GeoSmart Information

Environmental Thinking

# FloodSmart

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|---|---|
| Site address | 38 Glenloch Road<br>London<br>NW3 4DN |
| Site coordinates | 527168, 184967 |
| Report prepared for | **Nash Baker Architects**<br>167-169 Kensington High Street<br>London<br>W8 6SH |
| Report reference | 70356R1REV2 |
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| Date issued | 2018-02-16 |
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# 1. Executive summary

The National Planning Policy Framework (2012) and Planning Practice Guidance (2015) requires that flood risk assessments review flooding from all potential sources. A review has been undertaken of national environmental data sets to assess the potential flood risk to the Site. The review is provided within this concise interpretative report written by an experienced GeoSmart flood risk consultant.

## Site analysis

| Source of Flood Risk | Baseline | After Mitigation |
|---|---|---|
| River and coastal | Low | n/a |
| Surface water pluvial flooding | Very Low | n/a |
| Groundwater flooding | Negligible | n/a |
| Other flood risk factors present | No | n/a |
| Is any other further work recommended? | Yes | Yes (Please see below) |

N/A = mitigation not required

The site is currently used within a residential capacity. The development comprises of the subdivision of the existing mid-terrace house into 3 flats with an extension to the existing basement to accommodate a further 2 bedrooms and bathrooms, with a lightwell to the rear of the property.

According to the Environment Agency's Flood Map for Planning Purposes, the Site is located within Flood Zone 1 (Low risk).

According to the Environment Agency's Risk of Flooding from Surface Water flood mapping, the majority of the Site is at very low risk of pluvial flooding. According to GeoSmart's Groundwater Flood Risk (GW5) Mapping, the Site is at negligible risk of groundwater flooding during the 1 in 100 year event. In addition, the Site is not at risk of Reservoir Flooding.

## Recommendations / Next steps

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

- Basement developments should, as a minimum, ensure all drainage connections from basements to sewers are fitted with a one-way valve to prevent the drains flooding the basement if they surcharge.
- Although risks relating to other sources of flooding are assessed as low, some additional resilience measures are suggested.

We recommend that mitigation measures that have been discussed within this report in Section 7 regarding the basement are considered as part of the proposed development where possible and evidence of this is provided to the Local Authority as part of the planning application.

# 2. Introduction

## Background and purpose

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 (2012) 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 National Planning Policy Framework (NPPF, 2012).

"*The National Planning Policy Framework set out the Government's planning policies for England and how these are expected to be applied"* (NPPF, 2012).

The National Planning Policy Framework promotes a sequential, risk based approach to the location of development.

*"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

A thorough review of a commercially available flood risk report and Environment Agency 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 Environment Agency and a review of the London Borough of Camden Strategic Flood Risk Assessment (SFRA) (July 2014), London Borough of Camden Surface Water Management Plan (SWMP) (2011) and London Borough of Camden Preliminary Flood Risk Assessment (PFRA) (2011) is used to ascertain local flooding issues and, where appropriate, identify information to support a Sequential and/or Exception test required as part of the National Planning Policy Framework (NPPF, 2012).

Using the available data the existing and future flood risks to and from the Site from all flood sources will be assessed in line with current best practice.

An indication of potential flood risk from the Site to downstream receptors is provided where the proposed development increases run-off from the Site.

## 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.

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:

| Source of flooding | Datasets consulted | | | | | |
|---|---|---|---|---|---|---|
| | Commercial Flood Maps and GW5 Data (Appendix B) | SFRA, * | PFRA and SWMP | Environment Agency | Thames Water (Appendix C) | OS Data |
| Historical | X | X | | X | | |
| Fluvial/tidal | X | X | | X | | |
| Surface water (pluvial) | X | X | | X | | |
| Groundwater | X | X | | | | |
| Sewer | | X | | | X | |
| Culvert/bridges | | X | | | | X |
| Reservoir | | X | | X | | |

*London Borough of Camden Strategic Flood Risk Assessment (SFRA) (July 2014)
*London Borough of Camden Surface Water Management Plan (SWMP) (2011)
*London Borough of Camden Preliminary Flood Risk Assessment (PFRA) (2011)
(Supporting information on the datasets used is provided in the relevant appendix)

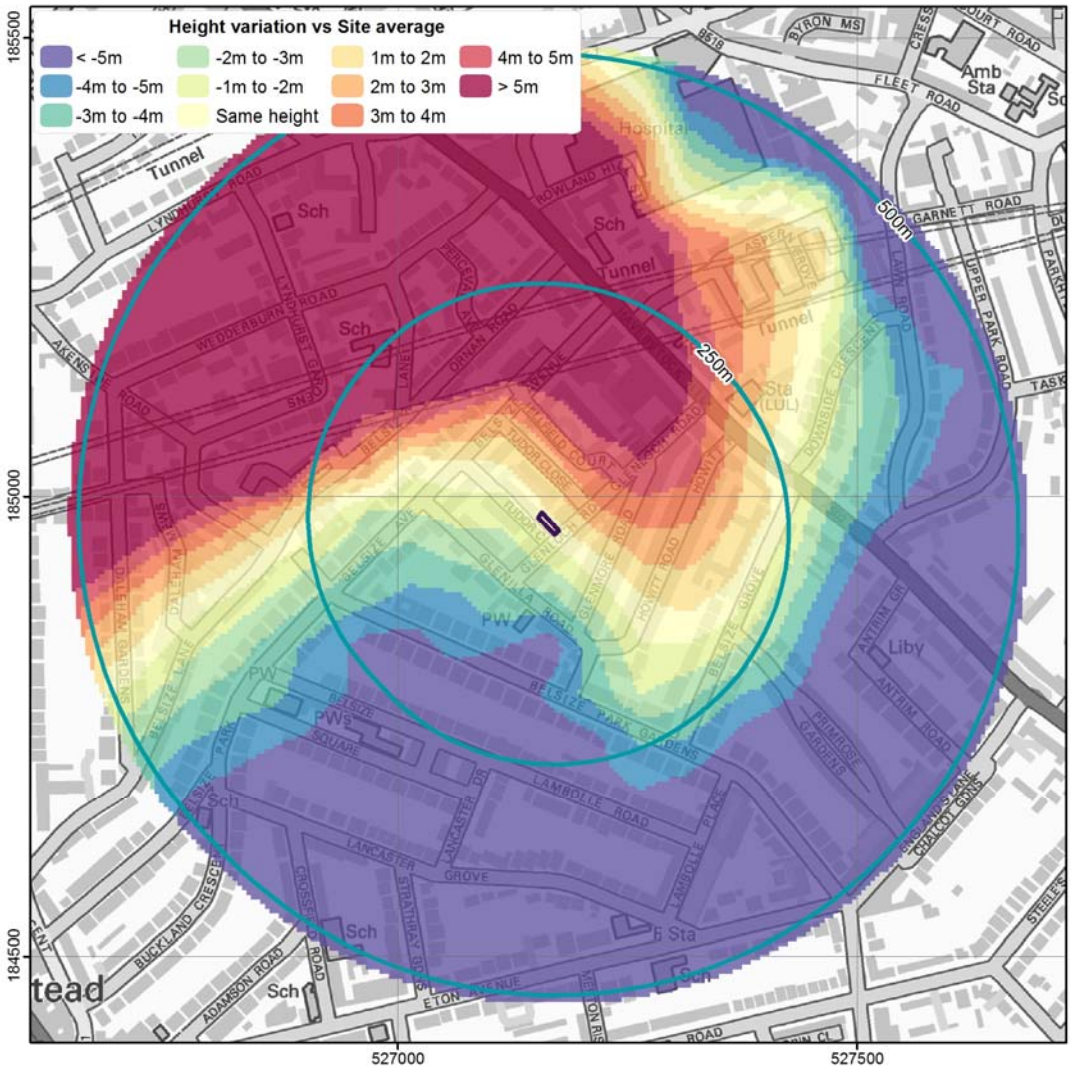
# 3. Site analysis

## Site information

The Site is located in Hampstead, London in a setting of residential land use, National Grid Reference TQ 27168 84967 (see Figure 1). Site plans and drawings are provided in Appendix A. According to OS data the immediate area surrounding the Site is on a gentle slope between 63-68 mAOD. Using a 500m buffer around the Site, it is noted that to the north land rises to c.68 mAOD. To the west land rises to c.74 mAOD, to the east land falls to c. 58 mAOD and to the south falls to c.58 mAOD.

The general level of the Site is between 63.53 and 64.65 mAOD with the Site falling gradually in a southeasterly direction. This is based on EA elevation data obtained for the Site to a 1m resolution with a vertical accuracy of ±150 mm.

Figure 1 Site Location and Relative Elevations



## Development

The site is currently used within a residential capacity. The development comprises of the subdivision of the existing mid-terrace house into 3 flats with an extension to the existing basement to accommodate a further 2 bedrooms and bathrooms, with a lightwell to the rear of the property (see Appendix A). The effect of the overall development will result in an increase in number of occupants and/or users of the building and will not result in the change of use, nature or times of occupation. The estimated lifespan of the development is 100 years.

## Hydrological features

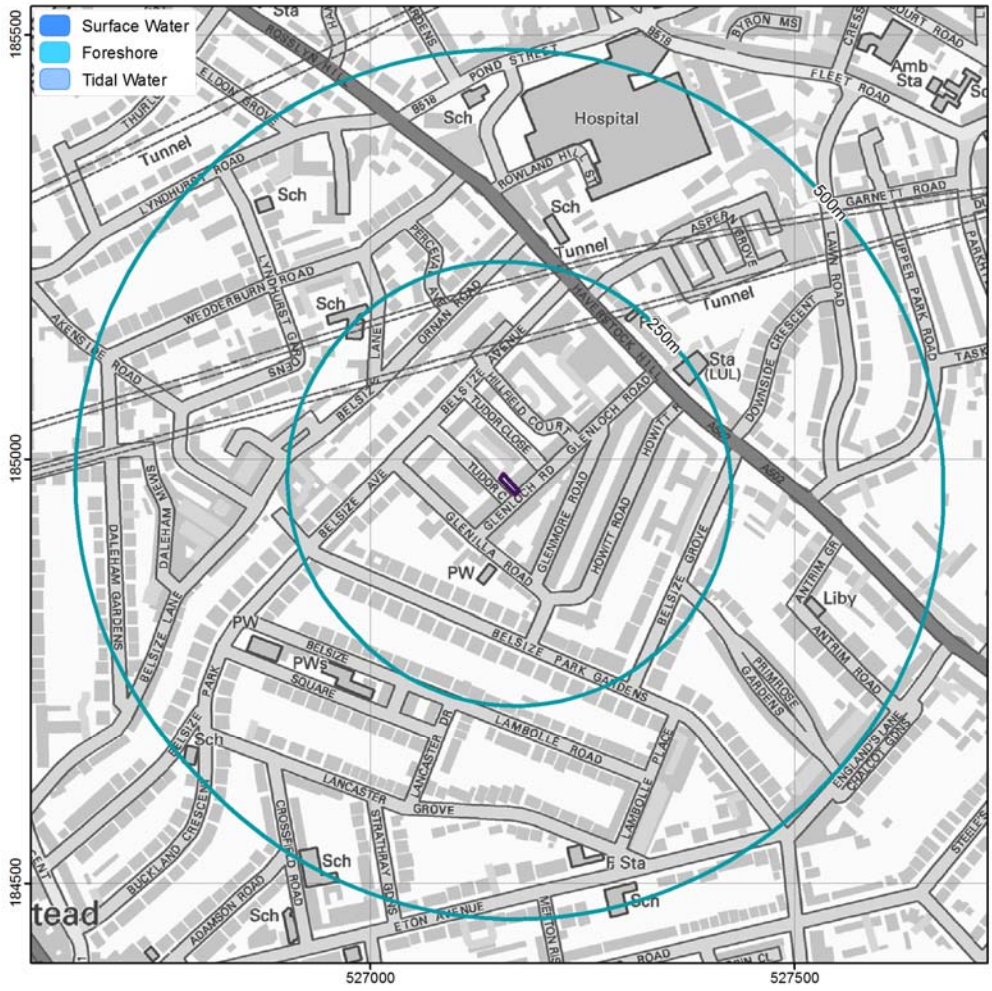
### Watercourses/surface water features within 1km of the Site:

Hampstead Ponds are located approximately 900m north of the Site.

Potential overland flow routes to the Site could exist from the north west.

Potential overland flow routes from the Site could exist to the south.

Figure 2 Surface water features



## Proximity to relevant infrastructure:

There is a culvert approximately 30m to the east of the Site.

## Hydrogeological features

British Geological Survey mapping indicates that there are no superficial deposits (BGS, 2017).

British Geological Survey mapping indicates that the underlying bedrock geology consists of the London Clay Formation - Clay, Silt and Sand. (BGS, 2017) and is not classified as an aquifer (EA, 2016).

The Site is not located within a Source Protection Zone (EA, 2017).

# 4. Flood risk to the development

## Historical flood events

According to the Environment Agency's historic flood map and the SFRA, no historical flood events have been recorded either at the Site or within 50m of the Site (Environment Agency, 2017)(URS Ltd, 2014).

Guidance

The purpose of historic 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 that flooding has never occurred on Site or that flooding will never occur at the Site.

## Fluvial/coastal flood risk

The Site is located within the Environment Agency's Flood Zone 1 and is therefore classified as being at low risk of fluvial flooding (Figure 2)(EA, 2017).

