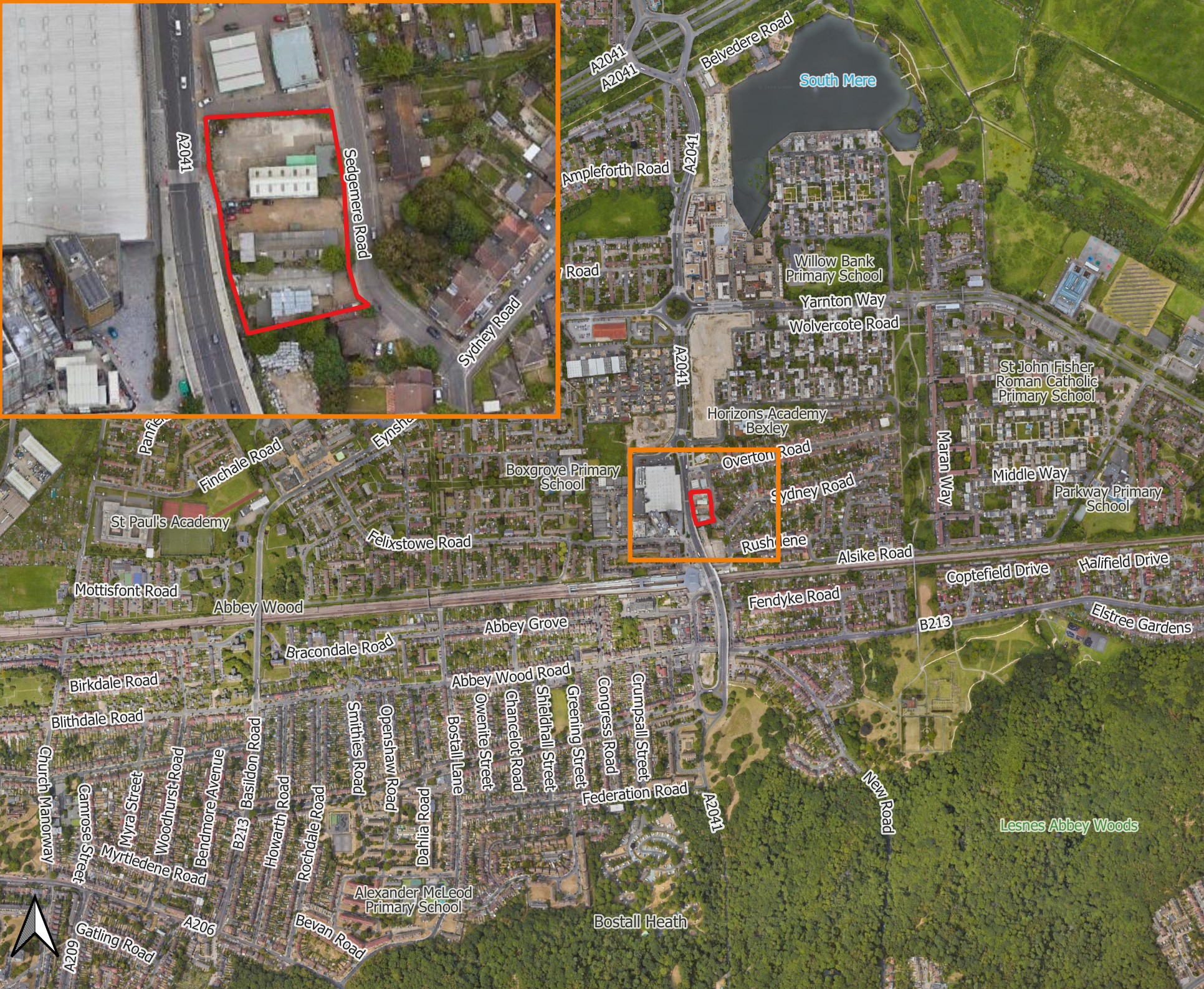
The main conclusions from this flood risk assessment are detailed below.

- The site is located in Flood Zone 3 defended categorizing the risk from fluvial and tidal flooding as very low.
- There is a medium risk of groundwater flooding.
- There is generally considered to be a low risk of flooding from all other sources assessed.
- Groundwater flood risk will be removed with mitigation measures specified in section 5.5.
- All sleeping accommodation will be set above the 1 in 200-year tidal breach data level.
- A Flood Warning and Evacuation Plan has been included within Appendix J.
- There are existing public sewers within proximity to the site, a CCTV survey confirmed that existing surface and foul water sewers discharge towards the Thames Water foul sewer within Sedgemere Road. Existing connections will be reused where possible.
- The proposed development provides the opportunity to utilise SuDS. Not all SuDS techniques will be suitable for this site but through assessing the benefits and constraints the most appropriate SuDS techniques have been incorporated.

Appendix A – Site Map

**SEDGEMERE ROAD
ABBEY WOOD
P451519
FEBRUARY 2024**

SITE LOCATION PLAN

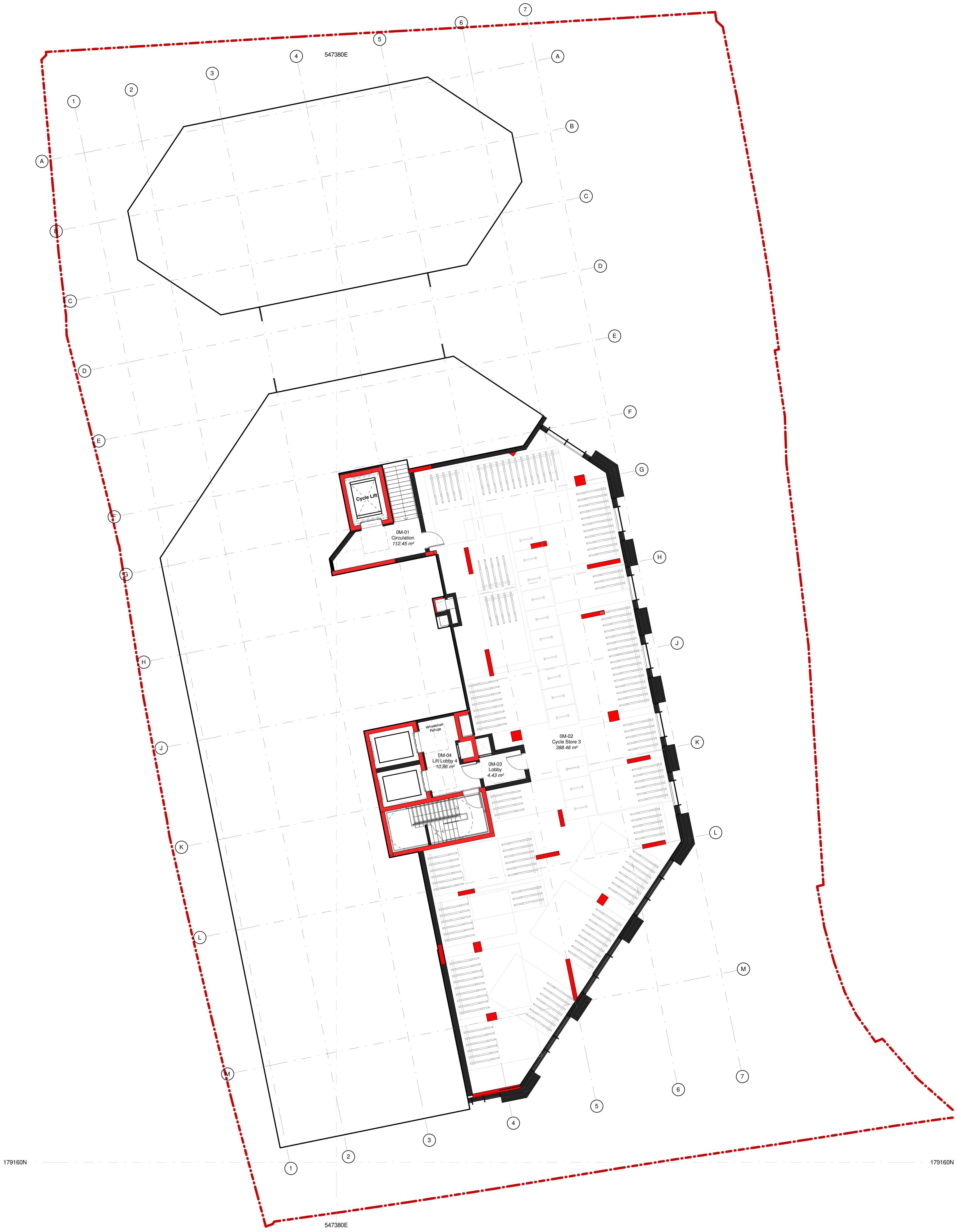


Legend

 Site Boundary

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1:10,000

Appendix B – Accommodation Schedule

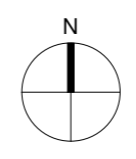
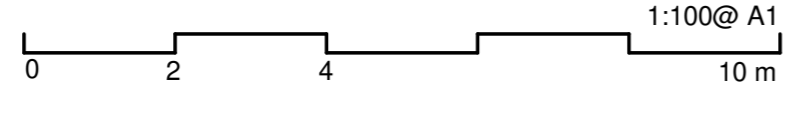


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J	Design Freeze	05/09/2024	BM	LO
K	Issued for Information	13/09/2024	CG	LO

Type	No of Bikes	%
Sheffield Oversized	20	5%
Sheffield Stand	64	16%
Two Tier	312	79%
Total	396	

Purpose of Issue:
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 Abbey Wood Sedgemere Limited

Project Name
 Sedgemere Road, Abbey Wood
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Drawing Title:
 Mezzanine GA Plan

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Issued by:
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GRID Project No:
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Drawing No:
 SDG-GRID-XX-0.1-DR-A-10100.1

Revision:
 K

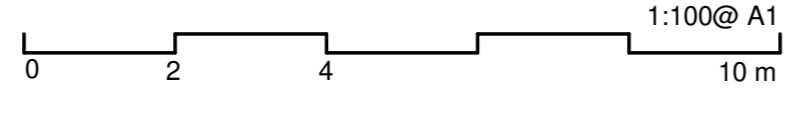
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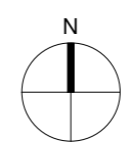
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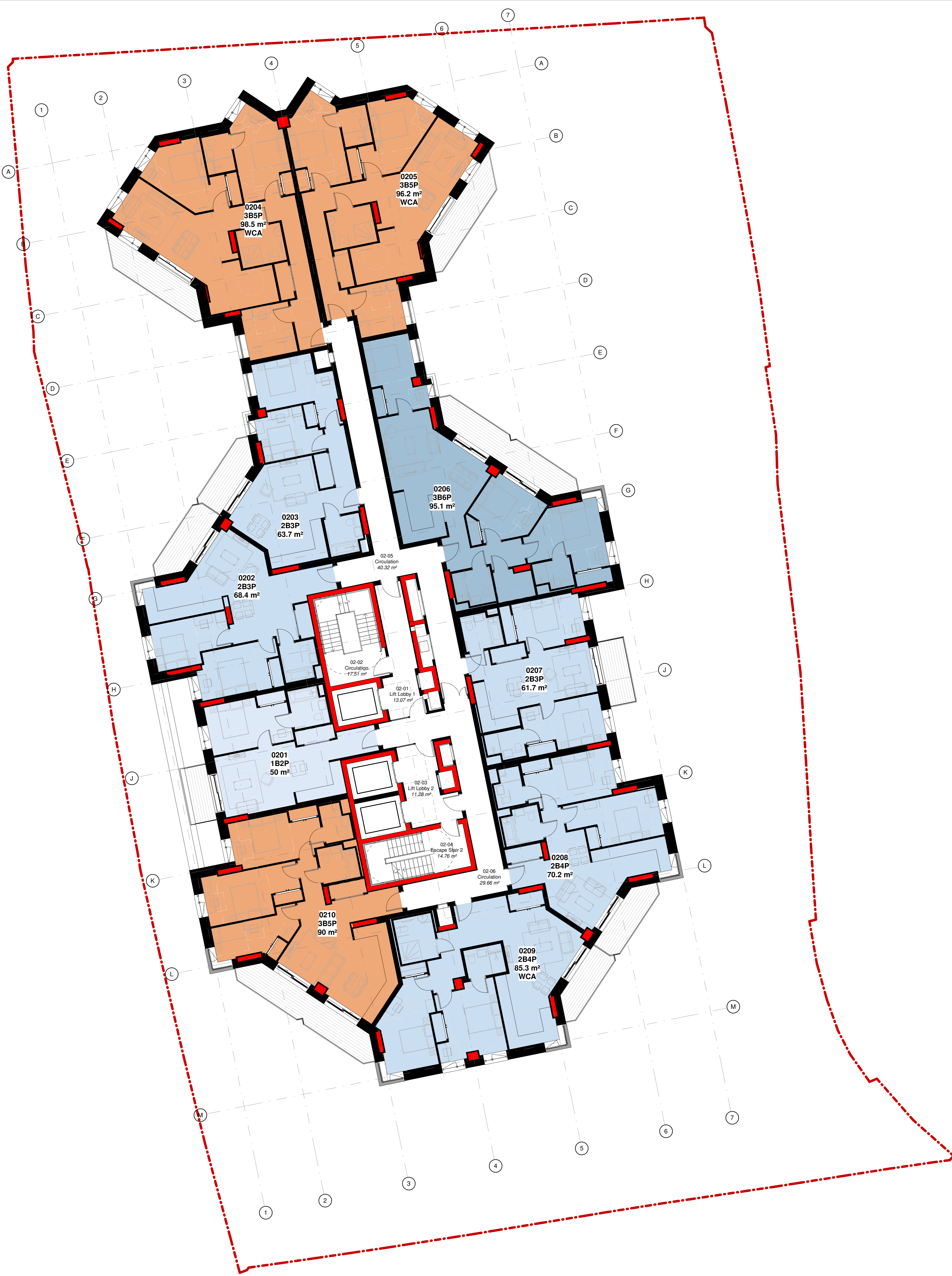
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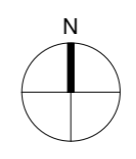
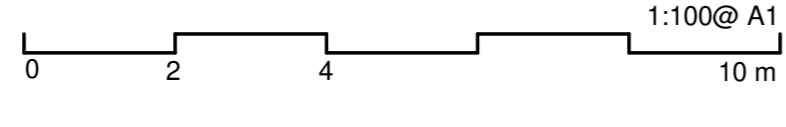




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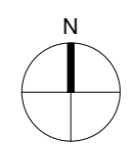
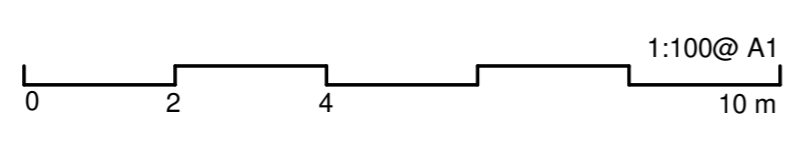
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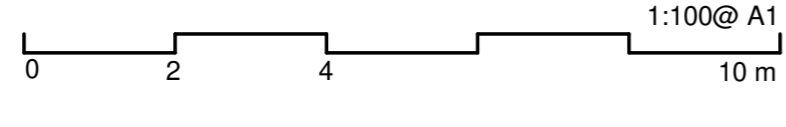
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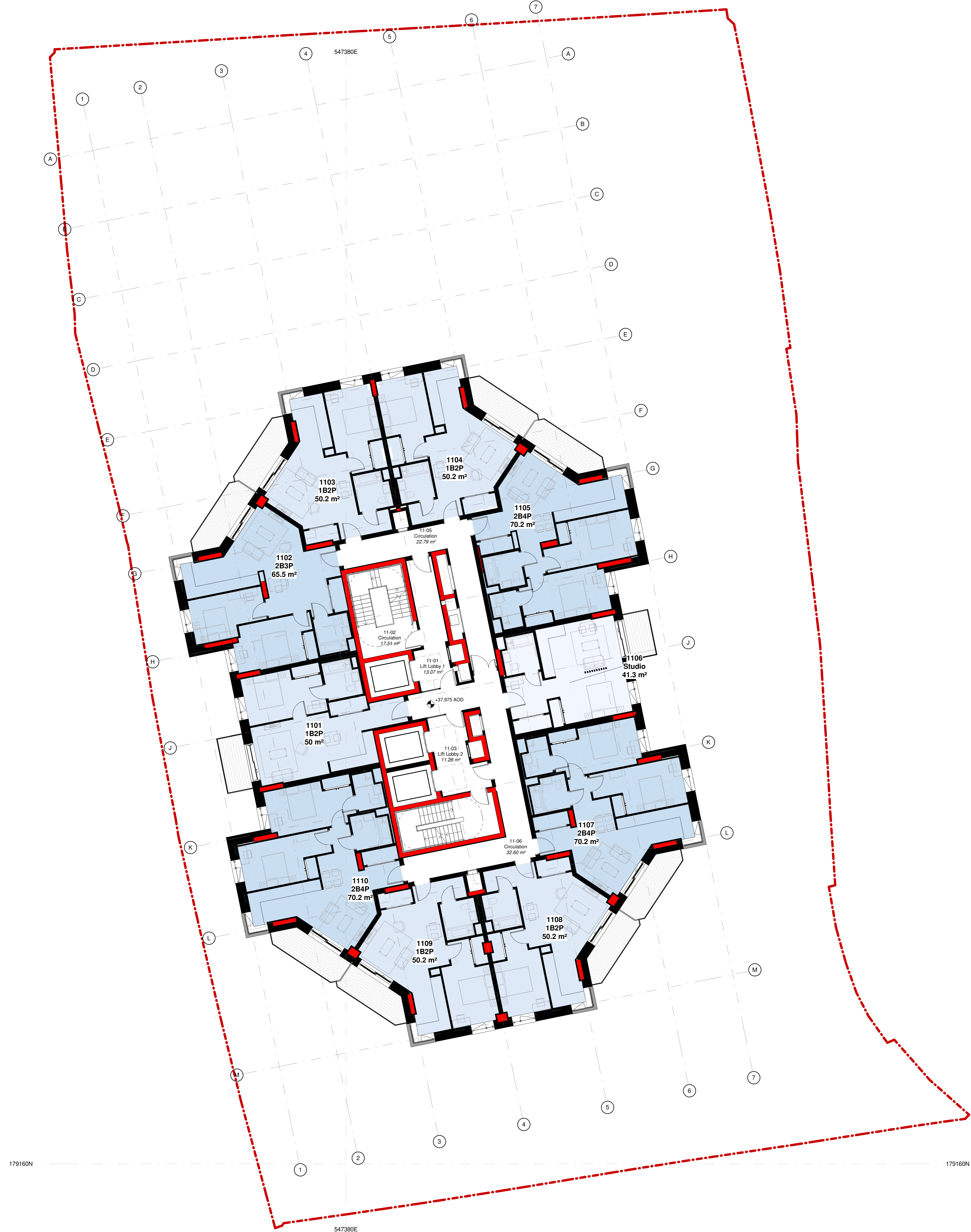
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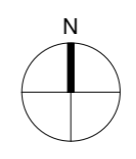
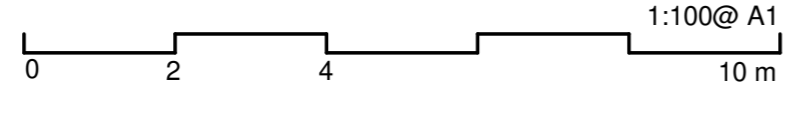
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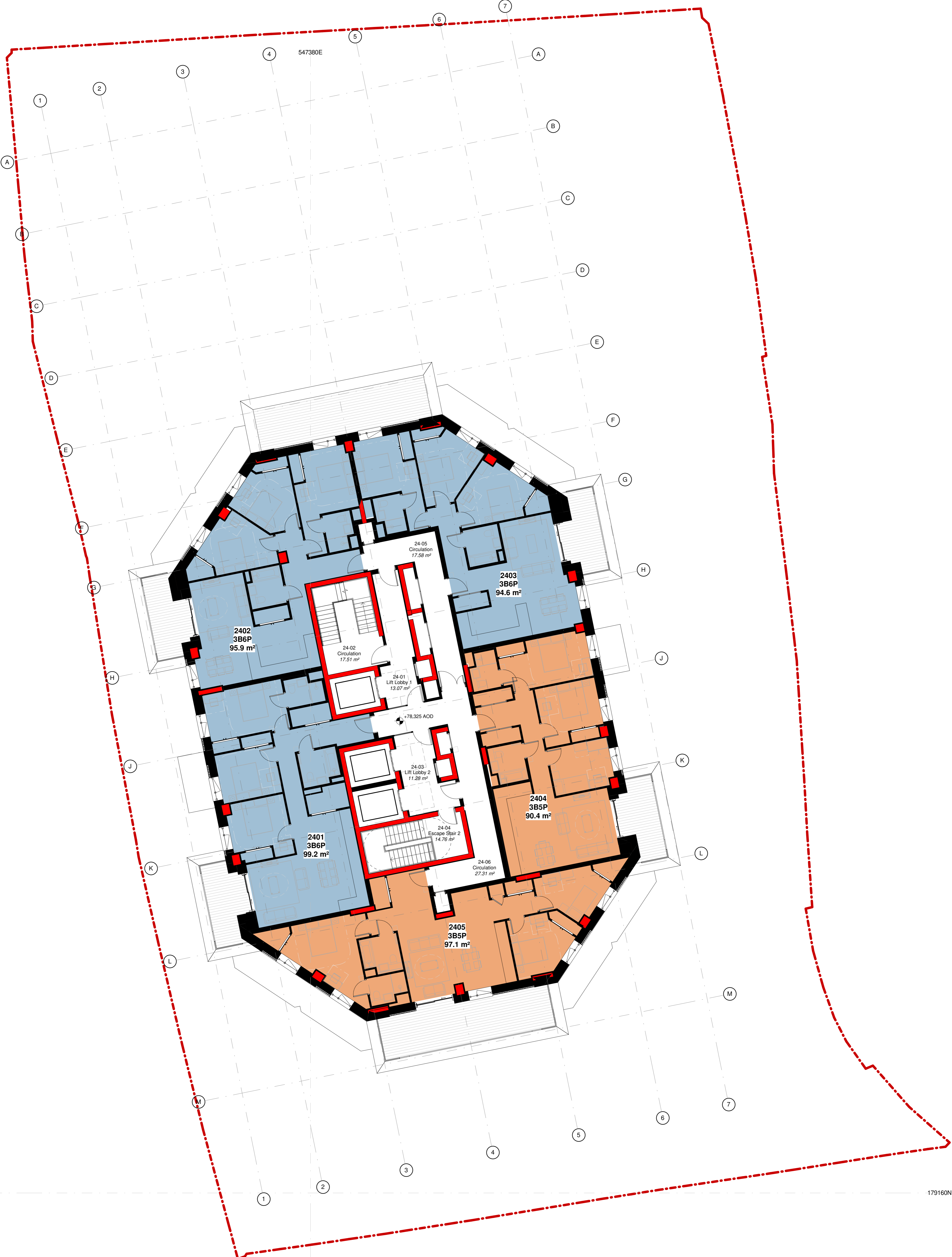
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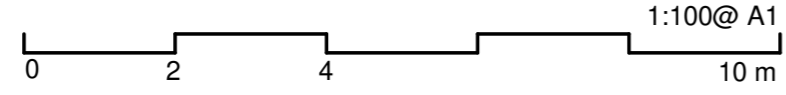
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Drawing Title:
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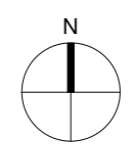
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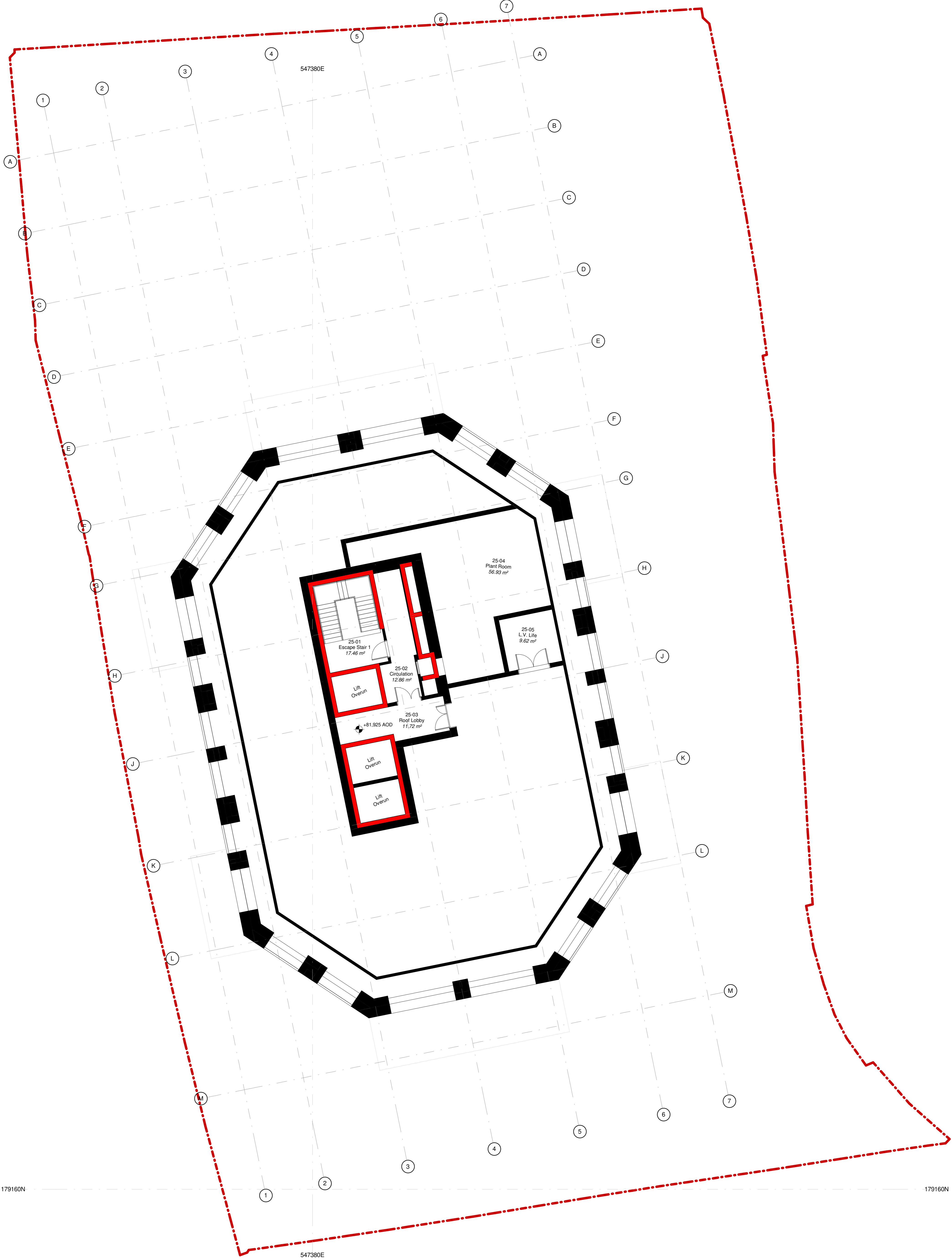
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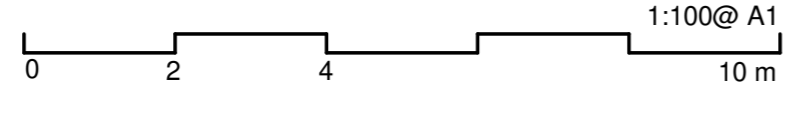




