GeoSmart Information

FloodSmart

Flood Risk Assessment

Site Address

Land at Dellfield
Uxbridge Road
Uxbridge
UB10 0PL

Grid Reference

507307, 182684

Report Prepared for

Cubix Contractors

Date

2022-09-26

Update

2023-07-13

Report Status

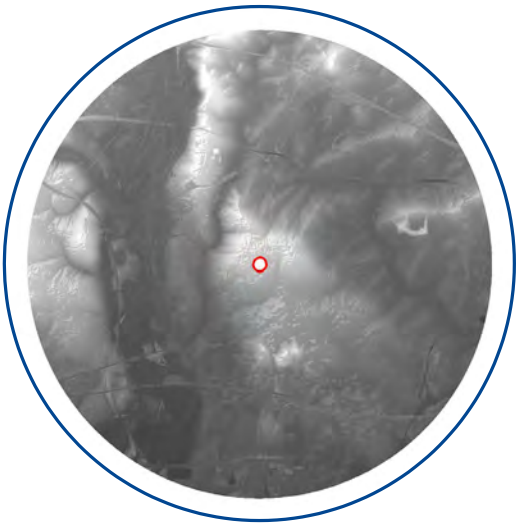
FINAL

Site Area

0.09 ha

Report Reference

77727.00.01R1



RISK - Very Low to High

The Site is located within fluvial and tidal Flood Zone 1 (low probability), and within an area defined as being at Very Low risk of fluvial and tidal flooding. The Site has a Very Low to High risk of surface water (pluvial) flooding and a Negligible to Low risk of groundwater flooding. Mitigation measures are recommended in this report to reduce the risks to an acceptable level over the lifetime of the development.

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1. Executive summary

A review has been undertaken of national environmental data sets to assess the flood risk to the Site from all sources of flooding in accordance with The National Planning Policy Framework (NPPF) (2021) and National Planning Practice Guidance (NPPG) (2014). A site-specific flood risk assessment, to assess the flood risk to and from the development Site, is provided within this concise interpretative report written by an experienced GeoSmart consultant. Baseline flood risk and residual risks that remain after the flood risk management and mitigation measures are implemented are summarised in the table below.

Site analysis

Source of Flood Risk	Baseline	After analysis	After Mitigation
River (fluvial) and Sea (coastal/tidal) flooding	Very Low	Very Low	N/A
Surface water (pluvial) flooding	Very Low to High	Very Low to High	Very Low to Low
Groundwater flooding	Negligible	Negligible to Low	Negligible
Other flood risk factors present	No	No	N/A
Is any other further work recommended?	Yes (see below)		

N/A = mitigation not required

Summary of existing and proposed development

The Site is currently used within a residential capacity as a single storey detached dwelling (Dellfield) including front access and rear garden.

Development proposals comprise the demolition of the existing building and the construction of four dwellings, including associated changes to access and landscaping. A front two-storey detached dwelling is proposed to replace the existing dwelling in the north of the Site. three further detached dwellings, which will comprise two storeys, are proposed in the central and southern parts of the Site.

Summary of flood risks

The flood risks from all sources have been assessed as part of this report and are as follows:

- According to the Environment Agency's (EA) Flood Map for Planning Purposes, the Site is located within a fluvial and tidal Flood Zone 1 (Low probability).
- According to the EA's Risk of Flooding from Rivers and Sea (RoFRS) map, which considers the type, condition and crest height of flood defences, the Site has a Very Low risk of flooding from Rivers and the Sea.
- According to the EA's Risk of Flooding from Surface Water (pluvial) flood mapping, the Site is at a variable risk of pluvial flooding ranging from Very Low to High.

  The current rear garden areas (positioned in the central and southern parts of the Site) are at Low to High risk of pluvial flooding as the garden includes an area of lower topography compared to the surrounding land. This could result in flood depths of between 0.0 m and 0.6 m within the rear garden area during the High and Medium risk scenarios and between 0.0 m and 0.9 m during the Low risk scenario.

  The northern part of the Site, including the existing dwelling, is at Very Low risk of pluvial flooding.

  The proposed dwelling in the north of the Site would be in an area at Very Low risk of pluvial flooding, whilst the three dwellings proposed within the current rear garden would be in an area at Very Low to High flood risk.

  Soakaways are proposed to attenuate surface water run-off from the dwellings; further assessment would be required to confirm the feasibility and design requirements for each soakaway.
- Groundwater Flood Risk screening data indicate that there is a Negligible risk of groundwater flooding at the surface in the vicinity of the Site during a 1 in 100 year event.

  However, as the Site is underlain by thin potentially permeable superficial deposits (Black Park Gravel Member), which overlie low permeability London Clay bedrock, shallow groundwater may be present at the Site. Additionally, as the rear garden includes an area of lower lying land, groundwater may be present closer to ground surface in this part of the Site.

  As such, following site-specific assessment (including consideration of the building designs), the risk of groundwater flooding is considered to be Negligible to Low, with a Negligible risk assigned to the north of the Site and a Low risk assigned in the current rear garden area.
- The risk of flooding from artificial (man-made) sources such as reservoirs, sewers and canals has been assessed:
  - The EA's Risk of Flooding from Reservoir map confirms the Site is not at risk of reservoir flooding.

- Ordnance Survey (OS) data confirm that there are no canals near to the Site.
- A sewer flooding history search was undertaken with Thames Water and using the Strategic Flood Risk Assessment (Metis Consultants, 2018). This confirms no recorded incidences of sewer flooding at or within the vicinity of the Site.

The risk of flooding from artificial sources is considered to be Negligible.

The risk to the development has been assessed over its expected 100 year lifetime, including appropriate allowances for the impacts of climate change. More extreme weather events could increase the risk to the Site from increased potential for surface water flooding. Site specific assessment indicates risk to the Site could potentially increase significantly and appropriate mitigation measures are proposed.

Recommendations / Next steps

Recommendations for mitigation are provided below, based upon the proposed development and the flood risk identified at the Site:

- As there is a risk of flooding from surface water (pluvial) sources, where flood depths could be up to 0.9 m during the Low risk scenario (used as a proxy for the 1 in 100 year plus climate change scenario), flood resistance measures are required to reduce the surface water flood risk to the proposed dwellings located in the rear garden area. Ground levels should aim to slope away from buildings and threshold levels to the dwellings should be set to 54.1 mAOD[1]. Standard flood resilient design measures should be incorporated.
- Where FFL's cannot be raised to the recommended level, the FFL should be set as high as possible and standard flood resistance and resilient design measures included (see Section 7).
- Soakaways have been proposed for each dwelling. A Sustainable Drainage Strategy (SuDS) should be developed to confirm the feasibility and design requirements for each soakaway. Any soakaways should be at least 5 m from the proposed buildings.
- The regular maintenance of any drains surrounding/on the Site should be undertaken to reduce the flood risk.
- As there is a modest risk of flooding from groundwater sources, interceptor drains, a sump and pump and/or non-return flap valves on the sewer inlet should be considered.

GeoSmart recommend the mitigation measures discussed within this report are considered as part of the proposed development where possible and evidence of this is provided to the Local Planning Authority as part of the planning application.

[1] 0.3 m above the 1 in 1000 year pluvial flood level of 53.8 mAOD.

2. Introduction

Background and purpose

A site-specific flood risk assessment has been undertaken, to assess the flood risk to and from the development Site. This assessment has been undertaken by firstly compiling information concerning the Site and the surrounding area. The information gathered was then used to construct a 'conceptual site model', including an understanding of the appropriateness of the development as defined in the NPPF (2021) and the source(s) of any flood risk present. Finally, a preliminary assessment of the steps that can be taken to manage any flood risk to the development was undertaken.

This report has been prepared with reference to the NPPF (2021) and NPPG (2014).

"*The National Planning Policy Framework set out the Government's planning policies for England and how these are expected to be applied*" (NPPF, 2021).

The NPPF (2021) and NPPG (2014) promote a sequential, risk based approach to the location of development. This also applies to locating a development within a Site which has a variable risk of flooding.

"*This general approach is designed to ensure that areas at little or no risk of flooding from any source are developed in preference to areas at higher risk. The aim should be to keep development out of medium and high risk flood areas (Flood Zones 2 and 3) and other areas affected by other sources of flooding where possible*" (NPPG, 2014).

The purpose of this report is to provide clear and pragmatic advice regarding the nature and potential significance of flood hazards which may be present at the Site.

Report scope

In accordance with the requirements set out within NPPG 2014 (Paragraph: 030 Reference ID: 7-030-20140306), a thorough review of a commercially available flood risk report and EA supplied data indicating potential sources of flood risk to the Site from rivers and coastal sources, surface run-off (pluvial), groundwater and reservoirs, including historical flood information and modelled flood extent. Appropriate measures are recommended to manage and mitigate the flood risk to the property.

Information obtained from the EA and a review of the West London Strategic Flood Risk Assessment (SFRA) (Metis Consultants, 2018) are used to ascertain local flooding issues and, where appropriate, identify information to support a Sequential and/or Exception test required as part of the NPPF (2021).

The existing and future flood risks to and from the Site from all flood sources is assessed in line with current best practice using the best available data. The risk to the development has been assessed over its expected lifetime, including appropriate allowances for the impacts of climate change. Residual risks that remain after the flood risk management and mitigation

measures are implemented, are considered with an explanation of how these risks can be managed to keep the users of the development safe over its lifetime.

An indication of whether the Site will potentially increase flood risk elsewhere is provided, including where the proposed development increases the building footprint at the Site. A drainage strategy to control runoff can be commissioned separately if identified as a requirement within this report.

Report limitations

It is noted that the findings presented in this report are based on a desk study of information supplied by third parties. Whilst we assume that all information is representative of past and present conditions, we can offer no guarantee as to its validity and a proportionate programme of site investigations would be required to fully verify these findings.

The basemap used is the OS Street View 1:10,000 scale, however the Site boundary has been drawn using BlueSky aerial imagery to ensure the correct extent and proportion of the Site is analysed.

This report excludes consideration of potential hazards arising from any activities at the Site other than normal use and occupancy for the intended land uses. Hazards associated with any other activities have not been assessed and must be subject to a specific risk assessment by the parties responsible for those activities.

Datasets

The following table shows the sources of information that have been consulted as part of this report:

Table 1. Datasets consulted to obtain confirmation of sources of flooding and risk

Source of flooding	Datasets consulted				
	Commercial Flood Maps	SFRA*	Environment Agency	Thames Water (Appendix B)	OS Data
Historical	X	X	X		
Fluvial/tidal	X	X	X		
Surface water (pluvial)	X	X	X		

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Source of flooding	Datasets consulted				
	Commercial Flood Maps	SFRA*	Environment Agency	Thames Water (Appendix B)	OS Data
Groundwater	X	X			
Sewer		X		X	
Culvert/bridges		X			X
Reservoir		X	X		

*The SFRA and local guidance have been used to inform this report as referenced in Section 6.

3. Site analysis

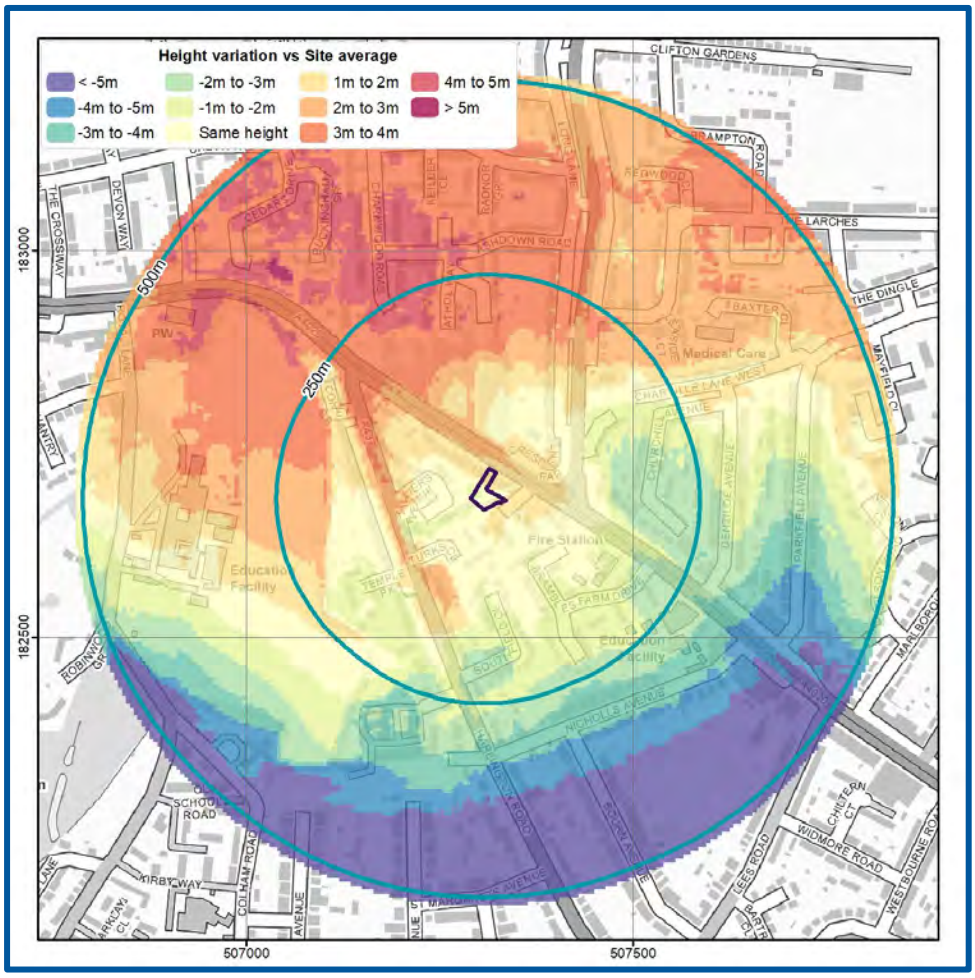
Site information

The Site is located in Uxbridge within a setting of mixed residential and commercial land use at National Grid Reference TQ 07307 82684. Site plans and drawings are provided in Appendix A.