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

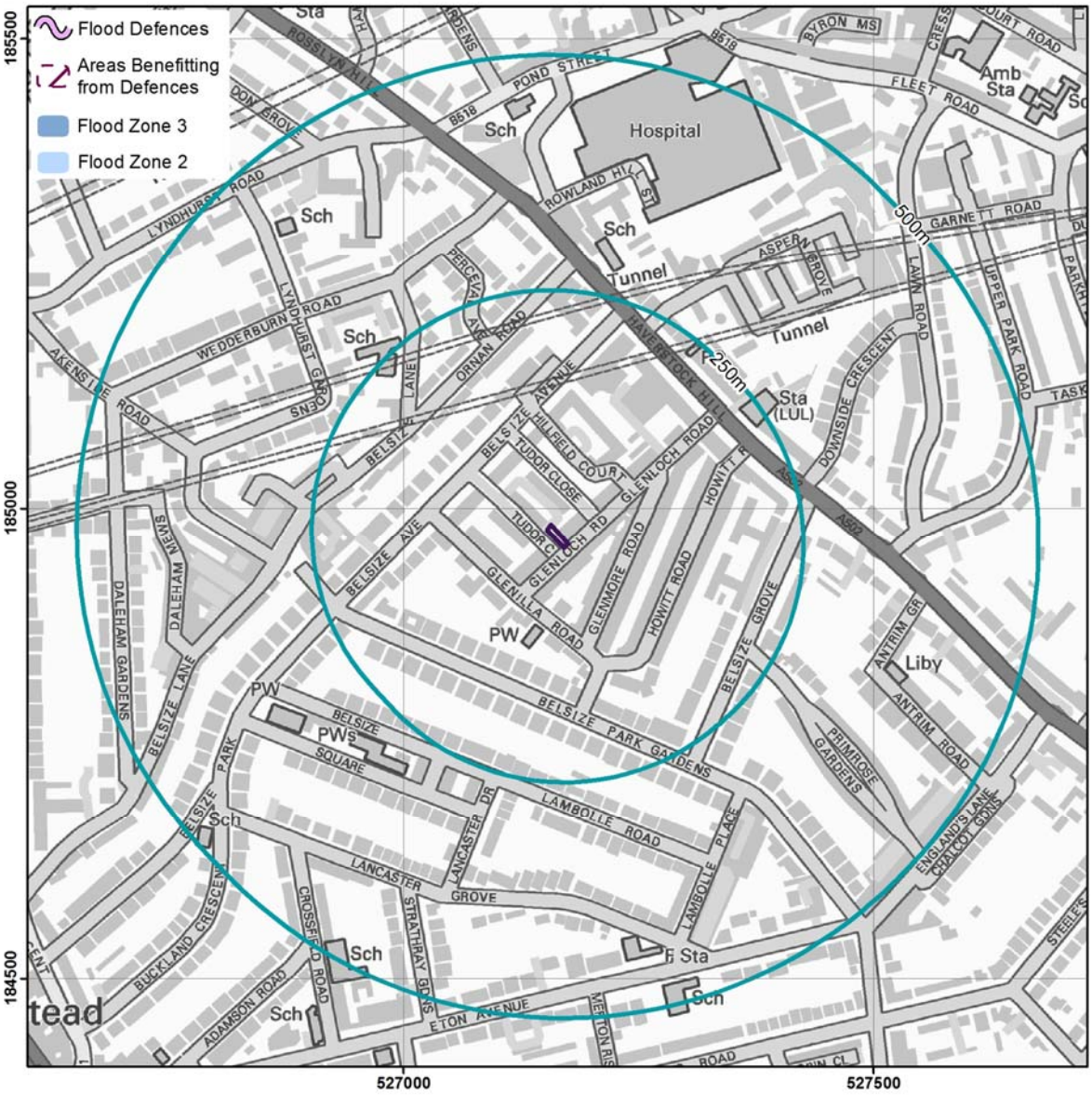
Guidance

As defined in the NPPF (2012):

Ignoring the presence of any defences, land located in a Flood Zone 1 is considered to be at 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).

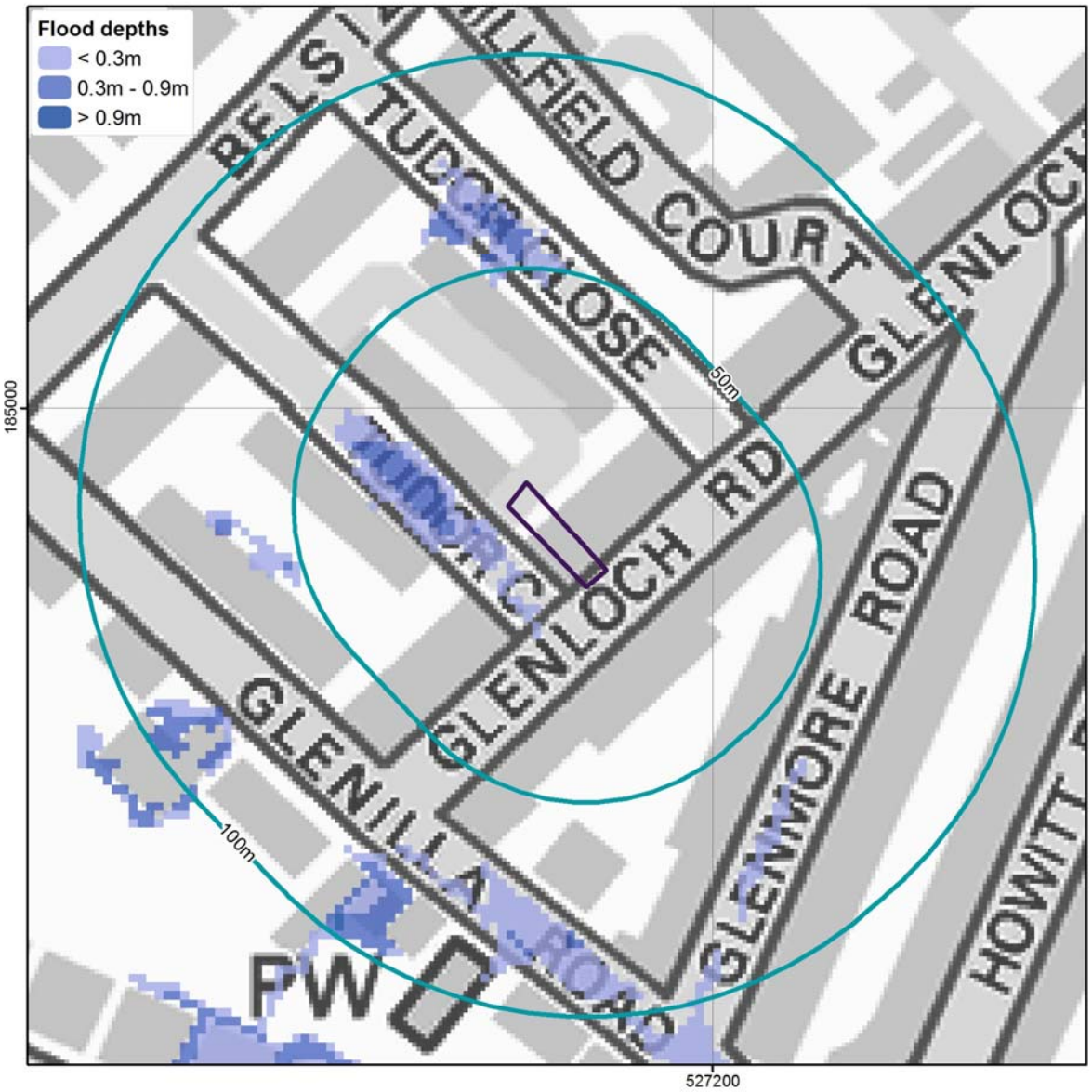
Figure 3 Environment Agency (EA) Flood Map for Planning Purposes (EA, 2017)



## Surface water (pluvial) flooding

According to the Environment Agency's Risk of Flooding from Surface Water (pluvial) mapping (Figure 4), there is a Very Low risk of pluvial flooding across the Site. The Site lies immediately adjacent to areas at low to moderate risk where flood depths could be up to 0.9m, however flooding is likely to be contained within the highway of Tudor Close, so is unlikely to affect the Site.

Figure 4 Environment Agency Risk of Flooding from Surface Water Map (EA, 2017)

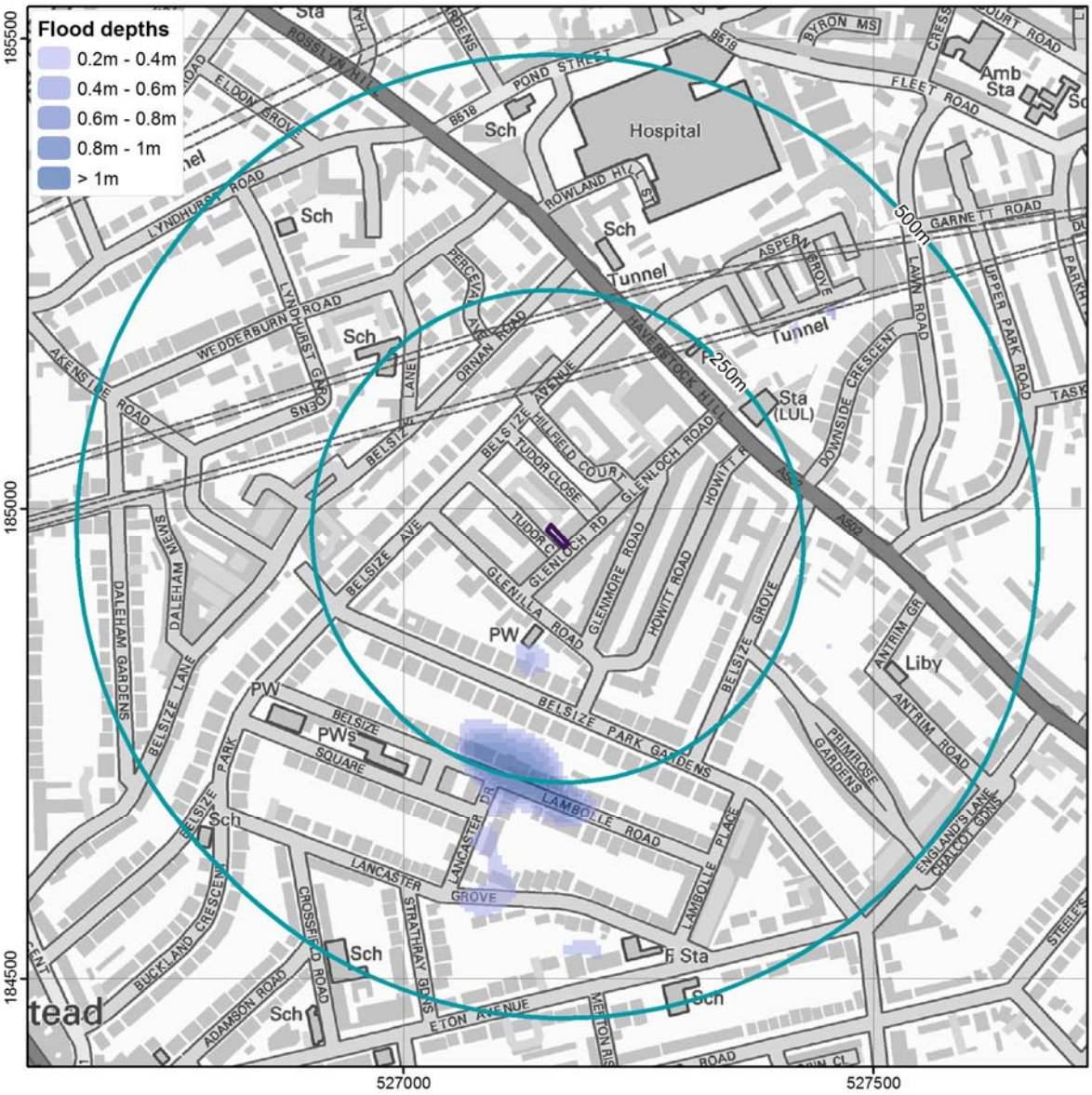


Guidance

According to EA's surface water flood risk map, a site at very low risk has a chance of flooding of less than 1 in 1000 (0.1%)

Ambiental UKFloodMap4™ surface water (pluvial) flood depth data was obtained for the 1 in 100 year event (Figure 5), to compare with the Environment Agency's data. The Ambiental mapping confirms the Site would not be affected in a 1 in 100 year storm event and is therefore at very low risk of surface water flooding.

Figure 5 Ambiental UKFloodMap4™ 1 in 100 year Surface Water Map (Ambiental, 2017)



Based on inspection of OS and ground elevation data, the Site is not located on a potential overland flow route but does contain areas of low topography in relation to the surrounding area.

The SFRA does not indicate reported incidents of surface water flooding within 100 m of the Site (URS Ltd, 2014).

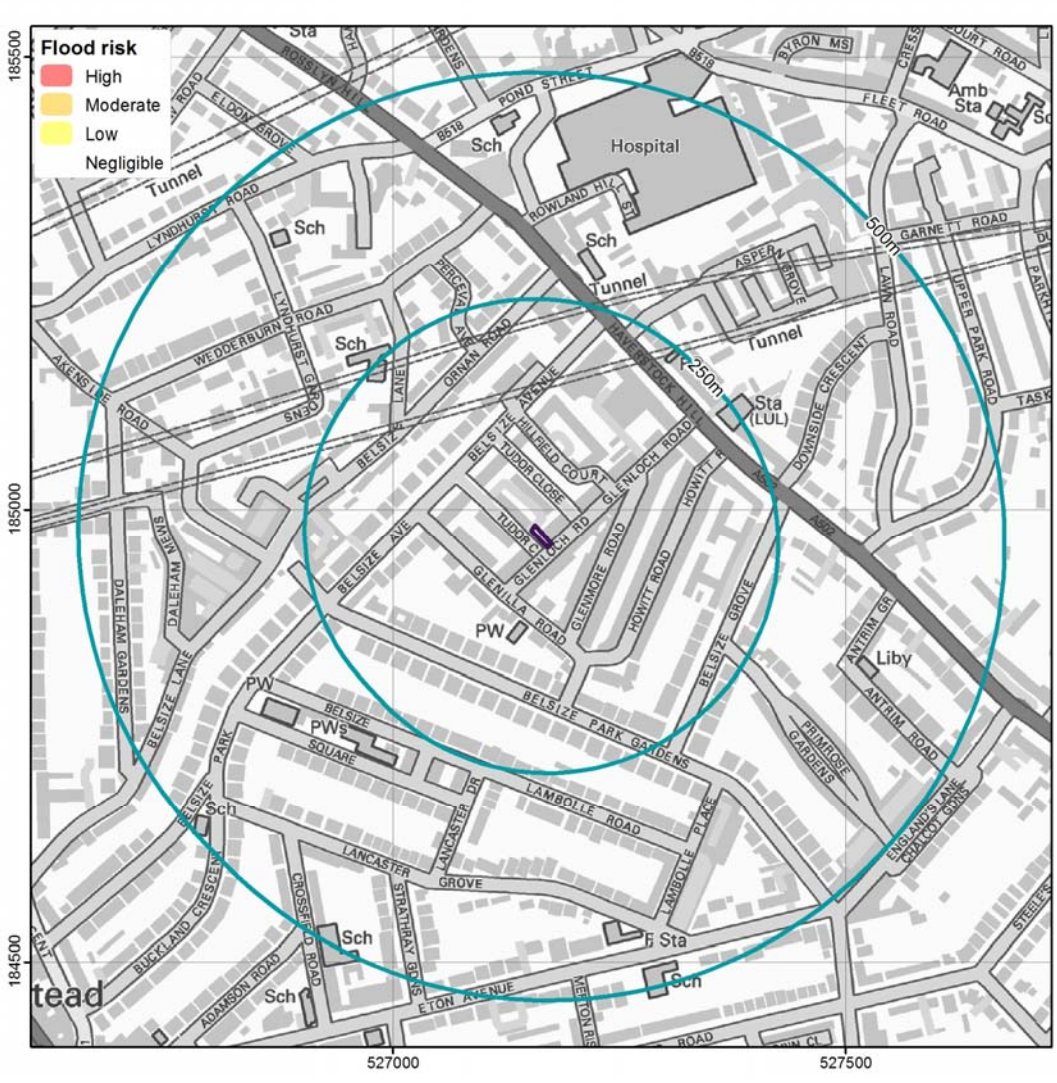
## Groundwater flooding

Based on GeoSmart's Groundwater Flood Risk (GW5) Map (Figure 6) the Site is considered to be at negligible risk of groundwater flooding.

The SFRA does not indicate reported incidents of ground water flooding within 20 m of the Site (URS Ltd, 2014).

The risks may be higher for basements and below ground structures and as such mitigation measures such as sumps and pumps may be required.

Figure 6 GeoSmart GW5 Groundwater Flood Risk Map (GeoSmart, 2017)



Guidance

According to GeoSmart (2017) there is a negligible risk of groundwater flooding in this area and any groundwater flooding incidence will be less frequent that 1 in 100 years return period.