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Drawing Title:
 Level 25 Roof Plan

Drawn by:
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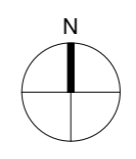
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Revision:
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Appendix C – Flood Maps

**SEDGEMERE ROAD
ABBEY WOOD
P451519
FEBRUARY 2024**

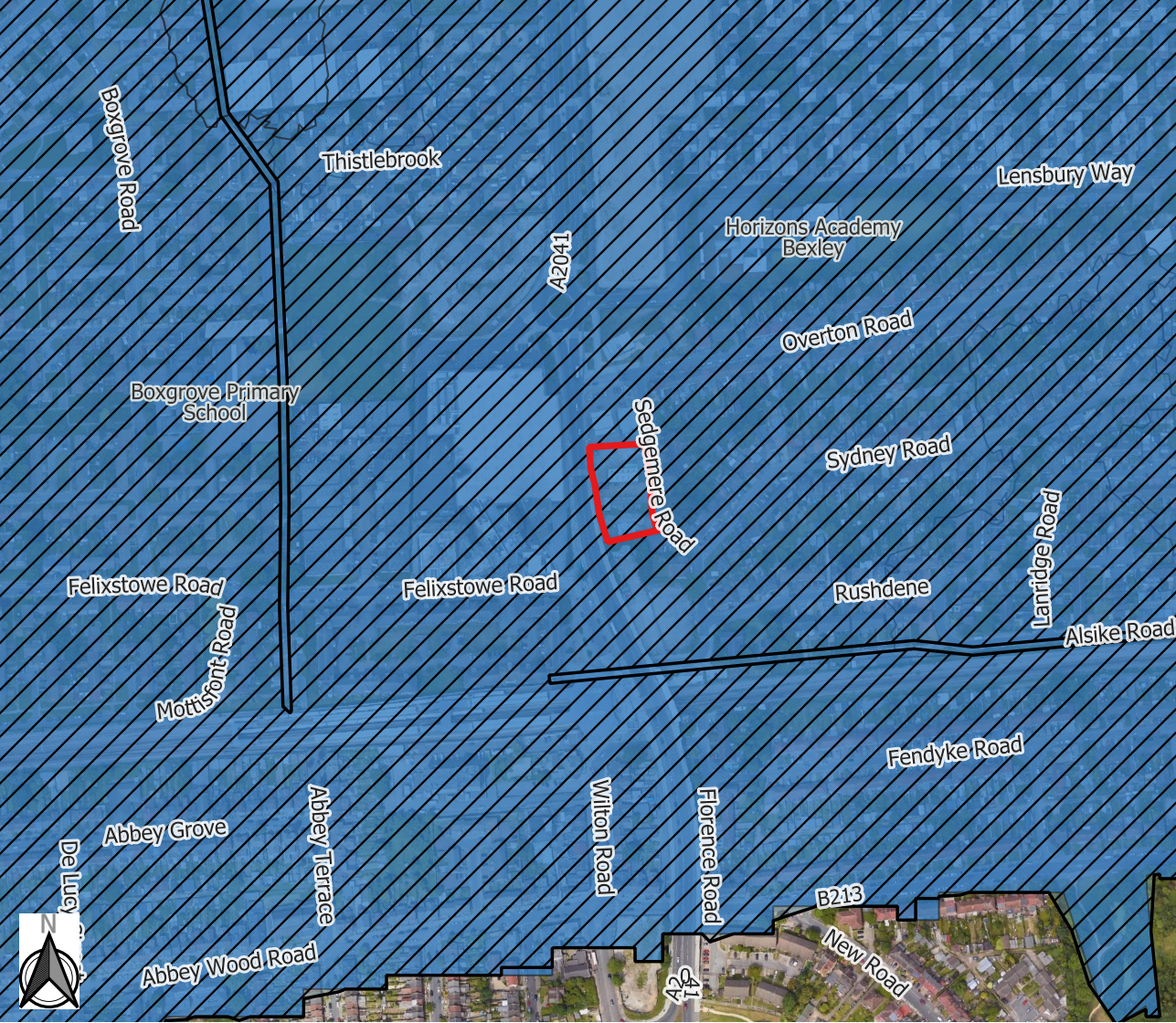
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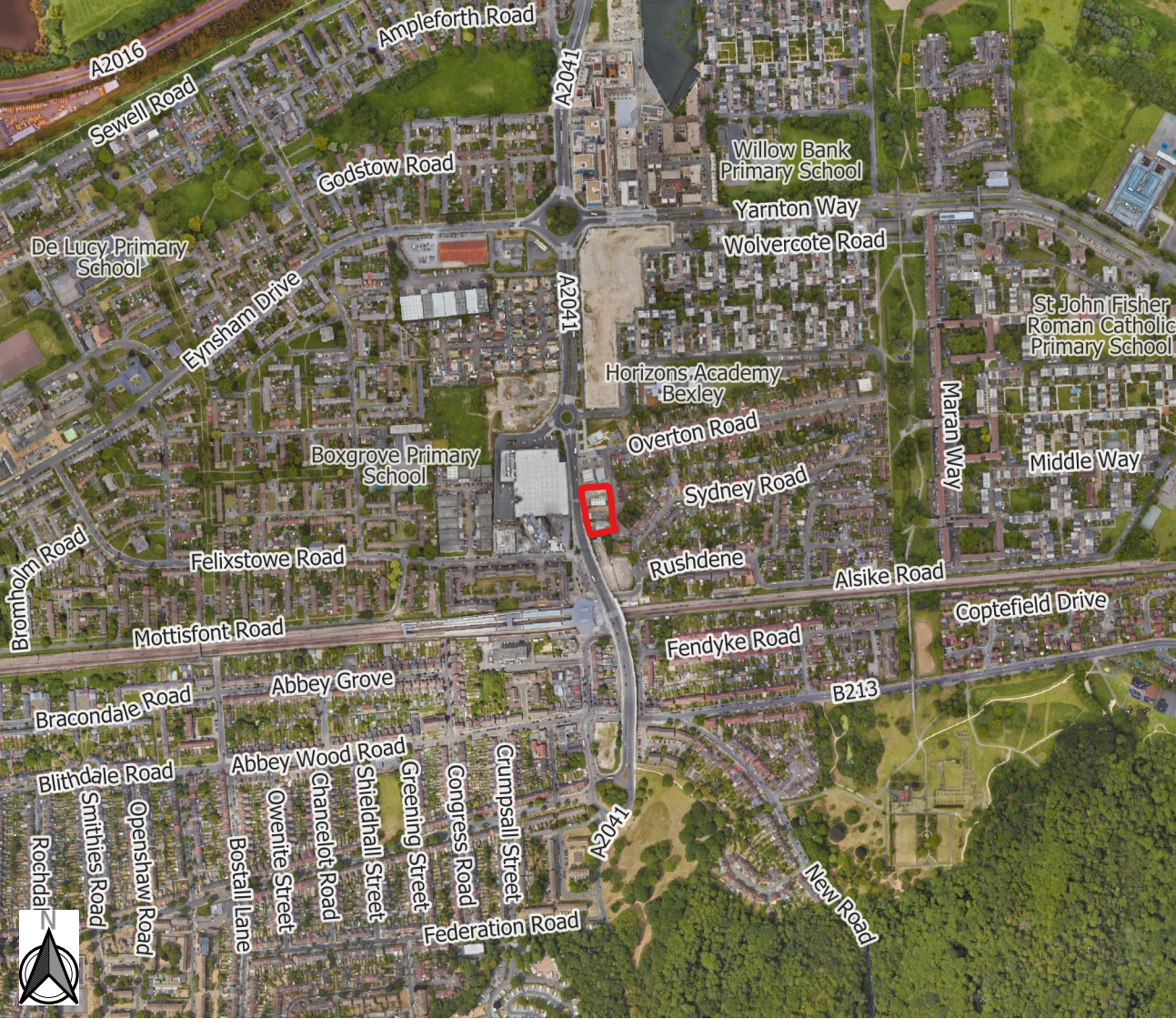
Legend

-  Site Boundary
-  Flood Zone 2
-  Flood Zone 3
-  Areas Benefitting from Flood Defences

1:5,000

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**SEDGEMERE ROAD
 ABBEY WOOD
 P451519
 FEBRUARY 2024**

**ARTIFICIAL FLOOD
 EXTENTS (RESERVOIR
 FLOODING)**

Legend

-  Site Boundary
-  Reservoir Flood Extents (Dry Day)
-  Reservoir Flood Extents (Wet Day)





1:10,000



**SEDGEMERE ROAD
ABBAY WOOD
P451519
FEBRAUARY 2024**

**RISK OF FLOODING
FROM SURFACE
WATER (EXTENT)**

Legend

-  Site Boundary
-  RoFSW Extent 1in30
-  RoFSW Extent 1in100
-  RoFSW Extent 1in1000

1:1,000

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Appendix D – Environmental Agency Product 4 & 8 Data

Product 4 (Detailed Flood Risk) for: BP, Harrow Manorway, West Heath, London, SE2 9SA

Requested by: Tom Tosetti, Whitby Wood

Reference: KSL 345478 RL

Date: 13 February 2024

Contents

- Flood Map for Planning (Rivers and Sea)
- Flood Map Extract
- Thames Estuary 2100 (TE2100)
- Thames Tidal Downriver Breach Inundation Modelling 2018
- Thames Tidal Downriver Breach Inundation Modelling Map
- Model Output Data – Marsh Dykes 2020
- Modelled Flood Outlines Map – Marsh Dykes 2020
- Site Node Locations Map
- Defence Details
- Recorded Flood Events Data
- Recorded Flood Events Outlines Map
- Additional Information

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

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

Please refer to the [Open Government Licence](#) which explains the permitted use of this information.

Flood Map for Planning (Rivers and Sea)

The Flood Map:

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

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

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

At this Site:

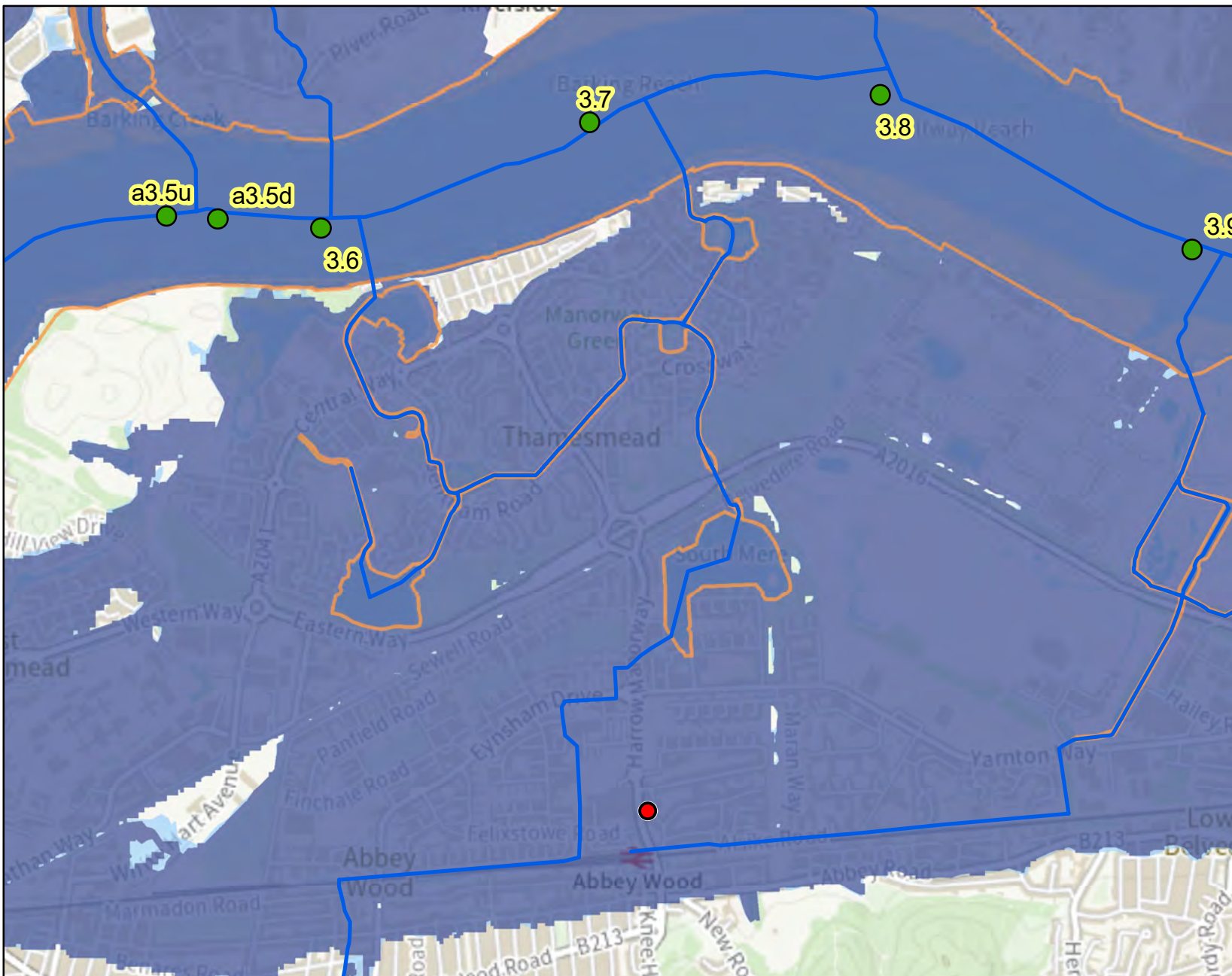
The Flood Map shows that this site lies within the outline of Flood Zone 3. This zone comprises land assessed as having a 0.5% (1 in 200) or greater annual probability of tidal flooding.

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

Method of production

The Flood Map at this location has been derived using detailed modelling of the tidal River Thames through the North Kent Coastal Modelling study completed in 2018 by JBA Consulting.

Flood Map for Planning centred on SE2 9SA created 13 February 2024 [Ref: KSL 345478 RL]



Scale 1: 20,000



Legend

- Site Location
- TE2100 Model Nodes
- Main Rivers
- Flood Zone 3
- Flood Zone 2
- Flood Defences

Flood Map for Planning (assuming no defences)

Flood Zone 3 shows the area that could be affected by flooding:

- from the sea with a 0.5% or greater chance of occurring each year
- or from a river with a 1% or greater chance of occurring each year.

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

Thames Estuary 2100 (TE2100)

You have requested in-channel flood levels for the tidal river Thames. These have been taken from the Thames Estuary 2100 study completed by HR Wallingford in 2008. The modelled node closest to your site is **3.7**; the locations of nearby nodes are also shown on the enclosed map.

Details about the TE2100 plan

The Plan sets out how the Environment Agency and our partners can work together to manage tidal flood risk, from now until the end of the century. The Plan covers the Thames Estuary from Teddington in the west to the mouth of the estuary at Shoeburyness (north bank) and Sheerness (south bank) in the east. It is an adaptive plan for managing the estuary, including the tidal defence system, until 2100 so that current standards of flood protection are maintained or improved taking into account climate change effects e.g. sea level rise. The Plan has 3 phases of activity:

- Until 2035 – maintain and improve current defences, safeguard areas required for future improvements, and monitor climate change indicators.
- 2035-2050 – raise existing walls, defences & smaller barriers whilst reshaping the riverside environment.
- 2050-2100 – determine and implement an option for the future of the Thames Barrier, and adapt other defences as required to work alongside this to protect the estuary.

The Thames Estuary 2100 Plan can be found at: <https://www.gov.uk/government/publications/thamesestuary-2100-te2100>

Details about the TE2100 in-channel levels

The TE2100 in-channel levels take into account operation of the Thames Barrier when considering future levels. The Thames Barrier requires regular maintenance and with additional closures the opportunity for maintenance will be reduced. When this happens, river levels – for which the Barrier would normally shut for the 2008 epoch – will have to be allowed through to ensure that the barrier is not shut too often. For this reason, levels upriver of the barrier will increase and the tidal walls will need to be raised to match.

For further information about the Thames Barrier please visit our website at:

<https://www.gov.uk/the-thames-barrier>

Where to find the in-channel levels and defence crest level data from the 2008 TE2100 study

The TE2100 in-channel levels and defence crest levels documents can be downloaded from ShareFile at the following link:

<https://ea.sharefile.com/d-s7c899d3320e84e948b080aefbb03a20f>

- Upriver of the Thames Barrier – is detailed within Table 6.1 (page 44) of the document titled '*Thames Estuary 2100, Improvements to Flood Risk Management System, Design Water Levels and Future Defence Crest Levels, May 2015*'.
- Downriver of the Thames Barrier is detailed within Table 7.1 (page 56) of the document titled '*Thames Estuary 2100, Improvements to Flood Risk Management System, Design Water Levels and Future Defence Crest Levels, May 2015*'. Defence raising for other barrier options can also be found in the document titled '*Thames Estuary 2100, Phase 3 Studies, Topic 1.5, Phase 3 Set 2 Estuary Wide Options Hydraulic modelling, December 2008*'

Thames Tidal Downriver Breach Inundation Modelling - 2018

The table below displays site-specific modelled flood levels at your site. These have been taken from the Downriver Breach Inundation Modelling Study 2018 completed by Atkins Ltd. in May 2018.

We have developed a modelling approach where all downriver breach locations along the Thames are equitably modelled, to ensure a consistent approach across London. This modelling simulates continuous tidal breaches along the entire extent of the Thames between the Thames Barrier and east of Gravesend on the south bank and east of Tilbury on the north bank. For hard and composite defences breaches are set at 20 m wide; for soft defences, breaches are 50 m wide. In both cases, the defence breach scour distance was assumed to extend into the floodplain by the same distance as the breach width.

Based on the 2008 TE2100 in-channel levels, the 0.5% (1 in 200 year) and 0.1% (1 in 1000 year) annual probability of exceedance tidal events were modelled for all breach locations downriver of the Thames Barrier. These were modelled for the 2014 year epoch (current year), as well as 2115 epoch which include allowances for climate change.

This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites within London.