According to OS data, using a 500 m buffer around the Site, the area is situated on sloping land (Figure 1). It is noted that to the north land rises then falls slightly to reach a final elevation of c. 56 m above Ordnance Datum (AOD). To the west and east land remains at a relatively constant elevation, reaching c. 54 mAOD in the west and c. 55 mAOD in the east. To the south, the land falls to c. 47 mAOD.

The general ground levels on the Site are between 53.3 mAOD and 55.2 mAOD with the Site topography falling gradually in a southerly direction. This is based on EA elevation data obtained for the Site to a 1 m resolution with a vertical accuracy of ±0.15 m (Appendix C).

Figure 1. Site Location and Relative Elevations (GeoSmart, 2022).



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Development

The Site is currently used within a residential capacity as a single storey detached dwelling (Dellfield) including front access and rear garden.

Development proposals comprise the demolition of the existing building and the construction of four dwellings, including associated changes to access and landscaping. A front two-storey detached dwelling is proposed to replace the existing dwelling in the north of the Site; three further detached dwellings, which will comprise two storeys are proposed in the central and southern parts of the Site. Site plans are included within Appendix A.

The effect of the overall development will result in an increase in number of occupants and/or users of the Site but will not result in the change of use, nature or times of occupation. According to Table 2 of the NPPG (2014), the vulnerability classification of the existing development is More Vulnerable and proposed development is More Vulnerable. The estimated lifespan of the development is 100 years.

Hydrological features

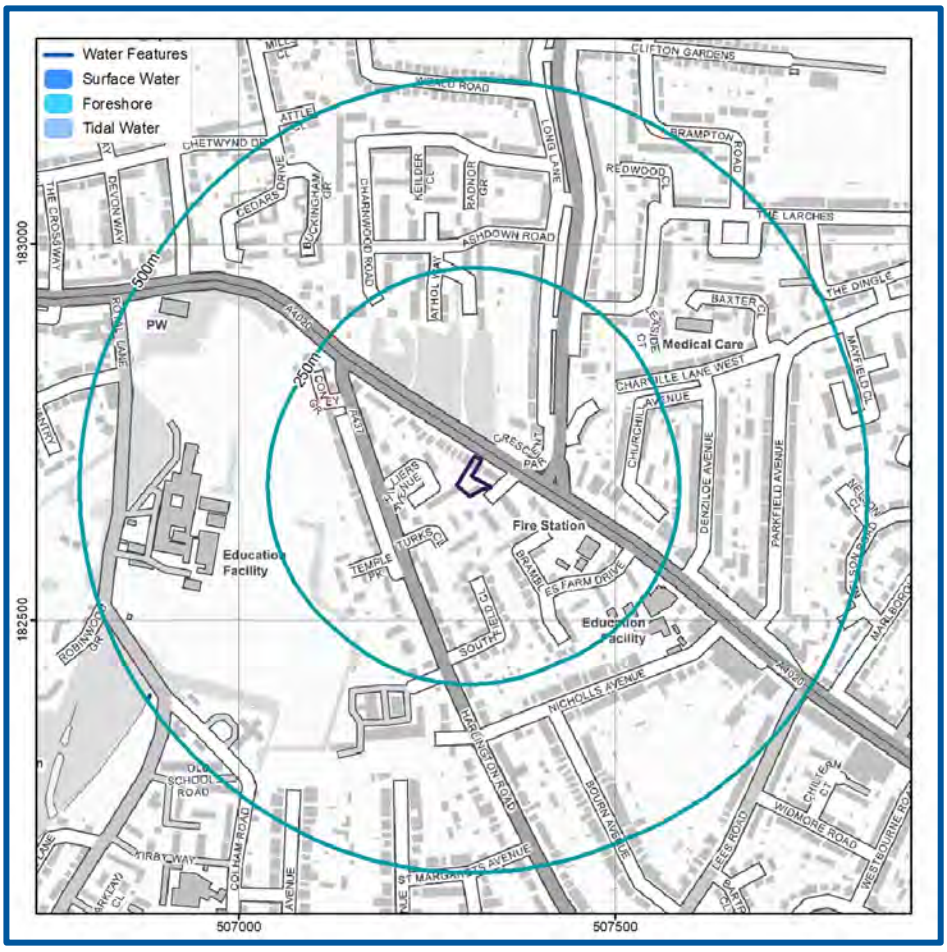
According to Ordnance Survey (OS) mapping included in the following figure, a single surface water feature is located within 500 m of the Site.

A drainage ditch is located c. 490 m south-west of the Site.

The River Pinn is c. 1 km to the north-west of the Site at its closest point.

No lost rivers have been identified within the vicinity of the Site (London's Lost Rivers, 2022).

Figure 2. Surface water features (EA, 2022)



Proximity to relevant infrastructure

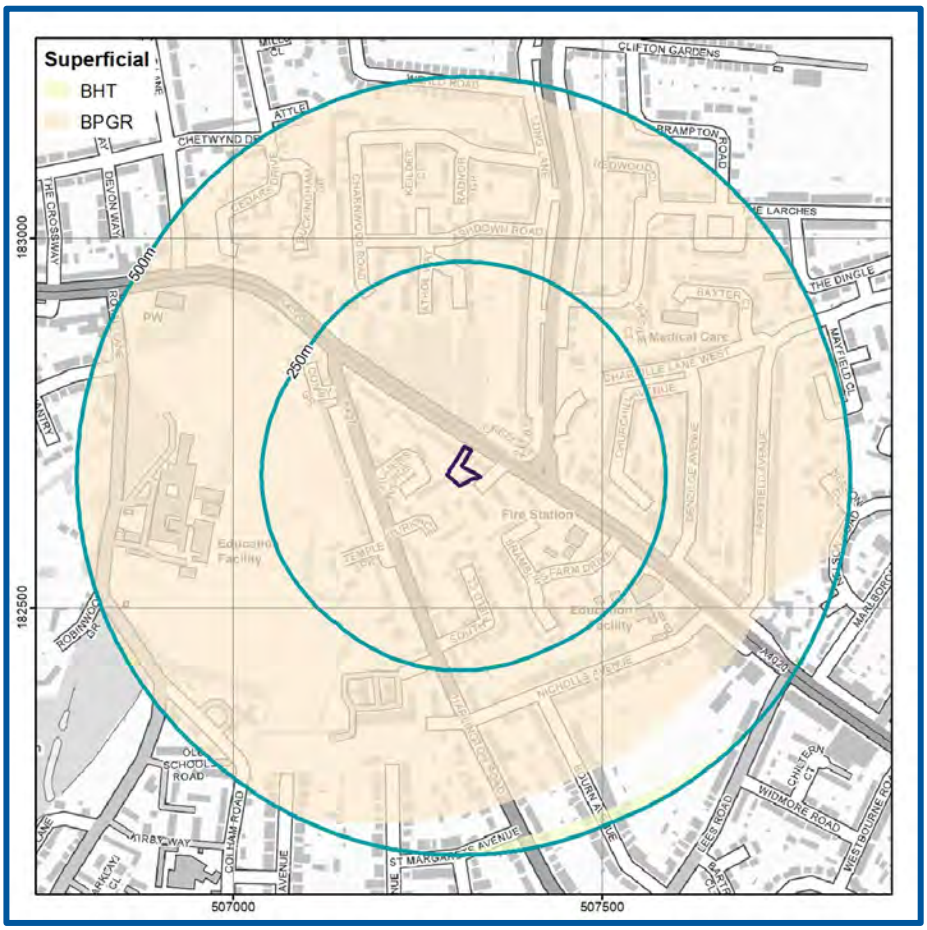
No relevant infrastructure, such as bridges or culverts, have been identified within 500 m of the Site.

Hydrogeological features

BGS mapping indicates that the underlying superficial geology (Figure 3) consists of the Black Park Gravel Member (BPGR) (BGS, 2022), which comprises of sand and gravel and is classified as a Secondary (A) Aquifer (EA, 2022).

The Boyn Hill Gravel Member (BHT), which comprises sand and gravel and is classified as a Secondary (A) Aquifer, is present c. 480 m to the south-east of the Site.

Figure 3. Superficial Geology (BGS, 2022)



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BGS mapping indicates the underlying bedrock geology (Figure 4) consists of the London Clay Formation (BPGR) (BGS, 2022), which comprises clay, silt and sand and is classified as an Unproductive Strata (EA, 2022).

Figure 4. Bedrock Geology (BGS, 2022)

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The Site does not lie within a groundwater Source Protection Zone (SPZ) (EA, 2022).

A review of the BGS borehole database (BGS, 2022) indicates the nearest and most relevant borehole (ref: TQ08SE228) is c. 90 m to the south east of the Site boundary at an elevation of 54 mAOD. This borehole indicates the underlying geology to consist of made ground (tarmac on concrete) to a depth of c. 0.2 m below ground level (bgl), underlain by clayey fine to coarse sand with flint gravel to a depth of c. 0.4 mbgl, slightly sandy silty clay with some flint gravel to c. 1.0 mbgl, clay with a little gravel to c. 3.1 mbgl and fissured silty clay to c. 15.0 mbgl, at which depth the borehole ended. Groundwater was not encountered during the borehole drilling in July 1995.

Another borehole (ref: TQ08SE16) is located c. 420 m south-west of the Site at an elevation of c. 50 mAOD. The borehole indicated the underlying geology to comprise turf to a depth of c. 0.3 mbgl, drift deposits to c. 2.4 mbgl, ballast to c. 5.2 mbgl, ballast and clay mixture to c. 6.1 mbgl, large stones and brown clay to c. 7.0 mbgl, blue clay and clay stones to c. 33.4 mbgl, Woolwich and Reading clays to c. 49.4 mbgl, hard brown sand to c. 50.6 mbgl, mottled clays to c. 56.4 mbgl, dark blue clays to c. 58.2 mbgl, black flints and pebbles to c. 60.0 mbgl, chalk and flints to c. 111.6 mbgl and chalk to c. 139.3 mbgl, at which depth the borehole ended. A

resting groundwater level of c. 38.1 mbgl was recorded within the borehole on an unknown date.

Permeable material has been identified overlying low permeability material which could give rise to either a shallow groundwater body or a locally perched water table. Groundwater seepage, overland flows and the formation of a spring line may occur at the contact with underlying low permeability material.

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4. Flood risk to the development

Historical flood events

According to the EA's historical flood map, no historical flood events have been recorded at the Site (EA, 2022).

According to the SFRA, there have been no records of historical flooding at the Site (Metis Consultants, 2018).

The purpose of historical flood data is to provide information on where and why flooding may have occurred in the past. The absence of any recorded events does not mean flooding has never occurred on-Site or that flooding will never occur at the Site.

Rivers (fluvial) / Sea (coastal/tidal) flooding

According to the EA's Flood Map for Planning Purposes (Figure 5), the Site is located within fluvial and tidal Flood Zone 1 and is therefore classified as having a Low probability of fluvial and tidal (coastal) flooding. The Site lies approximately 910 m to the south east of the nearest land within Flood Zones 2 and 3.

Guidance
As defined in the NPPF (2021): Ignoring the presence of any defences, land located in a Flood Zone 1 is considered to have a Low probability of flooding, with less than a 1 in 1000 annual probability of fluvial or coastal flooding in any one year. Development of all uses of land is appropriate in this zone (see glossary for terminology).

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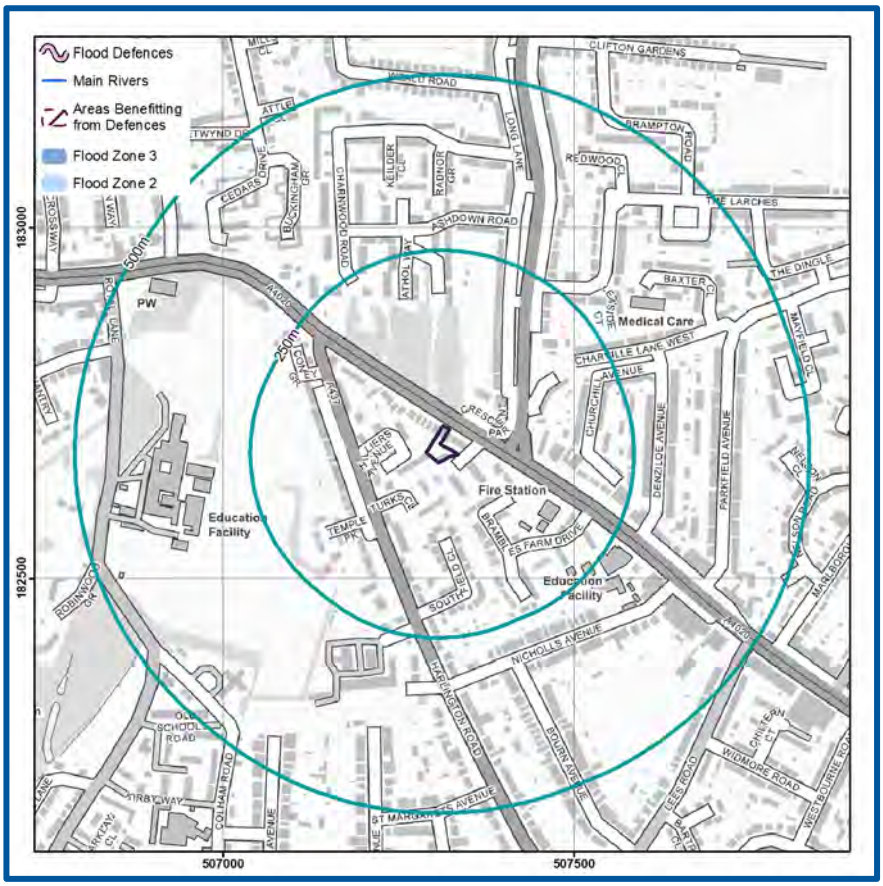
Figure 5. EA Flood Map for Planning Purposes (EA, 2022)

