V&R
VINCENT
& RYMILL

14 ROSECROFT AVENUE, LONDON. NW3 7QB

PROPOSED LOWER GROUND FLOOR UNDER FOOTPRINT OF BUILDING, INCLUDING LIGHTWELLS.

VINCENT & RYMILL

CONTENTS

1. INTRODUCTION.

Vincent & Rymill, Consulting Engineers, have been appointed by the building owner to prepare a B.I.A. for Planning purposes. The author of this report T. J. Vincent Bsc C.Eng M.I.Struct. E. first worked with The London Basement Company in 2004, designing and detailing such retro fitted basements all over London. Since that time T. J. Vincent has designed over 450 basements, both single and multi storey.

The property is a large three storey, semidetached dwelling probably constructed around the 1920's. The new development proposal is to provide a lower ground floor level below the footprint of the existing building, including light wells to the front and the rear.

Details of the proposals are shown by the relative 5d Architects drawings.

The purpose of this report / statement is to provide details of the stage 1 and 2 BIA as requested by the 'Camden Planning Guidance Basements and Light wells', together with details of the method and sequence of construction.

The figures referred to in the Screening section are those contained within the Arup Report, ' Camden Geological hydrogeological and hydrological study, guidance for subterranean development.' The relevant figure used are appended to the end of this report.

2. STAGE 1 - SCREENING FOR BIA- Reference Camden Planning Guidance Basements and Lightwells

Figure 1. Subterranean (ground water) flow screening chart.

Q1a Is the site located directly above an aquifer?
YES. See figure 8, site above 'Secondary 'A' aquifer'

Q1b Will the proposed basement extend below the water table surface?
NO. Formation of new lower ground floor is at - 3. 75m below rear garden level, site investigation has shown no ground water down to 4.00m below rear garden level.

Q2. Is the site within 100m of a watercourse, well or potential spring line?
NO. With reference to figure 12 the site is not within 100m of any of these features.

Q3. Is the site within the catchment of the pond chains on Hampstead Heath?
NO. Refer to figure 14.

Q4. Will the proposed basement development result in a change in the proportion of hard surfaced paved areas.
NO. Lower ground floor is below footprint of existing building, new light wells are formed replacing existing hard-scaped parts of the front and rear gardens.

Q5. As part of the site drainage will more surface water than at present be discharged into the ground.
NO. There is no increase in impermeable area.

Q6. Is the lowest point of the proposed excavation close to or lower than the mean level in any pond or spring line?
NO. There are no nearby ponds or spring lines.

Figure 2. Slope Stability Screening Flow Chart.

Q1. Does the existing site include slopes natural or manmade greater than 7^0
NO. Site does not include slopes greater than 7^0.

Q2. Will the proposed re-profiling of the landscaping at site change slopes at the boundary to more than 7^0
NO. There are no re-profiling works alongside the boundary that are not contained by r.c. walls.

Q3. Does the development neighbour land have slopes greater than 7^0.
NO. Neighbouring land does not contain slopes greater than 7^0.

Q4. Is the site within a wider hillside with general slopes greater than 7^0.
NO. Site is within a wider level area.

Q5 Is the London Clay the shallowest strata on the site.
NO. Head deposits of Bagshot Beds are shallowest strata.

Q6. Will any trees be felled or are any of the works within root zones of protected trees?
NO. No trees to be felled or no works within tree root protection zones.

Q7. Is there a history of seasonal shrink swell subsidence in the area? And evidence that this affects the site.
NO. Site examination of buildings did not reveal evidence of subsidence due to shrink / swelling of soils.

Q8. Is the site within 100m of a watercourse or a potential spring line?
NO. Site is not within 100m of such features

Q9. Is the site within an area of previously worked ground?
NO. The site is presently a dwelling within its own land.

Q10. Is the site within an aquifer?
Yes. See figure 8, site above 'Secondary 'A' aquifer'

Q11. Is the site within 50m of Hampstead Heath Ponds?
NO. Site is not within 50m of these ponds.

Q12. Is the site within 5m of a highway or pedestrian Way.
NO.

Q.13 Will the proposed basement significantly increase the differential depth of foundations to the relative properties.
YES. Carried forward to scoping

Q. 14. Is the site over any tunnels?
NO. No tunnels are known to exist under the site.

Figure 3. Surface Flow and Flooding Screening Flowchart.