Node	National Grid Reference		Modelled levels in mAODN for 0.5% AEP		Modelled levels in mAODN for 0.1% AEP	
	Easting	Northing	2014	2115	2014	2115
1	547366	179221	1.86	2.50	1.97	2.64
2	547387	179230	1.86	2.50	1.97	2.64
3	547358	179200	1.86	2.50	1.98	2.64
4	547375	179208	1.86	2.50	1.97	2.64
5	547394	179217	1.86	2.50	1.97	2.64
6	547410	179224	1.86	2.50	1.97	2.64
7	547361	179180	Nil return	2.50	Nil return	2.64
8	547384	179190	1.86	2.50	1.97	2.64
9	547404	179197	1.86	2.50	1.97	2.64
10	547417	179203	1.85	2.50	1.96	2.64
11	547371	179158	1.84	2.50	1.95	2.64
12	547400	179167	1.85	2.50	1.95	2.64
13	547419	179173	1.85	2.50	1.96	2.64
14	547383	179144	1.84	2.50	1.95	2.64
15	547410	179149	1.84	2.50	1.95	2.64

Downriver Breach Modelling Map centred on SE2 9SA created 13 February 2024 [Ref: KSL 345478 RL]



Scale 1: 20,000



Legend

- Site Location
- TE2100 Model Nodes
- Main Rivers

Downriver 0.5% AEP Outlines

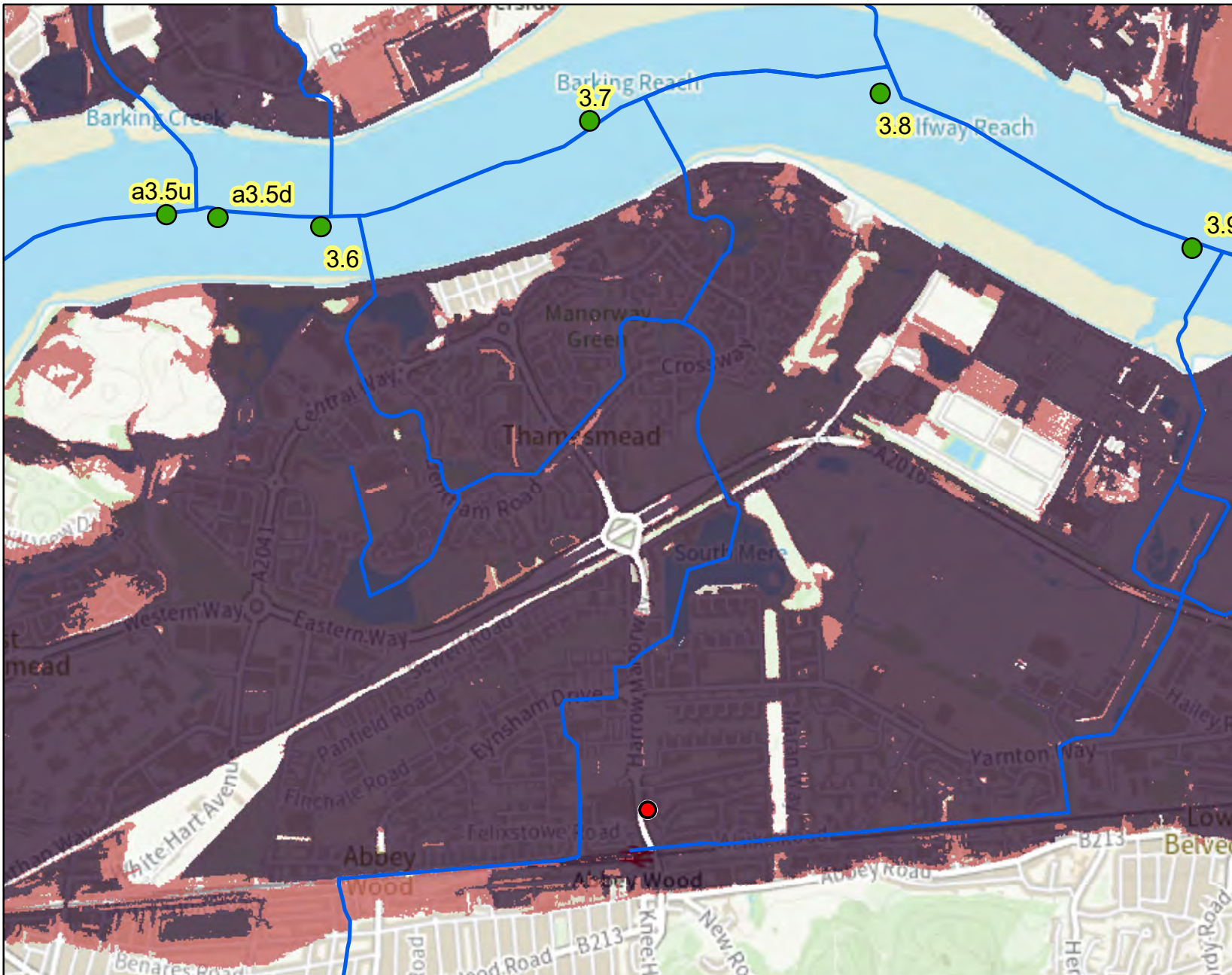
Epoch

- 2014 (Current year)
- 2115

Thames Tidal Downriver Breach Inundation Modelling 2018

A modelled representation of all tidal breach locations along the Thames from the Thames Barrier to Gravesend, based on low floodplain topography. For hard and composite defences breaches are set at 20 m wide; for soft defences, breaches are 50 m wide. In both cases, the defence breach scour distance was assumed to extend into the floodplain by the same distance as the breach width. The modelling is based on the 2008 TE2100 in-channel levels, with an allowance for climate change for epoch 2115.

Downriver Breach Modelling Map centred on SE2 9SA created 13 February 2024 [Ref: KSL 345478 RL]



Scale 1: 20,000



Legend

- Site Location
- TE2100 Model Nodes
- Main Rivers

Downriver 0.1% AEP Outlines

Epoch

- 2014 (Current year)
- 2115

Thames Tidal Downriver Breach Inundation Modelling 2018

A modelled representation of all tidal breach locations along the Thames from the Thames Barrier to Gravesend, based on low floodplain topography. For hard and composite defences breaches are set at 20 m wide; for soft defences, breaches are 50 m wide. In both cases, the defence breach scour distance was assumed to extend into the floodplain by the same distance as the breach width. The modelling is based on the 2008 TE2100 in-channel levels, with an allowance for climate change for epoch 2115.

Model Output Data – 2D Levels

You have requested flood levels for various return periods at this location.

The modelled flood levels for the closest most appropriate model grid cells, any additional information you may need to know about the modelling from which they are derived and/or any specific use or health warning for their use are set out below.

A map showing the location of the points from which the data is taken is enclosed. Please note you should read the notice enclosed for your specific use rights.

This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites.

Table 3: Modelled fluvial only defended levels in metres above Ordnance Datum Newlyn (m AODN), for various Annual Exceedance Probabilities (AEP).

Node	Easting	Northing	20% AEP	10% AEP	5% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.1% AEP
1	547366	179221	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return
2	547387	179230	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return
3	547358	179200	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return
4	547375	179208	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return
5	547394	179217	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return
6	547410	179224	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return
7	547361	179180	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return
8	547384	179190	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return
9	547404	179197	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return
10	547417	179203	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return
11	547371	179158	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return
12	547400	179167	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return
13	547419	179173	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return
14	547383	179144	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return
15	547410	179149	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return

Data taken from the detailed Marsh Dykes Modelling completed in May 2020 by JBA Consulting.

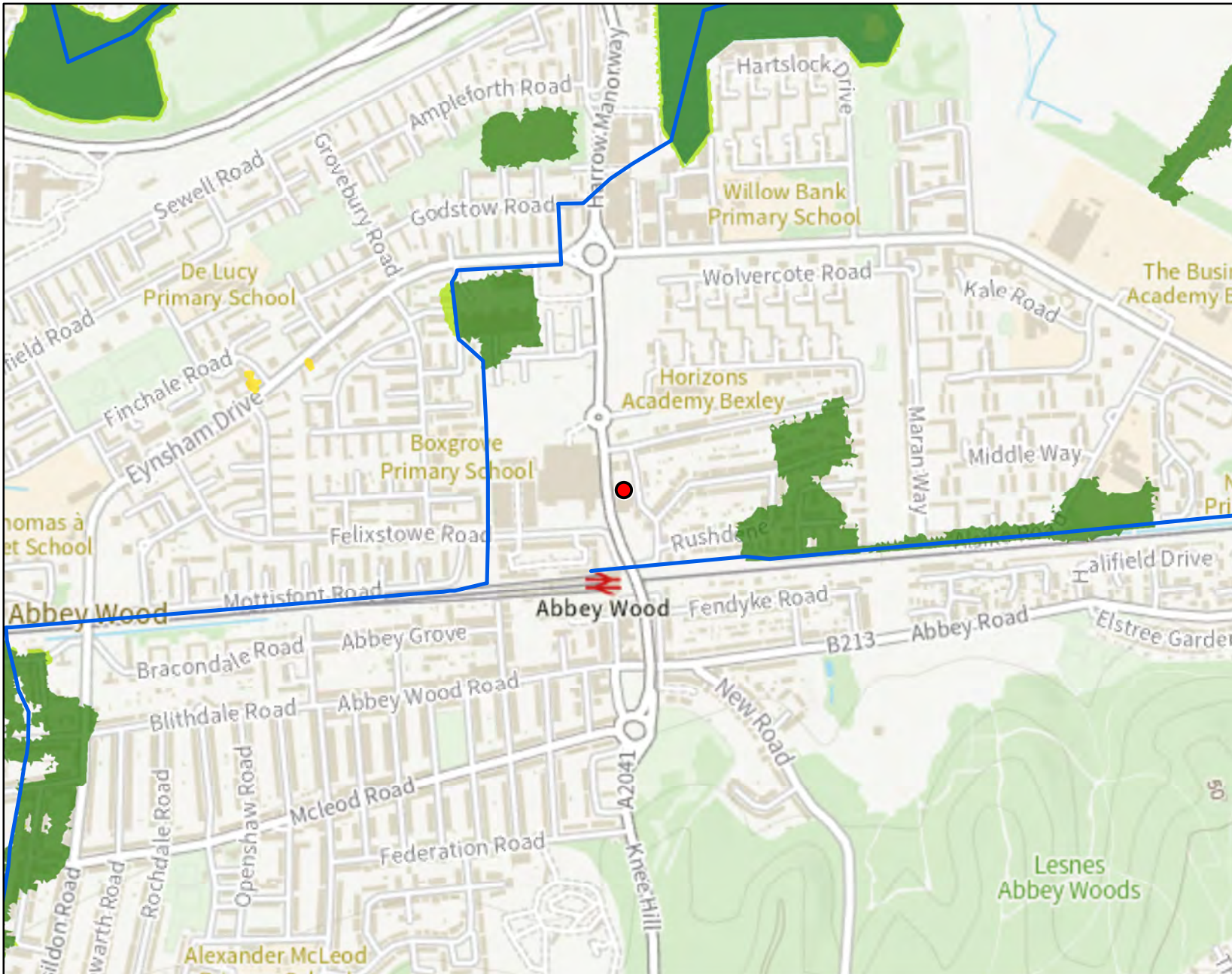
Environment Agency, Orchard House, Endeavour Park, London Road, West Malling, ME19 5SH

Customer services line: 020 8474 6848

Email: kslenquiries@environment-agency.gov.uk

Website: <https://www.gov.uk/government/organisations/environment-agency>

Modelled Defended Fluvial Extents centred on SE2 9SA created 13 February 2024
[Ref: KSL 345478 RL]



Scale 1: 10,000



Legend

- Site Location
- Main Rivers

Fluvial

AEP (%)

- 20% AEP
- 10% AEP
- 5% AEP
- 3.33% AEP
- 2% AEP
- 1.33% AEP
- 1% AEP
- 0.1% AEP

AEP = Annual Exceedance Probability
 The probability of a flood of a particular magnitude, or greater, occurring in any given year.

Table 4: Modelled **fluvial only defended** climate change levels in metres above Ordnance Datum Newlyn (m AODN), for various Annual Exceedance Probabilities (AEP).

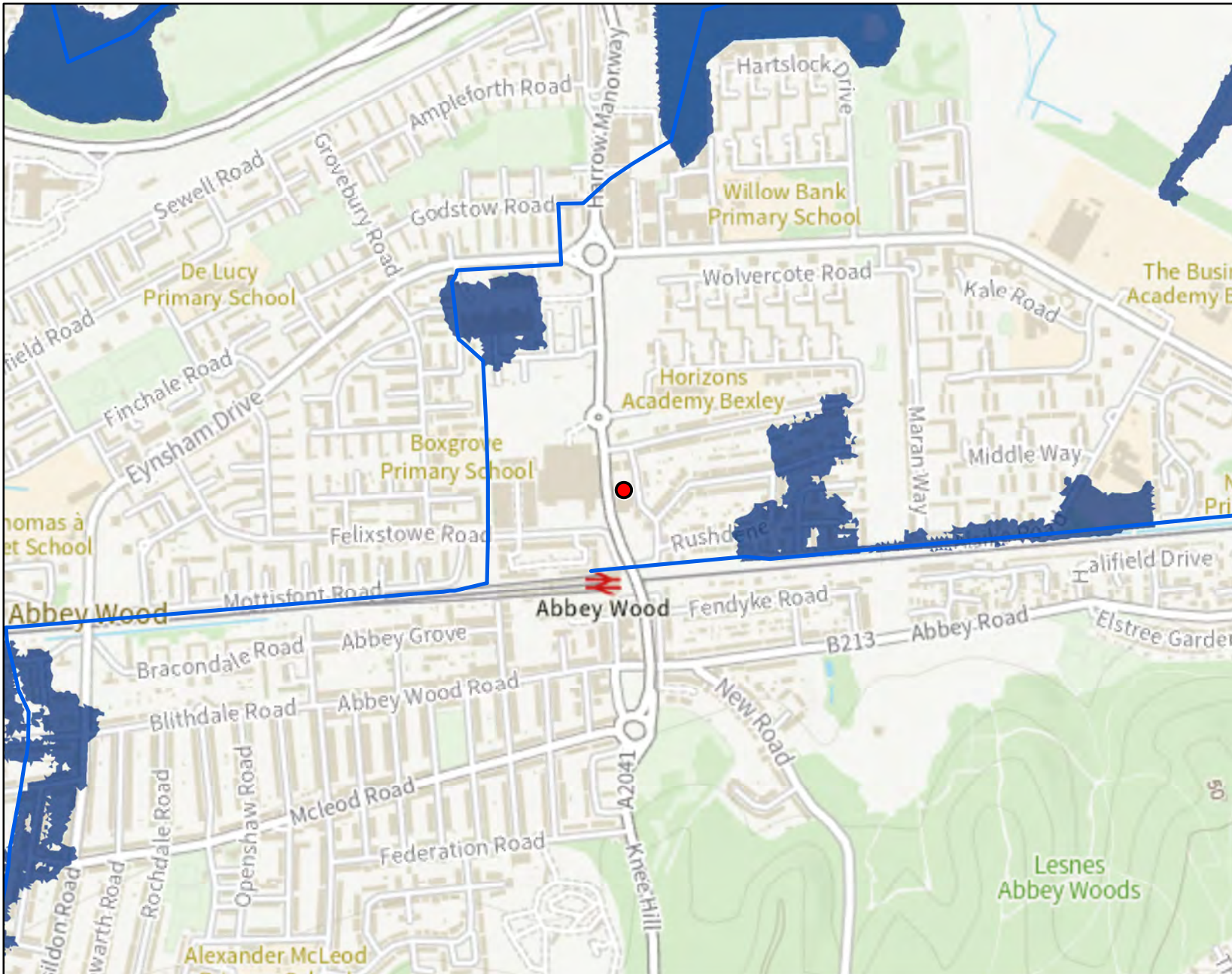
Node	Easting	Northing	1% AEP + CC (Central)	1% AEP + CC (Upper End)
1	547366	179221	Nil return	Nil return
2	547387	179230	Nil return	Nil return
3	547358	179200	Nil return	Nil return
4	547375	179208	Nil return	Nil return
5	547394	179217	Nil return	Nil return
6	547410	179224	Nil return	Nil return
7	547361	179180	Nil return	Nil return
8	547384	179190	Nil return	Nil return
9	547404	179197	Nil return	Nil return
10	547417	179203	Nil return	Nil return
11	547371	179158	Nil return	Nil return
12	547400	179167	Nil return	Nil return
13	547419	179173	Nil return	Nil return
14	547383	179144	Nil return	Nil return
15	547410	179149	Nil return	Nil return

Data taken from the detailed Marsh Dykes Modelling completed in May 2020 by JBA Consulting.

Climate change (CC) data represents modelled levels with:

- 2080s epoch, 'Central' scenario – 35% peak fluvial flow uplift and 20% peak rainfall uplift
- 2080s epoch, 'Upper End' scenario – 70% peak fluvial flow uplift and 40% peak rainfall uplift

**Modelled Defended Fluvial Climate Change Extents centred on SE2 9SA created 13 February 2024
[Ref: KSL 345478 RL]**



Scale 1: 10,000



Legend

● Site Location

— Main Rivers

Fluvial Climate Change

AEP (%)

1% AEP

1% AEP + 35% Flow + 20% Rainfall

1% AEP + 70% Flow + 40% Rainfall

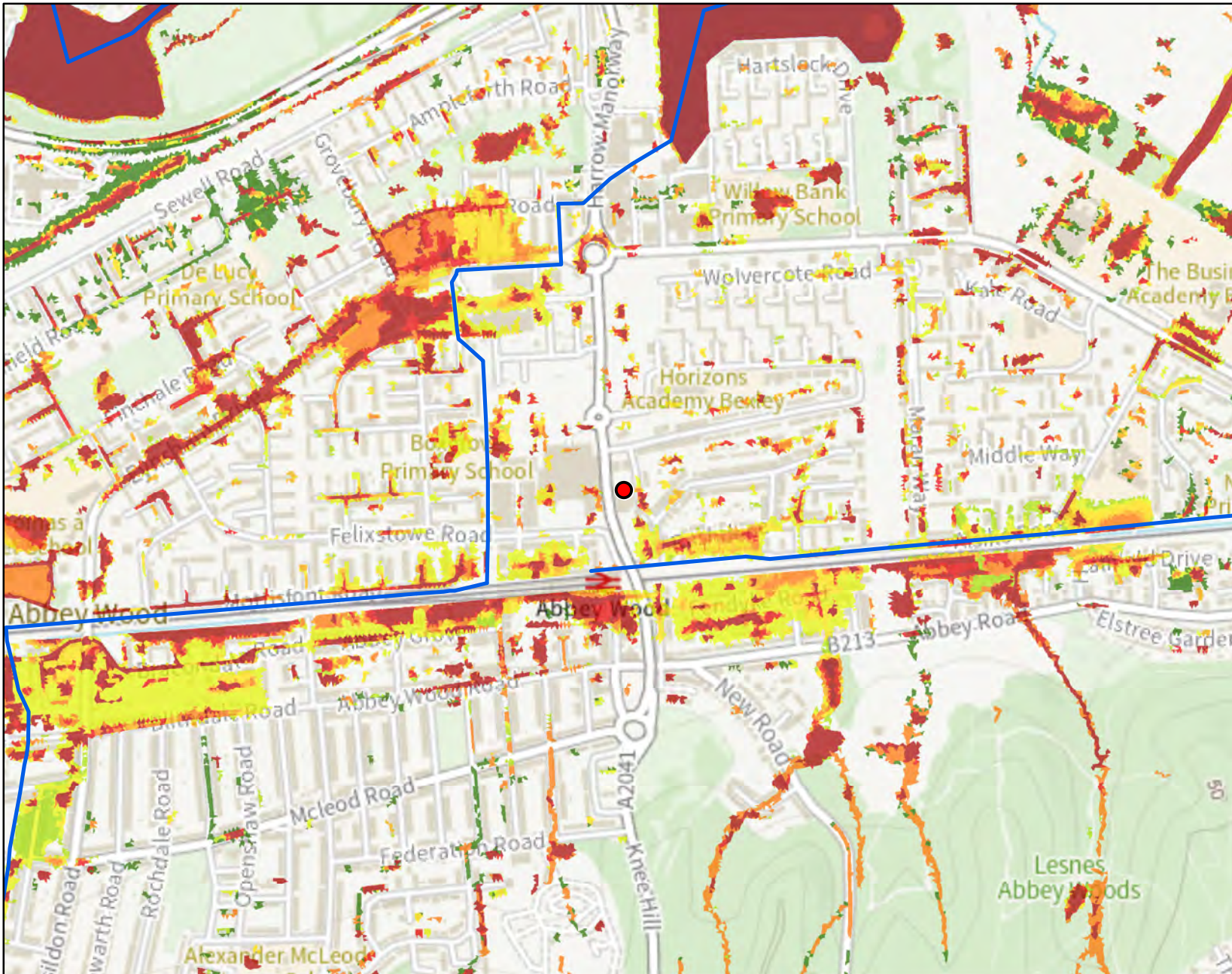
AEP = Annual Exceedance Probability
The probability of a flood of a particular magnitude, or greater, occurring in any given year.

Table 5: Modelled **combined (fluvial-surface water) defended** levels in metres above Ordnance Datum Newlyn (m AODN), for various Annual Exceedance Probabilities (AEP).

Node	Easting	Northing	20% AEP	10% AEP	5% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.1% AEP
1	547366	179221	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return
2	547387	179230	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	1.23
3	547358	179200	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return
4	547375	179208	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return
5	547394	179217	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return
6	547410	179224	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	1.24
7	547361	179180	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return
8	547384	179190	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	1.24
9	547404	179197	Nil return	Nil return	Nil return	Nil return	0.96	0.97	0.98	1.23
10	547417	179203	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	1.24
11	547371	179158	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return
12	547400	179167	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return
13	547419	179173	0.89	0.89	0.93	0.95	0.96	0.97	0.98	1.24
14	547383	179144	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	Nil return	1.24
15	547410	179149	0.66	0.65	0.70	0.71	0.73	0.88	0.98	1.24

Data taken from the detailed Marsh Dykes Modelling completed in May 2020 by JBA Consulting

Modelled Defended Combined Extents centred on SE2 9SA created 13 February 2024
[Ref: KSL 345478 RL]



Scale 1: 10,000



Legend

- Site Location
- Main Rivers

Combined

AEP (%)

- 20% AEP
- 10% AEP
- 5% AEP
- 3.33% AEP
- 2% AEP
- 1.33% AEP
- 1% AEP
- 0.1% AEP

AEP = Annual Exceedance Probability
 The probability of a flood of a particular magnitude, or greater, occurring in any given year.

Table 6: Modelled **combined (fluvial-surface water) defended** climate change levels in metres above Ordnance Datum Newlyn (m AODN), for various Annual Exceedance Probabilities (AEP).