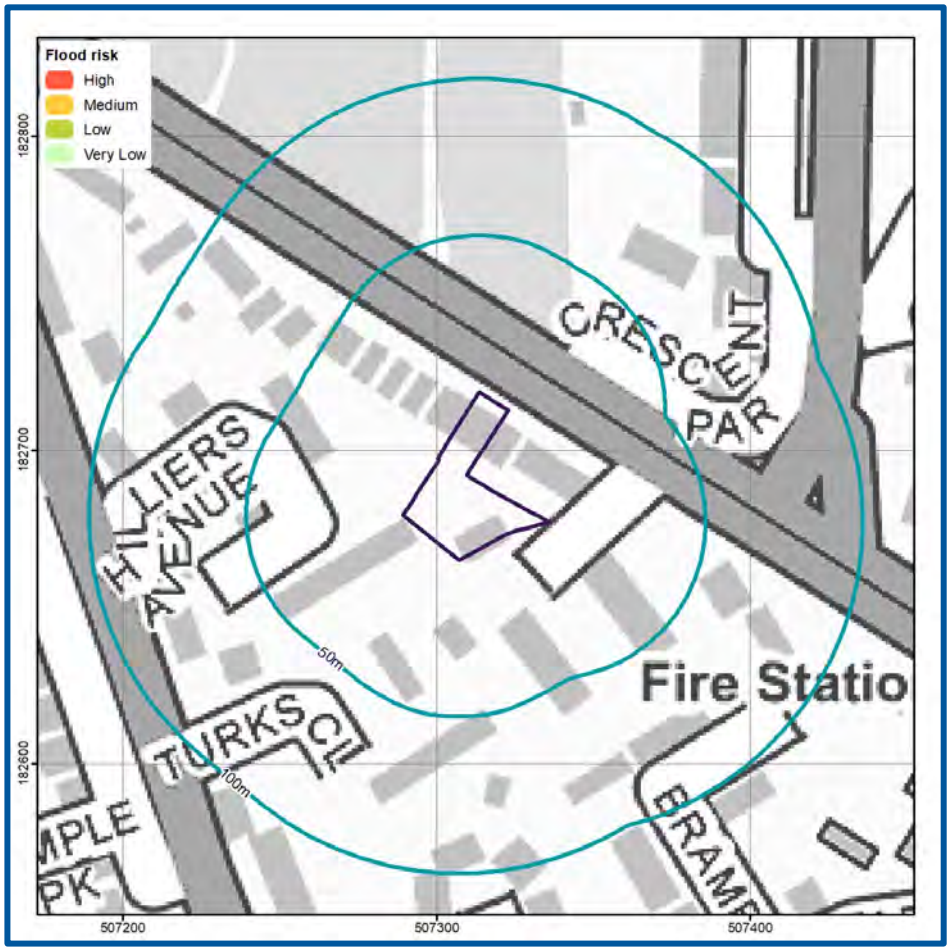


Flood risk including the benefit of defences

The type and condition of existing flood defences influence the 'actual' risk of fluvial flooding to the Site, albeit the long-term residual risk of flooding (ignoring the defences) should be considered when proposing new development.

According to the EA's Risk of Flooding from Rivers and the Sea (RoFRS) mapping (Figure 6), which considers the crest height, standard of protection and condition of defences, the flood risk from Rivers and the Sea is Very Low.

Figure 6. Risk of Flooding from Rivers and Sea map (EA, 2022)



Surface water (pluvial) flooding

Surface water flooding occurs when intense rainfall exceeds the infiltration capacity of the ground and overwhelms the drainage systems. It can occur in most locations even at higher elevations and at significant distances from river and coastal floodplains.

According to the EA's Risk of Flooding from Surface Water (pluvial) flood mapping (Figure 7), the Site is at a variable risk of pluvial flooding ranging from Very Low to High:

- The current rear garden area includes some lower lying areas. As such, the central part of the rear garden is at High risk of surface water flooding, with areas in the east and west of the rear garden at Medium and High risk.
- The north of the Site (including the existing dwelling and also the proposed entrance to the Site) is at Very Low risk of surface water flooding.
- The proposed dwelling in the north of the Site is located within an area at Very Low risk of surface water flooding, whilst the three dwellings proposed within the current rear garden would be in an area at Very Low to High risk.

Guidance

According to EA's surface water flood risk map, areas of the Site are at:

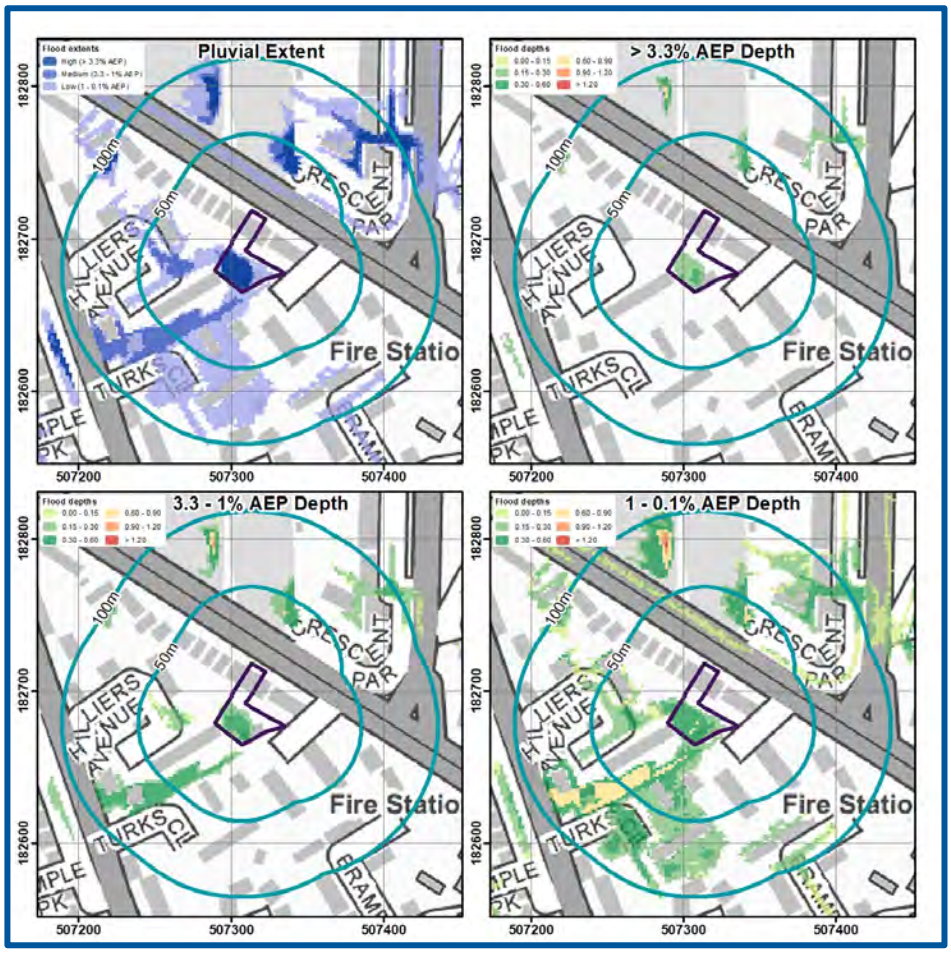
- Very Low risk - chance of flooding of less than 1 in 1000 (0.1%).
- Low risk - chance of flooding of between a 1 in 1000 & 1 in 100 (0.1% and 1%).
- Medium risk - chance of flooding of between a 1 in 100 and 1 in 30 (1% and 3.3%).
- High risk - chance of flooding of greater than 1 in 30 (3.3%).

Flood depths on-Site are between 0.0 m and 0.6 m in the High and Medium risk scenarios and 0.0 m to 0.9 m in the Low risk scenario. Comparison between the extent of surface water flooding within the EA's mapping and topographic LiDAR elevation contours indicates the surface water flood level can be estimated at c. 53.5 mAOD in the High risk scenario, c. 53.6 mAOD in the Medium risk scenario and c. 53.8 mAOD in the Low risk scenario.

The area of flooding during the High and Medium risk scenarios is restricted to the depression located within the current rear garden. However, in the Low risk scenario, flood waters are predicted to flow out of the Site through the southern boundary and would connect to areas of ponding along Hilliers Avenue and an alleyway to the south of the Site.

It is noted that the proposed development could potentially involve modifications of ground levels at the Site, including levelling the rear garden where the rear dwellings are proposed. This could potentially reduce the risk of ponding of surface water in the rear garden.

Figure 7. EA surface water flood risk map (EA, 2022)



Guidance

According to EA's surface water flood risk map the following advisory guidance applies to the Site:

Flood Depths:

- 0.15 to 0.3 m - Flooding would: typically exceed kerb height, likely exceed the level of a damp-proof course, cause property flooding in some areas.
- 0.3 to 0.9 m - Flooding is likely to exceed average property threshold levels and cause internal flooding. Resilience measures are typically effective up to a water depth of 0.60m above floor level.

According to the Policy Map included within the West London SFRA, an area in the rear of the Site, corresponding to the area of lower lying ground within the garden, is located within surface water Flood Zone 3a. The map also indicates the Site is not located within a Critical Drainage Area (CDA)[2] (Metis Consultants, 2018).

Climate change factors

Paragraph 002 of the National Planning Practice Guidance (August, 2022) requires consideration of the 1% AP (1 in 100 year) event, including an appropriate allowance for climate change.

As the Site is located within the Colne Management Catchment and the proposed development is classed as More Vulnerable, where the proposed lifespan is approximately 100 years. years, the Central (25%) allowance is required to determine a suitable climate change factor to apply to rainfall data.

The 0.1% AP (1 in 1000 year) surface water flooding event has been used as a proxy in this instance for the 1% AP (1 in 100 year) plus climate change event.

On-Site surface water drainage systems should be designed appropriately to manage the anticipated run-off.

Surface water flooding flow routes

Analysis of OS mapping, ground elevation data and the EA's pluvial flow route mapping in the 1 in 1000 year (Low probability) event confirms the Site is located on a potential overland flow route.

The 1 in 1000 year (low probability) event indicates the extent of flooding in a worst-case future 100 year with climate change scenario, where a flood flow route does develop within the Site.

During the 1 in 1000 year event the majority of of flow velocities are less than 0.25 m/s. The flows could potentiallyaffect the buildings on the Site.

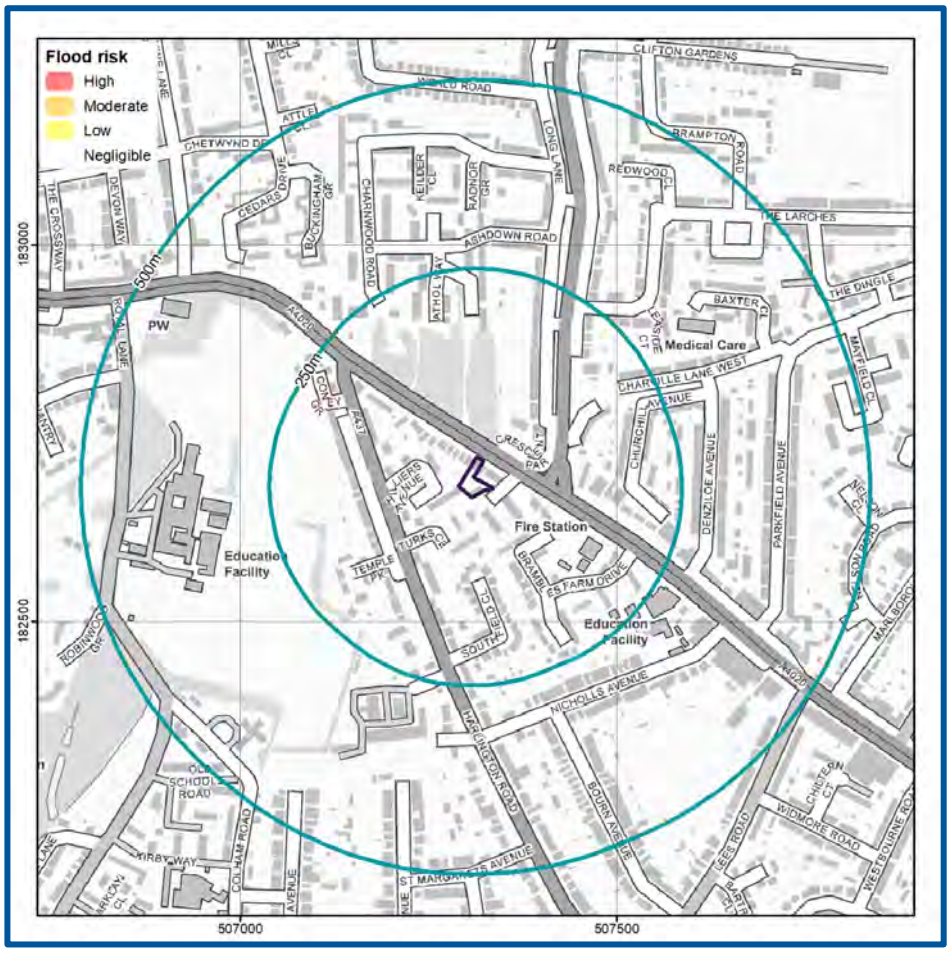
[2] A Critical Drainage Area (CDA) is an area that has critical drainage problems and which has been notified to the local planning authority as such by the Environment Agency in line with the National Planning Policy Framework (NPPF, 2021). CDA's are specific to Flood Zone 1, defined as areas where runoff can and may have historically contributed to flooding downstream, although they are not necessarily areas where flooding problems may occur. Where a Site is located in Flood Zone 1 and within a CDA, a Flood Risk Assessment (FRA) is required and the Council may also request Sustainable Drainage Scheme (SuDS) features to be included within the proposed development.