Neglibile 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.

## Basement flooding

In line with London Borough of Camden's guidance on basements and light wells (CPG4, section 3.51), basement development should not displace ground water or surface water flow so it causes flooding on nearby sites or those further away.

Applicants who wish to build basements in areas which have a risk of surface water flooding should consider the issue and take steps to protect their basements against water ingress as a result of this flooding.

Measures such as setting all thresholds to the basement to be above the flood level could be adopted or, if this is not feasible the construction could be designed to be flood resilient. According to client provided plans, two sump and pump features are already proposed for the basement level to accommodate for both foul and surface water.

In order to assess the impacts of the proposed development, a Basement Impact Assessment (BIA) is currently being undertaken for the Site.

## Sewer flooding

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, 2017; Appendix D). Figure 2.5 of the SFRA states that 2 incidents of external groundwater flooding have been recorded within the same 4 digit postcode of the Site. However, there is no mention that the Site itself was affected (URS Ltd, 2014).

It should be noted that as sewers are designed to surcharge to just below cover level, basement and other subterranean development is at risk of flooding with sewage. In order to protect against flooding the Council are required to ensure that all basement and other subterranean development is protected from sewer flooding by the installation of a positive pumped device.

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.

## Culverts and bridges

A culvert has been identified within 1 km of the Site. However, the SFRA states that the culvert has been incorporated into the sewer network and therefore the flood risk from the culvert is negligible (URS Ltd, 2014). The SFRA has not identified any historic drainage issues within the Site area (URS Ltd, 2014).

## Reservoir flooding

According to the Environment Agency’s Risk of Flooding from Reservoir mapping the Site is not at risk of flooding from reservoirs (EA, 2017).

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 (Environment Agency, 2017c).

# 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. Therefore, compensation for any loss in flood plain storage will not be required.

## Drainage and run-off

The proposed development involves an increase of impermeable surfaces at the Site. 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.

London Borough of Camden's planning guidance on basements and lightwells CPG 4 (July, 2015) section 3.51, confirms basement development should not displace ground water or surface water flow so it causes flooding on nearby sites or those further away.

Using FEH 2013 rainfall data from the online Flood Estimation Handbook (FEH), developed by NERC (2009) and CEH (2016), the potential surface water run-off generated from the Site during a 1 in 100 year return period should be calculated. Guidance included within the National Planning Policy Framework (NPPF) recommends that the effects of climate change are incorporated into Flood Risk Assessments (Flood Risk Assessments: Climate Change Allowances Guidance, 2016). As the proposed development is being changed to residential, the lifespan of the development and requirements for climate change should allow up to the 2115 scenario.

| Applies across all of England | Total potential change anticipated for 2010 to 2039 | Total potential change anticipated for 2040 to 2059 | Total potential change anticipated for 2060 to 2115 |
|---|---|---|---|
| Upper end | 10% | 20% | 40% |
| Central | 5% | 10% | 20% |

A method of investigating the run-off due to the proposed development can be calculated by multiplying the run-off per square metre by the impermeable area within the proposed development plan.

It is recommended that 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).

| Option | Description |
|---|---|
| Rainwater harvesting | Rain water harvesting can collect run-off from the roofs for use in non-potable situations, using water butts for example. |
| Green roof | Having part/all of the roof as a green roof covered in vegetation can intercept and store a proportion of the rainfall to result in an overall reduction in the amount of surface water run-off generated from a building structure.<br>They comprise a substrate (growth medium) layer which can be seeded with specially selected plants suitable for the local climatic conditions. Beneath the growth medium is a geotextile filter layer which filters out the substrate from entering the aggregate/geo-composite drainage layer below. At the very bottom of the green roofing, a waterproof membrane protects the roof structure below. |
| Permeable paving | Permeable pavements can be used for driveways, footpaths and parking areas to increase the amount of permeable land cover. Suitable aggregate materials (angular gravels with suitable grading as per CIRIA, 2007) will improve water quality due to their filtration capacity. Plastic geocellular systems beneath these surfaces can increase the void space and therefore storage but do not allow filtration unless they are combined with aggregate material and/or permeable geotextiles. |
| Swales | Shallow, wide and vegetated channels that can store excess run-off whilst removing any pollutants. |
| Soakaways | An excavation filled with gravel within the Site. Surface water run-off is piped to the soakaway. |
| Attenuation basins/pond | Dry basin or a permanent pond that is designed to hold excess water during a rainfall event. |

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 to/from the Site. Based on the low surface water flood risk in the vicinity interference with overland flow paths is considered unlikely.

GeoSmart could provide a separate outline drainage strategy as required, through our SuDSmart Pro report range. A separate proposal could be provided upon request.

# 6. Suitability of the proposed development

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

## National

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 probability of flooding (NPPF, 2012). 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 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.

Suitability of the proposed development, and whether an Exception Test is required, is based on the Flood Zone the Site is located within and the flood risk vulnerability classification of the development proposals. 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 the table overleaf (Table 3 of the Planning Practice Guidance).

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: Flood risk vulnerability and flood zone 'compatibility (taken from NPPF, 2012)

| 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

For this report, the London Borough of Camden Strategic Flood Risk Assessment (SFRA) (July 2014) and the London Borough of Camden Surface Water Management Plan (SWMP) (2011) were consulted. The SFRA was undertaken by URS Ltd in 2014 and the SWMP were undertaken by Halcrow Ltd in 2011. Relevant information contained in this report for the Site area is outlined below:

<u>London Borough of Camden Strategic Flood Risk Assessment</u>

- Historically the sources of the Rivers Fleet, Tyburn, Kilburn and Brent were located in the area of Hampstead Heath. In the present day no main rivers are located in the London Borough of Camden following the incorporation of the reaches into the Thames Water Utilities Ltd (TWUL) sewer network. The borough is located entirely in Flood Zone 1 (URS Ltd, 2014).

- The London Borough of Camden Surface Water Management Plan (SWMP) identified a number of Critical Drainage Areas (CDAs). Specific areas within a CDA are not necessarily at higher risk from surface water than an area outside of a CDA however the location of an area within a CDA indicates that it is within a catchment area which contributes to a flooding hotspot. Within CDAs, surface water management should be a particular focus of new developments. The majority of the borough is located within a CDA (URS Ltd, 2014).

- Mapping shows that for the model scenarios, the surface water flood extent broadly follows the natural topography of the borough, as expected. Potential flooding also

follows man-made features such as roads and rail lines. Historic flood records indicate that LBC, particularly to the north of Euston Road, is prone to surface water flooding (URS Ltd, 2014).

- For proposed developments located within a CDA, LBC should consider setting as a requirement a minimum reduction in surface water runoff rates post-development of 50%. The intention of such a requirement would be to reduce surface water runoff and also reduce the strain on the combined sewer network.

London Borough of Camden Surface Water Management Plan

- London Borough of Camden falls within the Counters Creek hydraulic catchment. It is known that several Boroughs within this area experience basement flooding as a result of sewer surcharge following heavy rainfall.

- The River Fleet, which is formed from two springs on Hampstead Heath, is the largest of London's subterranean rivers and historically drained the Camden area. The Fleet has long since been incorporated into the London sewer network although the traditional route of the Fleet and the large sewer in its place can still be traced in the south of the Borough as it passes into the City of London. Highgate and Hampstead Ponds were constructed to increase London's water supply.
- Surface water flooding mainly occurs when high intensity rainfall is not able to enter into the combined sewers. This mechanism of flooding can be combined with overflows from the combined sewers (out of gullies or blown out manhole covers) as a result of the storm event. Surface water builds up locally if the ground terrain is flat or travels following prevailing terrain gradients. Surface water flooding then occurs at locations where surface water flow paths converge, at local dips in the ground and/or due to overland obstructions. In particular, basement properties are vulnerable. Mechanism of surface water flooding can be combined with surcharge from the combined sewer network (see Section 3.6). Surface water may not be able to enter the combined system because it is already full or overflowing as a result of the same storm event or a previous storm event

- Surface water modelling indicates a widespread vulnerability to surface water flooding across the Borough and most of central London. This is in part due to the flat gradient and 'noisy' digital terrain data. In consultation with the London Borough of Camden, seven LFRZs have been identified, corroborated by modelling data (to a degree), local knowledge and records of historical incidents.

- Developments all across London should reduce surface water discharge in line with the Sustainable Drainage Hierarchy set out in Policy 5.13 of the draft replacement London Plan.

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, 2012).

# 7. Resilience and mitigation

Based on the available information mitigation measures outlined within this section of the report are likely to help protect the development from flooding.

## Fluvial/coastal mitigation measures

As the Site is located within Flood Zone 1, flooding is unlikely to affect the Site from fluvial and/or tidal sources, therefore mitigation measures are not considered to be required.

## Surface water (pluvial) flooding

The Site is not identified as at risk of pluvial flooding; however the following mitigation measures are recommended due to the basement extension:

Basement developments should, as a minimum, ensure all drainage connections from basements to sewers are fitted with a one way valve to prevent the drains flooding the basement if they surcharge.

Access to the basement is via an internal staircase as well as external lightwell staircases in the front and rear of the property. Any ingress of surface water flooding is therefore likely to occur via theses external lightwell staircases.

Additional measures which could be considered for the basement development include:

- Waterproof tanking of the ground floor and basement
- Interceptor drains
- Automatic sump to extract flood water

## Groundwater mitigation measures

The Site is identified as being at negligible risk of groundwater flooding, mitigation measures are therefore not required, based upon the flood risk classification alone. However, surface water and sewer flooding mitigation measures would reduce any residual risk from groundwater flooding to the basement.

## Other flood risk mitigation measures

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

# 8. Conclusions and recommendations

A LOW fluvial flood risk has been identified.

A VERY LOW surface water (pluvial) flood risk has been identified

A NEGLIGIBLE groundwater flood risk has been identified.

The Site is not located in an area classified as being at risk of flooding from reservoir failure.

As the Site is located within Flood Zone 1, all types of development listed within the Table 2 of the NPPF are acceptable according to National Policy.

The table below provides a summary of where the responses to key questions are discussed in this report.

| | |
|---|---|
| Key sources of flood risks identified | None (see Section 3). |
| Are standard mitigation measures likely to provide protection from flooding to/from the Site? | Yes, see Section 7. |
| Is any further work recommended? | Basement developments are should, as a minimum, ensure all drainage connections from basements to sewers are fitted with a one-way valve to prevent the drains flooding the basement if they surcharge.<br>Although risks relating to other sources of flooding are assessed as low, some additional resilience measures are suggested in Section 7.<br>We recommend that mitigation measures that have been discussed within this report in Section 7 regarding the basement are considered as part of the proposed development where possible and evidence of this is provided to the Local Authority as part of the planning application. |

# 9. Further information

The following table includes a list of products by GeoSmart:

| Recommendations for 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.<br>Please contact info@geosmartinfo.co.uk for further information. |
| | Additional assessment: FloodSmart Report  | The FloodSmart Report range provides clear and pragmatic advice regarding the nature and potential significance of flood hazards which may be present at a site. Our consultants assess available data to determine the level of risk based on professional judgement and years of experience.<br>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.<br>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.<br>Ideal for pre-planning or for addressing planning conditions for small developments. Can also be used for land transactions.<br>Please contact info@geosmartinfo.co.uk for further information. |

# 10. References and glossary


**British Geological Survey (BGS) (2017).** Geology of Britain Viewer. (http://mapapps.bgs.ac.uk/geologyofbritain/home.html), accessed on 27/11/2017.

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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 (eg. In a Flood Zone 1) that is entirely surrounded by areas at higher risk of flooding (eg. Flood Zone 2 and 3) |
| Flood resilience | Flood resilience of 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. In most cases, principal aquifers are aquifers previously designated as major aquifer. |
| 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. These are generally aquifers formerly classified as minor aquifers. |
| 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. These are generally the water-bearing parts of the former non-aquifers. |
| Secondary undifferentiated | Has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations 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. |