Node	Easting	Northing	1% AEP + Climate Change (35% Flow & 20% Rainfall)	1% AEP + CC (70% Flow & 40% Rainfall)
1	547366	179221	Nil return	Nil return
2	547387	179230	Nil return	1.13
3	547358	179200	Nil return	Nil return
4	547375	179208	Nil return	Nil return
5	547394	179217	Nil return	Nil return
6	547410	179224	Nil return	1.14
7	547361	179180	Nil return	Nil return
8	547384	179190	Nil return	Nil return
9	547404	179197	Nil return	1.13
10	547417	179203	Nil return	1.13
11	547371	179158	Nil return	Nil return
12	547400	179167	Nil return	Nil return
13	547419	179173	0.90	1.13
14	547383	179144	Nil return	1.14
15	547410	179149	0.66	1.14

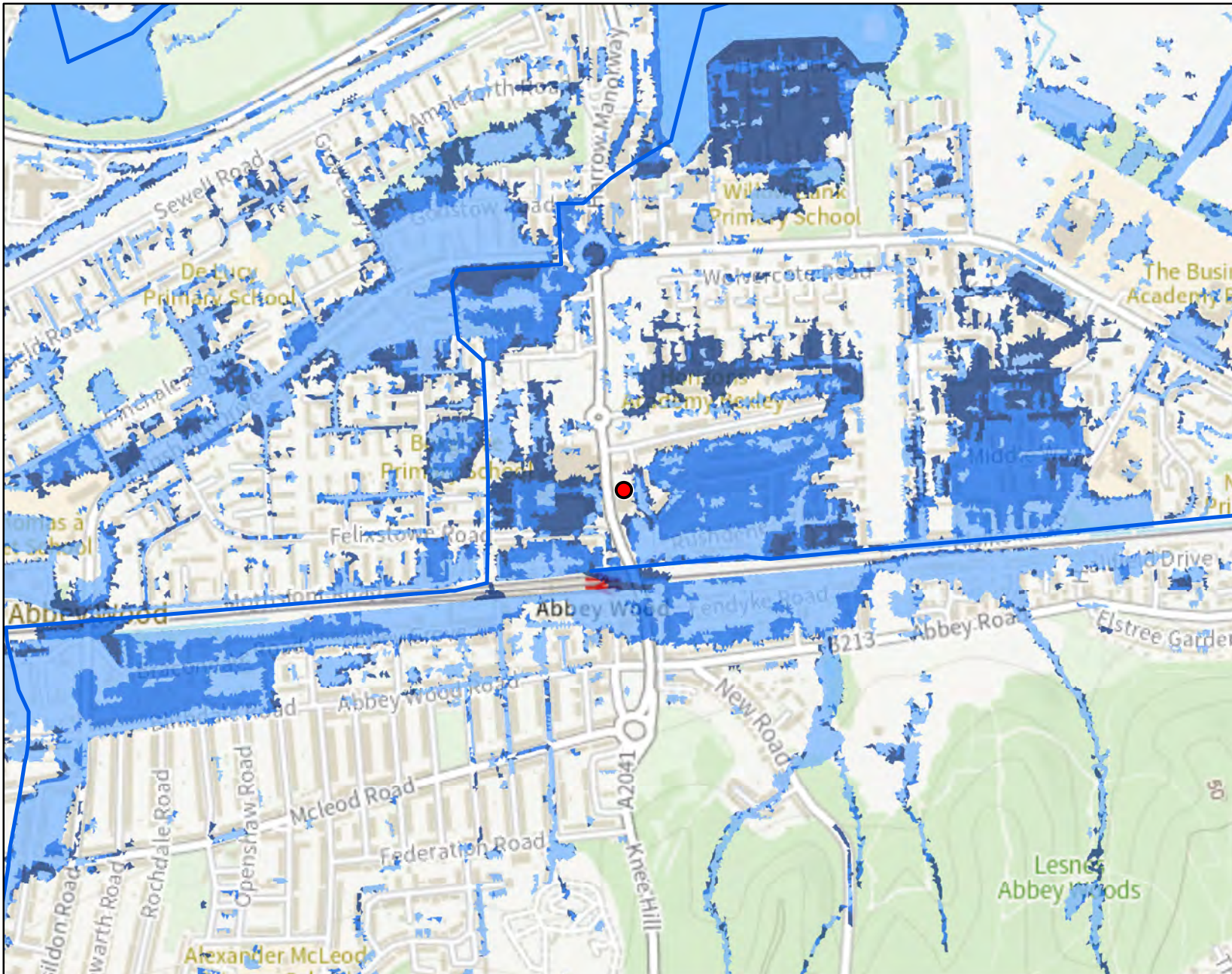
Data taken from the detailed Marsh Dykes Modelling completed in May 2020 by JBA Consulting.

Climate change (CC) data represents modelled levels with:

- 2080s epoch, 'Central' scenario – 35% peak fluvial flow uplift and 20% peak rainfall uplift
- 2080s epoch, 'Upper End' scenario – 70% peak fluvial flow uplift and 40% peak rainfall uplift

Please note this site is covered by the Marsh Dykes Modelling. The Marsh Dykes Modelling was completed in May 2020 by JBA Consulting. The outputs from this integrated model shows the flood extents from multiple sources, in the case of Marsh Dykes, flood risk from fluvial, pluvial runoff (surface water) and sewers.

**Modelled Defended Combined Climate Change Extents centred on SE2 9SA created 13 February 2024
[Ref: KSL 345478 RL]**



Scale 1: 10,000



Legend

● Site Location

— Main Rivers

Combined Climate Change

AEP (%)

1% AEP

1% AEP + 35% Flow + 20% Rainfall

1% AEP + 70% Flow + 40% Rainfall

AEP = Annual Exceedance Probability
The probability of a flood of a particular magnitude, or greater, occurring in any given year.

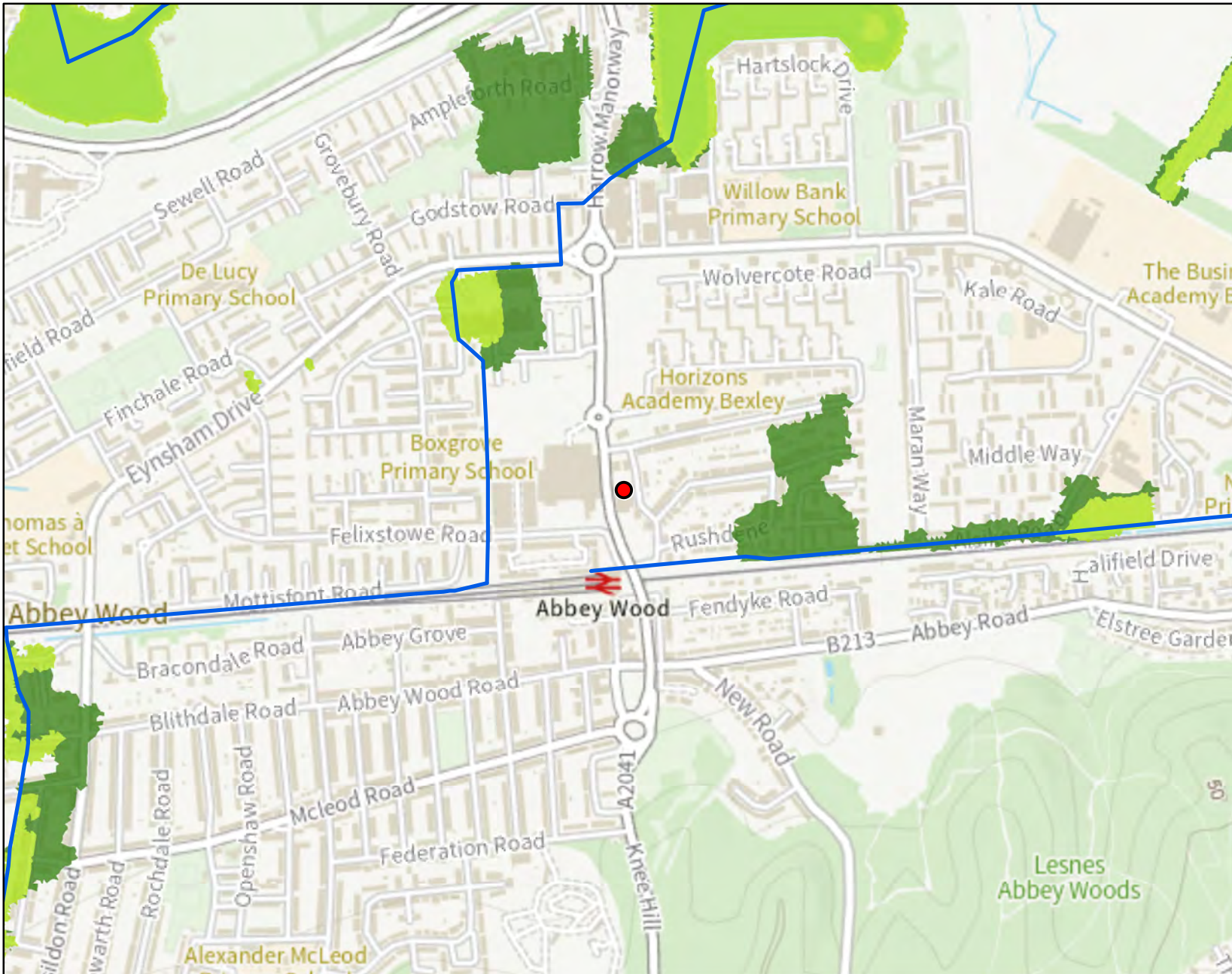
Usually our modelling is focused on flooding from rivers and sea. However, the Marsh Dykes is a combined model. This site is not affected by the fluvial outputs, however it is affected by the combined outputs, including surface water. Therefore the applicant should review the combined model outputs.

Table 7: Modelled **fluvial only undefended** levels in metres above Ordnance Datum Newlyn (m AODN), for various Annual Exceedance Probabilities (AEP).

Node	Easting	Northing	1% AEP	0.1% AEP
1	547366	179221	Nil return	Nil return
2	547387	179230	Nil return	Nil return
3	547358	179200	Nil return	Nil return
4	547375	179208	Nil return	Nil return
5	547394	179217	Nil return	Nil return
6	547410	179224	Nil return	Nil return
7	547361	179180	Nil return	Nil return
8	547384	179190	Nil return	Nil return
9	547404	179197	Nil return	Nil return
10	547417	179203	Nil return	Nil return
11	547371	179158	Nil return	Nil return
12	547400	179167	Nil return	Nil return
13	547419	179173	Nil return	Nil return
14	547383	179144	Nil return	Nil return
15	547410	179149	Nil return	Nil return

Data taken from the detailed Marsh Dykes Modelling completed in May 2020 by JBA Consulting.
 Undefended scenario represents all pumping stations removed.

Modelled Undefended Fluvial Extents centred on SE2 9SA created 13 February 2024
[Ref: KSL 345478 RL]



Scale 1: 10,000



Legend

- Site Location
- Main Rivers

Undefended - Fluvial

AEP

- 1% AEP
- 0.1% AEP

Marsh Dykes Modelling (2020)

Undefended scenario represents all pumping stations removed.

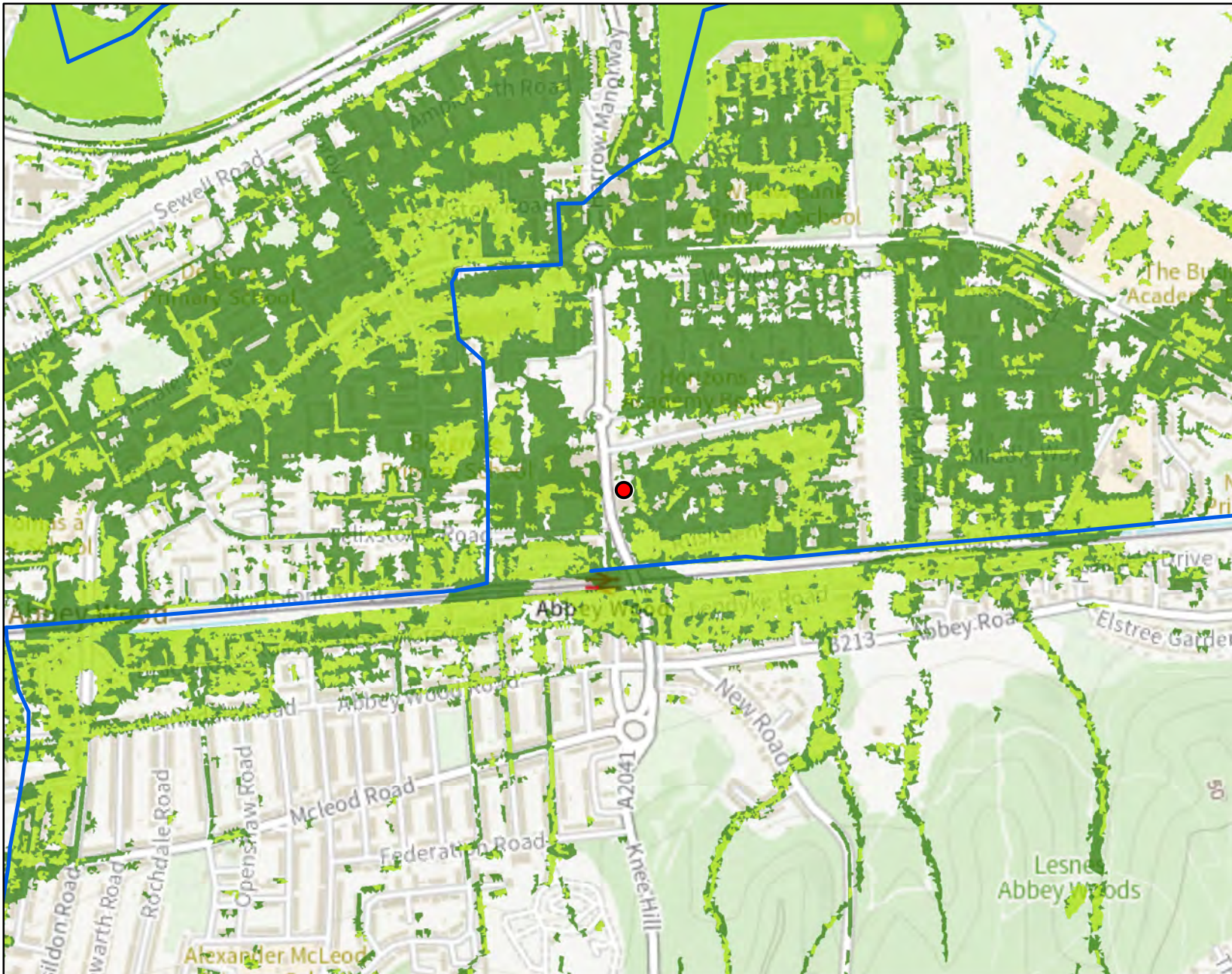
AEP = Annual Exceedance Probability
 The probability of a flood of a particular magnitude, or greater, occurring in any given year.

Table 8: Modelled **combined (fluvial-surface water) undefended** levels in metres above Ordnance Datum Newlyn (m AODN), for various Annual Exceedance Probabilities (AEP).

Node	Easting	Northing	1% AEP	0.1% AEP
1	547366	179221	Nil return	Nil return
2	547387	179230	Nil return	1.24
3	547358	179200	Nil return	Nil return
4	547375	179208	Nil return	Nil return
5	547394	179217	Nil return	Nil return
6	547410	179224	Nil return	1.24
7	547361	179180	Nil return	Nil return
8	547384	179190	Nil return	1.24
9	547404	179197	0.98	1.24
10	547417	179203	Nil return	1.24
11	547371	179158	Nil return	Nil return
12	547400	179167	Nil return	Nil return
13	547419	179173	0.98	1.24
14	547383	179144	Nil return	1.24
15	547410	179149	0.98	1.24

Data taken from the detailed Marsh Dykes Modelling completed in May 2020 by JBA Consulting.
Undefended scenario represents all pumping stations removed.

Modelled Undefended Combined Extents centred on SE2 9SA created 13 February 2024
[Ref: KSL 345478 RL]



Scale 1: 10,000



Legend

- Site Location
- Main Rivers

Undefended - Combined

AEP (%)

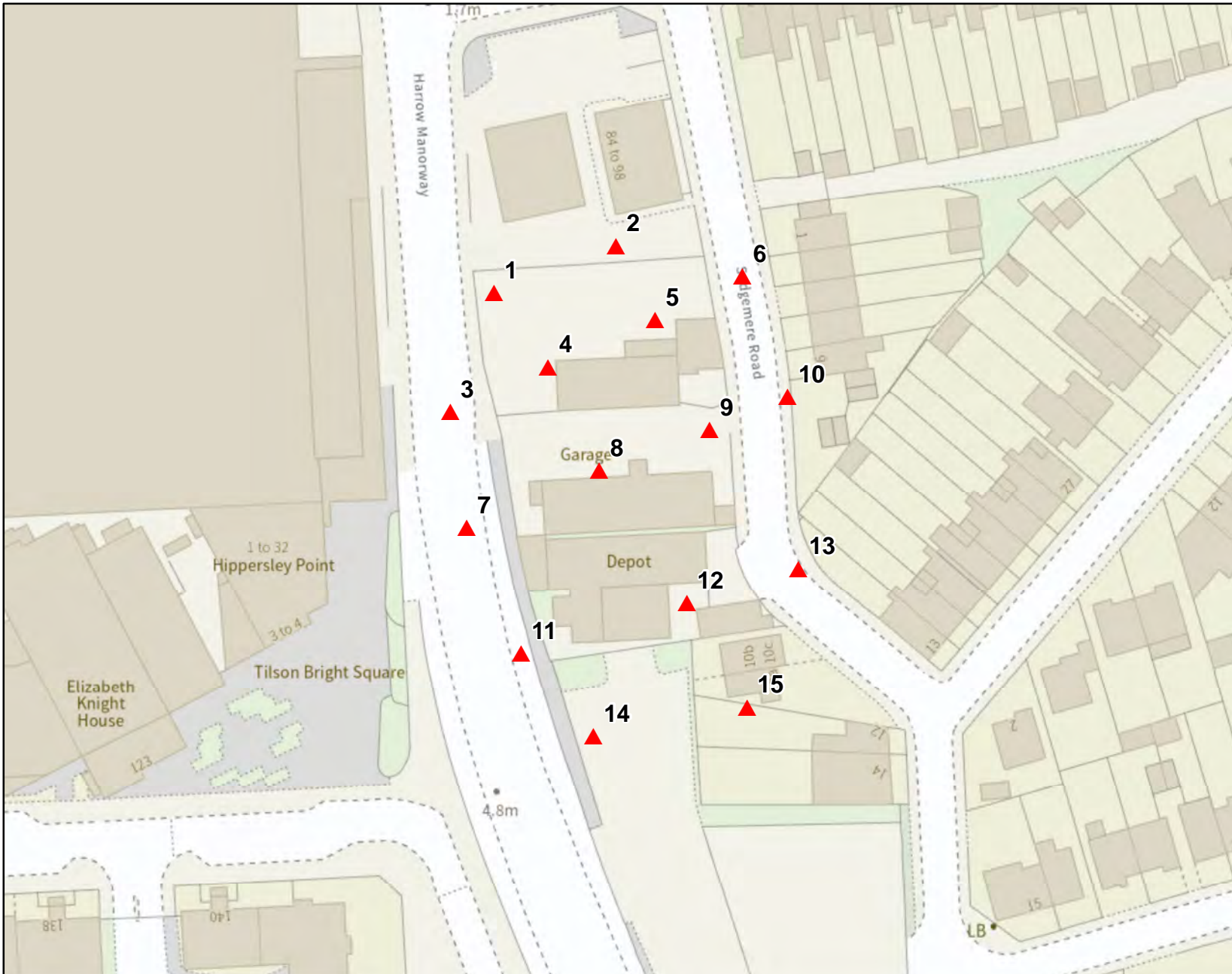
- 1% AEP
- 0.1% AEP

Marsh Dykes Modelling (2020)

Undefended scenario represents all pumping stations removed.

AEP = Annual Exceedance Probability
The probability of a flood of a particular magnitude, or greater, occurring in any given year.

Node Location Map centred on SE2 9SA created 13 February 2024 [Ref: KSL 345478 RL]



Scale 1: 1,000



Legend

▲ Node Point Locations

— Main Rivers

Defence Details

There are no formal flood defences owned or maintained by the Environment Agency in the area of this property.

Areas Benefiting from Flood Defences

The Environment Agency has taken the decision to retire this dataset and remove it from the Flood Map for Planning portal. This is because we have determined that it no longer meets the customer needs and creates a false sense of security for users.

To understand the long-term risk of flooding to an area, you can use the [Check Your Long Term Flood Risk portal](#): this will provide an understanding of flood risk from rivers and sea, taking into account the presence and condition of defences, and other sources of flood risk such as from surface water and reservoirs.

Recorded Flood Events Data

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

Flood Event Data

1953 – The site was subject to tidal flooding, due to a storm surge in the North Sea, on the night of the 31st January into the morning of 1st February. An approximate level in the Thames at the time was 5.10 m AODN.

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

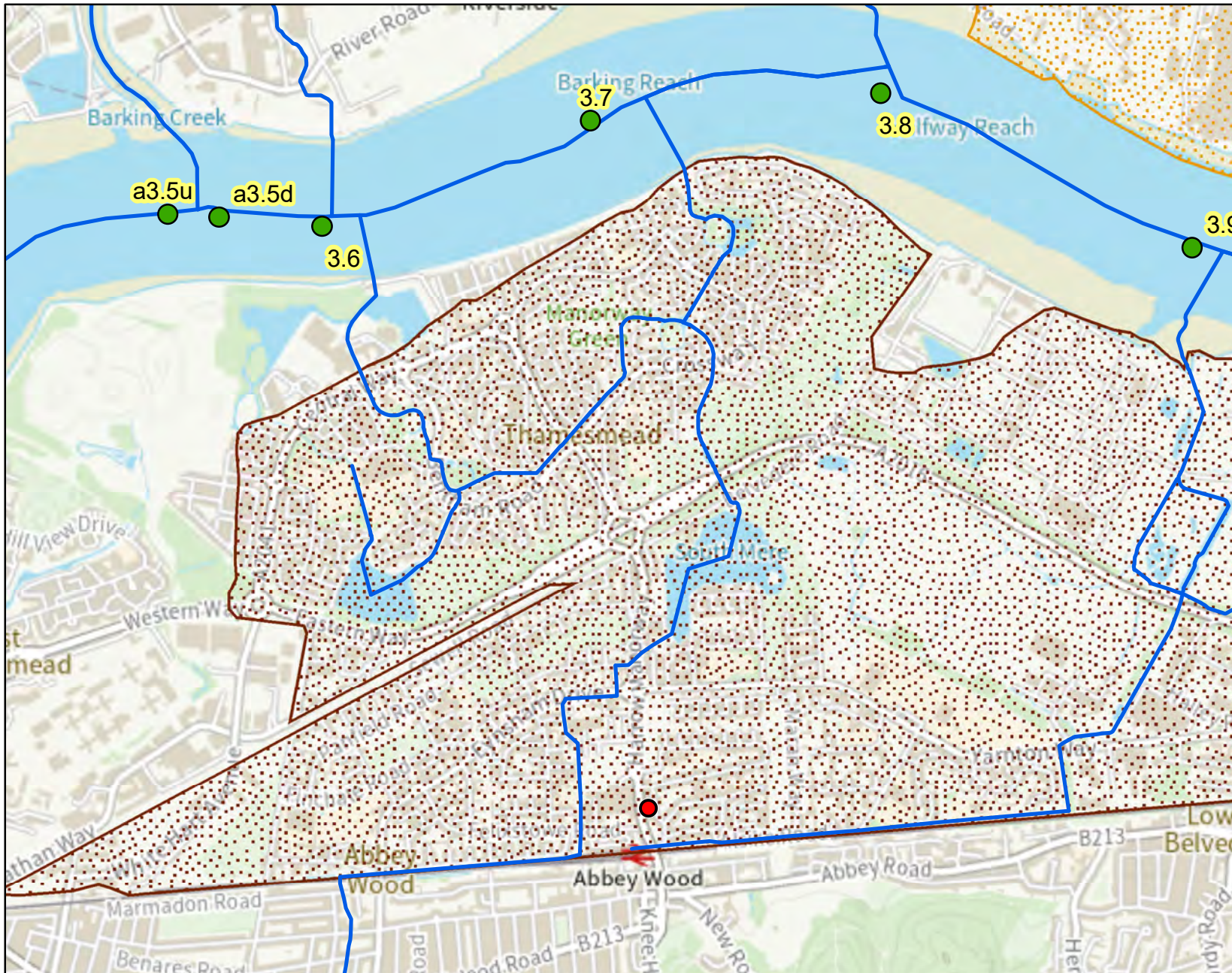
We map flooding to land, not individual properties. Our historic flood event record outlines are an indication of the geographical extent of an observed flood event. Our historic flood event outlines do not give any indication of flood levels for individual properties. They also do not imply that any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

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

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

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

Historic Flood Map centred on SE2 9SA created 13 February 2024 [Ref: KSL 345478 RL]