Groundwater flooding

Groundwater flooding occurs when sub-surface water emerges from the ground at the surface or into Made Ground and structures. This may be as a result of persistent rainfall that recharges aquifers until they are full; or may be as a result of high river levels, or tides, driving water through near-surface deposits. Flooding may last a long time compared to surface water flooding, from weeks to months. Hence the amount of damage that is caused to property may be substantially higher.

Groundwater Flood Risk screening data (Figure 8) indicate that there is a Negligible risk of groundwater flooding at surface in the vicinity from permeable superficial during a 1 in 100 year event.

Figure 8. GeoSmart GW5 Groundwater Flood Risk Map (GeoSmart, 2022)



Mapped classes combine likelihood, possible severity and the uncertainty associated with predicting the subsurface system. The map is a national scale screening tool to prompt site-specific assessment where the impact of groundwater flooding would have significant adverse consequences. Mapping limitations and a number of local factors may reduce groundwater flood risk to land and property even where it lies within mapped groundwater

flood risk zones, which do not mean that groundwater floods will occur across the whole of the risk area.

According to the GLA (2011) mapping in the interactive Sewer, Groundwater & Artificial Flood Risk Map included within the SFRA, the Site is not in an area at increased potential for elevated groundwater. However, the EA (2017) mapping indicates the Site is in an area in which between 25% and 50% of the area is susceptible to groundwater flooding (Metis Consultants, 2018).

A site-specific assessment has been undertaken to refine the groundwater risk screening information on the basis of site-specific datasets (see Section 3), including BGS borehole data, to develop a conceptual groundwater model. The risk rating is refined further using the vulnerability of receptors including occupants and the existing and proposed Site layout, including the presence of any basements and buried infrastructure. The presence of any nearby or on-Site surface water features such as drainage ditches, which could intercept groundwater have also been considered.

Based on a review of (limited) site specific data groundwater levels may rise in the superficial aquifer in response to prolonged rainfall recharge:

- BGS mapping and available borehole records suggest that the Site is underlain by superficial deposits comprising the Black Park Gravel Member which may be of the order 1 m to 5 m in thickness, beneath which London Clay is present The Black Park Gravel Member is classified as a Secondary (A) Aquifer and therefore may well contain a coherent groundwater body, or could potentially include perched water above the contact with the underlying low permeability bedrock.
- The rear garden area includes an area of lower lying topography, with an associated High risk of surface water flooding. Any groundwater seepage could potentially accumulate in the depression and could exacerbate any surface water flooding.
- It is noted that regionally the Site is located on a slope and hence groundwater may be expected to be present some distance below the ground surface. Additionally, no spring lines have been identified in the close proximity to the Site (which would provide an indication of locally shallow groundwater).

Site specific assessment suggests that groundwater levels could potentially reach the surface in the current rear garden area and appropriate mitigation should be considered. As such, on the basis of the site-specific assessment, the groundwater flood risk is considered to be Negligible to Low, with a Low risk assigned to the rear garden area, and a Negligible risk appropriate for the north of the Site (in the location of the existing dwelling).

Guidance

Negligible Risk - There will be a remote possibility that incidence of groundwater flooding could lead to damage to property or harm to other sensitive receptors at, or near, this location.

Low Risk - There will be a remote possibility that incidence of groundwater flooding could lead to damage to property or harm to other sensitive receptors at, or near, this location.

Climate change predictions suggest an increase in the frequency and intensity of extremes in groundwater levels. Rainfall recharge patterns will vary regionally resulting in changes to average groundwater levels.

The impact of climate change on groundwater levels beneath the Site is linked to the variation in rainfall recharge, which is uncertain.

Based on the available evidence the resulting increase to groundwater flood risk will be mitigated by the proposed measures.

Flooding from artificial sources

Artificial sources of flood risk include waterbodies or watercourses that have been amended by means of human intervention rather than natural processes. Examples include reservoirs (and associated water supply infrastructure), docks, sewers and canals. The flooding mechanism associated with flood risk from artificial sources is primarily related to breach or failure of structures (reservoir, lake, sewer, canal, flood storage areas, etc.).

Sewer flooding

According to the interactive Sewer, Groundwater & Artificial Flood Risk Map included within the SFRA, no incidences of sewer flooding have been recorded within the UB10 0 postcode area (Metis Consultants, 2018).

Records held by Thames Water indicate that there have been no incidences of flooding related to the surcharging of public sewers at the Site (Thames Water, 2022; Appendix B).

Guidance

Properties classified as “at risk” are those that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system either once or twice in the ten year reference period. Records held by the sewage utility company provide information relating to reported incidents, the absence of any records does not mean that the Site is not at risk of flooding.

Canal failure

According to Ordnance Survey (OS) mapping, there are no canals within 500 m of the Site.

Water supply infrastructure

Water supply infrastructure is comprised of a piped network to distribute water to private houses or industrial, commercial or institution establishments and other usage points. In urban areas, this represents a particular risk of flooding due to the large amount of water supply infrastructure, its condition and the density of buildings. The risks of flooding to properties from burst water mains cannot be readily assessed.

If more information regarding the condition and history of the water supply infrastructure within the vicinity of the Site is required, then it is advisable to contact the local water supplier (Thames Water).

Culverts and bridges

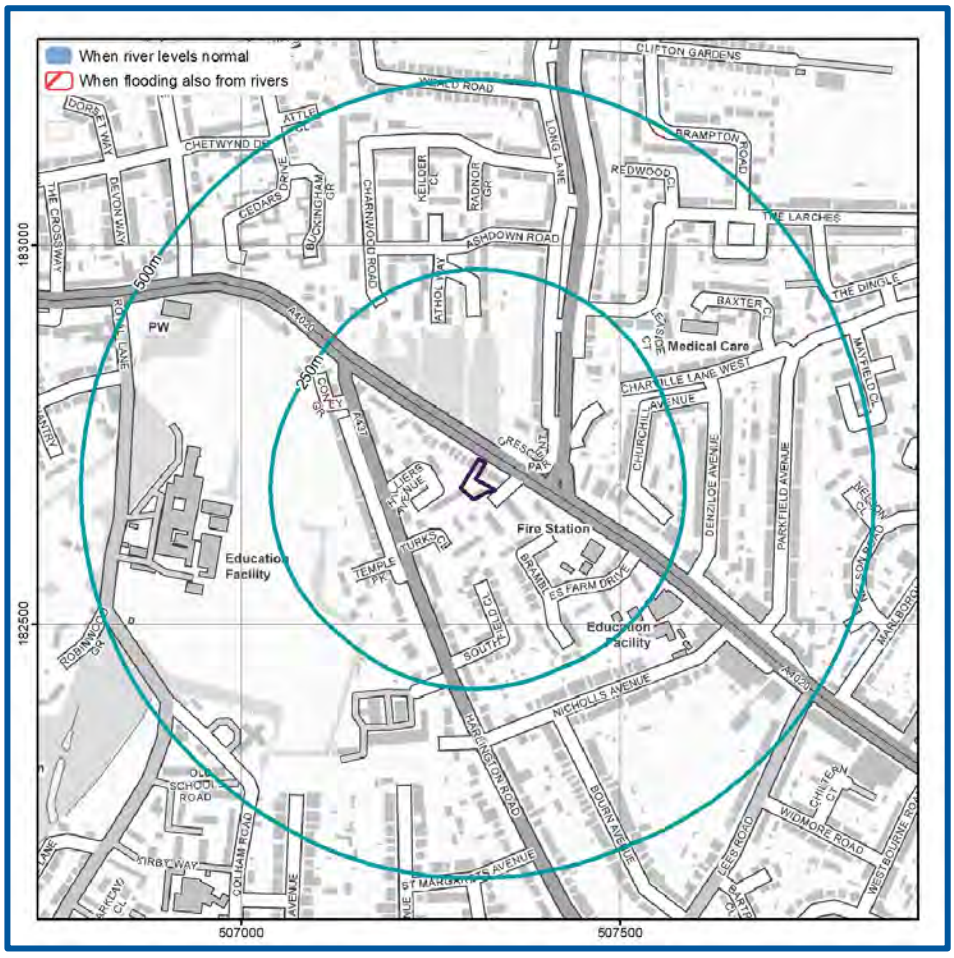
The blockage of watercourses or structures by debris (that is, any material moved by a flowing stream including vegetation, sediment and man-made materials or refuse) reduces flow capacity and raises water levels, potentially increasing the risk of flooding. High water levels can cause saturation, seepage and percolation leading to failure of earth embankments or other structures. Debris accumulations can change flow patterns, leading to scour, sedimentation or structural failure.

Culverts and bridges have not been identified within 500 m of the Site.

Reservoir flooding

According to the EA's Risk of Flooding from Reservoir mapping the Site is not at risk of flooding from reservoirs (Figure 9) (EA, 2022).

Figure 9. EA Risk of Reservoir Flooding (EA, 2022)



Guidance

The risk of reservoir flooding is related to the failure of a large reservoir (holding over 25,000 m^3 of water) and is based on the worst-case scenario. Reservoir flooding is extremely unlikely to occur (EA, 2022).

5. Flood risk from the development

Floodplain storage

As the development is located within Flood Zone 1, there would be no losses in floodplain storage as a result of the development. As such, floodplain compensation is unlikely to be required.

Drainage and run-off

The proposed development involves an increase in the coverage of impermeable surfaces at the Site. As a result, the rate and volume of runoff from the development is likely to increase over its lifetime. Therefore, an estimation of run-off is required to permit effective Site water management and prevent any increase in flood risk to off-Site receptors from the Site, over the lifetime of the proposed development.

The potential surface water run-off generated from the Site during a 1 in 100 year return period should be calculated, using FEH 2013 rainfall data from the online Flood Estimation Handbook (FEH), developed by NERC (2009) and CEH (2016).

The NPPF (2021) recommends the effects of climate change are incorporated into FRA's and the recently updated climate change guidance (published in 2016 and updated in 2021) confirms the requirements for inclusion within FRA's. As of May 2022, the applicable climate change allowance is defined by specific Management Catchment for the 1 in 30 (≥ 3.3% AEP) and 1 in 100 (< 3.3 to 1% AEP) year event.

As the proposed development is residential, the lifespan of the development is 100 years and requirements for climate change should allow up to the 2070s scenario for the upper end allowance within the Colne Management Catchment.

Table 1. Colne Management Catchment peak rainfall allowances

Colne Management Catchment	3.3% Annual exceedance rainfall event		1% Annual exceedance rainfall event	
	2050s	2070s	2050s	2070s
Central	20%	25%	20%	25%
Upper end	35%	35%	40%	40%

Sustainable Drainage System (SuDS)

It is recommended attenuation of run-off is undertaken on-Site to compensate for proposed increases in impermeable surface areas. Attenuation may comprise the provision of storage within a Sustainable Drainage System (SuDS). SuDS can deliver benefits from improving the management of water quantity, water quality, biodiversity and amenity.

Soakaways are understood to be proposed for each dwelling at the Site. Further assessment would be required to assess the feasibility of infiltration SUDS and to allow detailed design.

It is assumed that any changes to the existing drainage system will be undertaken in accordance with best practice and that care will be taken to ensure the new development does not overload/block any existing drainage or flow pathways from the Site.

6. Suitability of the proposed development

The information below outlines the suitability of proposed development in relation to national and local planning policy.

National policy and guidance

The aims of the national planning policies are achieved through application of the Sequential Test and in some cases the Exception Test.

Guidance

Sequential test: The aim of this test is to steer new development towards areas with the lowest risk of flooding (NPPF, 2021). Reasonably available sites located in Flood Zone 1 should be considered before those in Flood Zone 2 and only when there are no reasonably available sites in Flood Zones 1 and 2 should development in Flood Zone 3 be considered.

Exception test: In some cases, this may need to be applied once the Sequential Test has been considered. For the exception test to be passed it must be demonstrated that the development would provide wider sustainability benefits to the community that outweigh flood risk and a site-specific FRA 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.

Suitability of the proposed development, and whether the Sequential and Exception Tests are required, is based on the Flood Zone the Site is located within and the flood risk vulnerability classification of the existing and proposed development. Some developments may contain different elements of vulnerability and the highest vulnerability category should be used, unless the development is considered in its component parts.

This report has been produced to assess all development types, prior to any development. The vulnerability classification and Flood Zones are compared within Table 2 overleaf (Table 3 of the NPPG (2014)).

As the Site is located within Flood Zone 1, all types of development listed within the Table overleaf are acceptable according to National Policy.

Table 2. Flood risk vulnerability and flood zone 'compatibility (taken from NPPG, 2014)

Flood risk vulnerability classification		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood Zone	Zone 1 – low probability	✓	✓	✓	✓	✓
	Zone 2 – medium probability	✓	✓	Exception test required	✓	✓
	Zone 3a - high probability	Exception test required	✓	X	Exception test required	✓
	Zone 3b – functional flood plain	Exception test required	✓	X	X	X

Local policy and guidance

For this report, several documents have been consulted for local policy and guidance and relevant information is outlined below:

Local Plan: Part 1 (London Borough of Hillingdon, 2012):

Policy EM6: Flood Risk Management

The Council will require new development to be directed away from Flood Zones 2 and 3 in accordance with the principles of the National Planning Policy Framework (NPPF).