Q1. Is the site within the catchment of the pond chains on Hampstead Heath.
NO. Site is not within the catchment area of the pond chains on Hampstead Heath.

Q2. As part of the proposed site drainage will surface water flows be materially changed from the existing route?
NO. The existing surface water routes will not be changed by the development.

Q. 3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas.
NO. The development does not increase the impermeable paved areas.

Q4. Will the basement result in changes to the profiles of the inflows of surface water being received by adjacent properties or downstream watercourses.
NO. The development does not increase the impermeable paved areas.

Q5. Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses.
NO. The presence of the basement structure will not alter the quality of the surface water.

Q6. Is the site in an area known to be at risk of flooding?
No. Camden Planning Guidance on page 29 does not list Rosecroft Avenue as being previously flooded.

Items to be Taken Forward to Stage 2 – Scoping

There are 3 items to be taken forward to the Scoping Stage;

Figure 1. Subterranean (ground water) flow screening chart.

Q1a Is the site located directly above an aquifer?
YES. See figure 8, site above 'Secondary 'A' aquifer'

Figure 2. Slope Stability Screening Flow Chart.

Q10. Is the site within an aquifer?
YES. See figure 8, site above 'Secondary 'A' aquifer'

Q.13 Will the proposed basement significantly increase the differential depth of foundations to the relative properties.
YES. Carried forward to scoping

3. STAGE 2 - SCOPING FOR BIA- Reference Camden Planning Guidance Basements and Lightwells

Figure 8.
Q1a Is the site located directly above an aquifer?

YES. *Potential impact; Site is located over secondary 'A' aquifer. However new lower ground floor formation is above water table as identified by site investigation and the works will not therefore affect any existing ground water flows, or any existing local extraction points for water.*

Q10. Is the site within an aquifer?
YES. *See figure 8, site above 'Secondary 'A' aquifer' Relevant reply as above.*

Q.13 Will the proposed basement significantly increase the differential depth of foundations to the relative properties.
YES.
'The construction of the basement below no 14 will require underpinning of the party wall shared between with no 14 and no 16, these foundations will be some 2 to 2.5m below the existing foundations.
The borehole investigation has shown the site to be overlain with 0.20m depth of made ground then the head deposits of the Bagshot Beds, then the Claygate member beds of the London Clay. Formation of the new lower ground floor will be within the Claygate Beds and the investigation lists this soil as having a medium shrinkage potential. The existing foundations are formed into the Claygate Beds, i.e. at least 1.00m below ground level which is below the effective depth where seasonal variation can occur within the ground. It is unlikely therefore those seasonal variations within the soils will differentially affect the varying level of foundations.
Prior to works commencing the existing fabric of 14 and the adjoining buildings will be inspected to identify and record any existing cracks or movement. Monitoring points will be fixed at third points along the party wall, these levelled horizontally and vertically, these would be checked weekly to monitor movement of the party wall.
Differential movements between the underpinned foundations and those on the adjoining property will be minimised and controlled through careful structural design and controlled construction. The new and existing foundations will be founded upon similar material, i.e. the Claygate Beds. Structural design will be made that result in lower acceptable bearing pressures at formation level these to control settlement movements, or pressures that imitate the existing bearing pressures below the existing foundations.
The method statement and construction sequence is added below for information.'

4. STAGE 3 - SITE INVESTIGATION AND STUDY- Reference Camden Planning Guidance Basements and Lightwells

The site is assessed as low risk.

A geological desk top study and a site specific borehole have been completed. Site conditions are known to be Bagshot Beds overlaying the Claygate Beds. Ground water was found to be at a depth of 4 to 5m below ground level.

