

4.3.5 Boundary Condition Photos



Site Photo 1
South Eastern Boundary
St Edmund's Terrace



Site Photo 2
South Western Boundary
Broxwood Way



Site Photo 3
North Western Boundary
Car park and Caretaker's cottage adjacent
to residential flats



Site Photo 4
North Eastern Boundary
Regency Heights residential block

5 Ground Conditions

5.1 Geology

Soil Consultants conducted an investigation in 2012 which included a desk study, 3 trial pits and 3 window sample boreholes and 1 cable percussion borehole. CGL recently reviewed the latest site investigation and produced and updated report, attached in Appendix 2. The CGL report found that the site is underlain by the London Clay Formation. The London Clay Formation is indicated to be approximately 50m thick, with the base of the stratum anticipated at around -10mOD. The London Clay Formation is in turn documented to be underlain by approximately 15m of the Lambeth Group, which is in turn underlain by approximately 15m of the Thanet Sand Formation. The Thanet Sand Formation is underlain by the Chalk at a level of around -50mOD.

Detailed geographical data as well the logged records of the boreholes and window samples are available in the full site investigation report prepared by CGL in Appendix 2. This document should be reviewed when using geological information for design purposes, the summary included in this document is for general information only.

Strata	Description	Top Level (mOD) [mbgl]	Thickness (m)
[MADE GROUND – PAD LOCATIONS]	Brown topsoil and clay with occasional building rubble. Soft to firm brown clay with occasional flint gravel and dark brown sand/ silt lenses in WS2 only.	44.6 to 45.6 [0.0]	0.5 to 2.1
[CONCRETE FOUNDATION – PAD LOCATIONS]	Only observed in WS1 and WS3. One reinforcement bar circa. 10mm diameter observed in WS3 concrete core.	44.4 to 44.7 [0.9]	0.7 to 0.9
[MADE GROUND – CAR PARK AREA]	Asphalt over grey/black mixture of ashy sand with asphalt, clinker and flint gravel becoming clayey at 45.65mOD (0.35mbgl).	46.0 [0]	0.5
[LONDON CLAY FORMATION]	Stiff brown CLAY with some orange patches, occasional grey gleying, selenite crystals and rare orange sand partings. Noted as soft to firm in BH1 and becoming stiff at 6mbgl in WS1.	42.5 to 45.5 [0.5 to 2.1]	Base not proven at 38.5mOD (7.5mbgl)

5.2 Soil Parameters

CGL have defined the following design parameters for the London Clay:

Stratum	Bulk Density (kg/m³)	Effective Cohesion (c' – kN/m²)	Effective Friction Angle (Φ' – degrees)
Made Ground	1800	Zero	28
London Clay	2000	5	22

Refer to Appendix 2 for further details on testing techniques and the sample selected.

5.3 Ground Water

The groundwater was found at levels between 42.7mOD (1.9mbgl) and 44.78mOD (0.82mbgl). The groundwater levels were generally consistent at each of the window sample locations, however the groundwater level at borehole WS2 was approximately 1m lower than the groundwater level at borehole WS1. It is noted that as pipes had no cover and that some of the water could be standing water that has entered during rainfall.

The groundwater level at borehole WS1 was broadly consistent with the level reported in the Soil Consultants report, which was found to be at a level of 44.95mOD (0.95mbgl). The groundwater level measured by CGL at borehole WS2 was found to be higher than the level of 41.1mOD (3.5mbgl) reported by Soil Consultants.

The observed groundwater levels indicate that groundwater is likely to be encountered during the excavation of the proposed basement and as such ground water control measures will be required. Additionally, as the groundwater is within the Weather London Clay / London Clay Formation the ingress rate is anticipated to be slow and groundwater control is likely to be achieved by sump pumping as the excavation progresses. The water could potentially be perched within the Made Ground, in which case it would be expected to be of limited volume.

5.4 Impact of Proposal on Groundwater Regime

Whilst groundwater was encountered in both window sample boreholes WS1 and WS2 it was not encountered in borehole BH1 or window sample WS3. It is therefore considered likely that the groundwater is not laterally persistent. Based on this and the low permeability of the strata the groundwater is in, the proposed excavation is not anticipated to act as an obstruction to groundwater flow or to have a significant impact on local groundwater.