The subsequent Hillingdon Local Plan: Part 2 -Site Specific Allocations LDD will be subjected to the Sequential Test in accordance with the NPPF. Sites will only be allocated within Flood Zones 2 or 3 where there are overriding issues that outweigh flood risk. In these instances, policy criteria will be set requiring future applicants of these sites to demonstrate that flood risk can be suitably mitigated.

The Council will require all development across the borough to use sustainable urban drainage systems (SUDS) unless demonstrated that it is not viable. The Council will encourage SUDS to be linked to water efficiency methods. The Council may require developer

contributions to guarantee the long term maintenance and performance of SUDS is to an appropriate standard.

Local Plan Part 2 – Development Management Policies (London Borough of Hillingdon, 2020):

POLICY DMEI 9: Management of Flood Risk

- Development proposals in Flood Zones 2 and 3a will be required to demonstrate that there are no suitable sites available in areas of lower flood risk. Where no appropriate sites are available, development should be located on the areas of lowest flood risk within the site. Flood defences should provide protection for the lifetime of the development. Finished floor levels should reflect the Environment Agency's latest guidance on climate change.
- Development proposals in these areas will be required to submit an appropriate level Flood Risk Assessment (FRA) to demonstrate that the development is resilient to all sources of flooding.
- Development in Flood Zone 3b will be refused in principle unless identified as an appropriate development in Flood Risk Planning Policy Guidance. Development for appropriate uses in Flood Zone 3b will only be approved if accompanied by an appropriate FRA that demonstrates the development will be resistant and resilient to flooding and suitable warning and evacuation methods are in place.
- Developments may be required to make contributions (through legal agreements) to previously identified flood improvement works that will benefit the development site.
- Proposals that fail to make appropriate provision for flood risk mitigation, or which would increase the risk or consequences of flooding, will be refused.

West London Strategic Flood Risk Assessment (Metis Consultants, 2018):

- Drainage in the sub-region is serviced by Thames Water Utilities Ltd (Thames Water), who provide surface water, foul and combined sewer systems. Modern sewer systems are designed to be separate surface water and foul water systems, typically accommodating up to 1 in 30 year rainfall events. However, sewer system segments across London vary in capacity due to age. Older segments have a smaller capacity and may not be designed to accommodate rainfall events as significant as 1 in 30 year events. Combined sewer systems are also prevalent within older areas of London, including eastern parts of Ealing and Hounslow, leading to increased environmental risks were flooding to occur.

Guidance

Strategic Flood Risk Assessments are carried out by local authorities, in consultation with the Environment Agency, to assess the flood risk to the area from all sources both now and in the future due to climate change. They are used to inform planning decisions to ensure inappropriate development is avoided (NPPF, 2021).

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7. Resilience and mitigation

Based on the flood risk identified at the Site, the national and local policies and guidance and proposed development, the mitigation measures outlined within this section of the report are likely to help protect the development from flooding.

Sea (coastal/tidal) flood mitigation measures

As the Site is not identified as being at risk of flooding from the sea, mitigation measures are not required.

Rivers (fluvial) flood mitigation measures

As the Site is not identified as being at risk of flooding from fluvial sources, mitigation measures are not required.

Surface water (pluvial) flood mitigation measures

A Very Low to High surface water (pluvial) flooding risk has been identified at the Site. In order to ensure the development includes sufficient flood mitigation measures to reduce the risk of pluvial flooding over its lifetime, the flood depths, levels and appropriate mitigation measures are summarised below:

Flood event	Flood depth (m)*	Flood level (mAOD)
1 in 30	0.0 to 0.6	53.5
1 in 100	0.0 to 0.6	53.6
1 in 1000	0.0 to 0.9	53.8

*It is noted that comparison between the ground levels at the Site (between 53.3 and 55.2 mAOD) and the estimated flood levels for each event indicates that flood depths may be lower than anticipated from the EA's surface water flood mapping.

It is recommended that finished floor levels of the proposed development are set at least 0.3 m above the maximum 1 in 1000 year event (used as a proxy for the 1 in 100 year plus climate change event) flood level to 54.1 mAOD.

Where Finished floor levels cannot be set at the recommended elevation, the floor levels should be set as high as possible and flood resilience measures included (see below).

Alternative Mitigation

Where it is not possible to raise the minimum finished floor levels to the recommended elevation, it may be appropriate to adopt a water exclusion strategy for flood depths up to

0.3 m in line with the EA's Standing Advice. A water exclusion strategy, using avoidance and resistance measures, is appropriate where floods are expected to last for short durations. Potential water exclusion strategies include:

- Passive flood door systems;
- Temporary flood barriers;
- Air brick covers (manual or automatic closing);
- Non-return flap valves on sewer outfalls;
- Landscaping to divert water away from the property.

Avoidance and resistance measures are unlikely to completely prevent floodwater entering a property, particularly during longer duration flood events. Therefore, it is recommended that the following flood resilience measures are also considered.

- Flood resilient materials and designs:
    - Use of low permeability building materials up to 0.3 m such as engineering bricks (Classes A and B) or facing bricks;
    - Hard flooring and flood resilient metal staircases;
    - The use of internal lime plaster/render or where plasterboards are used these should be fitted horizontally instead of vertically and/or using moisture resistant plasterboard at lower levels;
    - Water, electricity and gas meters and electrical sockets should be located above the predicted flood level;
    - Communications wiring: wiring for telephone, TV, Internet and other services should be protected by suitable insulation in the distribution ducts to prevent damage.

Water entry strategies should also be considered in the event that flood depths are in excess of 0.3 m. Water entry strategies are used to preserve building integrity and to promote flood resilience rather than resistance (which is more difficult to achieve for significant flood depths). A structural engineer should be consulted to confirm this would be a suitable strategy for the proposed development, to ensure flood flows would not impact the structural integrity of the building. Potential strategies include:

- Ground floors designed to permit water passage at high flood depths;
- Hard flooring and flood resilient metal staircases;
- Heating systems, electrical sockets and utility meters raised above the predicted flood level where possible; and
- Sump and pump.

In addition, the regular maintenance of any drains surrounding/on the Site should be undertaken to reduce the flood risk.

Soakaways have been proposed for each dwelling for the effective management of surface water runoff from the proposed development. A Sustainable Drainage Strategy (SuDS) should be utilised to assess the feasibility of infiltration SuDS and inform the design requirements for each soakaway. Any soakaways should be at least 5 m from the proposed building foundations and 2-3 m from adjacent highways.

If these mitigation measures are implemented this could reduce the flood risk to the development from Very Low to High, to Very Low to Low.

Groundwater flood mitigation measures

It is likely the flood mitigation measures recommended for surface water (pluvial) risk will be sufficient to reduce the groundwater flood risk at the surface for the development. The following specific groundwater measures may also be considered for the Low risk identified in the current rear garden area:

- Interceptor drains;
- Automatic sump to extract flood water; and
- Non-return flap valves on the proposed foul and surface water sewer lines.

If these mitigation measures are implemented this would ensure the flood risk to the proposed properties within the rear garden area is Negligible.

Reservoir flood mitigation measures

The Site is not a risk of flooding from reservoirs; therefore, mitigation measures are not required.

Other flood risk mitigation measures

As the Site is not identified as at risk from other sources, mitigation measures are not required.

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Residual flood risk mitigation measures

The risk to the Site has been assessed from all sources of flooding and appropriate mitigation and management measures proposed to keep the users of the development safe over its lifetime. There is however a residual risk of flooding associated with the potential for failure of mitigation measures if regular maintenance and upkeep isn't undertaken. If mitigation measures are not implemented or maintained, the risk to the development will remain as the baseline risk.

Further flood mitigation information

More information on flood resistance, resilience and water entry can be found here: http://www.planningportal.gov.uk/uploads/br/flood_performance.pdf

www.knowyourfloodrisk.co.uk

8. Conclusions and recommendations

Table 3. Risk ratings following implementation and subsequent maintenance of mitigation measures

Source of Flood Risk	Baseline	After analysis	After mitigation
River (fluvial) and Sea (coastal/tidal) flooding	Very Low	Very Low	N/A
Surface water (pluvial) flooding	Very Low to High	Very Low to High	Very Low to Low
Groundwater flooding	Negligible	Negligible to Low	Negligible
Other flood risk factors present	No	No	N/A

The table below provides a summary of where the responses to key questions are discussed in this report. Providing the recommended mitigation measures are put in place it is likely that flood risk to this Site will be reduced to an acceptable level.

Table 4. Summary of responses to key questions in the report

Key sources of flood risks identified	Surface water (pluvial) and groundwater (see Section 4).
Are standard mitigation measures likely to provide protection from flooding to/from the Site?	Yes (see Section 7).
Is any further work recommended?	Yes (see Section 7 and executive summary for full details)

9. Further information

The following table includes a list of additional products by GeoSmart:

Additional GeoSmart Products			
✓	Additional assessment: SuDSmart Report		The SuDSmart Report range assesses which drainage options are available for a Site. They build on technical detail starting from simple infiltration screening and work up to more complex SuDS Assessments detailing alternative options and designs. Please contact info@geosmartinfo.co.uk for further information.
✓	Additional assessment: EnviroSmart Report		Provides a robust desk-based assessment of potential contaminated land issues, taking into account the regulatory perspective. Our EnviroSmart reports are designed to be the most cost effective solution for planning conditions. Each report is individually prepared by a highly experienced consultant conversant with Local Authority requirements. Ideal for pre-planning or for addressing planning conditions for small developments. Can also be used for land transactions. Please contact info@geosmartinfo.co.uk for further information.

10. References and glossary

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Glossary

General terms

BGS	British Geological Survey
EA	Environment Agency
GeoSmart groundwater flood risk model	GeoSmart's national groundwater flood risk model takes advantage of all the available data and provides a preliminary indication of groundwater flood risk on a 50m grid covering England and Wales. The model indicates the risk of the water table coming within 1 m of the ground surface for an indicative 1 in 200 year return period scenario.
Dry-Island	An area considered at low risk of flooding (e.g. In a Flood Zone 1) that is entirely surrounded by areas at higher risk of flooding (e.g. Flood Zone 2 and 3)
Flood resilience	Flood resilience or wet-proofing accepts that water will enter the building, but through careful design will minimise damage and allow the re-occupancy of the building quickly. Mitigation measures that reduce the damage to a property caused by flooding can include water entry strategies, raising electrical sockets off the floor, hard flooring.
Flood resistance	Flood resistance, or dry-proofing, stops water entering a building. Mitigation measures that prevent or reduce the likelihood of water entering a property can include raising flood levels or installation of sandbags.
Flood Zone 1	This zone has less than a 0.1% annual probability of river flooding
Flood Zone 2	This zone has between 0.1 and 1% annual probability of river flooding and between 0.1% and 0.5 % annual probability sea flooding
Flood Zone 3	This zone has more than a 1% annual probability of river flooding and 0.5% annual probability of sea flooding
Functional Flood Plain	An area of land where water has to flow or be stored in times of flood.

Hydrologic model	A computer model that simulates surface run-off or fluvial flow. The typical accuracy of hydrologic models such as this is ±0.25m for estimating flood levels at particular locations.
OS	Ordnance Survey
Residual Flood Risk	The flood risk remaining after taking mitigating actions.
SFRA	Strategic Flood Risk Assessment. This is a brief flood risk assessment provided by the local council
SuDS	A Sustainable drainage system (SuDS) is designed to replicate, as closely as possible, the natural drainage from the Site (before development) to ensure that the flood risk downstream of the Site does not increase as a result of the land being developed. SuDS also significantly improve the quality of water leaving the Site and can also improve the amenity and biodiversity that a Site has to offer. There are a range of SuDS options available to provide effective surface water management that intercept and store excess run-off. Sites over 1 Ha will usually require a sustainable drainage assessment if planning permission is required. The current proposal is that from April 2014 for more than a single dwelling the drainage system will require approval from the SuDS Approval Board (SABs).

Aquifer Types

Principal aquifer	These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.
Secondary A aquifer	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.
Secondary B aquifer	Predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.
Secondary undifferentiated	Has been assigned in cases where it has not been possible to attribute either category A or B to a rock type due to the variable characteristics of the rock type.
Unproductive Strata	These are rock layers or drift deposits with low permeability that has negligible significance for water supply or river base flow.

NPPF (2021) terms

Exception test	Applied once the sequential test has been passed. 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 FRA 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.
Sequential test	Aims to steer new development to areas with the lowest probability of flooding.
Essential infrastructure	Essential infrastructure includes essential transport infrastructure, essential utility infrastructure and wind turbines.
Water compatible	Water compatible land uses include flood control infrastructure, water-based recreation and lifeguard/coastal stations.
Less vulnerable	Less vulnerable land uses include police/ambulance/fire stations which are not required to be operational during flooding and buildings used for shops/financial/professional/other services.
More vulnerable	More vulnerable land uses include hospitals, residential institutions, buildings used for dwelling houses/student halls/drinking establishments/hotels and sites used for holiday or short-let caravans and camping.
Highly vulnerable	Highly vulnerable land uses include police/ambulance/fire stations which are required to be operational during flooding, basement dwellings and caravans/mobile homes/park homes intended for permanent residential use.

