

These aspects are considered further in Stage 4 (see section 5.) and elaborated upon in section 6. (detailed design considerations)

4. STAGE 3: SITE INVESTIGATION

A site investigation was carried out in September 2011, revised in June 2014, and further updated in March 2020.

Beneath a moderate thickness of made ground, the London Clay was encountered and underlain by the Claygate Member, which was proved to the maximum depth investigated.

4.1 CONTAMINATION TESTING

The results of the contamination testing indicate elevated concentrations of lead and total PAH including Benzo(a)pyrene.

A sample of made ground from Borehole 2 at a depth of 0.2 m has been found to have a significantly acidic pH level of 3.9 and this is considered within Section 7.7 of the soil investigation report.

4.2 GROUNDWATER

Slow inflows or seepages of groundwater were encountered in the Claygate Member during drilling of the boreholes at depths of between 4.00 m (98.73 m OD) and 9.20 m (94.75 m OD).

Groundwater monitoring standpipes were installed in four of the boreholes to depths of between 4.00 m (98.73 m OD) and 9.20 m (94.75 m OD) and were monitored on two occasions as part of the ground investigation in 2011. The standpipes were monitored again about three years later in April 2014, and groundwater was measured at depths of 1.34 m (102.61 m OD) in Borehole No 1 and 1.42 m (102.23 m OD and 101.81 m OD) in Borehole Nos 2 and 5 respectively.

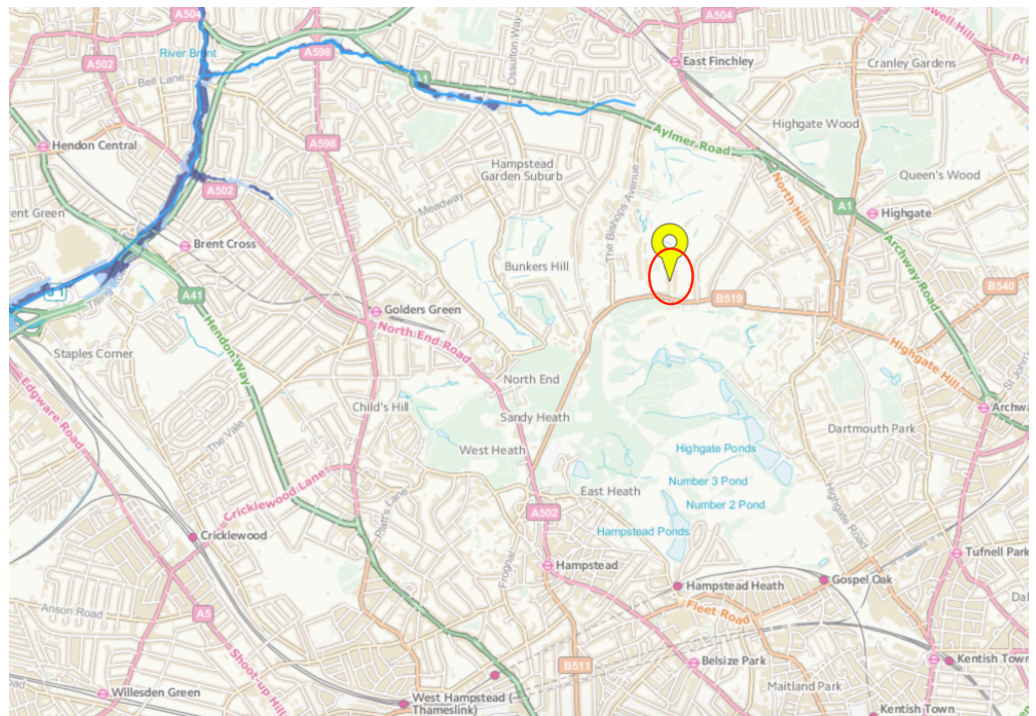
5. STAGE 4: IMPACT ASSESSMENT

5.1 SURFACE FLOW AND FLOODING IMPACT

With reference to the Environment Agency's Flood Risk map, it can be seen that the site lies outside any flood risk zones. As such, no detailed Flood Risk Assessment is deemed required.

The hard-standing and roof areas combined do not materially increase in the proposed scheme, and so the outflows into the public sewer system from the site due to surface waters will be comparable to the existing site.