Scale 1: 20,000



Legend

- Site Location
- TE2100 Model Nodes
- Main Rivers
- 1707 Flood Outline
- Jan 1953 Flood Outline

Additional Information

Information Warning - OS background mapping

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Environment Agency planning guidance and pre application service

- Planning Practice Guidance_- provides information about planning considerations in areas at risk of flooding. <https://www.gov.uk/guidance/flood-risk-and-coastal-change>
- Planning applications: assessing flood risk - information about completing Flood Risk Assessments. <https://www.gov.uk/planning-applications-assessing-flood-risk>
- Site specific flood risk assessment: Checklist_- a checklist to help ensure you have considered all the relevant factors in your flood risk assessment. <http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/site-specific-flood-risk-assessment-checklist/>
- Climate change allowance guidance <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

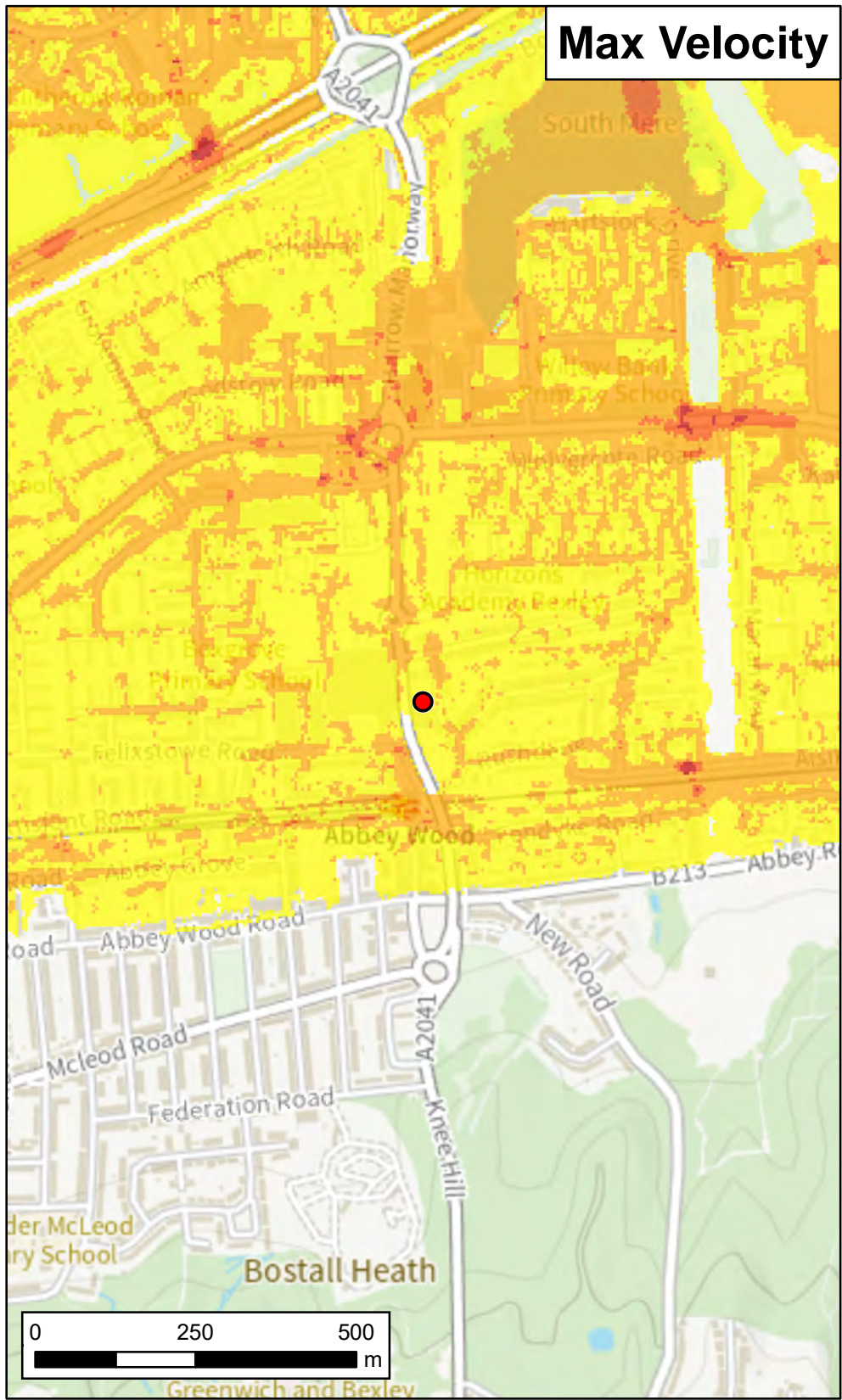
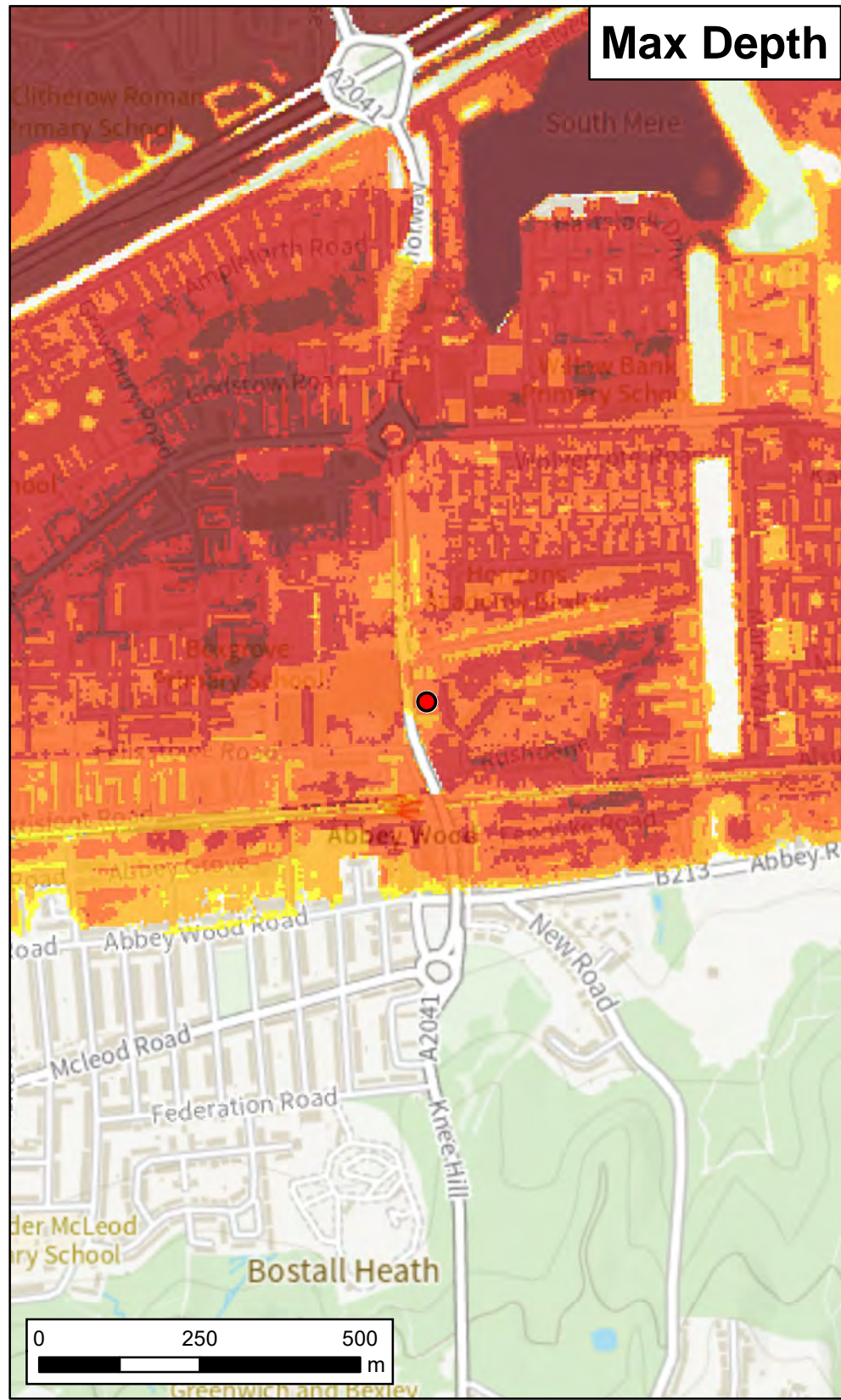
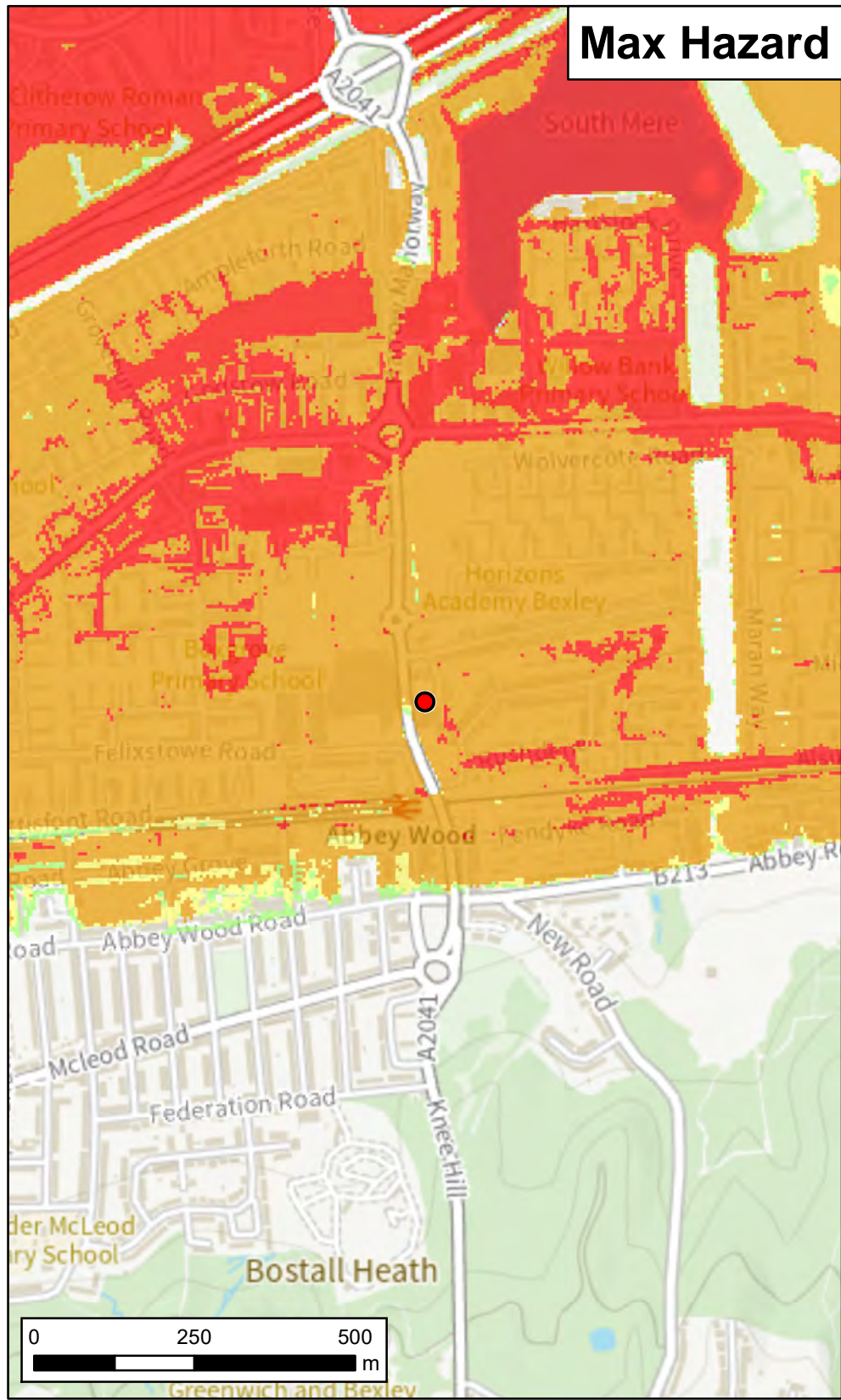
We recommend that you discuss your proposals with the Local Planning Authority at the earliest opportunity. They will be able to advise you on a wide range of planning matters in addition to flood risk.

Please see our website for details on how to get planning advice, including charged-for discretionary advice, from the Environment Agency <https://www.gov.uk/guidance/developers-get-environmental-advice-on-your-planning-proposals#when-to-consult>. Our planning team can be contacted at kslplanning@environment-agency.gov.uk

You should also consult the Strategic Flood Risk Assessment and flood risk local plan policies produced by your local planning authority.

You should note that:

1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk Assessment where one is required, but does not constitute such an assessment on its own.
2. This information covers flood risk from main rivers and the sea, and you will need to consider other potential sources of flooding, such as groundwater or overland runoff. You should discuss surface water management with your Lead Local Flood Authority.
3. Where a planning application requires a FRA and this is not submitted or deficient, the Environment Agency may well raise an objection due to insufficient information



● Site Location					
Max Hazard		Max Depth (m)		Max Velocity (m/s)	
	Less than 0.75 (Low Hazard)		0 - 0.25		0 - 0.3
	Between 0.75 and 1.25 (Danger for Some)		0.25 - 1.00		0.3 - 1.0
	Between 1.25 and 2.00 (Danger for Most)		1.00 - 1.50		1.0 - 1.5
	Greater than 2.00 (Danger for All)		1.50 - 2.00		1.5 - 2.5
			> 2.00		> 2.5
Date Printed	05/02/2024	Scenario year	2115	Scenario Annual Chance	0.5% (1 in 200)


This map shows the combined flood hazard to people (called a hazard rating) if our flood defences are breached at any given single location, for a range of scenarios. The hazard rating depends on the depth and velocity of floodwater, and maximum values of these are also mapped.

The map is based on computer modelling of simulated breaches covering the entire extent between the Thames Barrier and Gravesend. Each breach has been modelled individually and the results combined to create this map. Multiple breaches, other combinations of breaches, different sized tidal surges or flood flows may all give different results.

The map only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring. The likelihood of a breach occurring will depend on a number of different factors, including the construction and condition of the defences in the area. A breach is less likely where defences are of a good standard, but a risk of breaching remains.

Please contact the Environment Agency for further information on emergency planning associated with flood risk in this area.

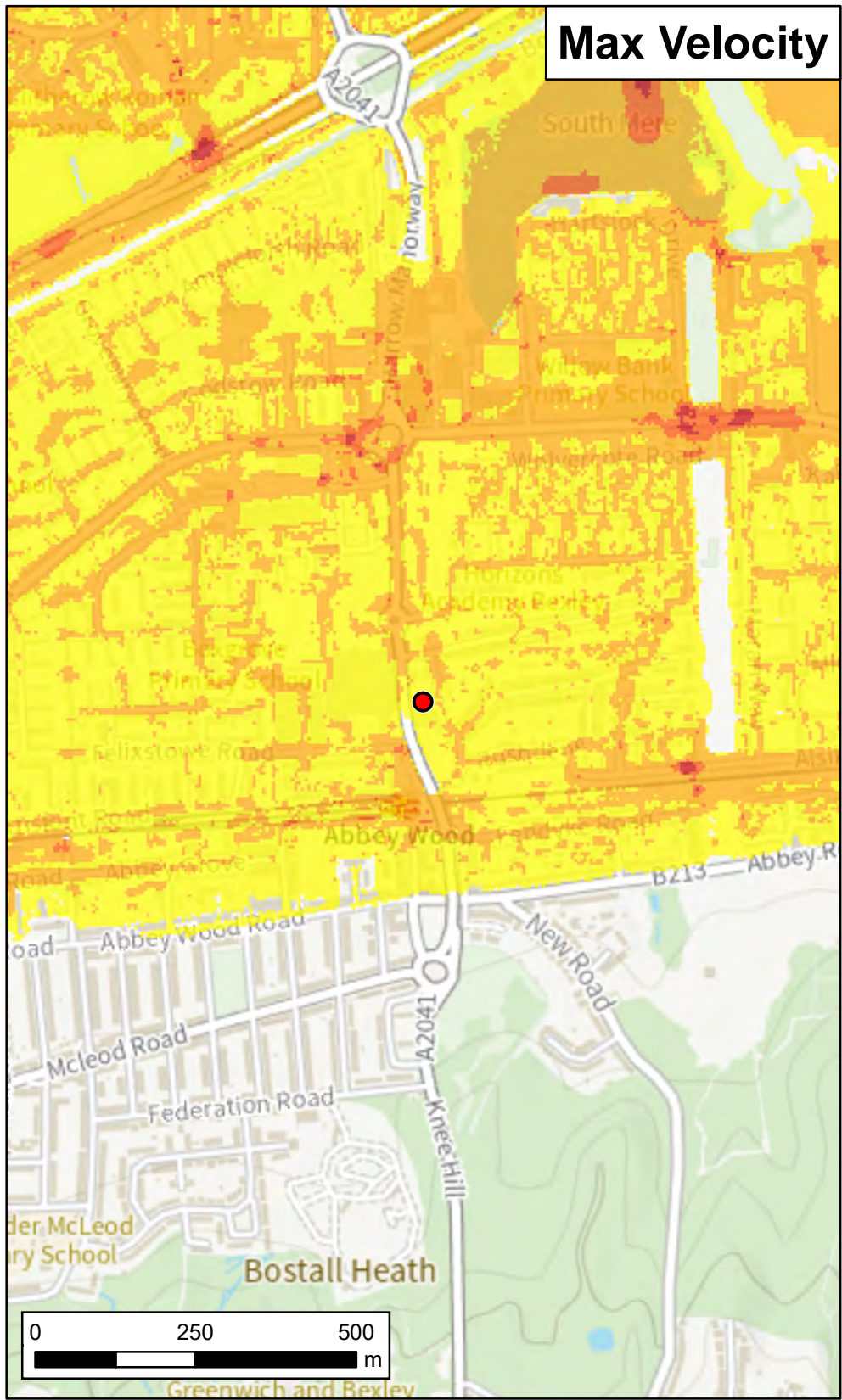
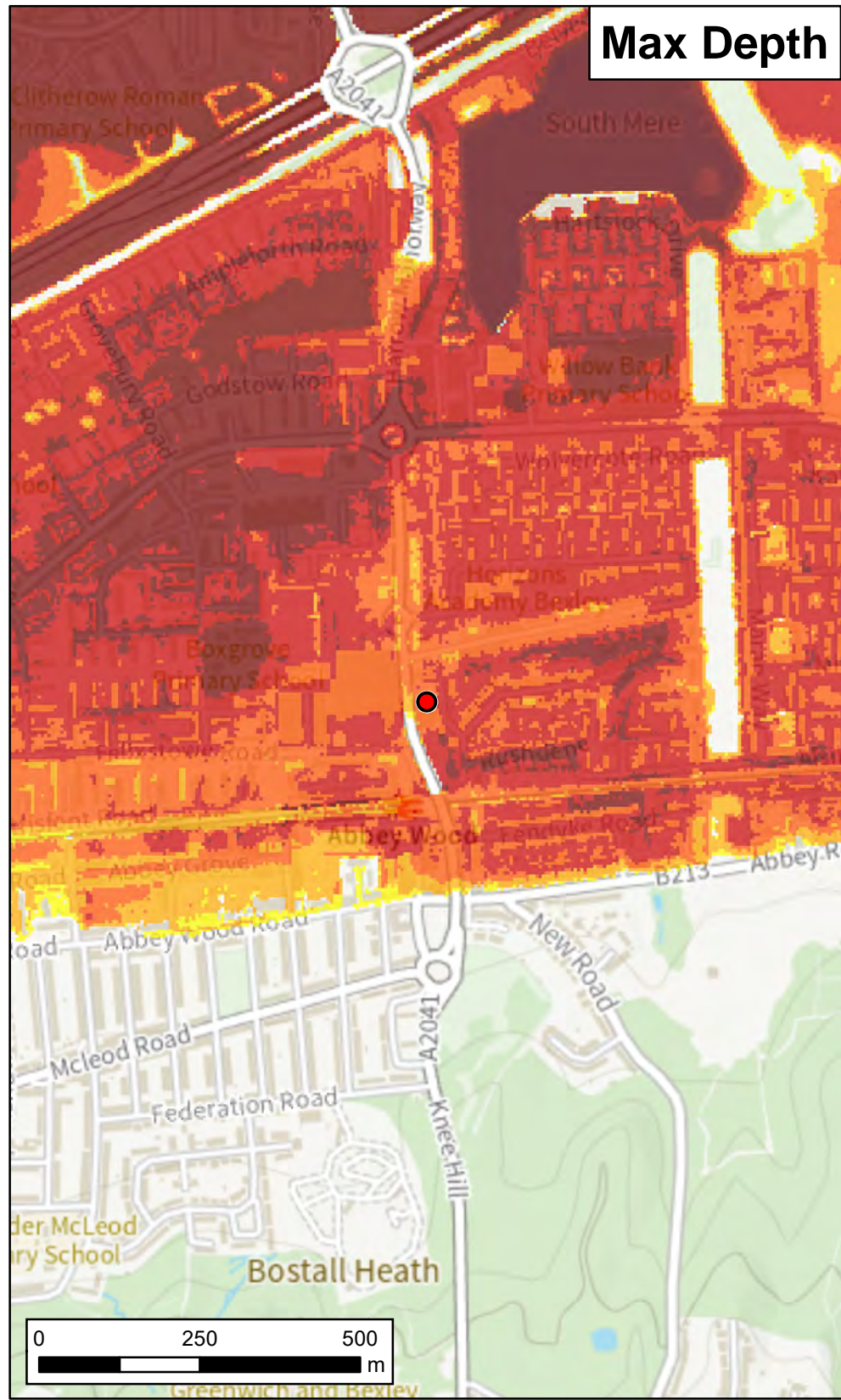
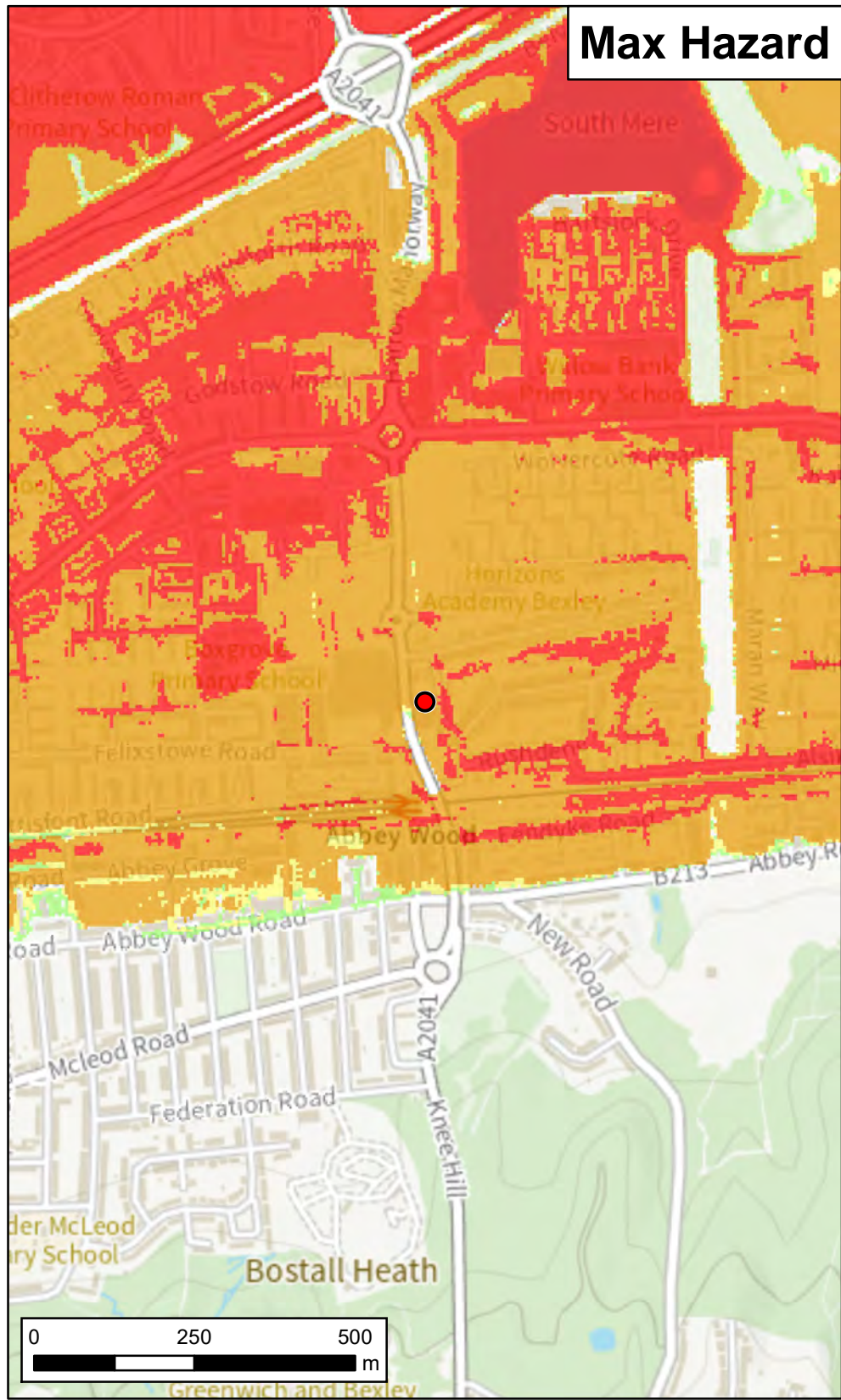
General Enquiries No: 03708 506 506. Weekday Daytime calls cost 5p plus up to 6p per minute from BT Weekend Unlimited. Mobile and other providers' charges may vary



Thames Tidal Downriver Breach Hazard Mapping

Map Centred on SE2 9SA
KSL 345478 RL

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● Site Location					
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	Less than 0.75 (Low Hazard)		0 - 0.25		0 - 0.3
	Between 0.75 and 1.25 (Danger for Some)		0.25 - 1.00		0.3 - 1.0
	Between 1.25 and 2.00 (Danger for Most)		1.00 - 1.50		1.0 - 1.5
	Greater than 2.00 (Danger for All)		1.50 - 2.00		1.5 - 2.5
			> 2.00		> 2.5
Date Printed	05/02/2024	Scenario year	2115	Scenario Annual Chance	0.1% (1 in 1000)


This map shows the combined flood hazard to people (called a hazard rating) if our flood defences are breached at any given single location, for a range of scenarios. The hazard rating depends on the depth and velocity of floodwater, and maximum values of these are also mapped.