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Data Sources

Aerial Photography	Contains Ordnance Survey data © Crown copyright and database right 2022 BlueSky copyright and database rights 2022
Bedrock & Superficial Geology	Contains British Geological Survey materials © NERC 2022 Ordnance Survey data © Crown copyright and database right 2022
Flood Risk (Flood Zone/RoFRS/Historic Flooding/Pluvial/Surface Water Features/Reservoir/ Flood Alert & Warning)	Environment Agency copyright and database rights 2022 Ordnance Survey data © Crown copyright and database right 2022
Flood Risk (Groundwater)	GeoSmart, BGS & OS GW5 (v2.4) Map (GeoSmart, 2022) Contains British Geological Survey materials © NERC 2022 Ordnance Survey data © Crown copyright and database right 2022
Location Plan	Contains Ordnance Survey data © Crown copyright and database right 2022
Topographic Data	OS LiDAR/EA Contains Ordnance Survey data © Crown copyright and database right 2022 Environment Agency copyright and database rights 2022

11. Appendices

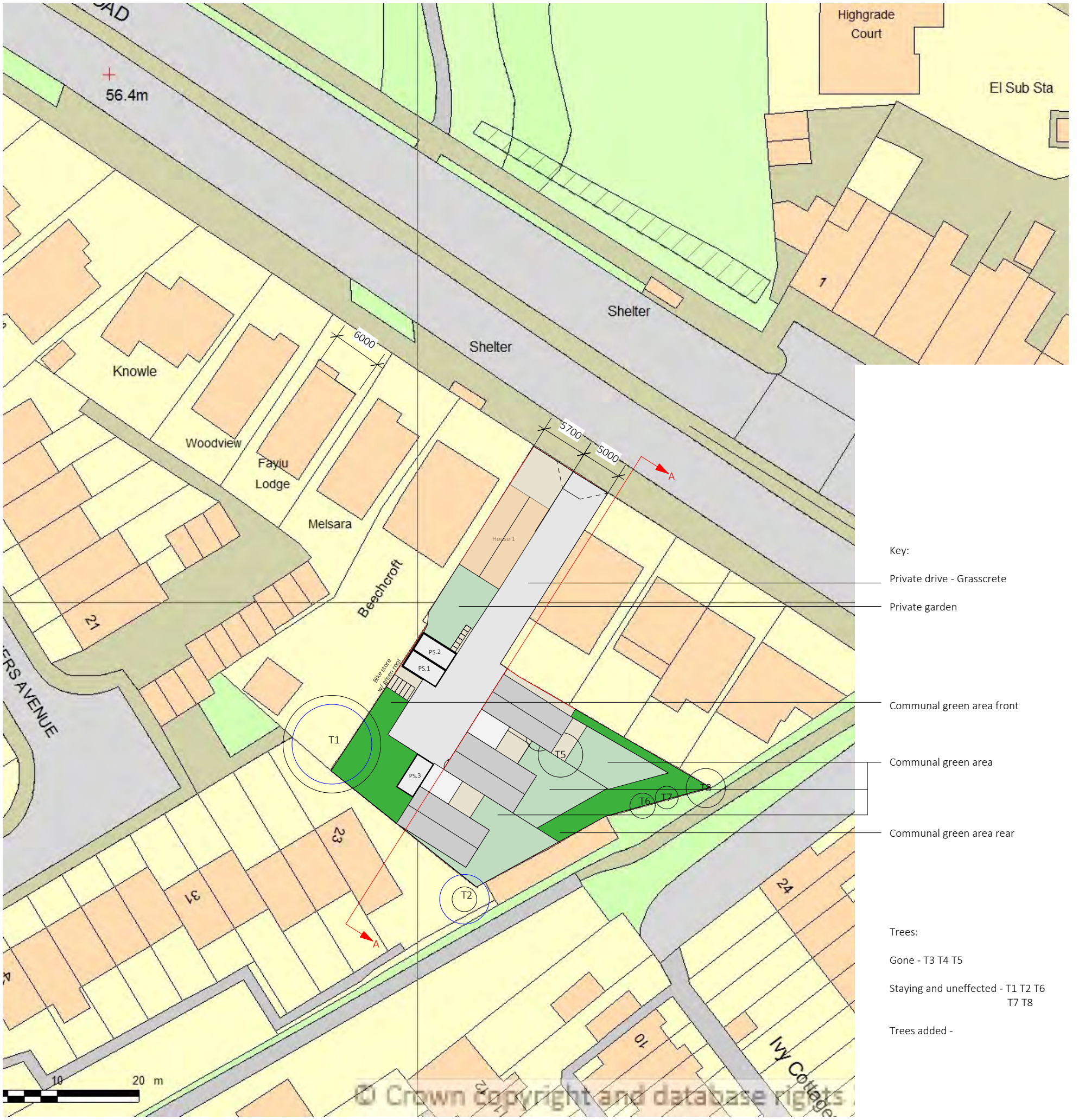
GeoSmart Information

Appendix A

Site plans

SITE LOCATION PLAN
AREA 2 HA
SCALE: 1:1250 on A4
CENTRE COORDINATES: 507315 , 182708

Skerryvore Designs Ltd **skerryvoredesigns.co.uk** Phone **01633 897922** Mobile **07816 934352** contact@skerryvoredesigns.co.uk	JOB TITLE Dellfield, Uxbridge Rd. UB10 0PL	DRAWING TITLE Resubmission: Existing Site Plan	DRAWING No. SD642-RE-01 SCALE 1:1250 @ A3 DATE JUNE 2023



Key:

Private drive - Grasscrete

Private garden

Communal green area front

Communal green area

Communal green area rear

Trees:

Gone - T3 T4 T5

Staying and uneffected - T1 T2 T6 T7 T8

Trees added -

4no. 2 bedroom houses with smaller (driveway style access to the rear)

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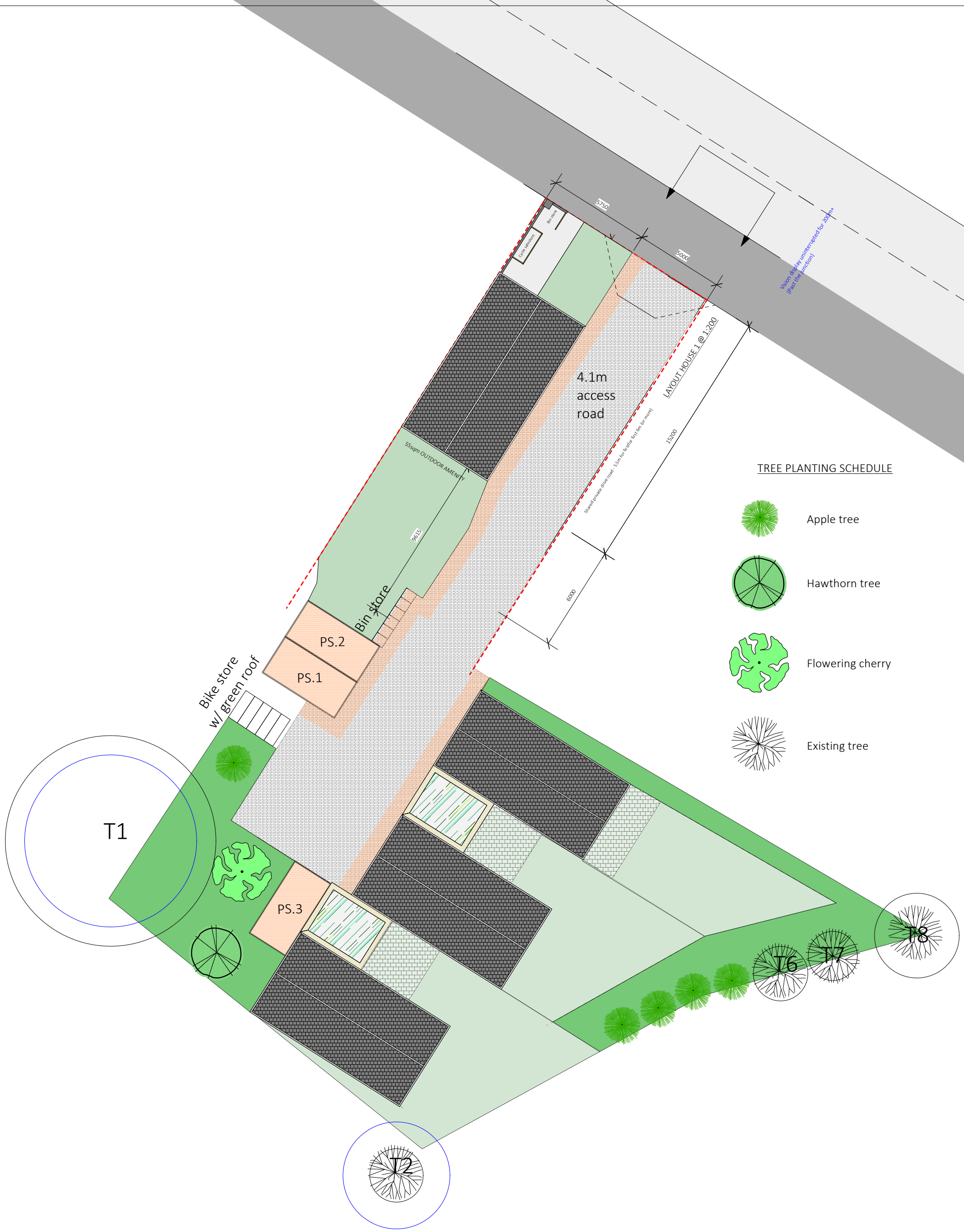
JOB TITLE	Dellfield, Uxbridge Rd. UB10 0PL
DRAWING TITLE	Resubmission: Proposed Block Plan
DRAWING No.	SD642-RE-02
SCALE	1:500 @ A3
DATE	JUNE 2023



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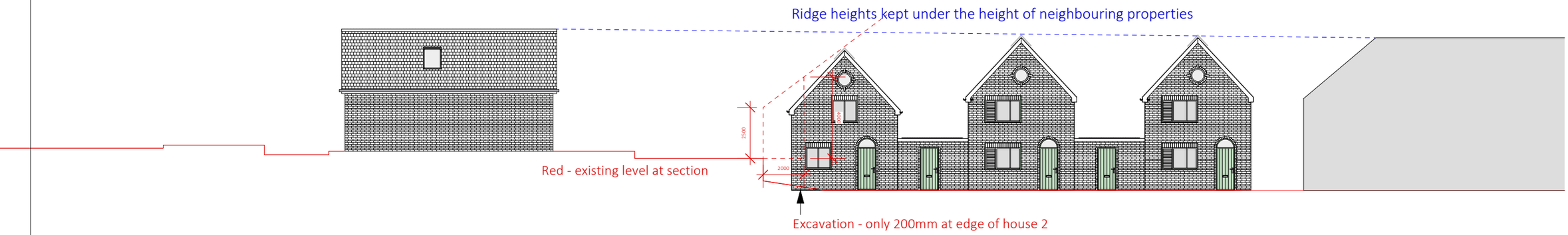
JOB TITLE	Dellfield, Uxbridge Rd. UB10 0PL
DRAWING TITLE	Resubmission: Detailed Block Plan
DRAWING No.	SD642-RE-03
SCALE	1:200 @ A3
DATE	JUNE 2023

SECTION A-A (from SD642-RE-02 Block plan)

House nearest to Leederville (nextdoor to Dellfield) has been lowered, and the orientation of the roof has been changed so they have a sloping face and not a gable end wall.
We have now kept it under the rules of permitted development for development against a boundary. We are under4m within 2m of the boundary. This means we are not overbearing and stoping light into the neighbouring property.
At the South of the site, we are facing the hip end of a terrace, and there are no side windows.



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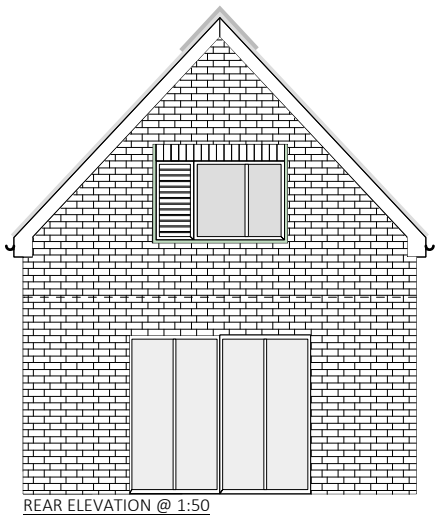
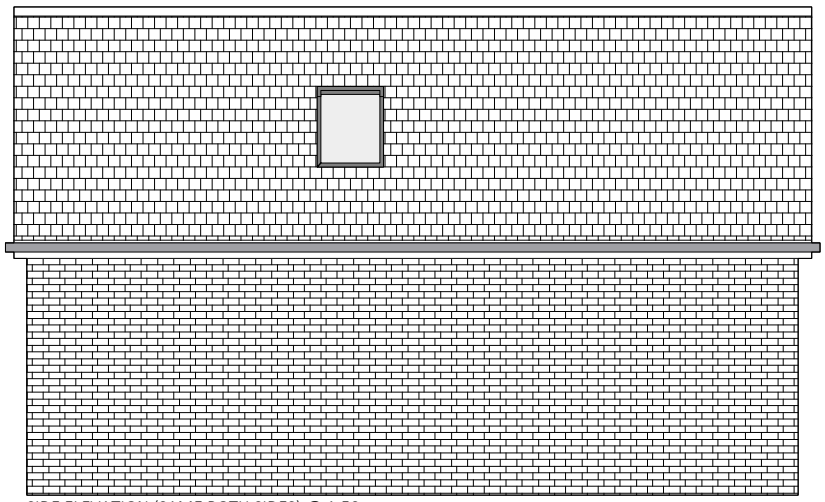
JOB TITLE	Dellfield, Uxbridge Rd. UB10 0PL
DRAWING TITLE	House Type 1: Layout
DRAWING No.	SD642-RE-04
SCALE	1:200 @ A3
DATE	JUNE 2023