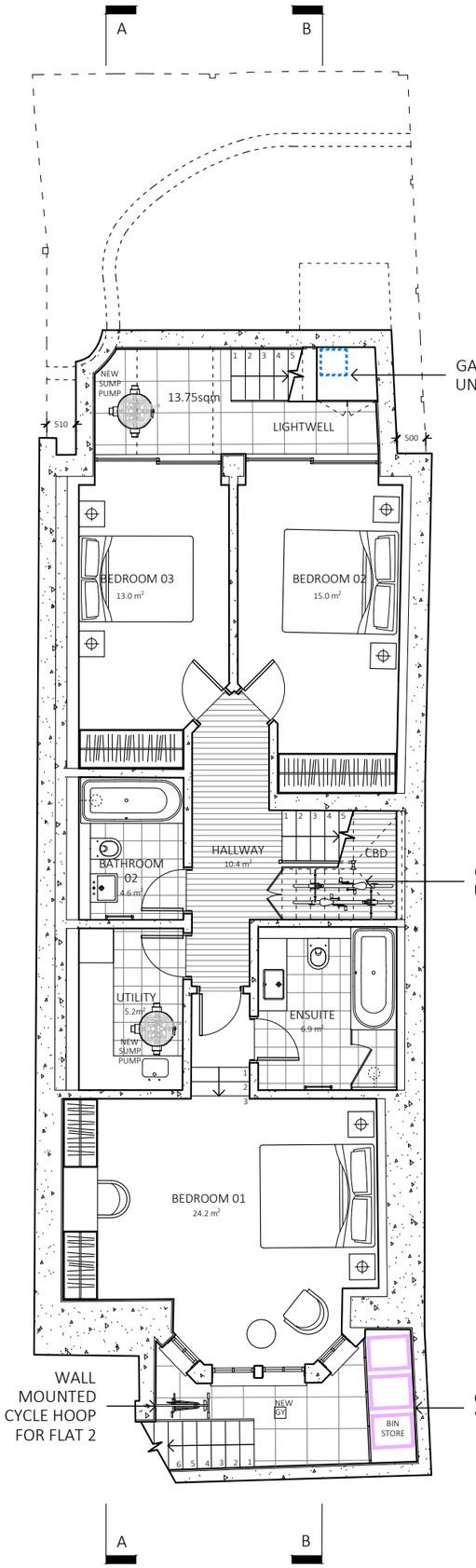
## NPPF (2012) terms

| | |
|---|---|
| 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. |

# Appendices

# Appendix A

## Current and proposed development plans



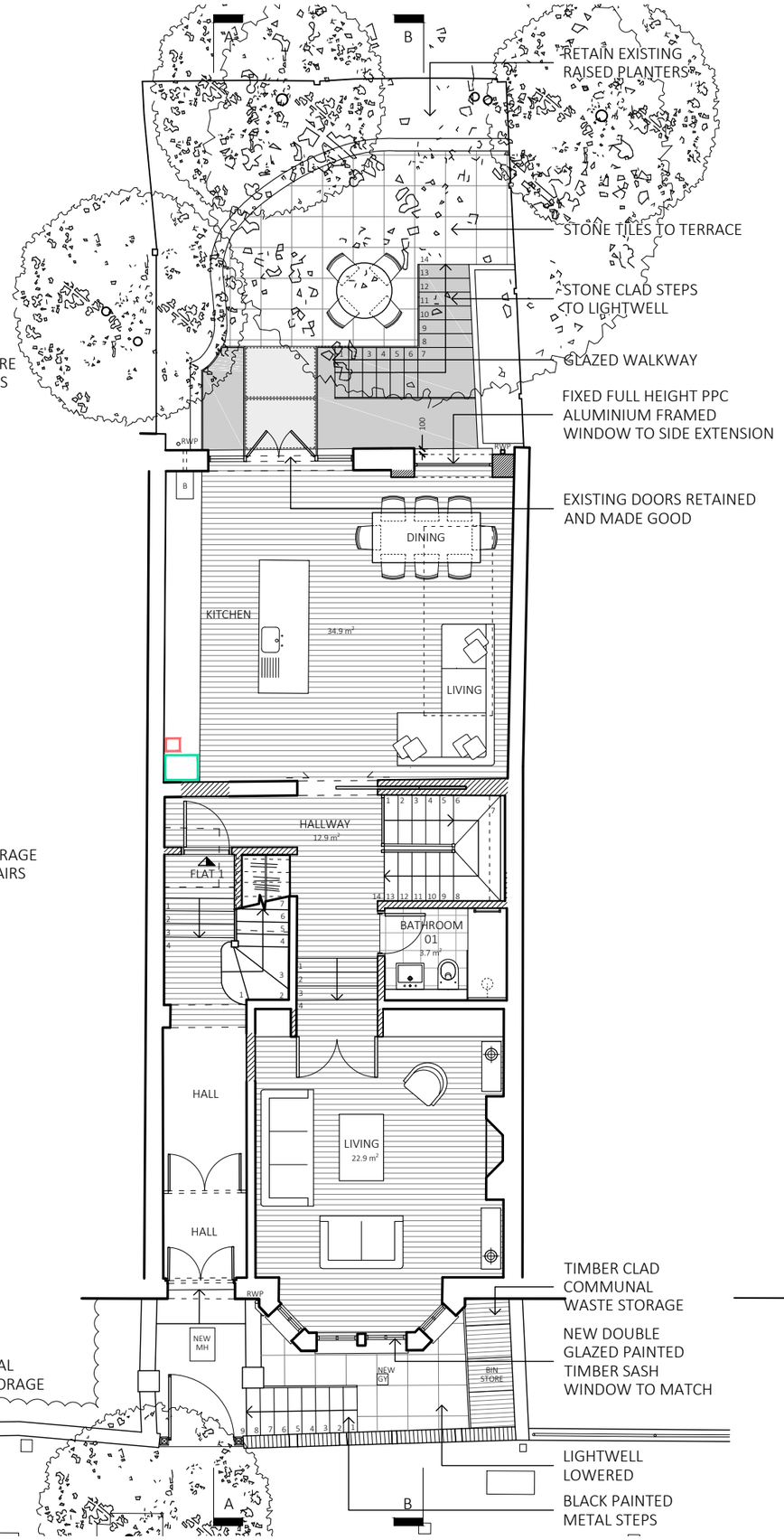

GARDEN STORE UNDER STAIRS

CYCLE STORAGE UNDER STAIRS

WALL MOUNTED CYCLE HOOP FOR FLAT 2

COMMUNAL WASTE STORAGE

LOWER GROUND FLOOR



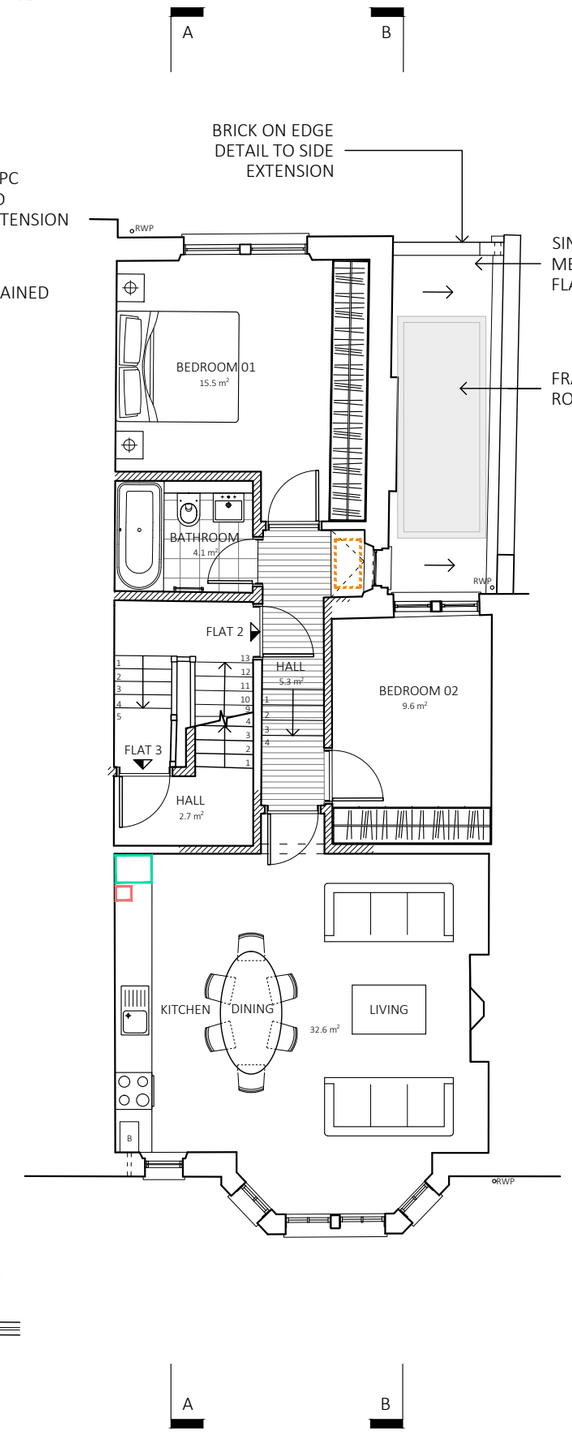

TIMBER CLAD COMMUNAL WASTE STORAGE

NEW DOUBLE GLAZED PAINTED TIMBER SASH WINDOW TO MATCH

LIGHTWELL LOWERED

BLACK PAINTED METAL STEPS

GROUND FLOOR




SINGLE-PLY MEMBRANE TO FLAT ROOF

FRAMELESS ROOFLIGHT

FIRST FLOOR

Workstage

# 03 - PLANNING

GENERAL NOTES

1. No dimensions to be scaled from this drawing for construction purposes.
2. This drawing is to be read in conjunction with all other consultants' drawings, specifications and schedules.
3. Any discrepancies found between this drawing and other documents should be referred immediately to the architect and consultants.
4. This drawing should be removed from currency immediately after a revised version is issued.
5. All dimensions are in millimetres.

Nash Baker Ltd, trading as Nash Baker Architects. Company Number. 7488262
Directors: Simon Baker RIBA, Howard Nash ARB



0 1 2 3 4 5m

| Address: | FLAT No. | Proposed GIA (m²) | Proposed GIA (sqft) | Proposed Bed No. | Persons | Outdoor Amenity |
|---|---|---|---|---|---|---|
| No. 38 | FLAT 1 | 162.6 | 1749 | 3 bed | 6 | Garden |
| Glenloch | FLAT 2 | 69.78 | 751 | 2 bed | 3 | None |
| Road | FLAT 3 | 95.3 | 1026 | 2 bed | 4 | Terrace |
| Total | | **328** | **3526** | | | |

KEY

EXTERNAL STORAGE FOR 27L ORGANIC KITCHEN WASTE (320X400MM) AND RECYCLABLES.

EXTERNAL STORAGE FOR GARDEN WASTE (LARGE HESSIAN SACKS)

INTERNAL STORAGE FOR 7 LITRE (252X229MM) KITCHEN CADDY

INTERNAL STORAGE FOR 55L (445X585MM) GREEN BOX FOR MIXED RECYCLABLES, OR INTERNAL STORAGE FOR 30L (320X265MM) GREEN BAGS FOR MIXED RECYCLABLES

INTERNAL LOW LEVEL STORAGE FOR COLLAPSIBLE/FOLDING BIKE

| Rev | Date | Reason For Issue | Chk |
|---|---|---|---|
| B | 08.02.2018 | UPDATES FOLLOWING PRE-APP | BS/SA |
| A | 11.12.2017 | BELOW GROUND DRAINAGE / REAR BEDROOM WINDOWS | SA/VT |

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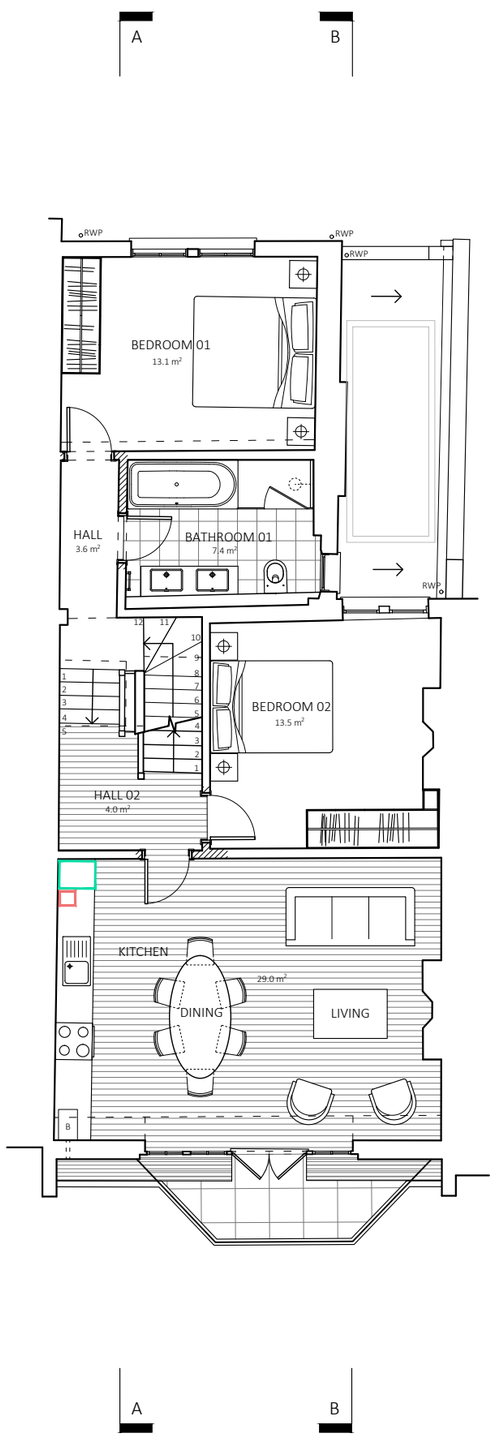
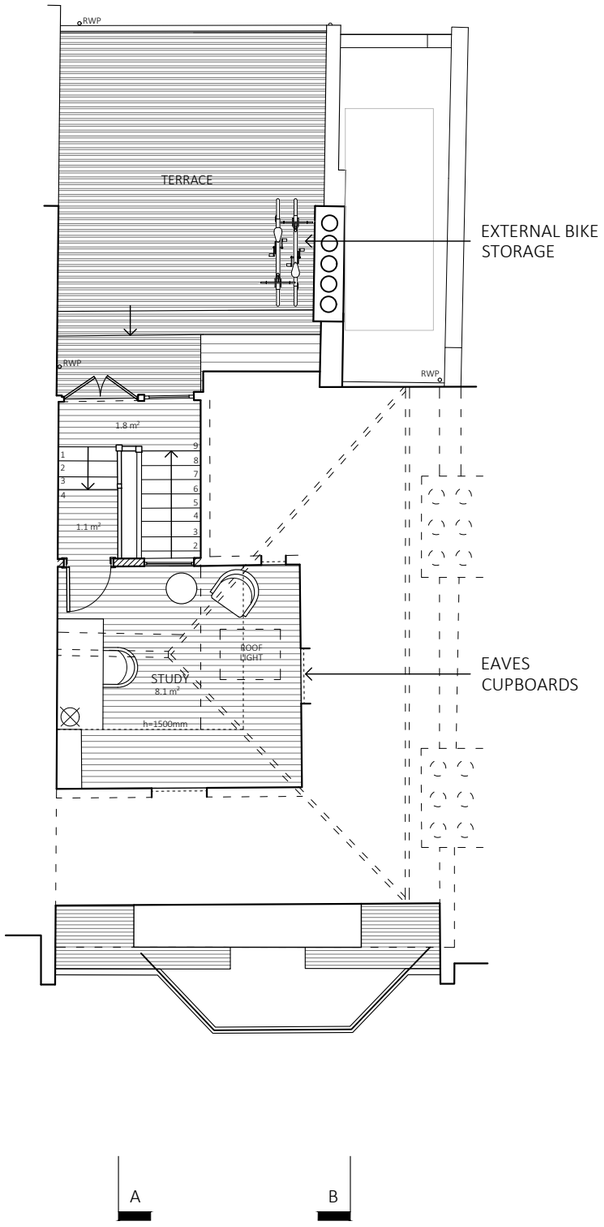
LONDON, W8 6SH
T + 44 (0) 207 229 1558
MAIL@NASHBAKER.CO.UK
WWW.NASHBAKER.CO.UK

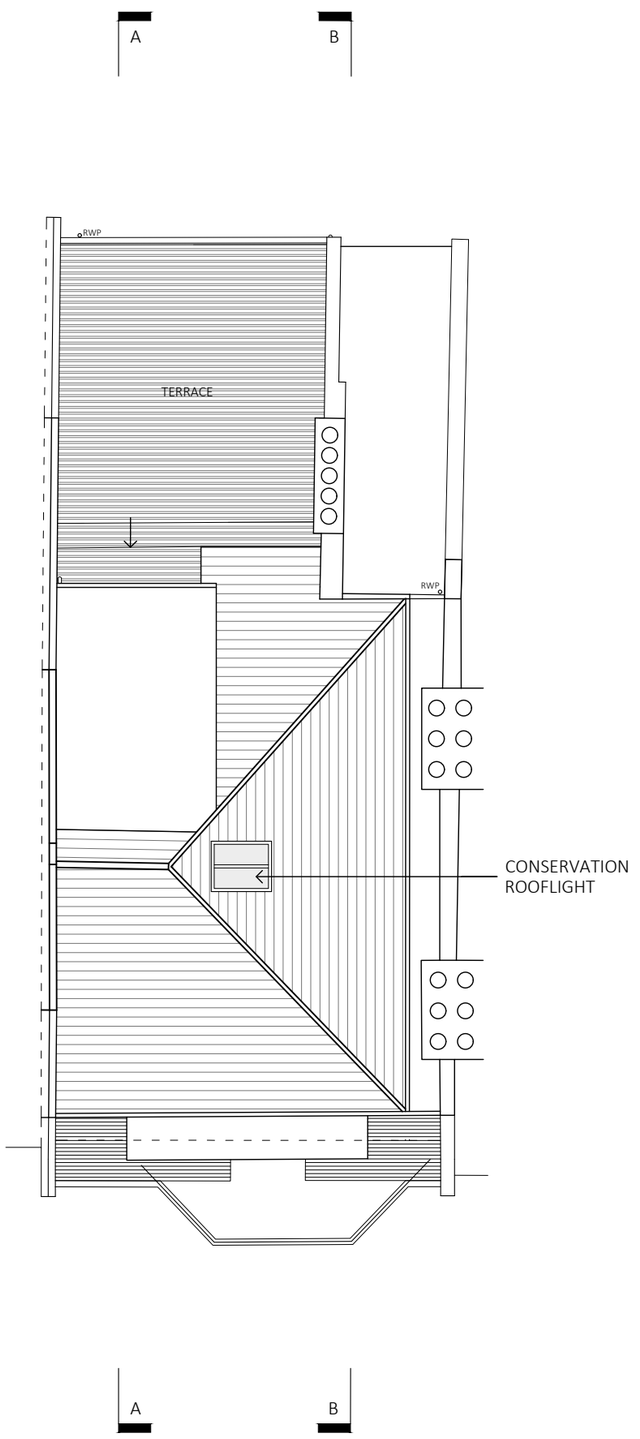
| | |
|---|---|
| PROJECT | 38, GLENLOCH ROAD<br>LONDON, NW3 4DN |
| DRAWING TITLE | LOWER GROUND, GROUND & FIRST FLOOR PLANS AS PROPOSED |
| JOB NUMBER | 1706 |
| DRAWING NUMBER | 301 |
| DRAWN | VT |
| CHECKED | SB |
| SCALE | 1:100 |
| PAPER SIZE | A3 |
| DATE | 26/07/2017 |
| REVISION | B |




SECOND FLOOR




THIRD FLOOR




ROOF PLAN

Workstage

# 03 - PLANNING

GENERAL NOTES

1. No dimensions to be scaled from this drawing for construction purposes.
2. This drawing is to be read in conjunction with all other consultants' drawings, specifications and schedules.
3. Any discrepancies found between this drawing and other documents should be referred immediately to the architect and consultants.
4. This drawing should be removed from currency immediately after a revised version is issued.
5. All dimensions are in millimetres.