The map is based on computer modelling of simulated breaches covering the entire extent between the Thames Barrier and Gravesend. Each breach has been modelled individually and the results combined to create this map. Multiple breaches, other combinations of breaches, different sized tidal surges or flood flows may all give different results.

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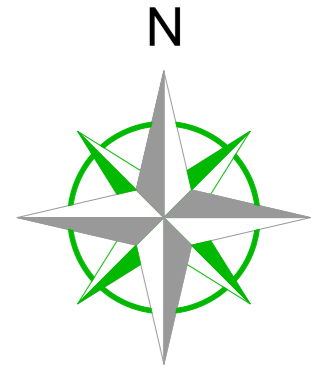
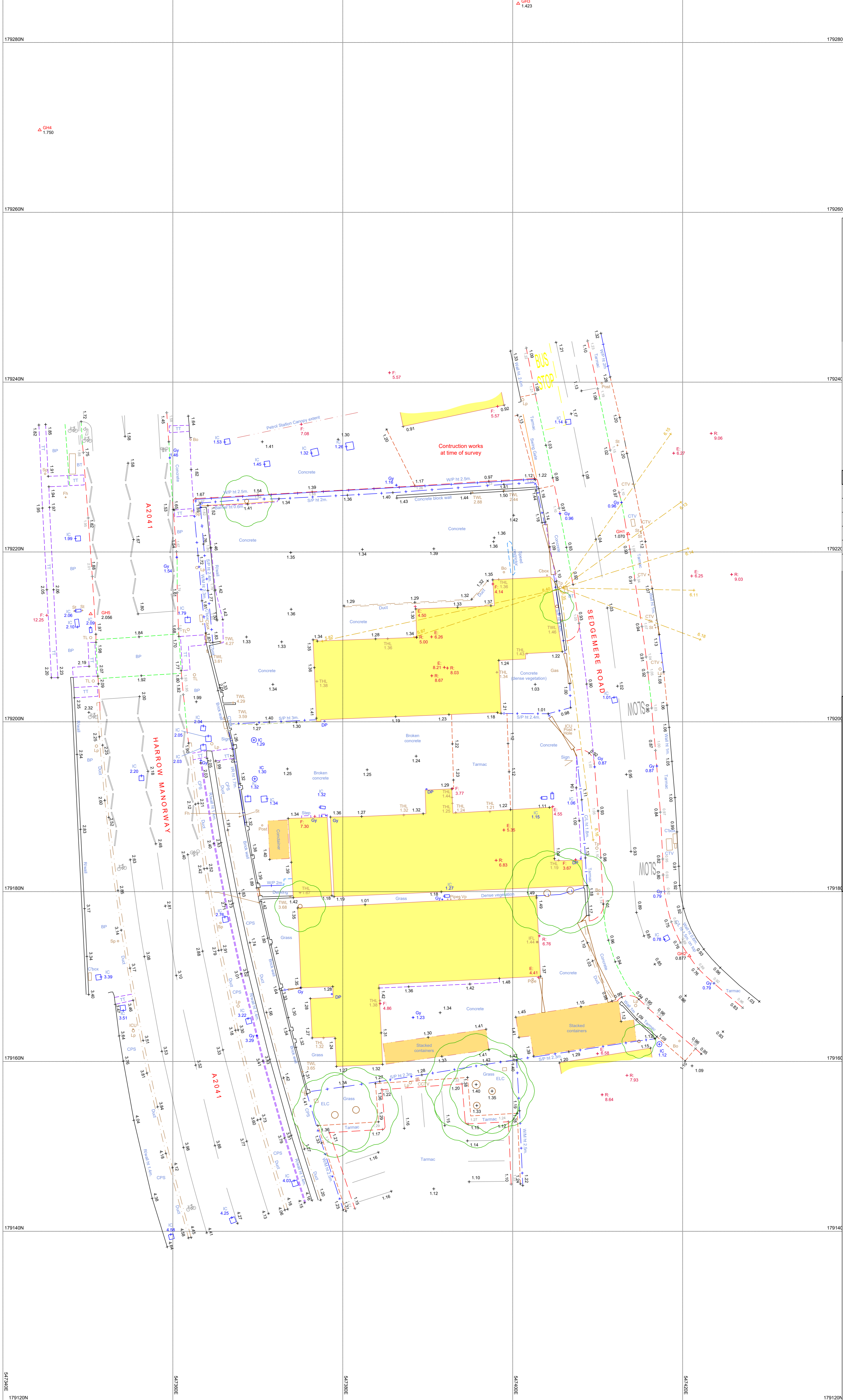


Thames Tidal Downriver Breach Hazard Mapping

Map Centred on SE2 9SA
KSL 345478 RL

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Appendix E – GPR Survey



Station Information:

Station	Easting (m)	Northing (m)	Level (m)
GH1	547413.610	179222.132	1.070
GH2	547420.802	179172.432	0.877
GH3	547400.659	179284.588	1.423
GH4	547344.344	179269.689	1.750
GH5	547350.348	179212.701	2.056

OS Note:
 This survey has been orientated to the Ordnance Survey (OS) National Grid (OSGB36) via Global Navigation Satellite Systems (GNSS) and the O.S. Active Network (OS Net).
 A true OSGB36 coordinate has been established near to the site centre via a transformation using the OSTN15GB & OSGB15GB transformation models.
 The survey has been correlated to this point and a further one or more OSGB36 (15) points established to create a true O.S. bearing for angle orientation.
 No scale factor has been applied to the survey therefore the coordinates shown are arbitrary & not true O.S. Coordinates which have a scale factor applied.
 Please refer to Survey Station Table to enable establishment of the on-site grid datum.
 Some services may have been omitted due to parked vehicles.

Legend:

Building	Overhead Cable	IC	Cont (cont)	SD	Drainage duct
Wall	Concrete edge	IP	Pipe invert	IB	Illuminated bollard
Earth line	Tarmac edge	GY	Gully	IB	Rubbish bin
Line marking	Close edge	BP	Back slope	WP	Waste pipe
Drop kerb	Canopy/Overhang	DP	Down pipe	GL	Ground light
Centre line	Verge	WP	Pipe above ground	LB	Letter box
Top of bank	Bottom of bank	MR	Merkle	US	Tree stump
Station and name	Station level	WL	Water level	TR	Tree
100,000	Station Level	FL	Flood light	IL	Internal floor level
Tree (Bath / Sapling)	Wooded	TP	Telegraph post	HP	High post
Area of Undergrowth	Wooded	TL	Traffic light	BN	Bench
Ridge Level	Blue water	EL	Electric	BT	Brick base
Edges Level	Stop line	BT	Brick base	BT	Brick base
Flat Road Level	Earth rod	TP	Traffic post	BT	Brick base
Fence Types	Gate	CP	Concrete paving stone	BT	Brick base
Iron Railings	Underfoot inspection	PR	Retaining wall	BT	Brick base
Wire Mesh	Wash out	TL	Top of Wall Level	BT	Brick base
Foot & Hand	Roading sign	TOL	Tree canopy level	BT	Brick base
Foot & Hand	Believe basem	GL	Grill	BT	Brick base
Chain Link	CTV	CTV	Cable tv	MS	Man gth
Wooden Panels	Maker post	CL	Clamp post	CL	Clamp post
Close Boarded	Close board	CL	Close level	CL	Close level
Steel Palisade	Soft	IS	Inset level	IS	Inset level
	Fire hydrant	WH	Water to rise	WH	Water to rise

Rev	Date	Description	Drawn	Q. Ref.



Topographical Surveys
 Site Engineering
 Utility / CCTV Surveys
 Measured Building Surveys
 3D Laser Scanning
 Revit & BIM Models

Rowan House
 Duffield Road
 Little Eaton
 Derby
 DE21 5DR
 Tel: (01332) 830044
 admin@greenhatch-group.co.uk
 www.greenhatch-group.co.uk

CLIENT
Abbey Wood Sedgemere Ltd

PROJECT
Abbey Wood
London
SE2 9SW

TITLE
Topographical
Survey

SCALE
A1 @ 1: 200

DATE SURVEYED
25.09.23

DRAWN
JK2

QUALITY REF
GH18454

Level datum See note
Grid orientation See note
Job number 48563
Drawing No. 48563_T
Rev. 0

Comments
 This plan should only be used for its original purpose. Greenhatch Group accepts no responsibility for this plan if supplied to any party other than the original client.
 All dimensions should be checked on site prior to design and construction.
 Drainage information (where applicable) has been visually inspected from the surface and therefore should be treated as approximate only.
Notes:

GH4
1.750

179260N

179240N

179220N

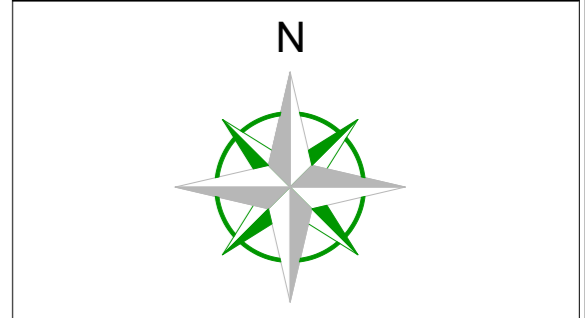
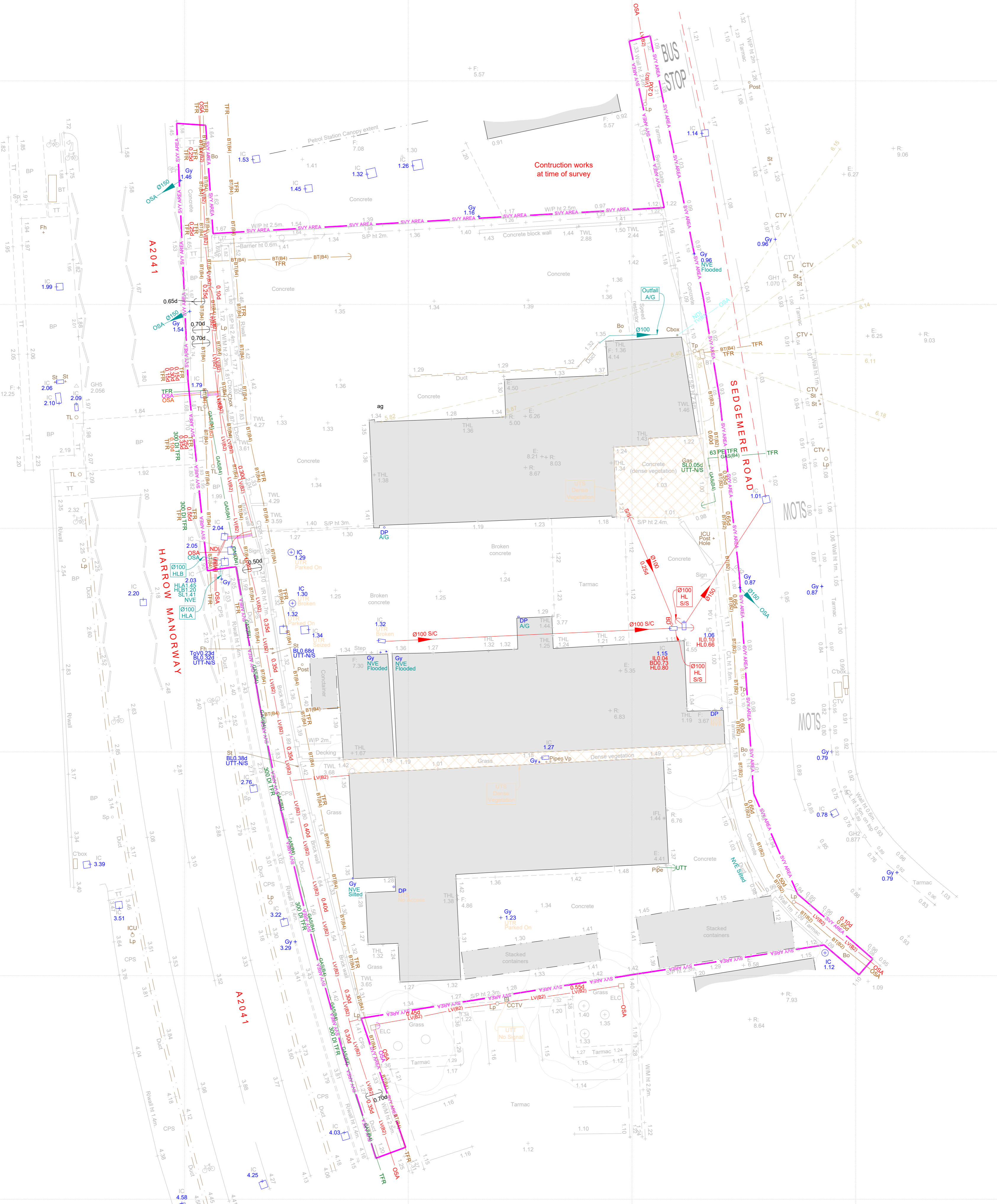
179200N

179180N

179160N

179140N

547340E
547350E
547360E
547370E



NOTES

1. All dimensions given are to the centre of lines unless otherwise stated.
2. All dimensions given are to the centre of lines unless otherwise stated.
3. All dimensions given are to the centre of lines unless otherwise stated.
4. All dimensions given are to the centre of lines unless otherwise stated.
5. All dimensions given are to the centre of lines unless otherwise stated.

UTILITY LINE TYPES

Utility Type	Line Style	Color
Water	Solid	Blue
Sewer	Solid	Red
Gas	Solid	Yellow
Electricity	Solid	Green
Telecom	Solid	Purple
Drainage	Solid	Brown
Other	Solid	Grey

UTILITY SURVEY INFORMATION

Utility Type	Survey Method	Accuracy
Water	As-Built	±100mm
Sewer	As-Built	±100mm
Gas	As-Built	±100mm
Electricity	As-Built	±100mm
Telecom	As-Built	±100mm
Drainage	As-Built	±100mm
Other	As-Built	±100mm

LEGEND

Symbol	Description
[Line]	Water
[Line]	Sewer
[Line]	Gas
[Line]	Electricity
[Line]	Telecom
[Line]	Drainage
[Line]	Other
[Symbol]	Manhole
[Symbol]	Valve
[Symbol]	Box
[Symbol]	Post
[Symbol]	Sign
[Symbol]	Light
[Symbol]	Tree
[Symbol]	Grass
[Symbol]	Concrete
[Symbol]	Tarmac
[Symbol]	Gravel
[Symbol]	Asphalt
[Symbol]	Brick
[Symbol]	Block
[Symbol]	Wall
[Symbol]	Roof
[Symbol]	Ground Level
[Symbol]	Spot Height
[Symbol]	Line Level
[Symbol]	Flow Direction
[Symbol]	Flow Rate
[Symbol]	Flow Velocity
[Symbol]	Flow Volume
[Symbol]	Flow Pressure
[Symbol]	Flow Temperature
[Symbol]	Flow Humidity
[Symbol]	Flow Density
[Symbol]	Flow Viscosity
[Symbol]	Flow Conductivity
[Symbol]	Flow Resistivity
[Symbol]	Flow Capacitance
[Symbol]	Flow Inductance
[Symbol]	Flow Impedance
[Symbol]	Flow Reactance
[Symbol]	Flow Susceptance
[Symbol]	Flow Admittance
[Symbol]	Flow Impedance
[Symbol]	Flow Reactance
[Symbol]	Flow Susceptance
[Symbol]	Flow Admittance

PAS 108:2012 LEVEL 2 SURVEY

Category	Accuracy	Location Accuracy
Horizontal	±100mm	±100mm
Vertical	±100mm	±100mm
Planimetric	±100mm	±100mm
Topographic	±100mm	±100mm
Hydrographic	±100mm	±100mm
Photogrammetric	±100mm	±100mm
Aerial	±100mm	±100mm
Space	±100mm	±100mm
Time	±100mm	±100mm
Frequency	±100mm	±100mm
Wavelength	±100mm	±100mm
Period	±100mm	±100mm
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UTILITY LINETYPES

Air Line	
British Telecom	
British Telecom Overhead	
CCTV / Cable Television	
Communication Cable	
Drainage - Combined Water	
Drainage - Foul Water	
Drainage - Storm Water	
Drainage - Unknown Water	
Drainage - Trade Effluent Water	
Drainage - Combined Water - Assumed/TFR	
Drainage - Foul Water - Assumed/TFR	
Drainage - Storm Water - Assumed/TFR	
Drainage - Unknown Water - Assumed/TFR	
Drainage - Trade Effluent Water - Assumed/TFR	
Drainage - Approximate Pipe Size/Extents	
Earth Cable	
Empty Duct	
Electric & Comms	

Electric Low Voltage	
Electric High Voltage	
Electric - Unknown Voltage	
Electric Overhead	
Fibre Optic	
Fuel Line	
Gas Line	
Gauge Line	
GPR Line	
Heating Pipes	
Offset Fills	
Oil Pipe	
Rising Main	
Telecom	
Traffic Light Signals	
Trench Scar	
Unknown	
Vapour Recovery	
Vent Line	
Water	

UTILITY SURVEY INFORMATION

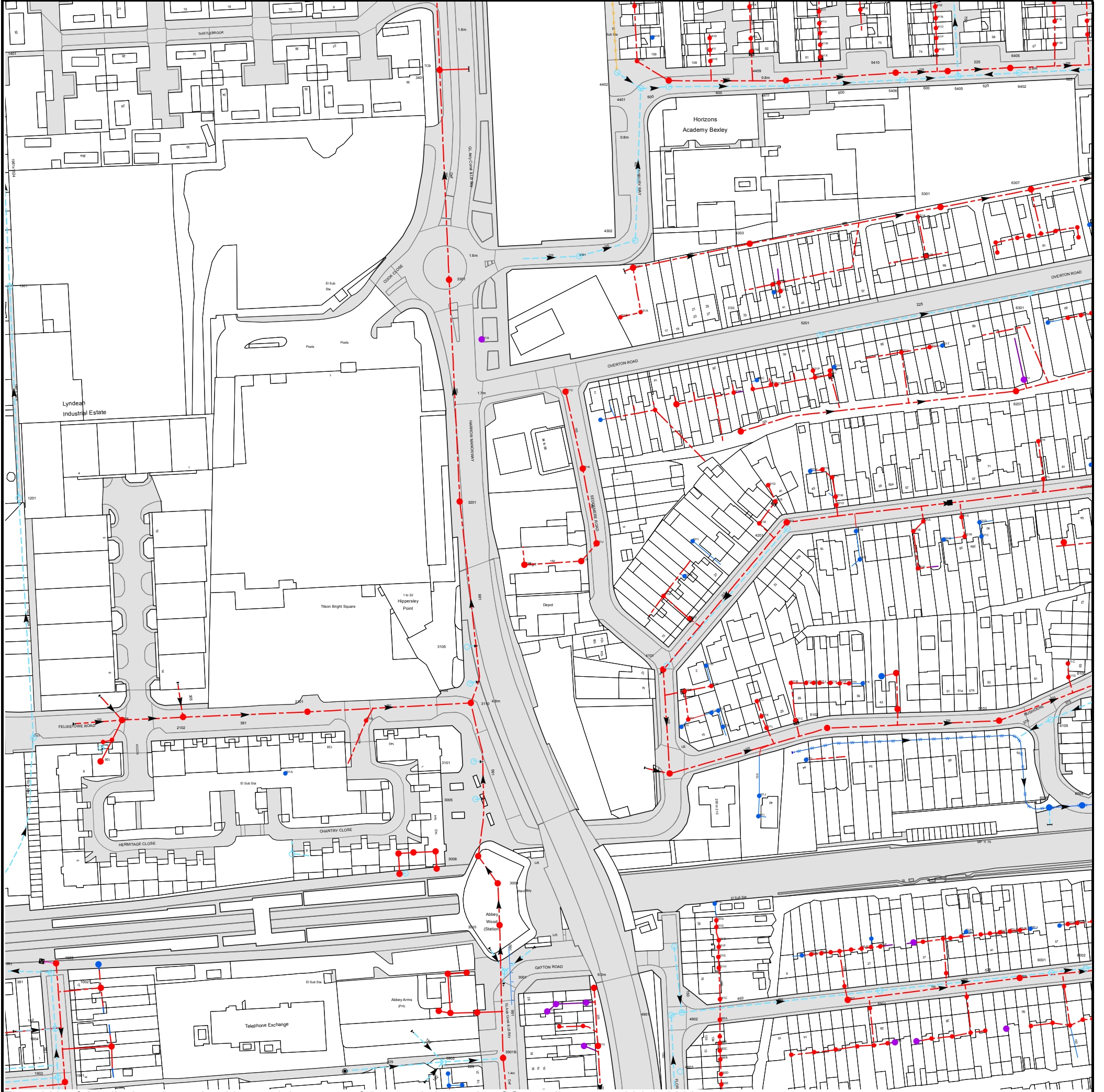
Contracted Survey Area	
Depth to Top of Service (m)	0.40d
End of Trace	EOT
Head of Run	HoR
Weak Signal	WS
Taken From Records	TFR
Off Survey Area	OSA
Back Drop	BD
Silt Level	SL
Above Ground	A/G
Unable to Locate	UTL
Unable to Survey	UTS
Unable to Raise (cover)	UTR
Unable to Trace	UTT