5.5 Swelling/ Shrinking

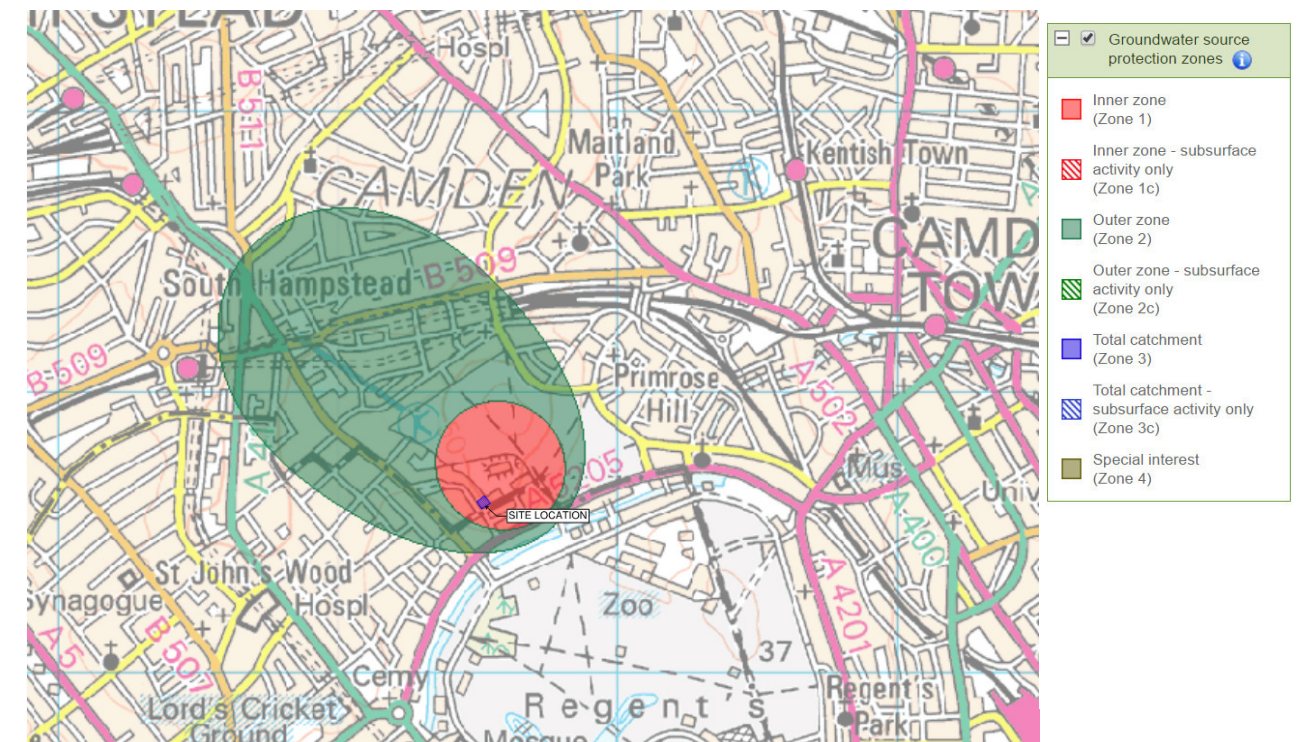
The construction of the basement will generate ground movements due to a variety of causes including heave, settlement, and installation of a contiguous pile wall and underpin deflection. However, there are no party wall structures and the nearest neighbouring structure is approximately 10.8m from the proposed development.

The London Clay Formation on site has the potential to create a shrink/swell hazard. Due to the high plasticity of the London Clay Formation the removal of any trees could have an effect on the shrink/swell potential of the clay. If any trees are planted or removed further advice may be required. However, it is noted that there are no changes to number of trees planned and that the foundations of the proposed development will be around 41.5mOD, considered to be beyond the likely depth of influence of tree roots.

5.6 Hydrology and Hydrogeology

The site hydrogeology is outlined in detail within the CGL report and can be summarised as follows:

1. The site is approximately 170m north of Regents Canal and approximately 750m north of the Boating Lake in Regents Park. Reference to CGL archive information and Barton's Lost Rivers of London indicates the historical (culverted) River Tyburn is located approximately 230m south west of the site (at its closets point) and flows broadly north to south towards Regents Park and into the Boating Lake. Based on the local topography sloping towards the south west it is considered that groundwater onsite will run towards the historical River Tyburn to the south west.
2. The Environment Agency Maps shows the site is within of the Environment Agencies Source Protection Zone 1 (SPZ). this relates to the Barrow Hill reservoir. This is a concrete lined tanked reservoir and is upstream of the proposed development. Additionally, as the proposed development will be within the relatively impermeable London Clay Formation and groundwater is not expected to flow within this stratum, the proposed development is not anticipated to have an impact on the reservoir.
3. Any groundwater flow within the London Clay will be at a very slow rate, due to its negligible permeability. Published data for the permeability of the London Clay indicates the horizontal permeability to generally range between 1×10^{-10} m/s and 1×10^{-8} m/s, with an even lower vertical permeability. The London Clay cannot therefore support groundwater flow and as such does not support a "water table" or continuous piezometric surface.
4. The Environment Agency (EA) mapping indicates the site is within a Flood Zone 1. This indicates the site has a 'low' probability of flooding from river or sea flooding.
5. The flood maps included within CPG41 and Camden's SFRAA3 indicate the site location has a 'very low' risk of surface water flooding
6. The site is located within a critical drainage area but is not located within a local flood risk zone.
7. The site does not overlie a designated superficial or bedrock aquifer and is noted as being underlain by the London Clay Formation, designated a 'non-productive stratum' by the Environment Agency.



SPZ zones within Camden



River Fleet