Nash Baker Ltd, trading as Nash Baker Architects. Company Number. 7488262
Directors: Simon Baker RIBA, Howard Nash ARB



0 1 2 3 4 5m

| Address: | FLAT No. | Proposed GIA (m²) | Proposed GIA (sqft) | Proposed Bed No. | Persons | Outdoor Amenity |
|---|---|---|---|---|---|---|
| No. 38 | FLAT 1 | 162.6 | 1749 | 3 bed | 6 | Garden |
| Glenloch | FLAT 2 | 69.78 | 751 | 2 bed | 3 | None |
| Road | FLAT 3 | 95.3 | 1026 | 2 bed | 4 | Terrace |
| Total | | **328** | **3526** | | | |

KEY

- EXTERNAL STORAGE FOR 27L ORGANIC KITCHEN WASTE (320X400MM) AND RECYCLABLES.
- EXTERNAL STORAGE FOR GARDEN WASTE (LARGE HESSIAN SACKS)
- INTERNAL STORAGE FOR 7 LITRE (252X229MM) KITCHEN CADDY
- INTERNAL STORAGE FOR 55L (445X585MM) GREEN BOX FOR MIXED RECYCLABLES, OR INTERNAL STORAGE FOR 30L (320X265MM) GREEN BAGS FOR MIXED RECYCLABLES
- INTERNAL LOW LEVEL STORAGE FOR COLLAPSIBLE/FOLDING BIKE

| Rev | Date | Reason For Issue | Chk |
|---|---|---|---|
| B | 08.02.2018 | UPDATES FOLLOWING PRE-APP | BS/SA |
| A | 11.12.2017 | GIA TABLE | VT |

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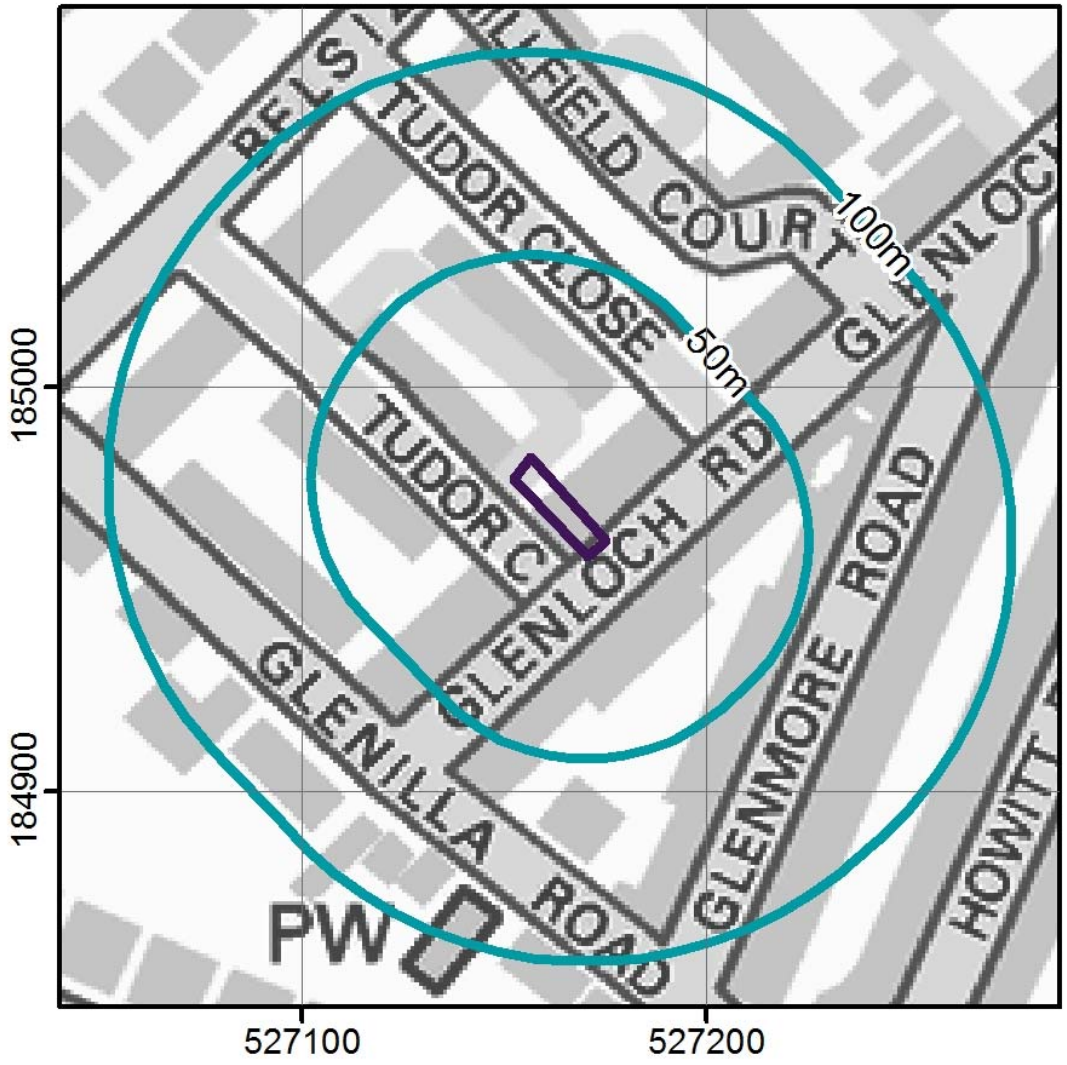
MAIL@NASHBAKER.CO.UK
WWW.NASHBAKER.CO.UK

| | |
|---|---|
| PROJECT | 38, GLENLOCH ROAD<br>LONDON, NW3 4DN |
| DRAWING TITLE | SECOND FLOOR, THIRD FLOOR AND ROOF PLANS AS PROPOSED |
| JOB NUMBER | 1706 |
| DRAWING NUMBER | 302 |
| DRAWN | VT |
| CHECKED | SB |
| SCALE | 1:100 |
| PAPER SIZE | A3 |
| DATE | 26/07/2017 |
| REVISION | B |

# Appendix B

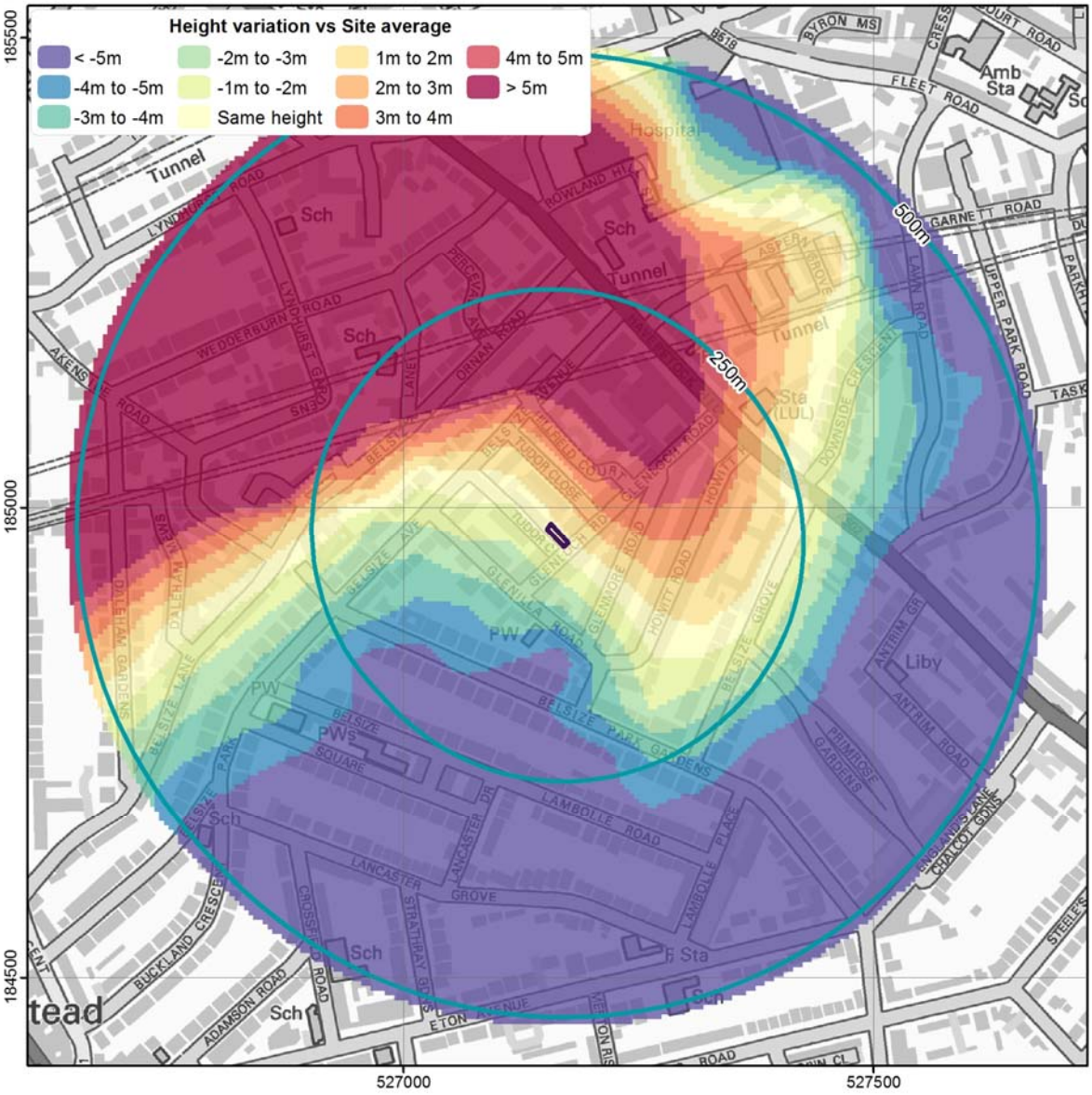
## Commercial flood mapping

Site Location Plan (OS, 2017)



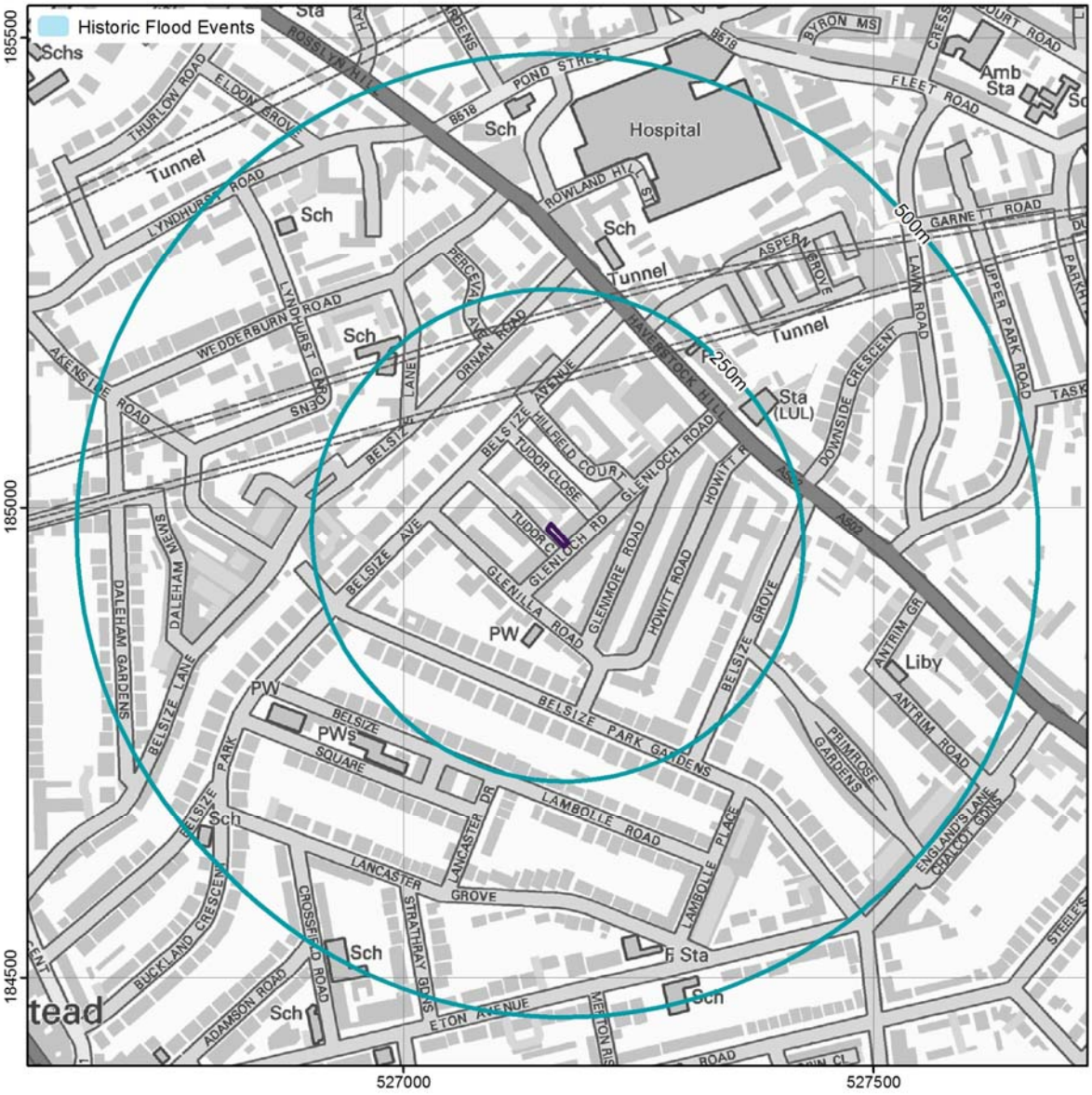
## Aerial Photograph (BlueSky, 2017)