It is also proposed to incorporate SUDS in the form of attenuation tanks to reduce the peak flows into the sewer system.



[FIGURE 4] ENVIRONMENTAL AGENCY FLOODING RISK MAP

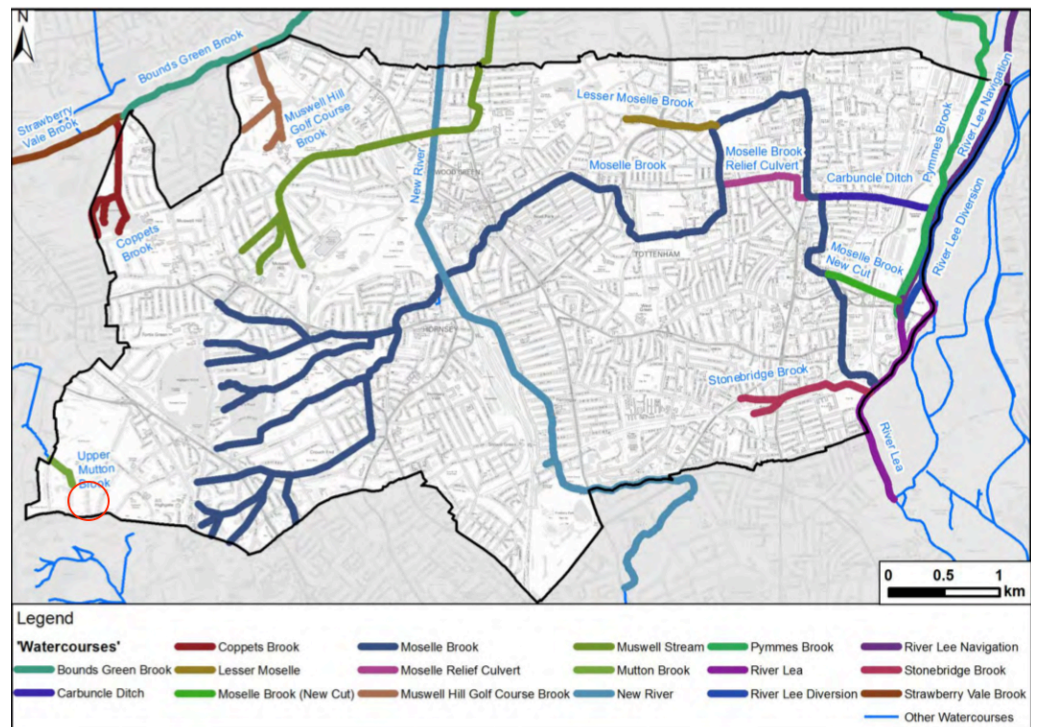
5.2 SUBTERRANEAN GROUNDWATER FLOW IMPACT

The existing subsoils are of London Clay. The trial pit investigation showed a nominal build-up of made ground underlain by the Claygate Formation, upon which the original foundations are situated.

The local natural watercourse has been historically culverted (as identified in the historic mapping study (ref section 2.1 and figure 1, along with figure 5, below), and is a suitable distance away to not be impacted by the proposed excavations.

It is undiscovered whether the existing building has any below ground structure, but if that is the case that will be a single level of basement. The proposed works involve a two-level basement construction, which means the proposed excavations might have a volumetric impact on the subsoils.

It is expected to find ground water flows during the excavation, however they would occur at a very slow rate such that they could be suitably controlled by sump pumping. According to the site investigation, the proposed works are not considered likely to have any detrimental effect on the local groundwater regime.



[FIGURE 5] LOCAL HARINGEY WATERCOURSES

5.3 PUBLIC HIGHWAY BOUNDARY PROXIMITY IMPACT

The implications of this matter are related to the design and construction of suitable retaining structures. This is therefore discussed and addressed in section 6, which details the considerations of how the structures will be built against the existing boundaries, and section 7, which addresses the works sequence.

5.4 STABILITY OF EXCAVATIONS

Excavations in made ground are more likely to be unstable and so may require temporary support.

Excavations within the firm sandy clay are expected to be stable in the short term.