5. STAGE 4 - IMPACT ASSESSMENT- Reference Camden Planning Guidance Basements and Lightwells

Attribute	Change from baseline	Comment
Geological / land stability	Nil	Ground is flat lying to rear of front elevation of property, Bagshot Beds over Claygate Beds.
Hydrogeological	Nil to not significant	Ground water level was found to be 4.0 to 5.0m below rear garden level, new construction will be above water table. Any ground water will flow around building.
Hydrological (surface water)	Nil	There is negligible increase in impermeable area. The lightwell area replace existing areas of hard standing.
Structural to own property	Nil	The existing foundations will be reformed down onto the stiffer soils of the Claygate Beds.
Structural to neighbouring properties / highway	Nil / improve	'The construction of the lower ground floor below no 14 will require underpinning of the party wall shared with no's 14 and 16, these foundations will be some 2 to 2.5m below the existing foundations. The borehole investigation has shown the site to be overlain with made ground then the Bagshot Beds then the Claygate Beds of the London Clay, the investigation lists the Claygate Beds as medium shrinkage potential. The existing foundations are formed into the Claygate Beds, i.e. at least 1.00m below ground level which is below the effective depth where seasonal variation can occur within the ground. It is unlikely therefore those seasonal variations within the soils will differentially affect the varying level of foundations.

The impact of the development is considered low and a full BIA is not considered necessary

6. STRUCTURAL DESIGN PHILOSOPHY

External Walls

New concrete walls below the property are designed as propped (at the base) cantilevers in reinforced concrete, the lower ground floor slab acting as the lateral prop at wall base level. The walls will be designed using the soil parameters relative to the site. The walls will be designed for a water table at 1.0m below ground level.

The surcharge load allowed on the external walls of the property will be 10KN/m^2 . The party wall bounding will have a surcharge load of 10.00KN/m^2 for adjoining floor and partition wall construction and will also take into account any loads from adjoining foundations.

Basement Slab

The slab will be formed in reinforced concrete. It will be designed for uplift due to water pressure below, or as a clear span as appropriate. The basement slab will act as a prop to the base of the basement walls. Ground floor slabs will be protected from heave by Cordek.

Design Criteria.

Basement walls and bases will be designed using the parameters for the retained soils and bearing soils as indicated by the Site Investigation.. The design is in accordance with BS 8002:1994.

The design will accomodate active and passive earth pressures. Pressure coeficients in the design will adopt ' at rest pressures'.

The wall and base in designed for the following

1. Vertical loads from walls above.
2. Party wall will be designed for a surcharge loading of 10kN/m^2.
3. Other external will be designed with a surcharge load of 10.00KN/m^2.
4. The design adopts a water head behind the wall to 1.0m below ground level.

The sub soils at new lower ground floor formation level will be Claygate Beds, an SBP of 125KN/m^2 will be used in the design to limit differential foundation movements.

Concrete will generally be grade RC35/45 and Class 1 to BRE Digest 363. Reinforcement will be grade 500N/mm^2.

Existing brickwork assumes 7N bricks in a lime mortar, CP.111 gives basic compressive stress for this makeup of 0.45N/mm^2, and therefore allowable bearing stress will be 0.45N/mm^2. Any bearings into existing external or party wall masonry will take account of this allowable stress.

Mortar will be class (ii) or (iii) as required.

Relevant Codes of Practice and British Standards

B.S. 8002	Code of Practise for Earth Retaining Structures
B.S. 8004	Code of Practice For Foundations
B.S. 6031	Code of Practice For Earthworks
B.S. 8110	Structural Use of Concrete
B.S. 5750	Structural Use of Steelwork in Buildings

7. PREDICTION OF DAMAGE TO ADJOINING PROPERTYS

Works to form the new lower ground floor will have construction sequenced in short sections, in excavations to form the walls and bases all soil faces will be continually temporarily laterally or vertically propped to avoid movement of soil during the construction stage. Permanent works will be designed to resist both pressures from the soils or structural loads from nearby buildings as appropriate.
Strict control of the construction method together with the structural design will limit any potential damage to the adjoining garage to categories 0 (nil) or 1 (slight) of the Burland Scale. Or none, or at worst, 'aesthetic' as described by the BRE document for movement in buildings.