## GeoSmart DTM5 (5m) map (EA, 2017)

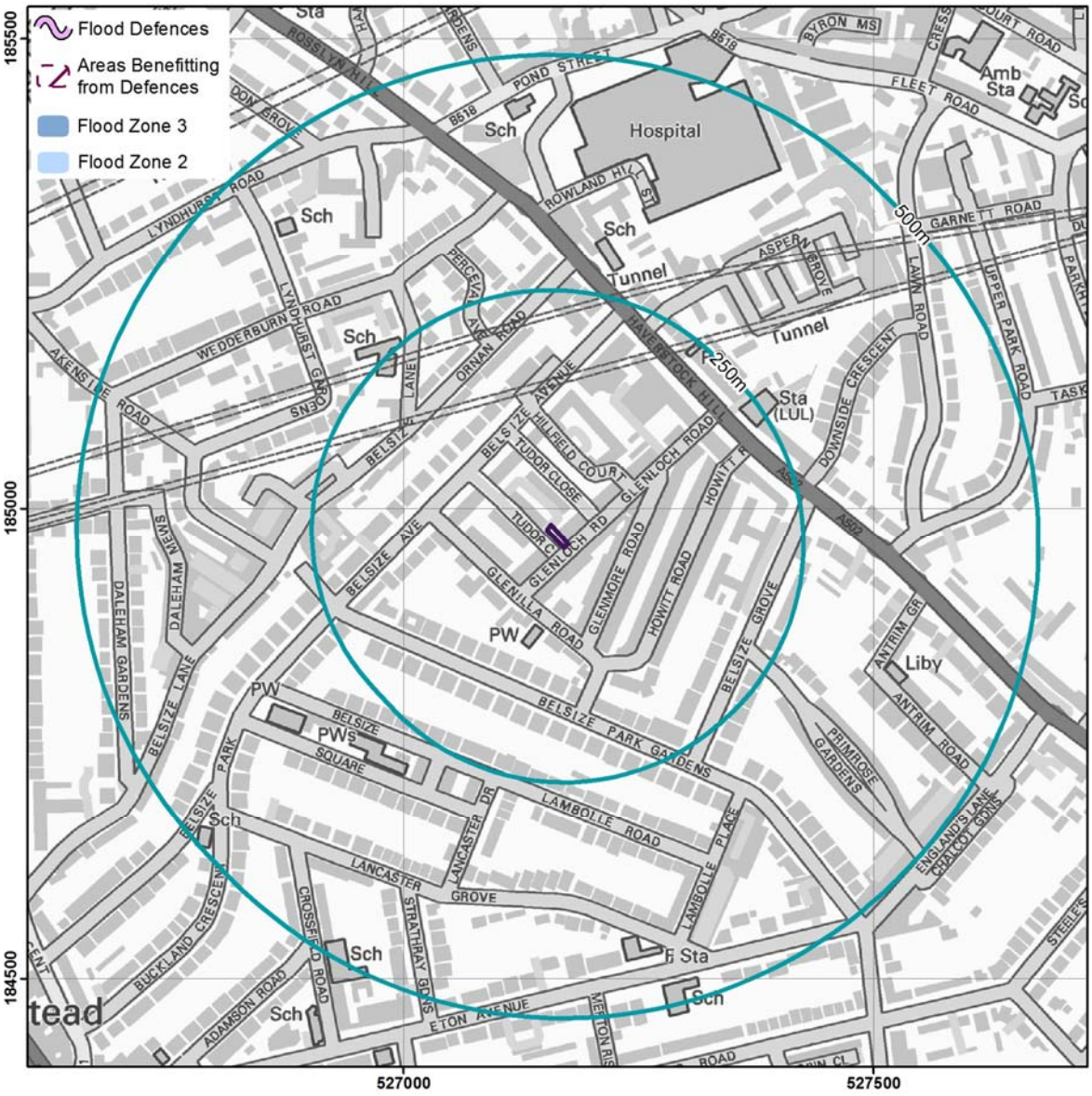


## Ordnance Survey Surface Water Feature Vector Map (OS, 2017)

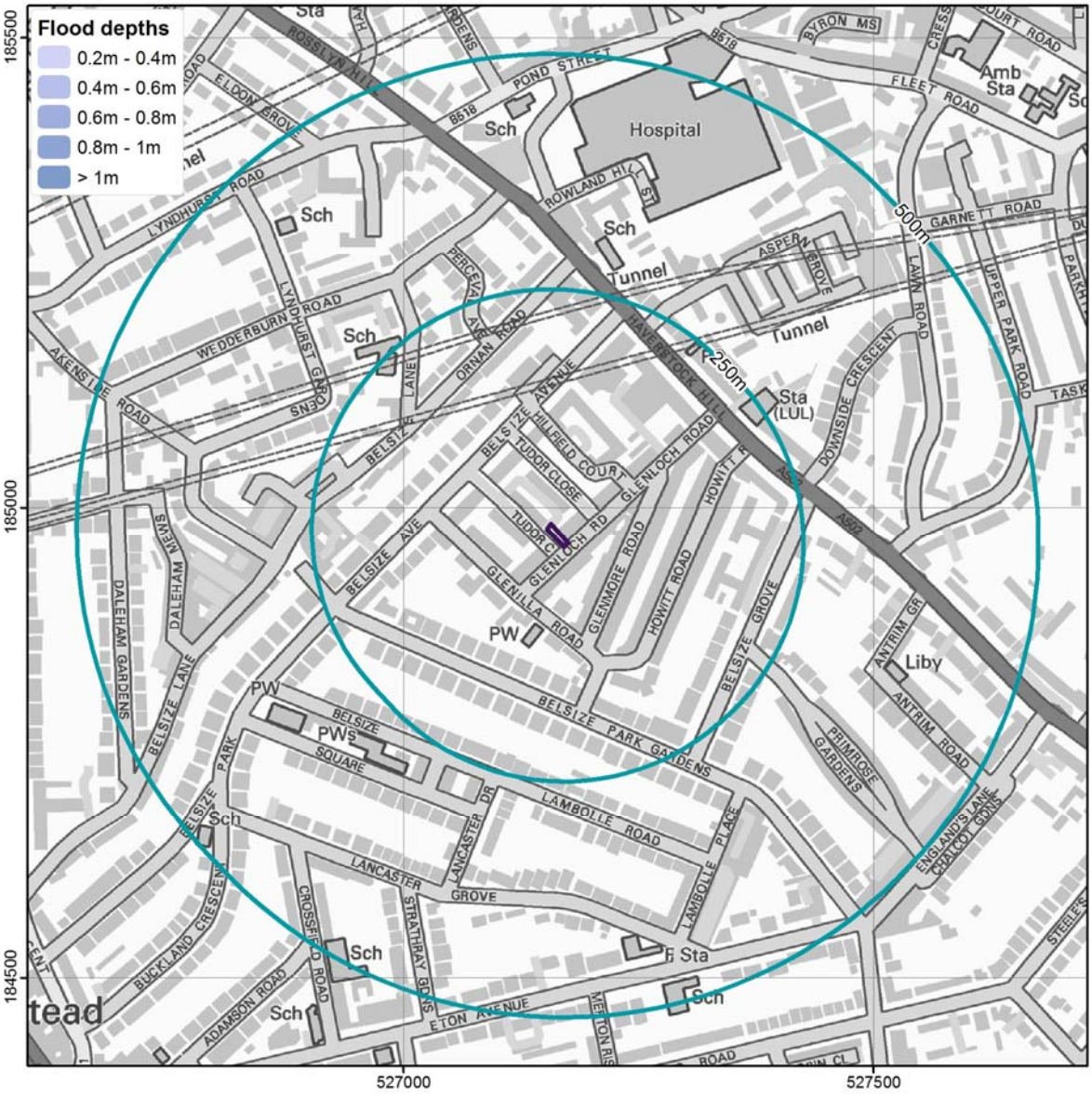
## Environment Agency Historic Flood Map (EA, 2017)