Unable to Survey	
Chamber Extents	

Assumed Route	AR
Assumed Connection	ACP
Sound Connection	S/C
Sonde Stopped	S/S
No Visible Access	NVA
No Visible Exit	NVE
No Visible Pipes	NVP
No Visible Services	NVS
No Depth Indicated	NDI
Base Level	BL
High Level	HL
Top of Pipe / Top of Valve	T.o.P / T.o.V
Landing Level	LL
Rubble Level	RL
Approximate Location	
GPR Anomaly	
Multiple Services Route	

Appendix F – Thames Water Asset Map

Asset Location Search Sewer Map - ALS/ALS Standard/2023 4882225



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 547391,179202

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map (2020) with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
541C	n/a	n/a
541R	n/a	n/a
541E	n/a	n/a
541N	n/a	n/a
541O	n/a	n/a
541P	n/a	n/a
641J	n/a	n/a
641K	n/a	n/a
641M	n/a	n/a
641G	n/a	n/a
641H	n/a	n/a
641N	n/a	n/a
441G	n/a	n/a
441H	n/a	n/a
441R	n/a	n/a
441D	n/a	n/a
441I	n/a	n/a
441E	n/a	n/a
441K	n/a	n/a
441L	n/a	n/a
441M	n/a	n/a
541T	n/a	n/a
541U	n/a	n/a
541V	n/a	n/a
541W	n/a	n/a
541X	n/a	n/a
3401	1.69	-2.31
3301	1.88	-2.18
4301	1.08	-.44
4402	n/a	n/a
431C	n/a	n/a
4302	1.08	-.51
4401	n/a	n/a
441A	n/a	n/a
441B	.91	-1.57
4303	1.14	.09
431D	n/a	n/a
431F	n/a	n/a
431E	n/a	n/a
431G	n/a	n/a
4409	.91	-1.79
4411	n/a	n/a
631A	n/a	n/a
6301	1.68	.13
531B	n/a	n/a
5302	n/a	n/a
5303	n/a	n/a
6303	n/a	n/a
6308	n/a	n/a
6304	n/a	n/a
6305	n/a	n/a
6306	n/a	n/a
6309	n/a	n/a
631H	n/a	n/a
531A	n/a	n/a
5301	1.12	-.33
6307	n/a	n/a
5406	n/a	n/a
5405	n/a	n/a
6402	n/a	n/a
5410	.92	-1.97
5409	.9	-2.1
6405	.93	-2.17
541Q	n/a	n/a
321A	n/a	n/a
321C	n/a	n/a
42CJ	n/a	n/a
431B	n/a	n/a
431A	n/a	n/a
42CC	n/a	n/a
42CE	n/a	n/a
421H	n/a	n/a
421A	.94	-.02
42ED	n/a	n/a
421C	n/a	n/a
421L	n/a	n/a
421F	n/a	n/a
521P	n/a	n/a
521H	n/a	n/a
5201	n/a	n/a
521K	n/a	n/a
521G	n/a	n/a
521I	n/a	n/a
521L	n/a	n/a
521F	n/a	n/a
521V	n/a	n/a
521U	n/a	n/a
521T	n/a	n/a
6207	1.12	-.33
621I	n/a	n/a
621K	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
621L	n/a	n/a
631I	n/a	n/a
631J	n/a	n/a
631K	n/a	n/a
621H	n/a	n/a
3201	1.63	-1.94
3105	1.4	-.05
311B	n/a	n/a
411P	n/a	n/a
421K	n/a	n/a
421J	n/a	n/a
411A	1.47	.05
411N	n/a	n/a
4101	1.55	.03
411M	n/a	n/a
411O	n/a	n/a
421I	n/a	n/a
411D	n/a	n/a
421E	n/a	n/a
421D	n/a	n/a
421B	n/a	n/a
4202	1.7	.51
4201	1.45	.05
521J	n/a	n/a
521M	n/a	n/a
521O	n/a	n/a
521E	n/a	n/a
511E	n/a	n/a
51AB	n/a	n/a
51AE	n/a	n/a
521B	n/a	n/a
511D	n/a	n/a
521A	n/a	n/a
521Q	n/a	n/a
521S	n/a	n/a
521R	n/a	n/a
521D	n/a	n/a
521C	n/a	n/a
62BI	n/a	n/a
611C	n/a	n/a
611D	n/a	n/a
62BH	n/a	n/a
411F	n/a	n/a
411E	n/a	n/a
411J	n/a	n/a
401I	n/a	n/a
401J	n/a	n/a
411K	n/a	n/a
411L	n/a	n/a
511B	n/a	n/a
511C	n/a	n/a
511I	n/a	n/a
511G	n/a	n/a
511J	n/a	n/a
5102	.82	-.63
511A	n/a	n/a
511F	n/a	n/a
511H	n/a	n/a
511K	n/a	n/a
311A	n/a	n/a
30XW	n/a	n/a
30YR	n/a	n/a
30YS	n/a	n/a
30YT	n/a	n/a
3104	1.4	-.05
3110	1.38	-1.91
3101	1.36	-.09
3005	1.41	n/a
3008	1.6	-1.81
401A	1.14	-.19
411H	n/a	n/a
411C	n/a	n/a
411I	n/a	n/a
411B	n/a	n/a
411G	n/a	n/a
69FD	n/a	n/a
69FA	n/a	n/a
69FC	n/a	n/a
69EJ	n/a	n/a
69JA	n/a	n/a
69FB	n/a	n/a
6001	1.18	-.57
59FI	n/a	n/a
59FH	n/a	n/a
59ZL	n/a	n/a
59FF	n/a	n/a
59FA	n/a	n/a
59EJ	n/a	n/a
59EH	n/a	n/a
59EG	n/a	n/a
59EF	n/a	n/a
59FB	n/a	n/a
5901	1.32	-.43

Manhole Reference	Manhole Cover Level	Manhole Invert Level
6008	1.26	-.31
50CF	n/a	n/a
6002	1.24	-.56
50JF	n/a	n/a
50CD	n/a	n/a
50CJ	n/a	n/a
5001	n/a	n/a
50CE	n/a	n/a
50JK	n/a	n/a
50CG	n/a	n/a
50CH	n/a	n/a
50JI	n/a	n/a
50CI	n/a	n/a
50JH	n/a	n/a
60JJ	n/a	n/a
60JK	n/a	n/a
60CJ	n/a	n/a
60DA	n/a	n/a
60DA	n/a	n/a
60JG	n/a	n/a
60JF	n/a	n/a
60DB	n/a	n/a
6005	n/a	n/a
6004	n/a	n/a
5103	.64	-.94
6105	n/a	n/a
51AF	n/a	n/a
492E	n/a	n/a
492D	n/a	n/a
492B	n/a	n/a
59GD	n/a	n/a
59GC	n/a	n/a
59GB	n/a	n/a
59GA	n/a	n/a
59FJ	n/a	n/a
5907	1.26	.61
491C	n/a	n/a
50DD	n/a	n/a
50BI	n/a	n/a
50JD	n/a	n/a
50JC	n/a	n/a
50BJ	n/a	n/a
50CA	n/a	n/a
50CB	n/a	n/a
50JE	n/a	n/a
50CC	n/a	n/a
511L	n/a	n/a
4903	1.5	n/a
492C	n/a	n/a
491V	n/a	n/a
491Z	n/a	n/a
49DE	n/a	n/a
492B	n/a	n/a
4913	n/a	n/a
492A	n/a	n/a
4901	1.39	.16
4902	1.4	.78
492A	n/a	n/a
n/a	n/a	n/a
401H	n/a	n/a
401G	n/a	n/a
401F	n/a	n/a
401B	1.34	.64
401E	n/a	n/a
401D	n/a	n/a
401D	n/a	n/a
401C	n/a	n/a
39XQ	n/a	n/a
39WZ	n/a	n/a
39YU	n/a	n/a
3902	1.02	-1.16
3901B	1.16	-1.77
3910	n/a	n/a
39XV	n/a	n/a
39XT	n/a	n/a
391C	n/a	n/a
39XU	n/a	n/a
391D	n/a	n/a
30YU	n/a	n/a
30YV	n/a	n/a
3001	.85	-.32
3010	1.44	-1.84
3009	1.59	-1.87
30XX	n/a	n/a
30XV	n/a	n/a
1301	1.26	n/a
1201	1.36	-.43
1101	1.87	-.49
11UY	n/a	n/a
11VQ	n/a	n/a
11UW	n/a	n/a
11UX	n/a	n/a
1108	1.56	-.3
















Manhole Reference	Manhole Cover Level	Manhole Invert Level
2102	1.47	-.36
201A	n/a	n/a
20ZX	n/a	n/a
2101	1.32	-.64
1901	1.69	-.14
1903	1.7	.17
19US	n/a	n/a
1904	1.37	.1
19WQ	n/a	n/a
1002	.73	-.26
10WT	n/a	n/a
1005	.71	-.13

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.









Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

-  **Foul Sewer:** A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
-  **Surface Water Sewer:** A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
-  **Combined Sewer:** A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
-  Storm Sewer
-  Sludge Sewer
-  Foul Trunk Sewer
-  Surface Trunk Sewer
-  Combined Trunk Sewer
-  Foul Rising Main
-  Surface Water Rising Main
-  Combined Rising Main
-  Vacuum
-  Thames Water Proposed
-  Vent Pipe
-  Gallery

Other Sewer Types (Not operated and maintained by Thames Water)

-  Sewer
-  Culverted Watercourse
-  Proposed
-  Decommissioned Sewer
-  Content of this drainage network is currently unknown
-  Ownership of this drainage network is currently unknown

Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plan are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

-  Air Valve
-  Meter
-  Dam Chase
-  Vent
-  Fitting

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

-  Ancillary
-  Drop Pipe
-  Control Valve
-  Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

-  Inlet
-  Outfall
-  Undefined End




Other Symbols

Symbols used on maps which do not fall under other general categories.





-  Change of Characteristic Indicator
-  Public / Private Pumping Station
-  Invert Level
-  Summit

Areas

Lines denoting areas of underground surveys, etc.

-  Agreement
-  Chamber
-  Operational Site

Ducts or Crossings

-  Casement
 -  Conduit Bridge
 -  Subway
 -  Tunnel
- Ducts may contain high voltage cables. Please check with Thames Water.

5) 'na' or 'of' on a manhole indicates that data is unavailable.

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.

Appendix G – Greenfield Calculation Sheet

Pre-development discharge

Site Makeup	Greenfield	▼	
Greenfield Method	FEH	▼	
Positively Drained Area (ha)	0.272		
SAAR (mm)	556		Load
Host	1	▼	
BFIHost	0.669		
Region	6	▼	
QBar/QMed conversion factor	1.136		
Betterment (%)	0		
	Calc		
QMed (l/s)	0.2		
QBar (l/s)	0.2		

Return Period (years)	Growth Factor	Q (l/s)
2	0.88	0.2
30	2.40	0.6
100	3.19	0.8

Appendix H – Attenuation Volume Calculation Sheet

Storage Estimate

Return Period (years)

100

Climate Change (%)

40

Impermeable Area (ha)

0.272

Peak Discharge (l/s)

1.000

Infiltration Coefficient (m/hr)
(leave blank if no infiltration)

Required Storage (m³)

Calc

from

279

to

324

Appendix I – Exceedance Flow Path



HEALTH AND SAFETY INFORMATION

CONSTRUCTION
THIS DRAWING SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES.

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING:

MAINTENANCE/CLEANING/OPERATION
MAINTENANCE OF SUDS FEATURES AND THE DRAINAGE SYSTEM SHOULD BE CARRIED OUT IN ACCORDANCE WITH THE CIRIA SUDS MANUAL AND MANUFACTURERS SPECIFICATIONS

DECOMMISSIONING/DEMOLITION
REFER TO DRAWING FOR EXTENT OF EXISTING SITE DRAINAGE TO BE ABANDONED/REMOVED

NOTES

1. DO NOT SCALE FROM THIS DRAWING. ONLY FIGURED DIMENSIONS ARE TO BE USED.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
3. ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM UNLESS NOTED OTHERWISE.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
5. ALL FOUL AND SURFACE WATER PIPEWORK TO BE LAID AT MINIMUM GRADIENTS OF 1:40 AND 1:100 RESPECTIVELY UNLESS NOTED OTHERWISE.
6. ALL PIPEWORK TO BE 100mm DIAMETER UNLESS NOTED OTHERWISE.
7. ROCKER PIPES TO BE INSTALLED AT CONNECTION POINTS TO STRUCTURES TO ALLOW FOR MOVEMENT CAUSED BY SETTLEMENT.
8. ALL DRAINAGE IS DESIGNED TO ADOPTABLE STANDARDS WHERE POSSIBLE, AND BUILDING REGULATIONS PART H.
9. COVER LEVELS BASED OFF EXISTING TOPO LEVELS. EXTERNAL LEVELS TO BE CONFIRMED BY LANDSCAPE ARCHITECT.

KEY

- RED LINE BOUNDARY
- PERMEABLE PAVING
- EXCEEDANCE FLOW PATH

PI	STAGE	ISSUE	TT	RW	RW	28.11.24
REV		DESCRIPTION	DRN	CHK	APP	DATE

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CLIENT
ABBEY WOOD SEDGEMERE LIMITED

PROJECT
4-8 SEDGEMERE ROAD

PRELIMINARY

DRAWING TITLE
EXCEEDANCE FLOW PATH

DATE	SCALES	DRAWN BY	CHECKED	APPROVED
28.11.24	@ A1 1:200	TT	RW	RW
DRAWING NUMBER P451519-VV-XX-00-DR-C-2101				REVISION P1



Appendix J – Flood Warning and Evacuation Plan

whitby wood

4-8 Sedgemere Road

Flood Warning and Evacuation Plan

Client: Abbey Wood Sedgemere Limited

Date: 24/03/2024

P451519-WW-XX-XX-RP-C-0003

whitby wood

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REVISION RECORD

Rev	Date	Description	Prepared	Reviewed	Approved
P1	13/09/2024	Stage Issue	TT	SM	RW
P2	24/03/25	Revised Architect Plans	TT	SM	RW

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1 INTRODUCTION

This Flood Warning and Evacuation Plan (FWEP) has been produced to raise awareness to the potential residual flood risk in the unlikely event of a defence failure and provide guidance regarding appropriate actions to be taken in the event of flooding or receipt of a flood warning.

The report should be considered a live document which will require regular review in accordance with any local changes in procedures. As a minimum, an annual review should be undertaken along with a review following each evacuation undertaken.

The principal objectives of this report are presented below:

- Raise awareness of the risk of flooding at the application site and the mitigation measures put into place to manage those risks;
- Define the people with responsibilities for activating the FWEP;
- Detail the procedures required to implement the FWEP including flood warnings; and
- Detail what actions are required by site occupants before, during and after a flood.

During times of flood, the procedures described within the current document should be followed by all users of the building.

This report should be read in conjunction with the Flood Risk Assessment (P451519-WW-XX-XX-RP-C-0001). The FWEP will be approved by Bexley Council as part of the planning application for the site and will be maintained by the nominated Flood Evacuation Manager.

1.1 The Site

The site is located at 4-8 Sedgemere Road, Abbey Wood, London, SE2 9SW. The site is bordered by Harrow Manorway to the west, Overton Road, a BP Garage to the north and Sedgemere Road to the east. To the southern boundary there is a collection of trees and residential buildings, further beyond is the Station Car Park. The approximate national grid reference of the site is 547386 E, 179184 N with a footprint that covers 0.272 hectares. Figure 1 shows the site location.



FIGURE 1 – SITE LOCATION MAP

1.2 Proposals

The proposed redevelopment of the site includes the demolition of the existing buildings and redevelopment for residential use (Use Class C3) and ancillary amenity with ground floor non-residential unit (Use Class E(a), E(b), E(c), E(c)i, E(c)ii, E(c)iii, E(e), E(g)i, E(g)ii, F2(b)), including boundary treatment, soft and hard landscaping, public realm improvements, highways works, cycle and car parking infrastructure and associated works.

2 FLOOD RISK SUMMARY

The following table provides a summary of the various risks of flooding which have been identified in the FRA along with a brief description, for further information refer to report number P451519-WW-XX-XX-RP-C-0001. Measures to mitigate the associated flood risk to the site have also been detailed within the FRA. This report aids to further reduce the hazard to people within the building in the unlikely event of a flood.

TABLE 1 – 4-8 SEDGEMERE ROAD FLOOD RISK SUMMARY

Flood Type	Risk			Description
	Low	Medium	High	
Fluvial	✓			The site is situated in a Flood Zone 3 area meaning a 1% or greater annual probability of sea river flooding and a 0.5% or greater annual probability of sea flooding. However, the area benefits from flood defence and so it can be treated as a Flood Zone 1 area.
Pluvial	✓			There is a 'very low' surface water flood risk within the site boundary, with a minor section of the site at the east being 'low' risk.
Groundwater		✓		The maps in the Strategic Flood Risk Assessment indicates that the site is within an area with a minor susceptibility to groundwater flooding. However, historical borehole logs indicate possible high groundwater levels. Therefore, it can be considered a medium risk.
Sewer	✓			The Thames Water DG5 flood risk register data, when taking into consideration the reference postcode area, suggests that the risk of sewer flooding is very low.
Artificial	✓			There is no predicted flooding from reservoirs when river levels are normal.
Breach		✓		In the event of a defence breach, the EA product 8 data shows the hazard for the 2115 epoch to correlate to 'danger for most'. However, the likelihood of a breach occurring is very rare. Therefore, breach flooding can be considered a medium risk.

3 FLOOD ACTION PLAN

3.1 Preparing for a Flood

A Flood Evacuation Manager for the development will need to be appointed. It is not expected that this role be carried out by an individual but be incorporated into the wider site management role. The main role of the Flood Evacuation manager is to review and update the FWEP, monitor the Environment Agency (EA) Early Flood Warning System, ensure the site users are aware of the flood and to execute the FWEP in times of flooding. Further details on the Flood Evacuation Manager roles are detailed in later chapters of this document.


The development will need to be registered with the EA Early Flood Warning Systems and Floodline Warnings Direct services. It is the responsibility of the Flood Evacuation Manager to act upon the receipt of the EA Flood Warnings and, in the event of flooding, to implement the FWEP ensuring that all people on site are made aware of the emergency and coordinate the evacuation procedure.


3.2 Flood Warnings

The EA is the competent warning authority and operates a free flood warning service in many areas at risk of flooding from rivers and the sea. The Floodline Warnings Direct (FWD) is a 24-hour service, giving an advance warning for the area by telephone, mobile, text message or e-mail.

It is the responsibility of developer or their delegated personnel to register the site on the EA Floodline Warnings Direct scheme (phone 0345 988 1188) or alternatively register online and provide a contact number to receive flood warnings when they are issued. The flood warning codes are listed in Table 2 along with a summary of the flood warning levels that are available via the EA's Floodline services. When a flood warning is issued, the appointed flood evacuation manager will make sure that all the site users, guests and employees of the application site are aware of the status, so that the appropriate action can be taken.

TABLE 2 - ENVIRONMENT AGENCY'S FLOOD WARNINGS

Flood Warning Type	Meaning	General Advice
	<ul style="list-style-type: none"> • Be aware. • Keep an eye on the weather situation. 	<ul style="list-style-type: none"> • Check weather conditions. • Check for updated flood forecasts on the EA website.


 <p>FLOOD ALERT FLOODING IS POSSIBLE. BE PREPARED.</p>	<ul style="list-style-type: none"> • Flooding of low-lying land and roads is expected. • Be alert, be prepared, and watch out. 	<ul style="list-style-type: none"> • Prepare to act on the FWEF. • Prepare a flood kit of essential items. • Monitor water levels and the flood forecast on the EA website. • Be aware of water levels near you. • Charge your mobile phone.
 <p>FLOOD WARNING FLOODING IS EXPECTED. IMMEDIATE ACTION REQUIRED.</p>	<ul style="list-style-type: none"> • Flooding of homes and businesses is expected. • Immediate action required now. 	<ul style="list-style-type: none"> • Move site users, employees, pets and valuables to a higher or safer place. • Get flood protection equipment in place. • Turn off gas, electricity and water supplies if safe to do so. • Protect yourself and others. • Act on your flood plan.
 <p>SEVERE FLOOD WARNING SEVERE FLOODING. DANGER TO LIFE.</p>	<ul style="list-style-type: none"> • Severe flooding is expected. • There is extreme danger to life and property. • Immediate action required now. 	<ul style="list-style-type: none"> • Stay in a safe place with means of escape. • Be ready should you need to evacuate. • Co-operate with emergency services. • Call 999 if you are in danger.
 <p>WARNING NO LONGER IN PLACE</p>	<ul style="list-style-type: none"> • No further flooding is currently predicted in the area. 	<ul style="list-style-type: none"> • Be careful, flood waters may be present for several days. • If you've been flooded call your insurance company as soon as possible.


3.3 Flood Warning Actions

Using the flood warnings identified above, the following table further dissects each warning to give detail on when it might be implemented and to break down the action required by both the users of the building and the flood evacuation manager.