The excavation of the whole basement area will be retained by a piling wall (either contiguous or secant, depending on ground water). Temporary lateral propping might be required during the construction works until the basement 1 level slab has been build and provides an intermediate prop to the piling wall.

5.5 STABILITY OF NEIGHBOURING PROPERTY

5.5.1 GROUND MOVEMENT ANALYSIS

The proposed excavation of the two level basements will remove an approximate depth of some 7m of soil.

A Ground Movement Analysis has been conducted, in line with CIRIA C580 to determine the movement response of the clay subsoils as a result of the proposed excavations. This has been calculated to determine an expected movement of the ground supporting neighbouring foundations, and correlated to a value on the Burland Scale.

Taking into account that the neighbouring building (Far End, Compton Avenue) is at approximately 1.5m distance from the position of the piling wall. For this study it has been assumed that the neighbouring building has a single storey basement (according to latest available information on the planning portal) with a piling wall acting as a retaining structure and the main building supported off strip foundations (very safe assumption). According to attached analysis in the appendix, we can certify that the movement on the existing building would be negligible.

The site investigation report states that following the excavation works will likely result in an elastic heave.

6. DETAILED PROPOSALS AND DESIGN CONSIDERATIONS

6.1 BASEMENT EXCAVATION

The protection of the neighbouring properties and boundary structures has been carefully considered, such to ensure that during the works, the boundary and neighbouring structures are protected from ground movement. The techniques proposed therefore are designed to conform with this.

6.1.1 PILING WALL

A piling wall will be installed to the whole perimeter of the basement to act as a retaining wall and allow the excavation works to be carried out, lowering the ground level to the proposed basement level. Temporary intermediate propping will be installed to ensure lateral stability of the retaining structure and removed once the basement and lower ground floor slabs have been built. The chosen contractor may choose to adopt a 'top down' method of construction, where the permanent slab would be used to prop the piled walls.

6.1.2 FLOOR SLAB

It is proposed to create a piled raft slab in order to spread the load into as many piles as possible. This will imply the installation of a heave zone under the reinforced concrete slab to avoid requiring to design the raft slab for ground recovery and soil heave.

6.1.3 HEAVE PROTECTION

Allowance has been made for a heave mat, a layer of cellcore under the raft slab and thicker layer under thickenings (pile caps) to avoid that soil movement affects the structure.

6.1.4 WATER PRESSURE AND CONTROL

No groundwater was evident that would impose load to the new floor slab. Investigations suggest that in the temporary as well as the permanent condition, groundwater is likely to be found but at slow rate such that sump pumping but be enough to dewater the area.

For the permanent design the water table will be assumed at a higher level, in accordance with the latest design guides and Codes, for designs of such items as buoyancy and structural design of basement slabs and retaining walls (including crack width calculations).

6.2 PARTY WALLS

The proposed development falls within the scope of the Party Wall Act 1996. Procedures under the Act will be dealt with in full by the Employer's Party Wall Surveyor. The Party Wall Surveyor will prepare and serve necessary notices under the provisions of the Act and agree Party Wall Awards in the event of disputes. The Contractor will be required to provide the Party Wall Surveyor with appropriate drawings, Method Statements and other relevant information covering the works that are notifiable under the Act. The resolution of matter under the Act and provision of the Party Wall Awards will protect the interests of all owners.

The scheme for Nice Place, Compton Avenue will be developed so as not to preclude or inhibit similar, or indeed any, works on the adjoining properties in the street. The Surveyors will verify this as part of the process under the Act.

6.3 DESIGN CODES

The following design codes will be followed during the detailed design stage:

- BS EN 1990:2002 Basis of Structural Design
- BS EN 1991-1-1:2002 Actions on Structures
- CIRIA 580 - Retaining Walls
- BS EN 1991-1-3:2003 Actions on structures - Snow
- BS EN 1991-1-4:2005 Actions on structures - Wind
- BS EN 1991-1-5:2003 Actions on structures - Thermal
- BS EN 1992-1-1:2004 Design of concrete structures. General rules and rules for buildings
- BS EN 1997-1:2004 Geotechnical design. General rules

Cross-checked with:

- BS 648 Weights of building materials
- BS 5268 - Structural use of timber

- BS 5628-1:2005 - Code of practise for the use of masonry
- BS 5950:1 - Structural use of steelwork in building
- BS 6399:1 - Loadings for buildings (Dead and imposed loads)
- BS 6399:2 - Loadings for buildings (Wind loads)
- BS 8000:Section 2.2:1990 - Workmanship on building sites
- BS 8002 - Earth retaining structures
- BS 8004 - Foundations
- BS 8102 - Protection of structures against water from the ground
- BS 8110:1 - Structural use of Concrete
- BS 8500-1:2015+A2:2019 Concrete specification
- The Building Regulations 2010 - Approved Document A

7. CONSTRUCTION METHODOLOGY

7.1 SEQUENCE OF WORKS

The outline construction sequence and temporary works assumed in the design and described in this report will be superseded by the Contractor's construction proposals. The Contractor will be required to provide full proposals, method statements and calculations to the engineer prior to the commencement of any works on site and these will be considered in conjunction with the permanent structures and verified as suitable before the works are implemented.

The appointed contractor will be required to provide a detailed sequence of works with their tender submission. An outline sequence of the substructures works is likely to be as follows:

- Secure site, erect hoardings, establish welfare facilities, and divert on-site services.
- Enabling works, demolition and stripping out works. Detailed sequence by specialist contractor. Remove debris and excavation arisings from site via the highway, in accordance with agreed management plan.
- Break out and remove existing ground floor and foundations.
- Installation of piling wall (secant or contiguous depending on the presence of ground water).
- Reduce level of soil internally to reach the proposed level of basement.
- Install any below-slab service runs
- Lay blinding and cellcore.
- Arrange reinforcement for raft slab then cast concrete slab.
- Construct slab and liner wall base
- Construct basement vertical elements (walls and columns) up to the lower ground floor level.

- Once cured, progress to lower ground floor level and repeat the process.
- When lower ground floor slab is cured, temporary props can be removed.

7.2 MOVEMENT CONTROL

The techniques proposed are proven to produce minimal or negligible movement effects to the party walls, and the deflection of the retaining walls can be practically limited so as to avoid disturbance to the retained ground.

It has been demonstrated that the excavations made and the works being conducted using normal techniques it is practical to achieve a level of 1 [very slight damage] on the Burland Scale, such to limit any damage to 'slight'.

A heave response, due to the relatively minor overburden relief, is not considered to represent a practical risk.

7.3 MONITORING OF ADJACENT STRUCTURES

It is proposed that the integrity of the adjacent properties is safeguarded by a system of movement monitoring. The Contractor shall appoint a specialist survey company to establish monitoring positions (targets) to key elements of the neighbouring buildings as deemed required.

The external facades and Party Walls will be monitored at these positions and the targets shall be firmly attached to allow 3D location measurement for the duration of the work, to a continuous and uninterrupted accuracy of +/- 1mm. Suitable remote reference bases unaffected by the works will be adopted.

Two series of baseline readings shall be taken before the work begins then readings shall be taken shortly after the start of excavation then at weekly intervals during the basement construction until the RC shell is complete and propped after which point the frequency will be reduced to then a final reading 6 months after completion.

All measurements will be plotted graphically, clearly indicating any movements over time. Results shall be submitted and circulated to all relevant parties including the appointed Party Wall Surveyors within 24 hours of being measured.

Trigger levels set out below are indicative and to be superseded by contractor/temporary works engineer proposal. In the event of a 'red' value being reached the Contractor must immediately stop, make safe the works, notify the Party Wall Surveyors and only recommence when agreed by the appointed Surveyors.

Trigger Levels for movement:

Vertical movement of Party Walls (including garden walls):

Amber +/- 5mm	All parties notified
Red +/- 8mm	Work stopped and reviewed

Lateral movement of Party Walls (including garden walls):

Amber +/- 5mm	All parties notified
Red +/- 8mm	Work stopped and reviewed

Lateral or vertical movement of facades:

Amber +/- 5mm	All parties notified
Red +/- 8mm	Work stopped and reviewed

7.4 NOISE, DUST AND VIBRATION

All demolition and construction works will be carried out by a competent and qualified contractor, who will be required to accord with the Considerate Constructors Scheme, and take all necessary measures to minimise the short term disturbances in terms of noise, vibration and dust which might impact on the local environment and the neighbouring residents and businesses.