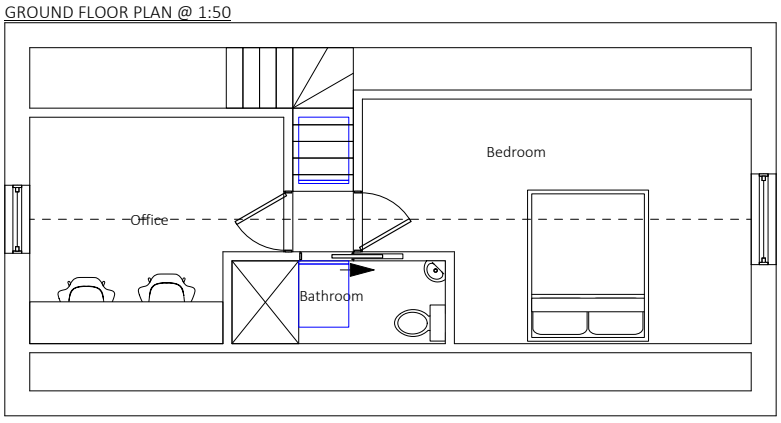


REAR ELEVATION @ 1:50

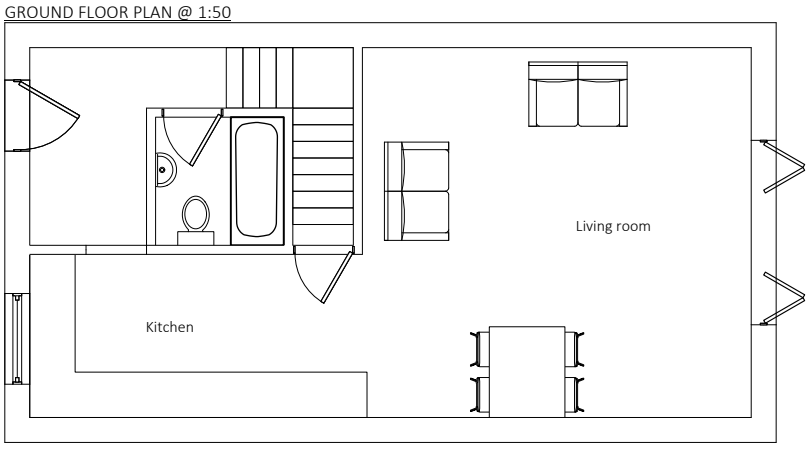


SIDE ELEVATION (SAME BOTH SIDES) @ 1:50

GROUND FLOOR PLAN @ 1:50

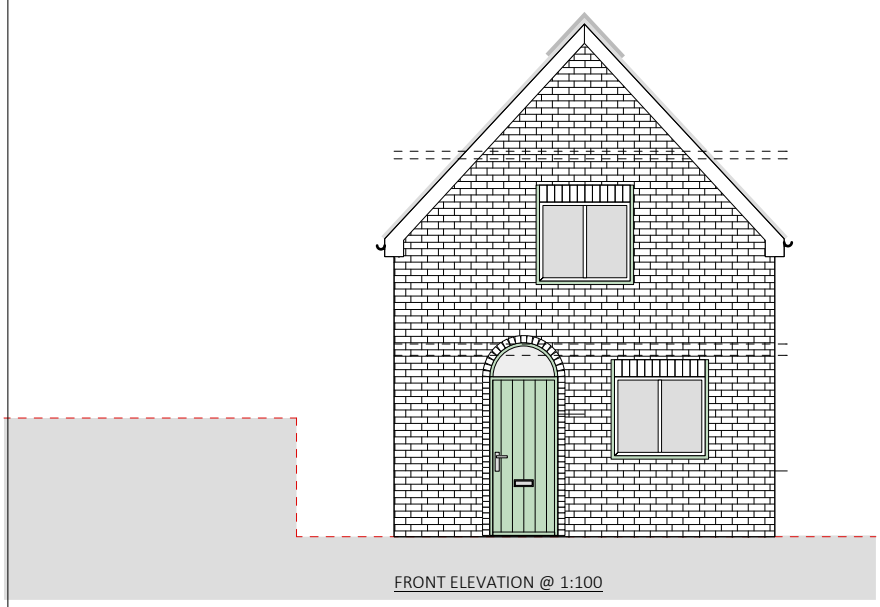


GROUND FLOOR PLAN @ 1:50

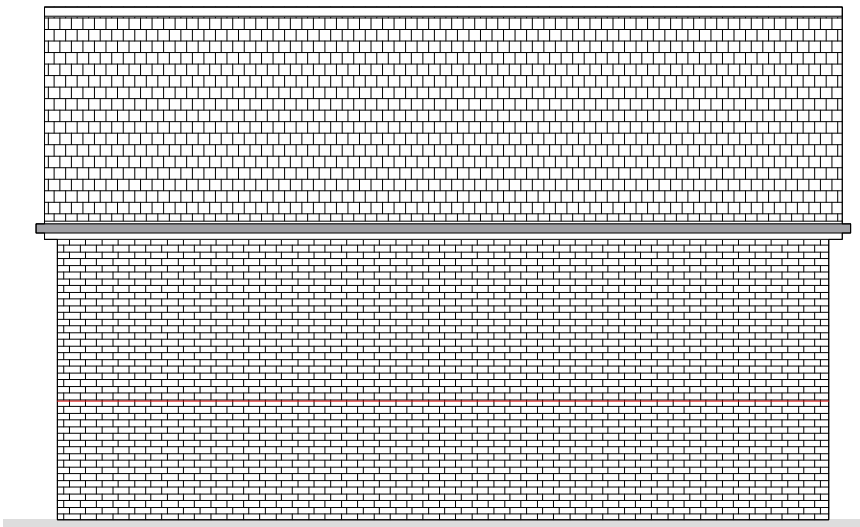


Skerryvore Designs Ltd
Sexton's Tower
2 Caerphilly Road
Bassaleg,
Newport,
NP10 8LE.
Phone **01633 897922**
Mobile **07816 934352**
steve_groucott@hotmail.com

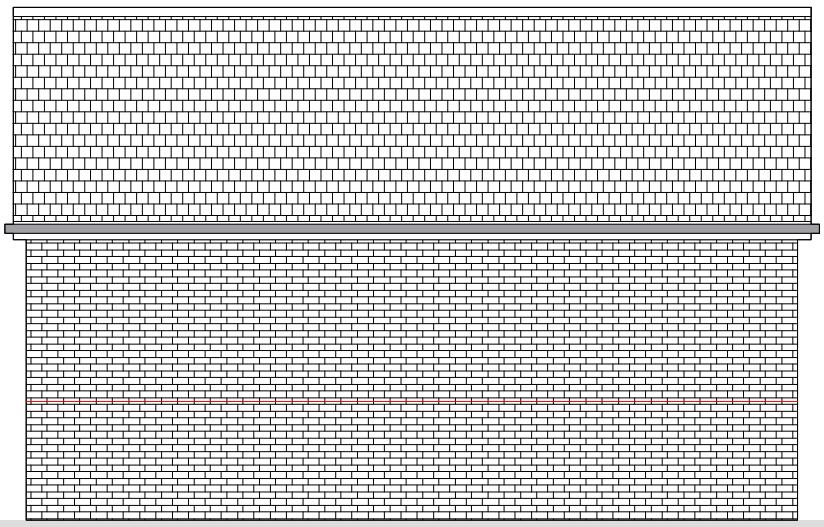
JOB TITLE	Dellfield, Uxbridge Rd. UB10 0PL
DRAWING TITLE	House Type 1: Floor Plans & Elevations
DRAWING No.	SD642-RE-05
SCALE	1:100 @ A3
DATE	JUNE 2023



FRONT ELEVATION @ 1:100

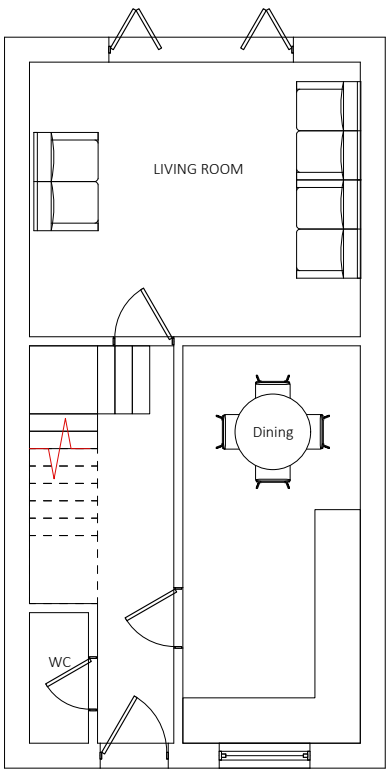


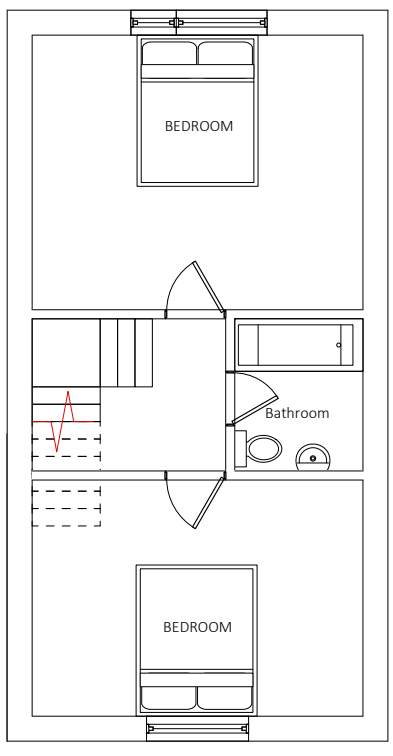
SIDE ELEVATION South side @ 1:100



SIDE ELEVATION South side @ 1:100

LIMIT ELEVATION @ 1:100





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steve_groucott@hotmail.com

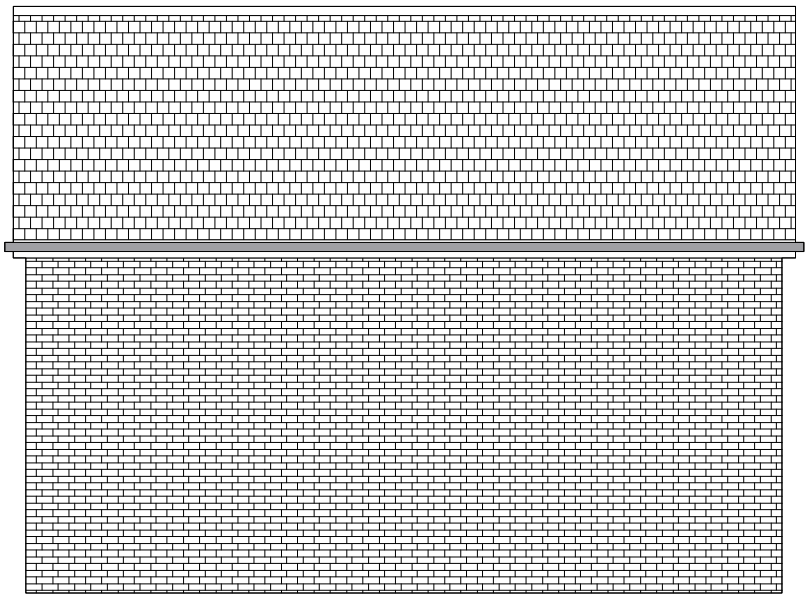
JOB TITLE: Dellfield, Uxbridge Rd. UB10 0PL

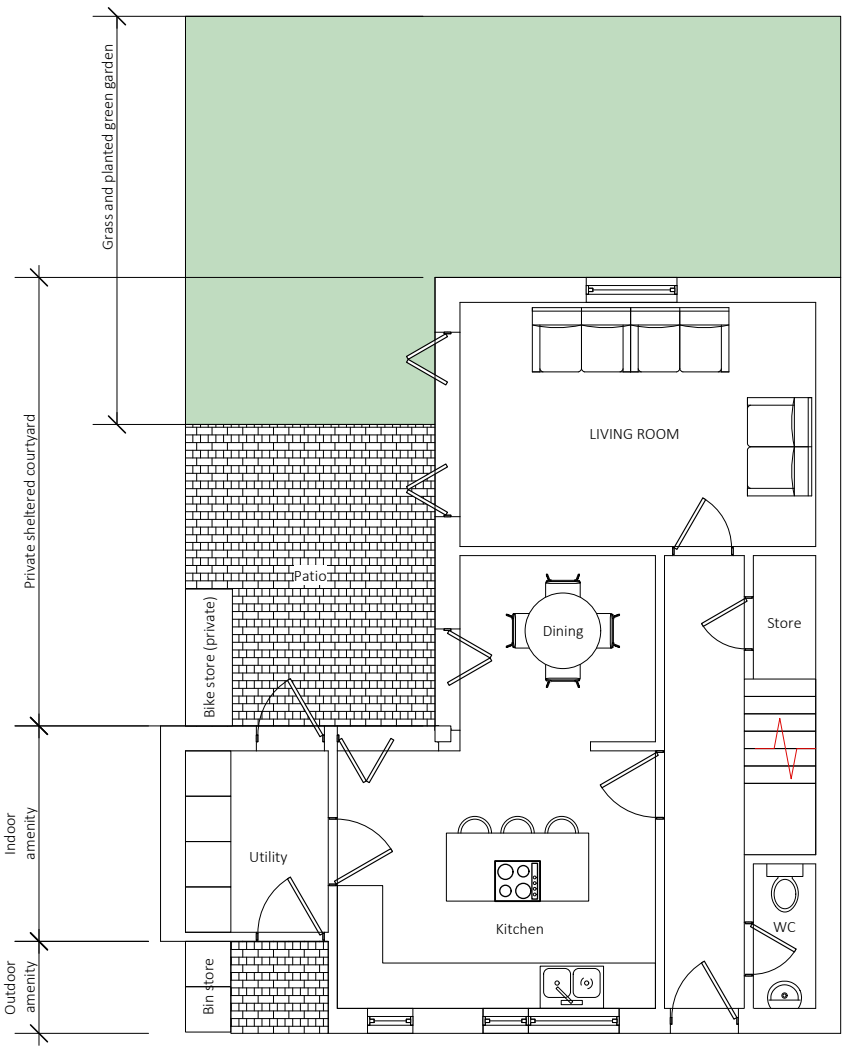
DRAWING TITLE: House Type 2: Floor plans & Elevations