8. BRIEF METHOD STATEMENT FOR CONSTRUCTION .

The exact sequence of works will be agreed with Main Contractor and Structural Engineer, clauses for a typical Contruction Method Statement for the works could be as follows.

a) The walls to the perimeter of the existing rooms will be underpinned in reinforced concrete. Underpins will take the vertical loads from the walls and horizontal loads from the earth. During their construction the walls and bases will require laterally propping in the temporary condition; propping will be made against the central earth pudding.
b) Underpinning legs will be excavated in short sections not exceeding 1200mm in width.
c) The sequence of the underpinning will be in the 1, 3, 5, 2, 4 sequence and such that any given underpin will be completed, dry packed, and a minimum period of 48 hours lapsed before an adjacent excavation commenced to form another underpin.
d) In the event that the existing foundations to the wall are found to be unstable, sacrificial steel jacks will be installed underneath the foundation to prop the bottom few courses of bricks. These steel jacks will be left in place and will be incorporated into the concrete stem.
e) Whilst forming the wall and in the event that the vertical soil face is unstable, lateral propping will be provided as required to the excavation and to the sides of the working trench. The front and side faces of the excavation will be propped using a sacrificial inert board and acrow props as appropriate.

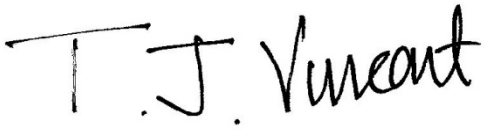
f) Concrete will be chuted from the point of delivery into a 'holding bath' within the working areas and placed by wheelbarrow and /or bucket, or mixed on site. The exact arrangement will be finalised when works commence on site.
g) Concrete will be placed within 30 minutes of batching on site, or delivery by lorry, concrete will be compacted with a mechanical hand held vibrator.
h) Excavation for an underpin section will be excavated in a day, and the concrete to the base poured by the end of the same day.
i) The concrete to the wall of the underpin will be poured the following day. This will be poured up to within 50 – 75mm of the underside of the existing wall foundations.
j) On the following day, the gap between the concrete and the underside of the existing foundation will be dry packed with a mixture of sharp sand and cement (ratio 3 : 1).
k) Once the dry pack has gained sufficient strength, any protrusions of the footings into the site will be carefully trimmed back using hand tools to avoid causing any damage to the foundation. The protrusions will be trimmed back to be flush in-line with the face of the wall above.
l) A minimum of 48 hours will be allowed before adjacent sections will be excavated to form a new underpin.
m) Once all pins are complete a temporary cross propping system will be introduced between the walls to allow bulk excavation will be carried out down to formation level.
n) The below – slab drainage for foul & ground water, sumps and pumps will then be installed. The pumps will discharge the foul / ground water into the sewer system to the front of the properties. The drainage layout will be designed in due course.
o) The basement slab will then be constructed, once cured this will provided the designed propping to the walls and the temporary cross propping can be removed.
p) A cavity drainage layer will be laid to the slabs and walls.

9. CONSTRUCTION SEQUENCE

1. Site set up will include a hoarding to the front garden; placement for skips will either be made within the front garden or on the public highway subject to Camden approval.
2. The site is only accessible from Rosecroft Ave, and therefore all site deliveries and operations will take place from here. This entrance will be manned throughout operational hours by a banksman to ensure construction deliveries do not pose a risk to other users of Rosecroft Avenue
3. Construct site hoarding, entrance gates to provide protection to passers-by from site operations. Site accommodation including welfare facilities will be confined to the main building throughout the site works.
4. Terminate / protect any incoming services temporarily divert any active drainage.
5. Install any tree protection measures as necessary.
6. Install enclosed skip to front on property and install conveyor to remove excavated soil to discharge soil into skip.
7. Construction under the property will commence by taking out the ground floor and reducing ground levels to just above existing foundation formation.
8. Underpins will be carried out in the usual 1, 3, 5, 2, 4 underpinning sequence, the construction sequence for forming the pin is shown on the Vincent & Rymill drawings submitted for planning. Backfilling of the excavation will be made after each pin has been formed.
9. On completion of all underpinning and fixing of the structural steelwork supporting the upper ground floor, cross propping of the pin walls will be erected to allow release of the local pins

that may be propped against the central dumpling so the basement slab can be constructed. The propping will be designed to suit the lateral loads behind the walls but generally takes the form of a series of horizontal slimshor props adequately laced and braced set approximately 1.5m from lower ground floor level.