The following measures and actions will be implemented:

Noise – Neighbours will be notified in advance of noisy activity, in particular where these are on or near boundary structures. Where there is particular sensitivity, activity will be restricted to 09:00-17:00 Monday to Friday.

In all cases where possible, electrically operation tools will be used in preference to engine driven machinery.

The use of site radios will be considered carefully in terms of their locations and volume levels, and if any neighbour complaints are received, a firm prohibition of their use will be enforced.

Vibration – While the use of percussive, powered machinery upon hard construction materials in many situations will likely give rise to inevitable vibration, wherever possible and in accordance with CCS Code, unnecessary vibration will be avoided and mitigated. This will take the form of the careful planning and consideration of the hardness of the material being demolished, and the works planned and notified accordingly, and where considered particularly unavoidable, the 09:00-17:00 working hours principle be observed.

Dust – Most of the works will be internal and so can be relatively easily isolated from becoming airborne and dispersing to neighbours and the local environment. External activity shall be contained as best as possible using suitable hoardings and sheeting.

Materials stored externally would be covered or contained to avoid wind and weather disturbance to granular and particulate materials. Structural concrete will be typically mixed off-site and delivered, but where small quantities or mortar are to be site mixed, this can be done in an enclosed area to limit cement dust from becoming airborne.

Deliveries of materials shall be covered where potential for dust is prevalent. Waste skips and excavated soils are to be covered whenever practicable.

For activities that generate dust, surface wetting-down, and water misting will be used to suppress dusting. Rotary cutters will use water as a dust suppressant.

Housekeeping – Shared driveways, external pavements on the site and in front of, will be regular swept, and should vehicles or windows become soiled, the contractor shall arrange cleaning as the neighbour so desires.

8. TEMPORARY WORKS

Temporary works design and coordination is to be carried out by a suitably qualified and experienced specialist and full design details (drawings and calculations) will be submitted to the engineer for comment. This specialist will be appointed by the Contractor who will be responsible for the design, erection and maintenance of all temporary works to ensure the stability of the existing structure, excavations and adjacent structures at all times.

9. SUMMARY

Temporary works during demolition of the existing building will assure the overall stability of the same. These will be designed by a specialist engineer and will be send for approval to the structural engineer.

During the excavation phase to create the two levels of basement, piling walls and lateral props will provide stability until the main structure is finished and the props can be removed.

Finally during the erection of the proposed building, sequence will be followed to achieve stability temporarily before the building is finished. Elements designed for

lateral stability (i.e. lift shaft, shear walls) will be erected first and rest of the structure will follow.

Environmental impacts have been assessed, and the response to geotechnical and hydrological aspects have been considered. The proposals are deemed to not have any adverse impact in this respect.

Once complete, the new structure will provide a robust and secure support without detriment to the overall stability of the adjoining property.

The front (eastern boundary) of the property is adjacent to the private highway of Compton Avenue. The surcharge to be used in the detail design phase is based on the Highways Agency Design Manual for Roads and Bridges Volume 1, Section 3, Part 14. Values of HB loading of 12.0kN/m² or HA loading of 10.0kN/m² would be adopted accordingly. The proposed retaining structures in the vicinity of this highway will therefore be designed to accommodate these loads in addition to the loadings imposed by the ground.

APPENDICES.

APPENDIX A: DRAWINGS

1733_01-A: Basement Plan - Sheet 1
1733_01-B: Basement Plan - Sheet 2
1733_02-A: Lower Ground Floor Plan - Sheet 1
1733_02-B: Lower Ground Floor Plan - Sheet 2
1733_03-A: Ground Floor Plan - Sheet 1
1733_03-B: Ground Floor Plan - Sheet 2
1733_21: Details & Sections - Sheet 1
1733_22: Details & Sections - Sheet 2
1733_23: Details & Sections - Sheet 3
1733_24: Details & Sections - Sheet 4
1733_25: Details & Sections - Sheet 5

APPENDIX B: SITE INVESTIGATION REPORT

GEA - Site Investigation Report (J11150A)

APPENDIX C: GROUND INVESTIGATION REPORT AND BASEMENT IMPACT ASSESSMENT

GEA - Ground Investigation Report and Basement Impact Assessment (J11150B)