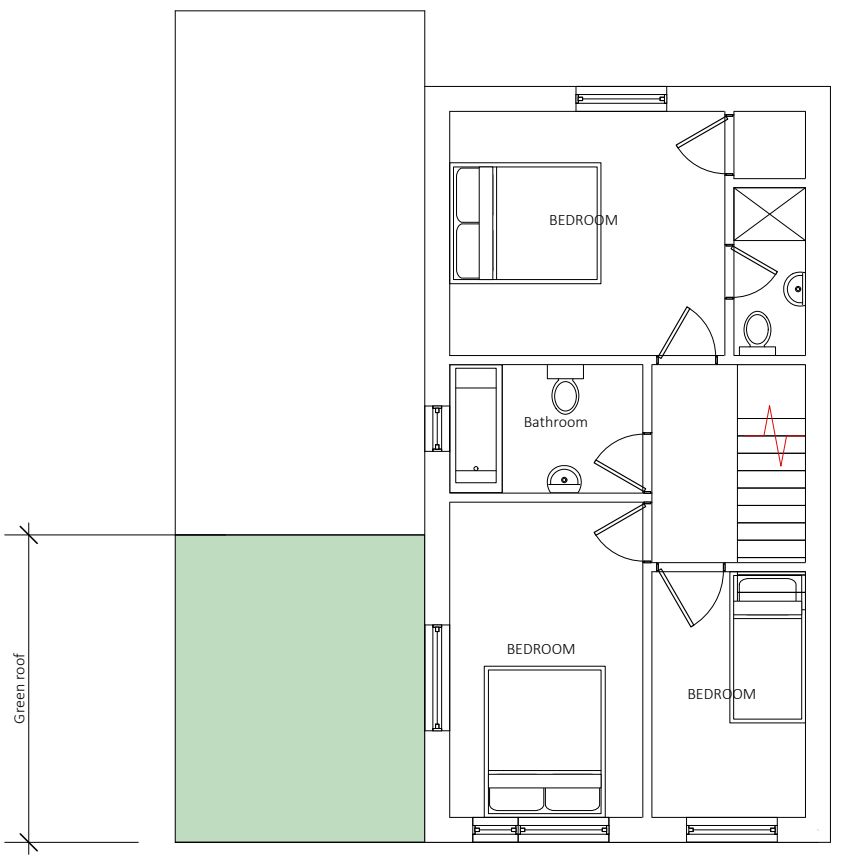
DRAWING No. SD642-RE-06

SCALE 1:100 @ A3

DATE JUNE 2023







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steve_groucott@hotmail.com

JOB
TITLE Dellfield,
Uxbridge Rd.
UB10 0PL

DRAWING
TITLE House Type 3:
Floor Plans &
Elevations

DRAWING No. SD642-RE-07

SCALE 1:50 @ A3

DATE JUNE 2023

GeoSmart Information

Appendix B

Thames Water sewer flooding report

t. +44(0)1743 298 100 info@geosmartinfo.co.uk www.geosmartinfo.co.uk

Sewer Flooding
History Enquiry

Property Searches

GeoSmart Information Ltd

Bellstone

Search address supplied	Dellfield Uxbridge Road Uxbridge UB10 0PL
Your reference	77727
Our reference	SFH/SFH Standard/2022_4720743
Received date	**20 September 2022**
Search date	**20 September 2022**

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0800 009 4540

Sewer Flooding
History Enquiry

Property Searches

Search address supplied: Dellfield,Uxbridge Road,Uxbridge,UB10 0PL

This search is recommended to check for any sewer flooding in a specific address or area

TWUL, trading as Property Searches, are responsible in respect of the following:-

(i) any negligent or incorrect entry in the records searched;

(ii) any negligent or incorrect interpretation of the records searched;

(iii) and any negligent or incorrect recording of that interpretation in the search report

(iv) compensation payments

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13

searches@thameswater.co.uk
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0800 009 4540

Sewer Flooding
History Enquiry

Property Searches

History of Sewer Flooding

Is the requested address or area at risk of flooding due to overloaded public sewers?

The flooding records held by Thames Water indicate that there have been no incidents of flooding in the requested area as a result of surcharging public sewers.

For your guidance:

- A sewer is “overloaded” when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.
- “Internal flooding” from public sewers is defined as flooding, which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
- “At Risk” properties are those that the water company is required to include in the Regulatory Register that is presented annually to the Director General of Water Services. These are defined as properties that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company’s reporting procedure.
- Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk Register.
- Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company.
- Public Sewers are defined as those for which the Company holds statutory responsibility under the Water Industry Act 1991.
- It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company. This report excludes flooding from private sewers and drains and the Company makes no comment upon this matter.
- For further information please contact Thames Water on Tel: 0800 316 9800 or website www.thameswater.co.uk

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

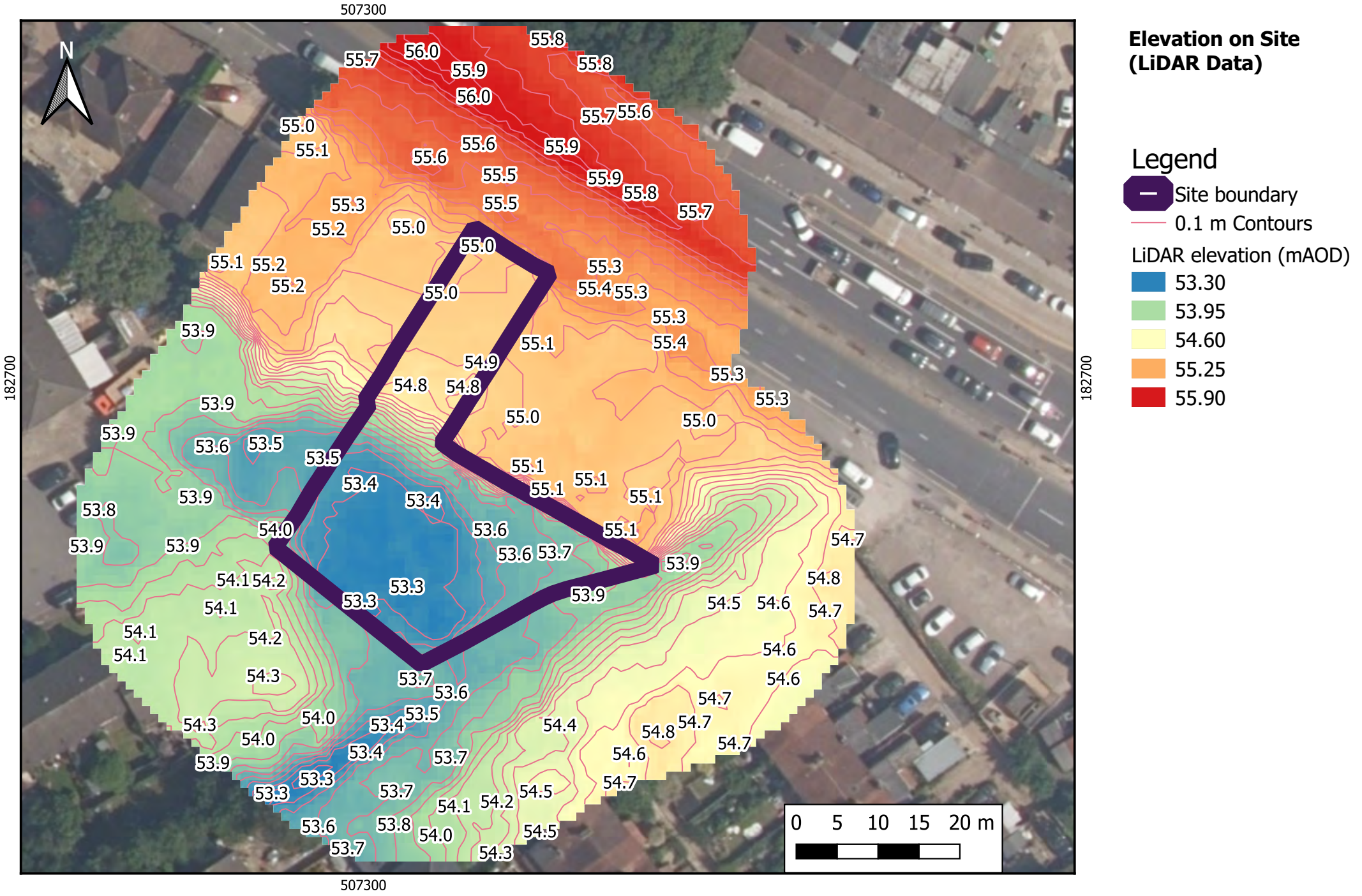
0800 009 4540

GeoSmart Information

Appendix C

Environment Agency LiDAR ground elevation data

t. +44(0)1743 298 100 info@geosmartinfo.co.uk www.geosmartinfo.co.uk


507300
182700
182700
507300
N
Elevation on Site
(LiDAR Data)
Legend
Site boundary
0.1 m Contours
LiDAR elevation (mAOD)
53.30
53.95
54.60
55.25
55.90
0 5 10 15 20 m

Disclaimer

This report has been prepared by GeoSmart in its professional capacity as soil, groundwater, flood risk and drainage specialists, with reasonable skill, care and diligence within the agreed scope and terms of contract and taking account of the manpower and resources devoted to it by agreement with its client and is provided by GeoSmart solely for the internal use of its client.

The advice and opinions in this report should be read and relied on only in the context of the report as a whole, taking account of the terms of reference agreed with the client. The findings are based on the information made available to GeoSmart at the date of the report (and will have been assumed to be correct) and on current UK standards, codes, technology and practices as at that time. They do not purport to include any manner of legal advice or opinion. New information or changes in conditions and regulatory requirements may occur in future, which will change the conclusions presented here.

This report is confidential to the client. The client may submit the report to regulatory bodies, where appropriate. Should the client wish to release this report to any other third party for that party's reliance, GeoSmart may, by prior written agreement, agree to such release, provided that it is acknowledged that GeoSmart accepts no responsibility of any nature to any third party to whom this report or any part thereof is made known. GeoSmart accepts no responsibility for any loss or damage incurred as a result, and the third party does not acquire any rights whatsoever, contractual or otherwise, against GeoSmart except as expressly agreed with GeoSmart in writing.

For full T&Cs see http://geosmartinfo.co.uk/terms-conditions

Important consumer protection information

This search has been produced by GeoSmart Information Limited, Suite 9-11, 1st Floor, Old Bank Buildings, Bellstone, Shrewsbury, SY1 1HU.

Tel: 01743 298 100

Email: info@geosmartinfo.co.uk

GeoSmart Information Limited is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered search firms maintain compliance with the Code.

The Search Code:

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the United Kingdom.
- sets out minimum standards which firms compiling and selling search reports have to meet.
- promotes the best practice and quality standards within the industry for the benefit of consumers and property professionals.
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.
- By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you.

The Code's core principles

Firms which subscribe to the Search Code will:

- display the Search Code logo prominently on their search reports.
- act with integrity and carry out work with due skill, care and diligence.
- at all times maintain adequate and appropriate insurance to protect consumers.
- conduct business in an honest, fair and professional manner.
- handle complaints speedily and fairly.
- ensure that products and services comply with industry registration rules and standards and relevant laws.
- monitor their compliance with the Code.

GeoSmart Information

Complaints

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award up to £5,000 to you if the Ombudsman finds that you have suffered actual financial loss and/or aggravation, distress or inconvenience as a result of your search provider failing to keep to the Code.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs contact details:

The Property Ombudsman scheme

Milford House

43-55 Milford Street

Salisbury

Wiltshire SP1 2BP

Tel: 01722 333306

Fax: 01722 332296

Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk.

Please ask your search provider if you would like a copy of the search code

Complaints procedure

GeoSmart Information Limited is registered with the Property Codes Compliance Board as a subscriber to the Search Code. A key commitment under the Code is that firms will handle any complaints both speedily and fairly. If you want to make a complaint, we will:

- Acknowledge it within 5 working days of receipt.
- Normally deal with it fully and provide a final response, in writing, within 20 working days of receipt.
- Keep you informed by letter, telephone or e-mail, as you prefer, if we need more time.
- Provide a final response, in writing, at the latest within 40 working days of receipt.
- Liaise, at your request, with anyone acting formally on your behalf.

If you are not satisfied with our final response, or if we exceed the response timescales, you may refer the complaint to The Property Ombudsman scheme (TPOs): Tel: 01722 333306, E-mail: admin@tpos.co.uk.

We will co-operate fully with the Ombudsman during an investigation and comply with his final decision. Complaints should be sent to:

Martin Lucass

Commercial Director

GeoSmart Information Limited

Suite 9-11, 1st Floor,

Old Bank Buildings,

Bellstone, Shrewsbury, SY1 1HU

Tel: 01743 298 100

martinlucass@geosmartinfo.co.uk

12. Terms and conditions, CDM regulations and data limitations

Terms and conditions can be found on our website:

http://geosmartinfo.co.uk/terms-conditions/

CDM regulations can be found on our website:

http://geosmartinfo.co.uk/knowledge-hub/cdm-2015/

Data use and limitations can be found on our website:

http://geosmartinfo.co.uk/data-limitations/