## Environment Agency's Flood Map for Planning Purposes (EA, 2017)

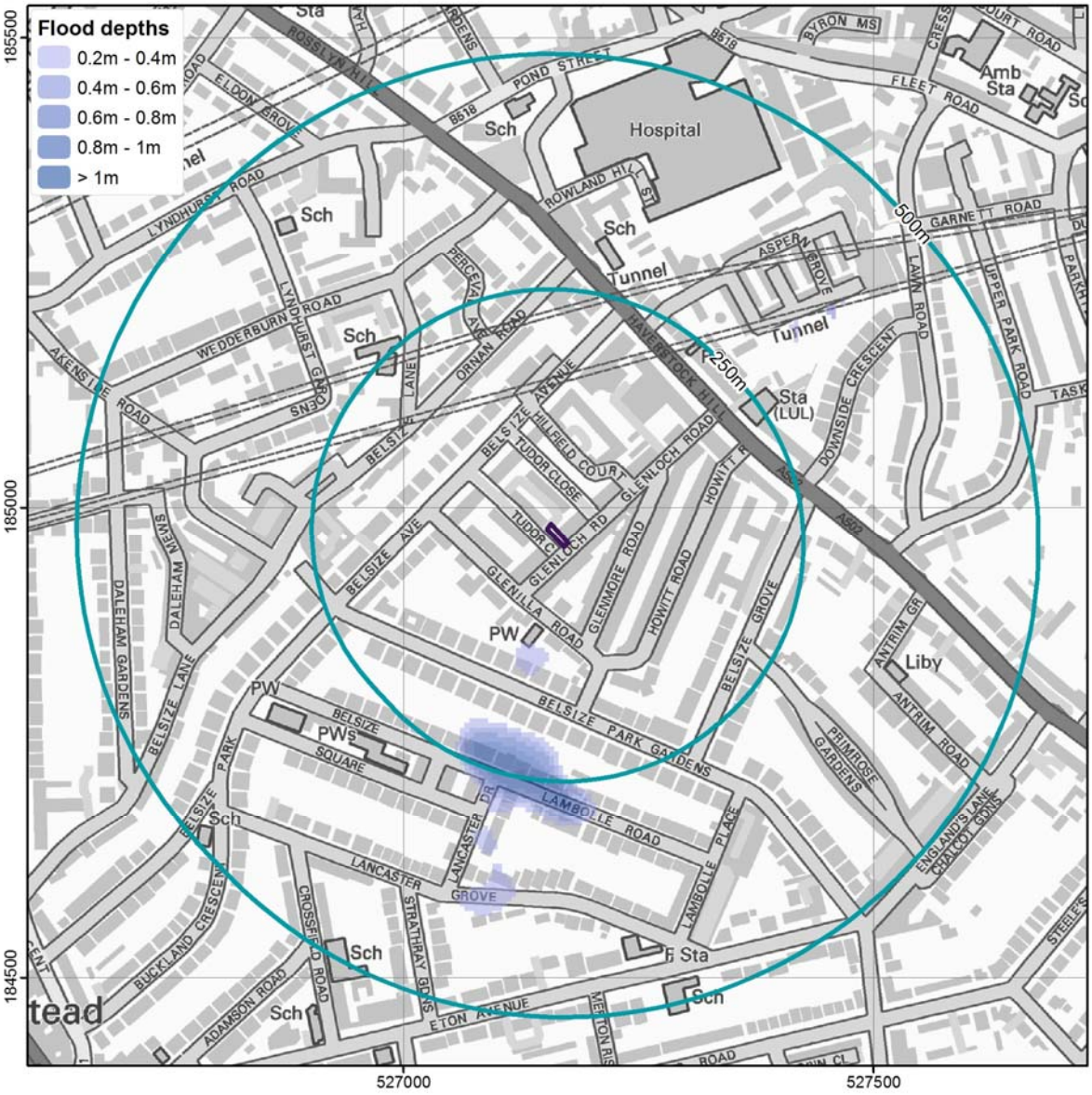


## UKFloodMap4TM 1 in 100 year Fluvial/Tidal Flood Depth Map (Ambiental, 2017)

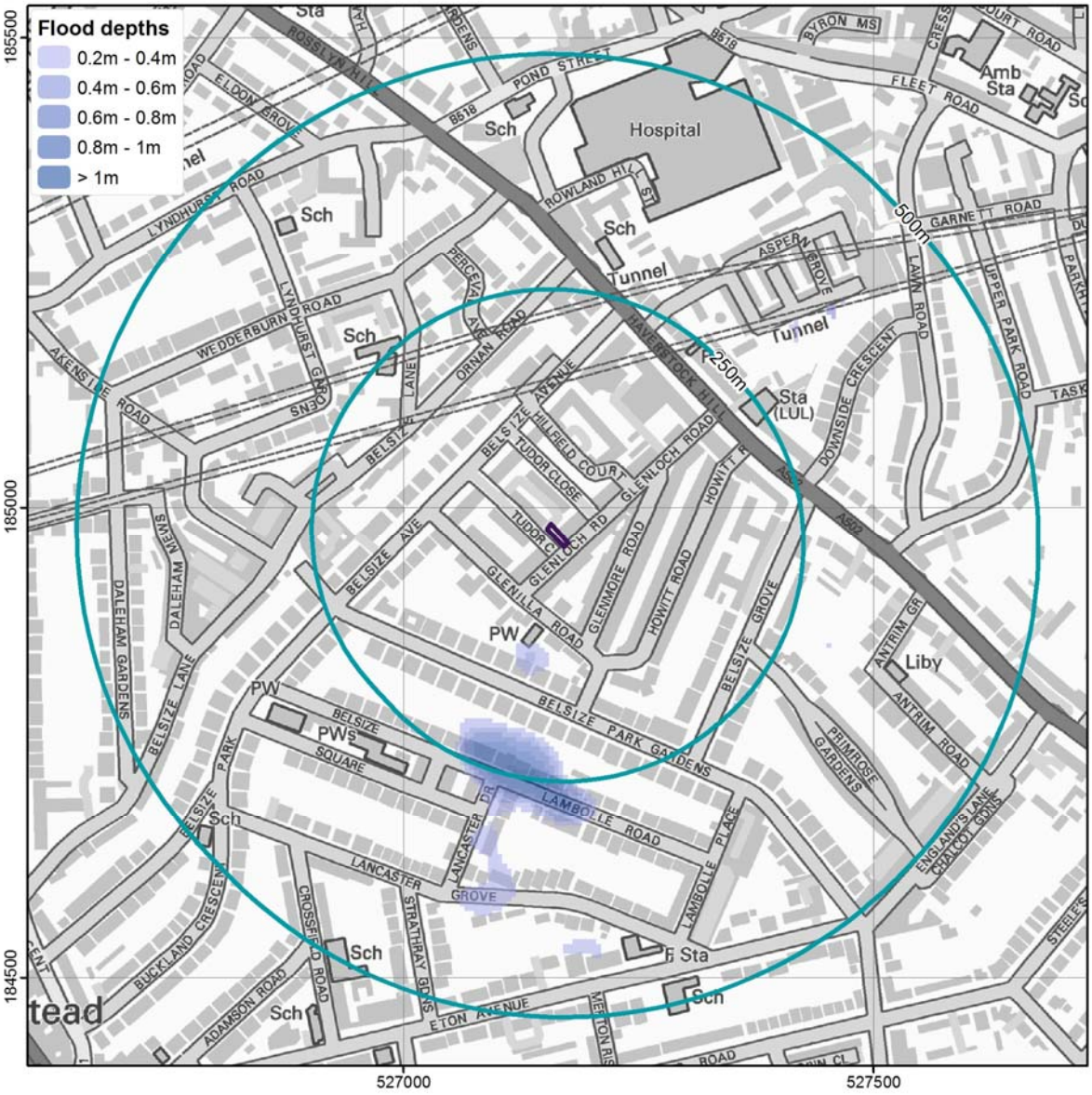


## GeoSmart Groundwater Flood Risk (GW5, v2.1) Map (GeoSmart, 2017)

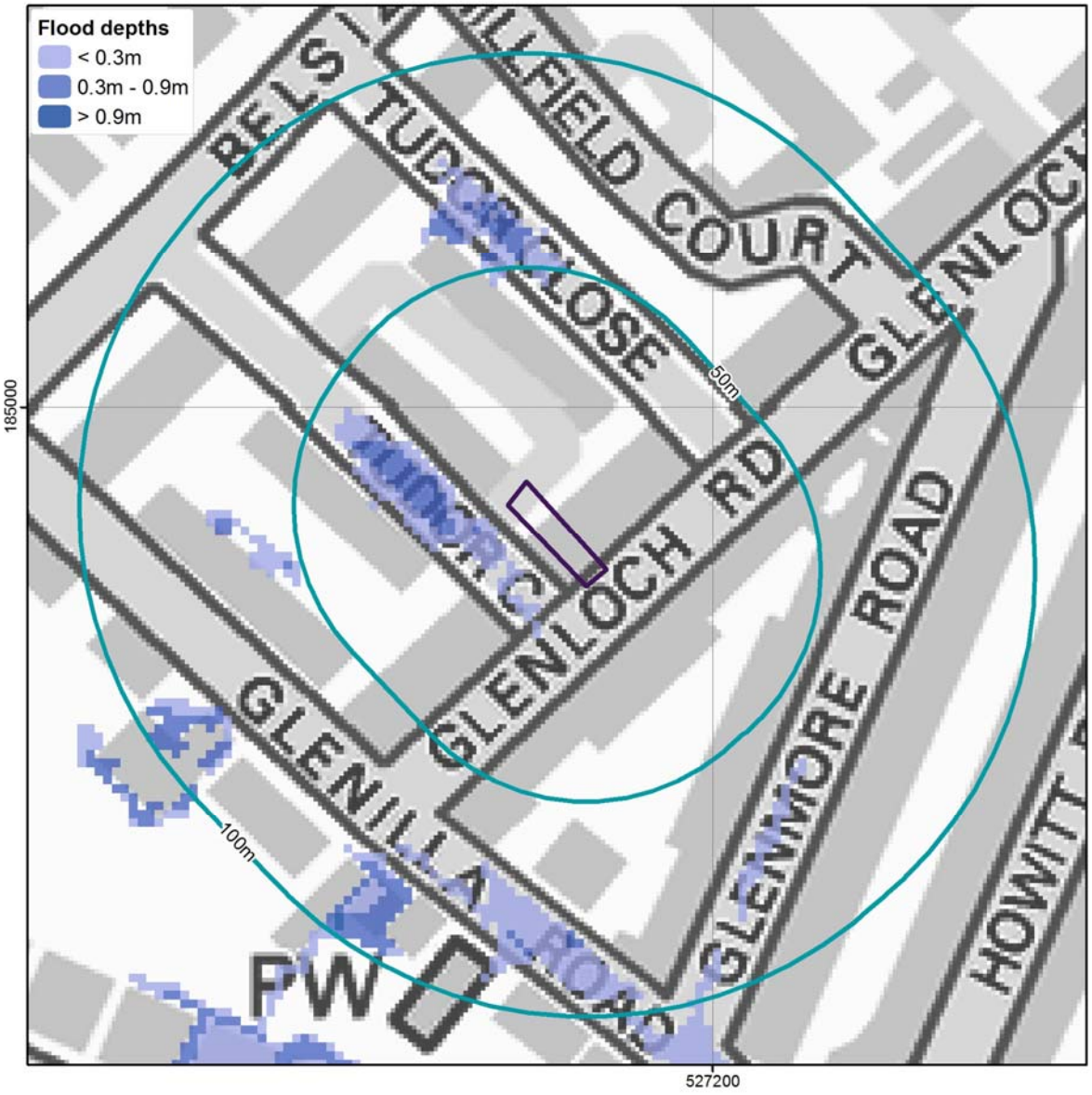
## UKFloodMap4$^{TM}$ Pluvial 1 in 75 year Pluvial Flood Depth Map (Ambiental, 2017)



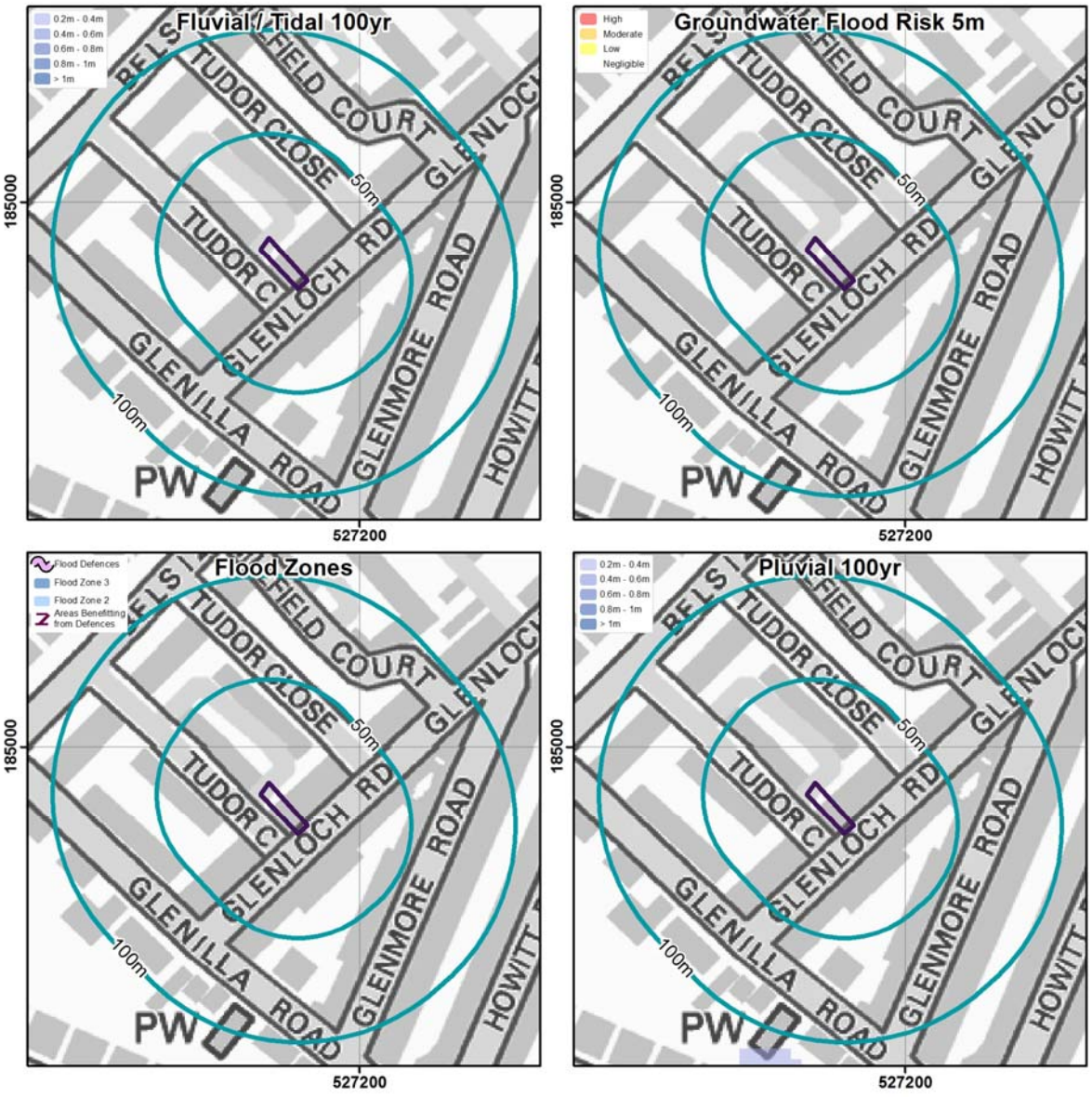
## UKFloodMap4TM Pluvial 1 in 100 year Pluvial Flood Depth Map (Ambiental, 2017)



## Environment Agency Risk of Flooding Surface Water (pluvial) Depth map 1 in 100 year (EA, 2017)



## Quad Map (EA and Ambiental Data, 2017)



# Appendix C

## Thames Water sewer flooding report

# Sewer Flooding
## History Enquiry

Property Searches

GeoSmart

| | |
|---|---|
| **Search address supplied** | 38<br>Glenloch Road<br>London<br>NW3 4DN |
| **Your reference** | 70356 |
| **Our reference** | SFH/SFH Standard/2017_3698227 |
| **Received date** | **27 November 2017** |
| **Search date** | **27 November 2017** |


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

0845 070 9148

# Sewer Flooding
## History Enquiry

Property Searches

**Search address supplied:** 38,Glenloch Road,London,NW3 4DN

**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
www.thameswater-propertysearches.co.uk

0845 070 9148

# Sewer Flooding
History Enquiry

Thames Water 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

0845 070 9148

# Appendix D

## Environment Agency LiDAR Elevation Data



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

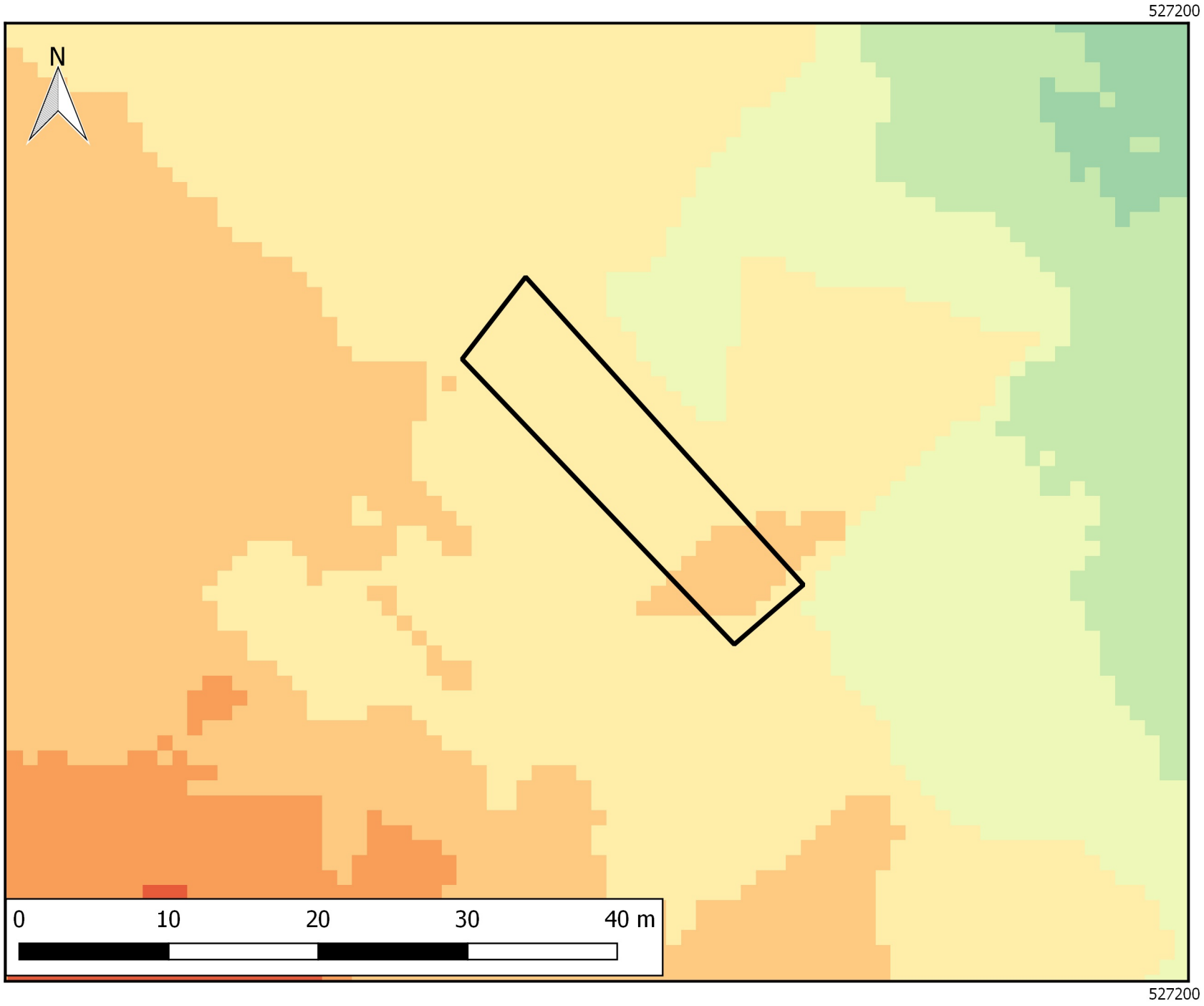



**Figure D.1**
**Elevation on Site**
**(LIDAR Data)**

Legend

Site Boundary

tq2784_DTM_1M

- <= 61
- 61 - 62
- 62 - 63
- 63 - 64
- 64 - 65
- 65 - 66
- 66 - 67
- 67 - 68
- 68 - 69
- > 69

GeoSmart Information
Environmental Thinking

| | |
|---|---|
| Date 28/11/2017 | Drawn |
| Scale 1:363 | Checked |
| Original | Revision |
| File Reference | |

## 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

## 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 compensation of up to £5,000 to you if he finds that you have suffered actual loss 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:

Jemma Prydderch
Operations Manager

GeoSmart Information Limited
Suite 9-11, 1st Floor,
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Bellstone,
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# Terms and Conditions

GEOSMART INFORMATION LIMITED
Conditions of contract for environmental reports

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Definitions:

The following words shall have the following meaning:

a) "Client" means the person for whom the Report has been procured either directly or through an Intermediary;

b) "Conditions" means these terms and conditions of sale, the User Guide and the Order;

c) "GEOSMART" means GeoSmart Information Ltd of Suite 9-11, Old Bank Buildings, Bellstone, Shrewsbury, SY1 1HU, registered in England and Wales with company registration number 05475394.

d) "Information" means environmental data, including other third party sources of information;

e) "Intermediary" means the party that places the Order acting on behalf of the Beneficiary, who might be a lawyer, consultant or other party;

f) "Order" means the order for Services sent by a Client or an Intermediary to GEOSMART;

g) "Report" or "Reports" means a report which relates to environmental information (as distinct from opinion) and which is prepared by GEOSMART in respect of a Site;

h) "Services" means the preparation and provision of Report(s) by GEOSMART from the Information;

i) "Site" shall mean the site specified in the Order;

j) "User Guide" means the document (if any) which may be produced from time to time by GEOSMART entitled 'GeoSmart User Guide', which may be requested with the Report by writing to GEOSMART at the above address and will be provided if applicable.