TABLE 3 - ACTIONS TO TAKE FOR EACH FLOOD WARNING

Flood Warning Type	Meaning
 <p data-bbox="272 1003 580 1066">FLOOD ALERT FLOODING IS POSSIBLE. BE PREPARED.</p>	<p data-bbox="655 396 1402 562">When it is used: The EA will issue a flood alert status when flooding is possible. It is usually issued between two hours and two days in advance of flooding, dependent on the form and characteristics of the flood risk.</p> <p data-bbox="655 600 1402 766">Triggers: Forecasts that indicate that flooding from rivers or the sea may be possible, when intense rainfall that may affect rivers with a rapid response rate, and forecasts of high tide, surges or strong winds.</p> <p data-bbox="655 804 1402 1055">How is it issued: This will be issued through the EA website (https://flood-warninginformation.service.gov.uk/) and via the Flood Warnings Direct service, based upon weather and river conditions. For location specific information call Floodline on 0345 988 1188, select Option 1 and enter quick-dial number 012115 to get more information.</p> <p data-bbox="655 1093 895 1122">Role of all site users:</p> <ul data-bbox="671 1160 1382 1368" style="list-style-type: none"> • Be aware of water levels and check the sea/river level rise and fall • Monitor weather and flood warnings on local radio, television stations and other media sources • Be prepared to act on the FWEP <p data-bbox="655 1384 1098 1413">Role of the Flood Evacuation Manager:</p> <ul data-bbox="671 1451 1398 1525" style="list-style-type: none"> • Ensure that all site users are aware of the Flood Alert notice • Prepare flood kit of essential items ready for use
 <p data-bbox="197 1821 632 1883">FLOOD WARNING FLOODING IS EXPECTED. IMMEDIATE ACTION REQUIRED.</p>	<p data-bbox="655 1547 1402 1666">When it is issued: Flood warnings will be issued when water levels are rising, and further rain is expected. It is usually issued between 30 minutes to one day in advance of flooding.</p> <p data-bbox="655 1704 1402 1823">Triggers: High tides and storm surges coupled with strong winds, heavy rainfall forecast to cause flash flooding of rivers and forecast flooding from rivers.</p> <p data-bbox="655 1861 1402 1980">How it is issued: This will be issued through the EA website and via the Flood Warnings Direct service, based upon weather and river conditions. The EA aim to provide at least two hours warning</p>

	<p>between the flood warning status being issued and the commencement of flooding.</p> <p>Building should be evacuated.</p> <p>Role of all site users:</p> <ul style="list-style-type: none"> • Remove cars from the site to a higher level or area outside the flood zone • Valuable equipment and belongings to be moved higher or to a safe place <p>Role of the Flood Evacuation Manager:</p> <ul style="list-style-type: none"> • Monitor the situation and listen out for weather and flood warning updates on local radio and television stations • Check flood kit and make available for site users and guests in the refuge area • Contact the LLFA to find out whether evacuation is considered necessary, and if so, where they are providing shelter for evacuees. If evacuation is required, follow the evacuation procedures set out during severe flood warning below.
 <p>SEVERE FLOOD WARNING SEVERE FLOODING. DANGER TO LIFE.</p>	<p>When it is used: When flooding poses a significant threat to life.</p> <p>Triggers: Actual flooding where the conditions pose a significant risk to life and/or widespread disruption to communities, onsite observations from flooded locations or a breach in defences or failure of a barrier that is likely to cause significant risk to life.</p> <p>How it is issued: This will be issued through their website and via the Flood Warnings Direct service based upon weather and river conditions. Role of all site users:</p> <ul style="list-style-type: none"> • Stay in a safe place with a means of escape • Be ready if evacuation is needed • Cooperate with the emergency service <p>Role of the Flood Evacuation Manager:</p> <ul style="list-style-type: none"> • Monitor water levels and contact the LLFA to find out whether evacuation is considered necessary, and if so, where they are providing shelter for evacuees. If evacuation is required ensure that:

	<ul style="list-style-type: none"> ○ All site users are aware of any temporary places of shelter that the Council has set up ○ All site users evacuate the building - elderly, frail or ill people should take priority for evacuation- or relocate to refuge area if evacuation is not feasible ○ Record details of site users who refuse to evacuate and pass it onto all Multi-agency Flood Response organisations ○ Before evacuation, check that all doors and windows are closed and locked ○ Water, electricity and gas intakes to be switched off if it is safe to do so <p>NOTE:</p> <ul style="list-style-type: none"> ● By this time the LLFA, the emergency services and the EA will be managing the situation. They shall provide further advice on evacuation routes, shelter and other assistance now.
<div style="text-align: center;">  <p>WARNING NO LONGER IN PLACE</p> </div>	<p>When it is issued: When a Severe Flood Warning, Flood Warning or Flood Alert is no longer in force.</p> <p>Triggers: The risk of flooding has passed, river levels have dropped below the warning level and no further flooding is affected.</p> <p>How it is issued: It will be issued by the EA when it is considered safe to return to the site, and there are no remaining flood warnings in force.</p> <p>Role of the Flood Evacuation Manager:</p> <ul style="list-style-type: none"> ● If evacuation has occurred, check with the LLFA that it is safe to return to the building. ● Assist the Multi-agency Flood Response Organisation in contacting the site users to inform them that the flood event has finished, and no further event is expected. ● Contact the utility companies to inform them that the building is safe, and utilities can be switched back on. ● Check rest of the building whether it is safe before entering. Seek for professional opinion from the Emergency Response Organisation if needed.

	<ul style="list-style-type: none">• Only allow staff to enter in order carry out necessary clean-up before opening the building to site users and guests. Insurance companies to be contacted in order to arrange any clean ups or repairs if needed.• Within one month provide feedback to the LLFA, and if required update the FWEP based on comments from the local authority.
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4 EVACUATION PROCEDURE AND SAFE REFUGE

The evacuation procedure will be signalled via an alarm. In the event of flooding, the flood evacuation manager will direct all site users to refuge points.

As detailed in the FRA, there is medium risk of groundwater and tidal breach flooding to the site (in the present day and 2115 epoch), with a 200-year event and 1000-year event for the 2115 epoch shown in Figures 2 and 3 below respectively. Therefore, in the event of a flood, the evacuation manager should direct people from the lower levels of the building to the upper levels unless instructed by the emergency services team to evacuate the building. Should evacuation be instructed by emergency services, then they will manage the evacuation procedure and egress routes.

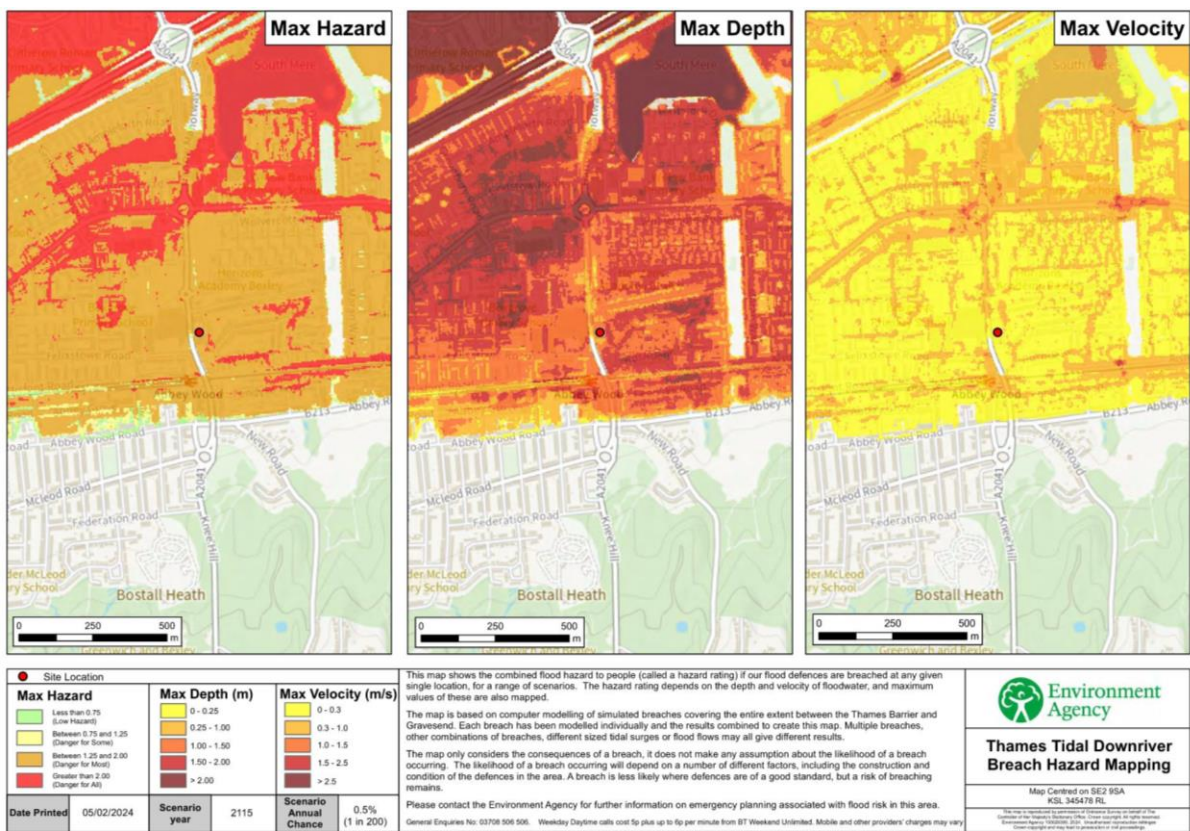


FIGURE 2 – BREACH HAZARD MAPPING SCENARIO YEAR 2115, 200-YEAR EVENT

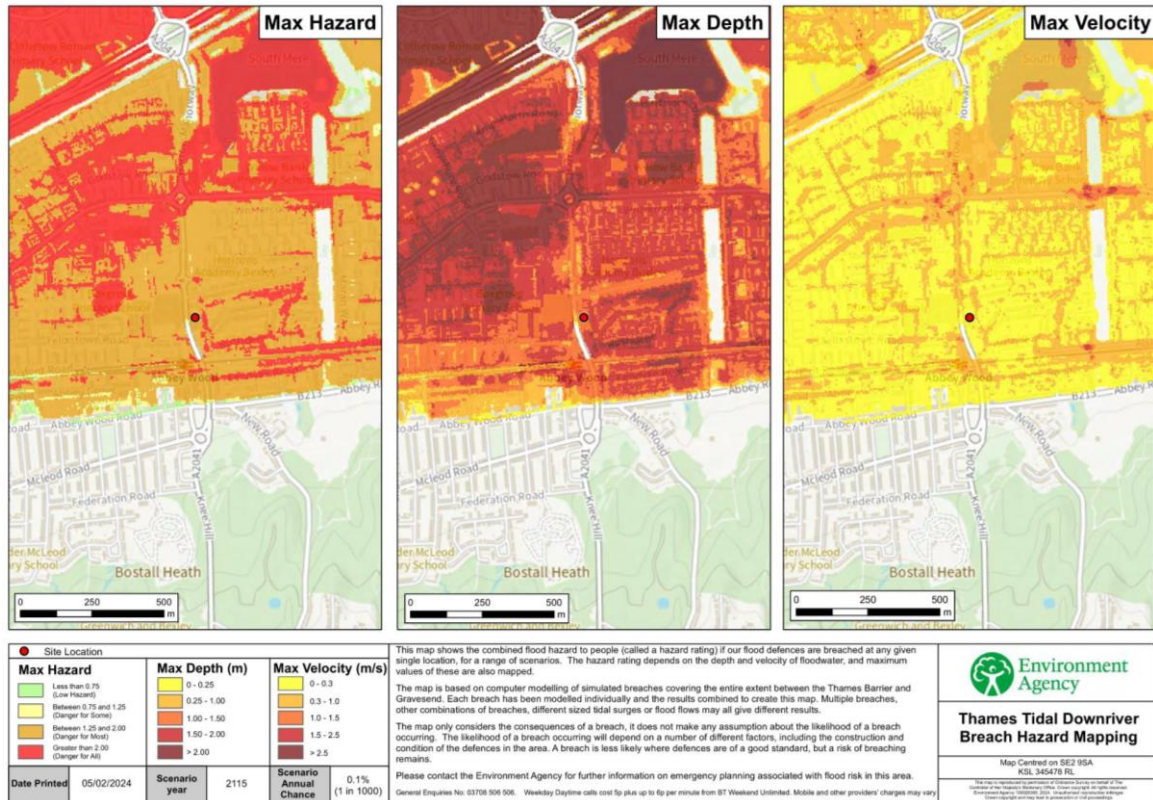


FIGURE 3 – BREACH HAZARD MAPPING SCENARIO YEAR 2115, 1000-YEAR EVENT

There are varying localities of safe refuge that all building users could use in the event of a flood. The site comprises of multi-story floor levels, where the upper floor levels of the building will count as primary areas of refuge which will be accessed through internal staircases. Building users in the building to the north are directed to go into the building to the south and seek refuge on an upper floor. Building users in rooms with no internal doors are directed to exit the building and go to the nearest building entrance which leads to a staircase to upper floors. Following this, they should then wait for the flood waters to recede or until emergency services direct otherwise. The routes to safe refuge from the ground floor have been presented in **Appendix A**.

The flood evacuation manager is responsible for monitoring the evacuation process prior to the involvement of staff from the emergency services, EA or Bexley Council. The flood evacuation manager will need to ascertain that people who refuse to evacuate will reach the safe refuge area before the site begins to be inundated by flood water. The flood kit should be prepared and kept in an identified location within the building that will be accessible before seeking safe refuge or evacuating.

4.1 Dangers of Flood Water

The following is a list of reminders regarding the dangers associated with flood waters as well as secondary impacts that can arise from flood waters. These pointers should be put into practice when any evacuation procedure is in place.

- Do not walk or swim through flowing water as currents can be deceptive.
- Take care walking through standing water as any obstacles may not be visible and if possible, use a pole or stick to help locate deeper water, open manholes and ditches.
- Don't drive through a flooded area, only half a metre can carry a car away.
- Avoid contact with flood water as it may be contaminated with sewage, oil, chemicals, and other substances, wash hands thoroughly if any contact is made.
- Post-flood; dispose of anything that has come into contact with flood water and cannot be cleaned.

5 ROLES OF EMERGENCY SERVICES AND KEY CONTACTS

The response to a major flood event in the borough will involve a number of organisations working together at a local level, including the Bexley Council, designated as the Lead Local Flood Authority (LLFA), the EA, emergency services and utility companies.

The general roles of the main bodies in relation to a major flood event in Abbey Wood are summarised below. It should be noted that this is a general list and specific duties may vary between different bodies.

5.1 Bexley Council (LLFA)

- Prepare for risks and respond to any incidents resulting from them in the most effective ways possible;
- Maintain the public highway network; excluding red routes which are managed by Transport for London (TfL);
- Lead on local flood risk management, including establishing effective partnerships within their local authority;
- Develop, maintain, apply and monitor a Local Flood Risk Management Strategy in the area;
- Investigate and record details of flood events within their area to an extent it considers appropriate.
- Maintain a register of structures or features which are considered to have a significant effect on flood risk, including details on ownership and state of repair as a minimum
- Undertake works to manage flood risk from surface runoff and groundwater, consistent with the LFRM strategy for the area.
- Increase environmental protection and integrate considerations into the preparation and implementation of policies and programs that promote sustainable development;

5.2 Environment Agency

- Issue flood alerts, flood warnings and/or operational messages using their flood warning services to warn and inform the public and partners;
- Responsible for maintaining and operating of EA owned flood defences. Checking defences and undertaking essential repairs and maintenance on EA owned flood defences and advise other owners on their maintenance responsibilities;
- Monitor water levels and flows, assessing the risk, clearing obstructions from known pinch points and advising the emergency services and the local authority;
- Along with partners, deploy temporary flood defences (where available) where impacts can be mitigated; and
- Support the police and local authority by providing materials, equipment and manpower as far as resources and other duties permit, once own systems and flood defences are secure.

5.3 Metropolitan Police

- Coordinate the multi-agency response at a major flood event within the borough;
- Coordinate any multi-agency decision to evacuate in consultation with key partner agencies; and
- Save life in cooperation with the other emergency services.

5.4 London Fire Brigade

- Assist with evacuation, search and rescue operations;
- Provide and/or obtain specialist advice and assistance where hazardous materials are involved;
- Obtain specialist equipment such as high-volume pumps; and
- Assist other relevant agencies to minimise the effects of major flooding on the community.

5.5 Utility Companies

- Maintain the safety and integrity of the electricity, gas and water supply system;
- Respond to flooding incidents involving their assets;
- Investigate reports of flooding incidents;
- Maintain a register of properties that have flooded; and
- Repair services and seek alternative means of supply during disruption

5.6 Useful Contacts

Below is a list of useful contact numbers that can be used to get help or advice quickly.

- EA Floodline – 0845 988 1188;
- NHS Direct – 0845 4647 or 111
- National Gas Emergency Service – 0800 111 999
- UK Power Networks (power cut) – 0800 028 0247
- Thames Water (loss of water supply) – 0845 9200 800
- Bexley Council – 0345 988 1188
- London Fire Brigade – 999 (emergency) or 020 8555 1200 (non-emergency, switchboard service is available Monday to Friday 8.30am-5pm); and
- Metropolitan Police – 999 (emergency) or 101 (non-emergency, enquiry office open 24 hours).

It is the responsibility of the flood evacuation manager to collate the following useful contact telephone numbers and update it on a regular basis:

- Site manager;
- Service providers for the site; and
- Insurance company.

Appendix A – Safe Refuge Routes

SEDGEMERE ROAD



FLOOD EVACUATION ROUTE - SAFE REFUGE

Ground Floor Plan

GENERAL NOTES:

- DO NOT SCALE FROM THIS SKETCH
- THIS SKETCH CAN NOT BE USED FOR CONSTRUCTION

KEY:

-  Site Boundary
-  Evacuation Routes



SAFE REFUGE FOUND AT HIGHER FLOORS

SAFE REFUGE FOUND AT HIGHER FLOORS

SAFE REFUGE FOUND AT HIGHER FLOORS

2115 EPOCH EA BREACH DATA (200-YEAR EVENT) DEMONSTRATING THAT THE SITE AND SURROUNDING AREA IS AT MEDIUM RISK. THEREFORE, SAFE REFUGE IS THE MOST APPROPRIATE OPTION IN A TIDAL BREACH



PRELIMINARY

whitby wood

Project Title:	SEDGEMERE ROAD			
Project No:	P451519			
Sketch No:	P451519-WW-XX-SK-C-1002			
Title:	FLOOD EVACUATION ROUTES			
Scale:	Rev:	Date:	Eng:	Checked:
NTS	P3	24/03/25	TT	SM

SEDGEMERE ROAD



FLOOD EVACUATION ROUTE -
SAFE REFUGE

Basement Plan

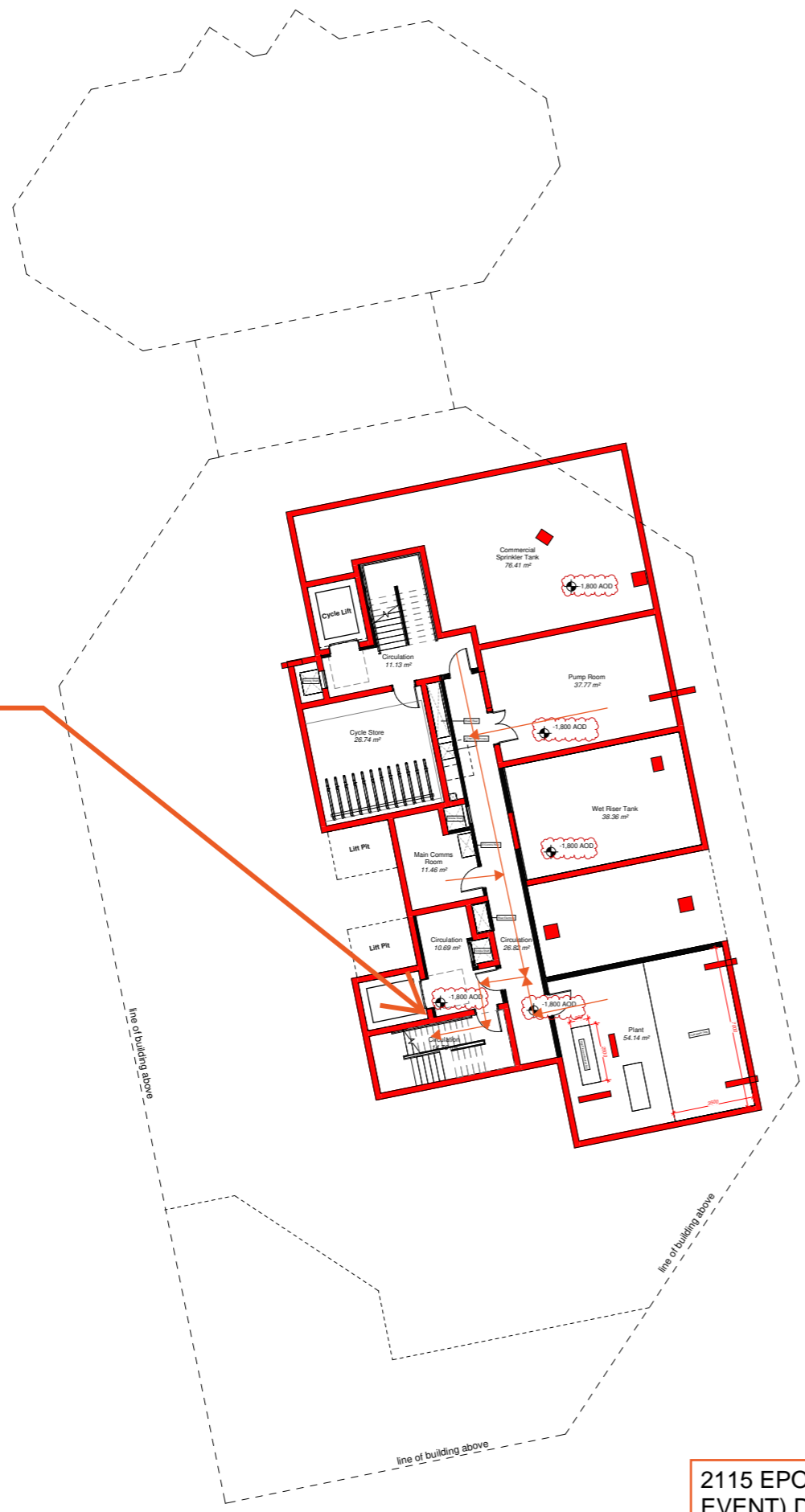
GENERAL NOTES:

- DO NOT SCALE FROM THIS SKETCH
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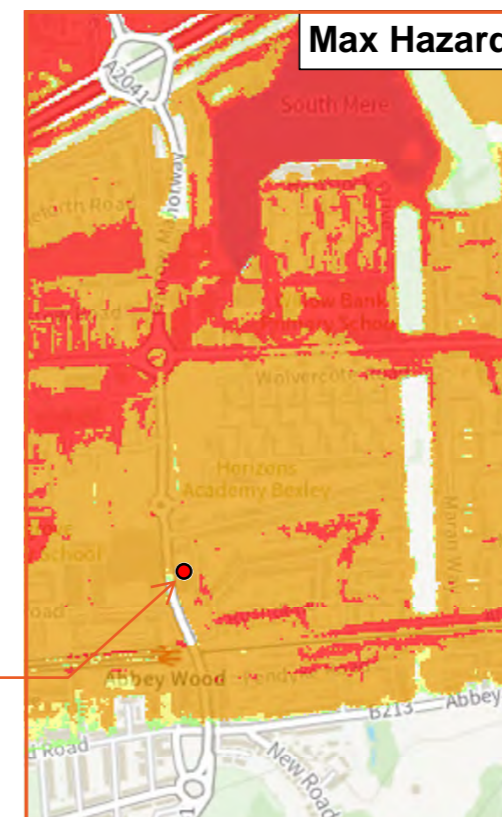
KEY:

-  Site Boundary
-  Evacuation Routes

SAFE REFUGE FOUND AT HIGHER FLOORS



2115 EPOCH EA BREACH DATA (200-YEAR EVENT) DEMONSTRATING THAT THE SITE AND SURROUNDING AREA IS AT MEDIUM RISK. THEREFORE, SAFE REFUGE IS THE MOST APPROPRIATE OPTION IN A TIDAL BREACH



PRELIMINARY

whitby wood

Project Title:	SEDGEMERE ROAD			
Project No:	P451519			
Sketch No:	P451519-WW-XX-SK-C-1003			
Title:	FLOOD EVACUATION ROUTES			
Scale:	Rev:	Date:	Eng:	Checked:
NTS	P2	23/03/25	TT	SM

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