1. Conditions

1.1 Subject to receipt of a valid Order, GEOSMART agrees to supply to the Client or the Intermediary (if the Client has appointed one) the Services subject to these Conditions and the Client or the Intermediary agrees that by placing an Order for the Services it accepts these Conditions. The User Guide applicable to each Report should be read in conjunction with the Report and is incorporated into these Conditions as if it were repeated herein. A Report is sold subject to all information contained in such User Guide

1.2 GEOSMART acknowledges that in the provision of the Report and Services it owes a duty of care to the Intermediary and to the Client.

1.3 In providing search reports and services GEOSMART will comply with Search Code and will take into account the requirements of the Alternative Dispute Resolution for Consumer Disputes (Amendment) Regulations 2015. Further details are provided in the PCCB Bulletin which accompanies GEOSMART Reports.

2. Report

GEOSMART shall use reasonable care, skill and diligence in carrying out the Services and providing the Report to the Intermediary (and the Client). However the Report is provided to the Intermediary (and the Client) on the express basis that the Intermediary (and the Client) acknowledge and agree to the following:

2.1 information and data supplied in Report(s) is derived from the Information and GEOSMART does not warrant the accuracy or completeness of such Information;

2.2 the sources of information and data supplied in Report(s) are specifically cited in the Report and the User Guide; however GEOSMART does not claim that these sources represent an exhaustive or comprehensive list of all sources that could or might be consulted; and

2.3 GEOSMART does not guarantee that all environmental risks that are or might be associated with the Site will be identified in the Report; and

2.4 Reports and other services provided by GEOSMART are generally professional business to business services and intended as such for use or interpretation by professional persons skilled in the use of environmental information; and

2.5 GEOSMART shall not be responsible for any error or corruption in a Report resulting from inaccuracy or omission of third party information and data provided by the Intermediary or the Client (as applicable), inaccurate processing of information and data by third parties, computer malfunction or corruption of data whilst in the course of conversion, coding, processing by computer or electronic means, or in the course of transmission by telephone or other communication link.

3. Liability

3.1 As some of the data and information which GEOSMART interprets in Reports is obtained by GEOSMART from third parties, GEOSMART cannot control the accuracy or completeness of such data and information, nor is it within the scope of the Services to verify the data or information by a physical inspection of the Site. Save as provided in Conditions 3.5 and 3.11 GEOSMART will only be liable to the Client or to the Intermediary in respect of the Services:

3.1.1 for loss or damage caused by breach by GEOSMART of these Conditions accordingly save as provided in Condition 3.5 GEOSMART shall not be liable in any other circumstances for any errors, inaccuracies, faults or omissions in the Services;

3.1.2 for any obvious errors or obvious inaccuracies in any information obtained by it where GEOSMART should reasonably have been alerted to such error or inaccuracy;

3.2 GEOSMART has no liability whatsoever for, under or in respect of any insurance policy purchased by the Client or the Intermediary where insurance is made available to the Client or Intermediary following the provision of a Report by GEOSMART issued in accordance with these Conditions. Where such a policy has been purchased, all liability arising from or relating to the Site shall remain exclusively with the insurers. Moreover, GEOSMART is not endorsing any policy recommended by insurers and the Client or the Intermediary is entirely responsible for ensuring the insurance policy offered is suitable for its needs and should seek independent advice.

3.3 GEOSMART does not guarantee that an insurance policy will be available for the environmental risks that may be associated with the Site specified in the Report and the provision of a Report does not constitute any indication by GEOSMART that insurance will be available for the Site.

3.4 GEOSMART has undertaken the Services for use by the Client or the Intermediary and those persons referred to at condition 5.1 and 5.2 and for no other purpose whatsoever and the Services should not be relied upon by any other third party. GEOSMART cannot accept responsibility and will not be liable to any other party for any loss caused as a result of reliance upon the Services. Any other party relying on the Services does so entirely at its own risk, including without limitation, any insurers. Recipients of the Services are to rely on their own skill and judgment in determining the suitability of the Services for their own purpose and use.

3.5 Nothing in these Conditions shall exclude or restrict GEOSMART's liability for death or personal injury resulting from the negligence of GEOSMART or their employees while acting in the course of their employment or arising from a breach of its statutory duty or fraud.

3.6 GEOSMART shall not be liable to any recipient of the Service for loss of profits, loss of contracts, (or other indirect or consequential loss or damage) resulting from any event or default by GEOSMART in the provision of the Services to the fullest extent permitted by law.

3.7 GEOSMART shall make reasonable endeavors to supply the Report on the date agreed with the Intermediary or the Client (as applicable). This date will be taken as a guideline for time planning purposes only. Time shall not be of the essence with respect to the provision of the Services except where it has agreed in writing to a deadline with the Client or Intermediary in which it is stated that time is of the essence.

3.8 GEOSMART shall not be liable for any delay, interruption or failure in performance of its obligations hereunder which is caused by war,

flood, riot, Act of God, strike or other labour dispute (including those affecting Government officials), suspension or delay of service at public registries, lack of power, telecommunications failure or overload, or computer malfunction caused by any event beyond the reasonable control of GEOSMART.

3.9 The Client or the Intermediary (as appropriate) shall on receipt of the Services make a reasonable inspection of the Site to satisfy itself that there are no apparent defects or failures with respect to the description of the Site.

3.10 GEOSMART's liability under the Conditions shall cease upon the expiry of six (6) years from the date when the Client, Intermediary or any person making use of the Report in accordance with Condition 5.2 became aware that it may have a claim in respect of a particular Report provided always that there shall be no liability at the expiration of six (6) years from the date of the Report. For the avoidance of doubt, any claims in respect of which proceedings are notified to GEOSMART prior to the expiry of the time periods referred to in this Condition shall survive the expiry of those time periods.

3.11 Subject as otherwise provided in these Conditions, GEOSMART's aggregate liability arising out of the provision or use of the Services, in contract, negligence or in any other way, for damages or loss sustained or incurred by the Intermediary shall be limited to an aggregate amount not exceeding £5,000,000 pounds. For the avoidance of doubt, if multiple parties make use of the Report, the limit referred to above applies to all users of that Report in aggregate.

3.12 GEOSMART undertakes for the duration of the six (6) year period of liability provided for by Condition 3.11 to maintain and renew annually Professional Indemnity Insurance in respect of the Services with a liability limit of not less than £5,000,000 provided that such insurance is available at commercially reasonable rates (and in such case then at the next highest limit which is available in the market at commercially reasonable rates). Details of Professional Indemnity Insurance shall be made available to the Client or Intermediary (as applicable) on request.

3.13 Where GEOSMART procures for the Intermediary, otherwise than as part of a Report, any third party service, including but not limited to, environmental reports, risk models, risk assessments, professional opinions, or any other service, GEOSMART accepts no liability whatsoever for the information contained therein.

3.14 The Client and the Intermediary warrant that they shall: (i) comply with all applicable laws, statutes and regulations relating to anti-bribery and anti-corruption including but not limited to the Bribery Act 2010; (ii) comply with such of GEOSMART 'S anti-bribery and anti-corruption policies as are notified to them from time to time; and (iii) promptly report to GEOSMART any request or demand for any undue financial or other advantage of any kind received by the or on their behalf in connection with these Conditions. Breach of this clause shall be deemed a material breach of these Conditions.

4. Copyright

4.1 The Intermediary, the Client and any recipient of the Report pursuant to the provisions of condition 5.2 acknowledge that the proprietary rights subsisting in copyright, design rights and any other intellectual property rights in respect of the data and information in the Report are and shall remain the property of GEOSMART and these Conditions do not purport to grant, assign, or transfer any such rights in respect thereof.

4.2 Reports may be stored on the Intermediary's server and used on up to ten (10) units (where a "Unit" means a single client personal computer or workstation) on the Intermediary's network and any network of a recipient of the Report pursuant to the provisions of Condition 5.2. Data in Reports is deemed to be in use when it is loaded into the temporary memory (i.e. RAM) or installed onto the permanent memory (i.e. memory chip, hard disc, CDROM) of that computer.

4.3 The Intermediary, the Client and all recipients of the Report pursuant to the provisions of Condition 5.2 are all entitled to make up to five printed copies only of any Report. Copies of the Report may be provided for information purposes for proper and lawful use only to a person who is considering whether to acquire or hold an interest in the Site or to provide funding in relation to the Site. Further copies may not be made in whole or in part without the written permission of GEOSMART who shall be entitled to make a charge for each additional copy.

4.4 The Intermediary and the Client (as applicable) shall (and shall procure that all recipients of the Report pursuant to the provisions of Condition 5.2 shall):

4.4.1 not remove, suppress or modify any trademark, copyright or other proprietary marking belonging to GEOSMART from the Services;

4.4.2 not create any product which is derived directly or indirectly from the data contained in the Services; save for products documents and advice provided by those acting in a professional or commercial capacity in accordance with 5.2.3;

4.4.3 not combine the Services with or incorporate such Services into any other information data or service;

4.4.4 not re-format or otherwise change (whether by modification, addition or enhancement) data contained in the Services save for those modifications made by those acting in a professional or commercial capacity in accordance with 5.2.3;

4.5 The mapping (if any) contained in any Services is protected by Crown Copyright and must not be used for any purpose outside the context of the Services.

5. Confidentiality and reliance

5.1 Subject to (i) full payment of all relevant Fees and (ii) compliance with this Contract, the Client or the Intermediary is entitled to rely on the report and information provided.

5.2 Subject to Condition 5.3, the Client or the Intermediary (as applicable) may without further charge make the Report available to:

5.2.1 Up to a maximum of three (3) persons who acquire or hold an interest in the Site or an interest in the Client or the entity which holds or acquires an interest in the Site save that nothing shall hereby entitle any such person to recover twice (whether directly or indirectly) in respect of the same loss nor seek recovery in respect of any loss relating to any period after such entity ceases to hold its interest or to have potential liability for the Site(whichever is the later) (unless otherwise agreed by the parties);

5.2.2 Up to a maximum of three (3) persons who provide funding to the Client or to a person at condition 5.2.3;

5.2.3 Up to a maximum of three (3) persons acting in a professional or commercial capacity for the Client in relation to the Site.

5.3 GEOSMART shall have the same duties and obligations to those persons referred to in Conditions 5.2.1, 5.2.2, 5.2.3 in respect of the Services as it has to the Client and the Intermediary , and such persons shall be entitled to rely on the relevant Report as if it was addressed to them and any such person shall be entitled to enforce each of these Conditions as if they were named as joint Client in the Order, provided always that the person to whom the Report is made available accepts these Conditions by writing accordingly to GEOSMART citing the Report and the Site.

5.3 The Report is to be used solely for the benefit of such persons as are set out in Condition 5.1 and 5.2, and GEOSMART exclude all liability to all other persons unless GEOSMART has expressly agreed in writing to a third party taking the benefit of the Report and has been paid reasonable fees for so doing.

5.4 Any information provided by the Intermediary or the Client to GEOSMART in contemplation of the Services to be provided together with the Report will be treated as confidential information.

5.5 GEOSMART agrees not to disclose or publish any statement relating to such confidential information (in whole or in part) to any third party without the prior written consent of the Intermediary  save for its provision to GEOSMART 's employees who require access to the confidential information in order to perform their duties to GEOSMART.

5.6 GEOSMART will procure that its employees will maintain the confidential information in strict confidence.

6. GEOSMART's charges

6.1 The Client or the Intermediary (as applicable) shall pay GEOSMART's charges for the Services at the rate set out in the Order.

6.2. Unless otherwise stated all prices are exclusive of Value Added Tax which shall, where applicable, be payable in addition to any sum payable for the Services at the relevant rate in force from time to time, against delivery of an appropriate tax invoice.

6.3 The Client or the Intermediary (as applicable) shall pay the price referred to in Condition 6.1 above for the Services:

6.3.1 without any set off, deduction or counterclaim;

6.3.2 GEOSMART requests upfront payment by debit or credit card (No surcharges for credit cards) or by bank transfer. A credit agreement can be set up for repeat clients with terms based on 14 days from the date of GEOSMART's invoice.

6.4 GEOSMART shall not be obliged to invoice any party other than the Client or the Intermediary (as applicable) for the provision of Services, but where GEOSMART does so invoice any third party at the written request of the Client Intermediary, and such invoice is not accepted or remains unpaid, GEOSMART shall have the right at any time to cancel such invoice and invoice the Client or the Intermediary (as applicable) direct for such Services. Where the Intermediary 's order comprises a number of Services or separate elements within any one or more Services, any failure by GEOSMART to provide an element or elements of the Services shall not prejudice GEOSMART's ability to require payment in respect of the other Services delivered to the Intermediary or the Client (as applicable).

6.5 If the Intermediary or the Client (as applicable) fails to make any payment on the due date GEOSMART shall be entitled to cancel or suspend any further orders or delivery. In addition, GEOSMART may charge the Intermediary or the Client (as applicable) interest on overdue amounts at 4% over the NatWest plc base rate (as varied from time to time) from the due date until payment in full is made (whether before or after judgment).

7. General

7.1 These Conditions constitute the entire agreement between the parties and no statement given orally or in writing should be deemed incorporated herein unless executed in writing by a director of GEOSMART and countersigned by the Intermediary or the Client (as applicable). Each of the Conditions and Sub-conditions of these Conditions is distinct and severable. If any provision of these Conditions shall be determined to be invalid, illegal or unenforceable, the remainder of these Conditions shall continue to be valid, legal and enforceable to the fullest extent of the law.

7.2 Any time or indulgence granted by GEOSMART or the Client or the Intermediary or delay in exercising any of its rights under these Conditions shall not prejudice or affect GEOSMART's or the Client's or the Intermediary 's rights or operate as a waiver of the same.

7.3 GEOSMART, the Client and the Intermediary shall not be entitled to assign their respective rights or obligations pursuant to these Conditions without the prior written approval of the other parties.

7.4 GEOSMART may suspend or terminate the provision of the Services if the Client or the Intermediary (as applicable) is bankrupt or insolvent or makes any voluntary arrangements with its creditors or become subject to an administration order or has an administrative receiver appointed over any of its assets or GEOSMART has reason to believe that any of foregoing circumstances may come into existence or any amount owing to GEOSMART that is overdue or where the Client or Intermediary (as applicable) has exceeded any credit limit.

7.5 These Conditions shall at all times be governed construed and enforced in accordance with English Law which shall be the proper law of these Conditions, and both parties thereby submit to the exclusive jurisdiction of the English courts.

7.6 Except as otherwise provided in these Conditions a person who is not a party to any contract made pursuant to these Conditions shall have no right under the Contracts (Rights of Third Parties) Act 1999 to enforce any terms of such contract and GEOSMART shall not be liable to any such third party in respect of the Products.

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