10. Bulk excavation will be carried out down to basement slab formation level. Muck will continue to be removed from site via the conveyor belt.
11. The below – slab drainage for foul & ground water, sumps and pumps will then be installed. The pumps will discharge the foul / ground water into the sewer system to the front of the properties. The drainage layout will be designed in due course.
12. The basement slab (ground – bearing slab) will then be constructed.
13. After the new basement slabs have cured, the cross propping will be removed.
14. A drained – cavity layer will be laid to the slabs and walls.



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T. J. Vincent BSc C.Eng M.I.Struct E.
10 February 2016

FIGURE 1. CAMDEN ADMIN BOUNDARIES

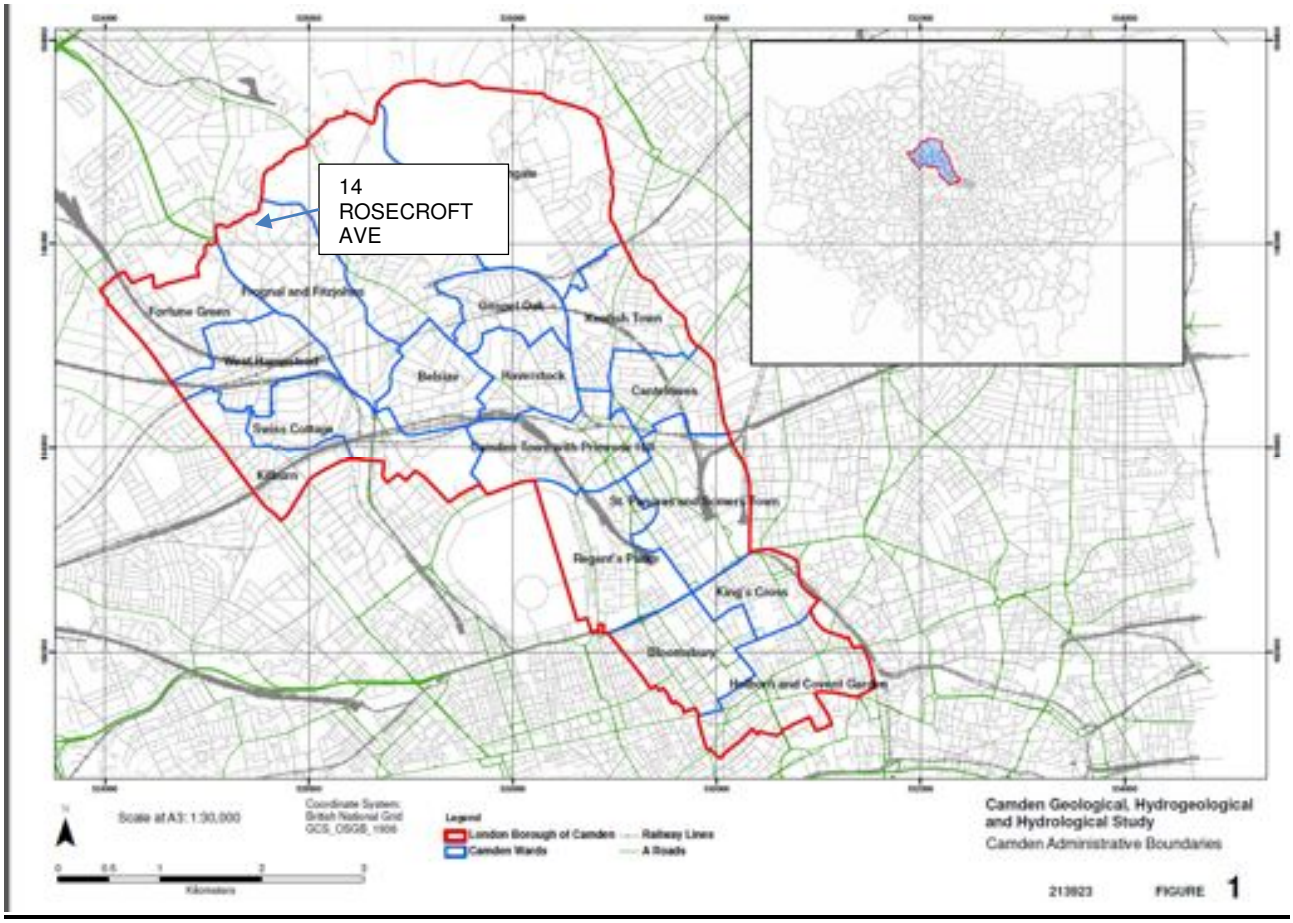


FIGURE 8. CAMDEM AQUIFER DESIGNATION MAP

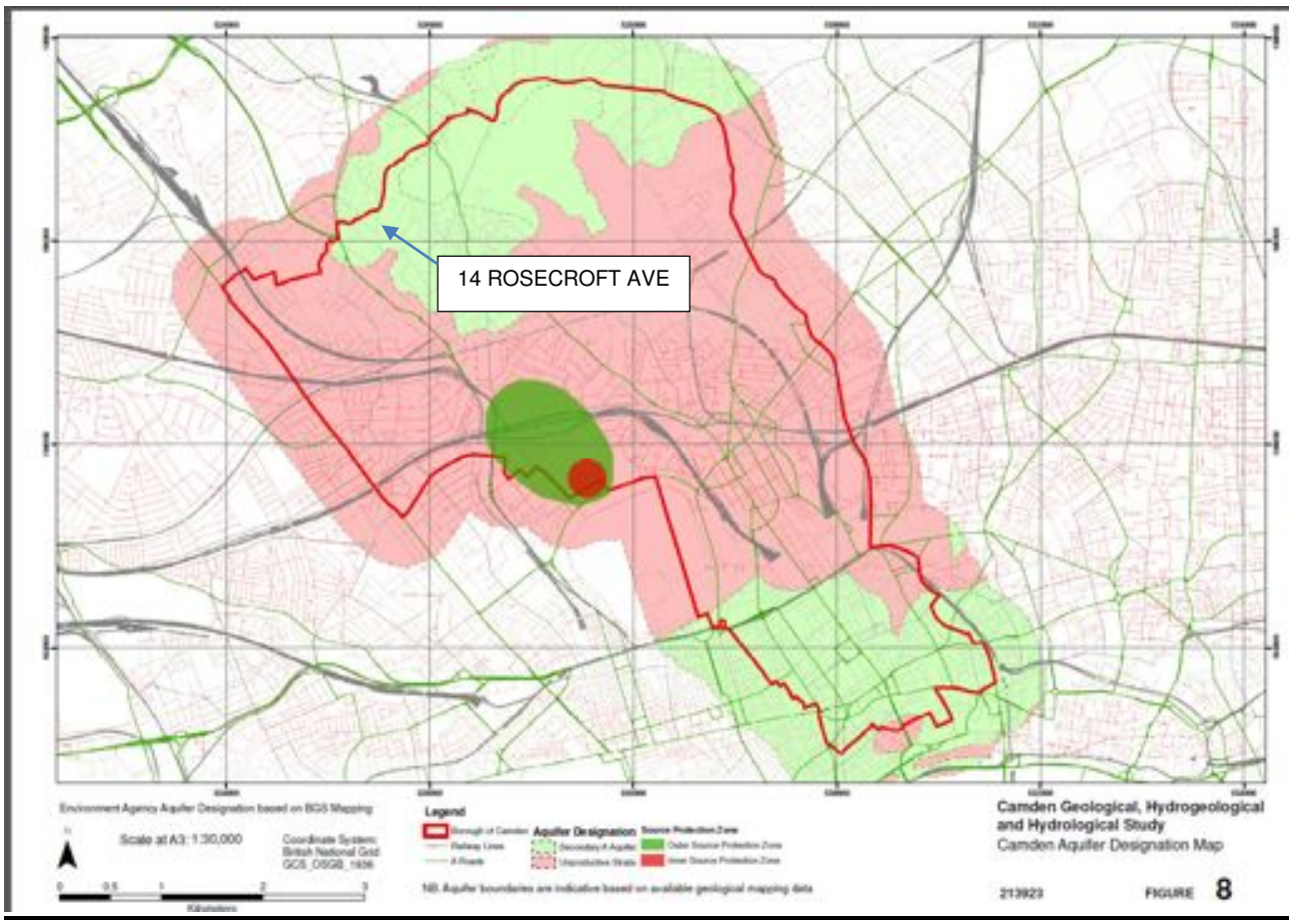


FIGURE 12 . CAMDEN WATER FEATURES

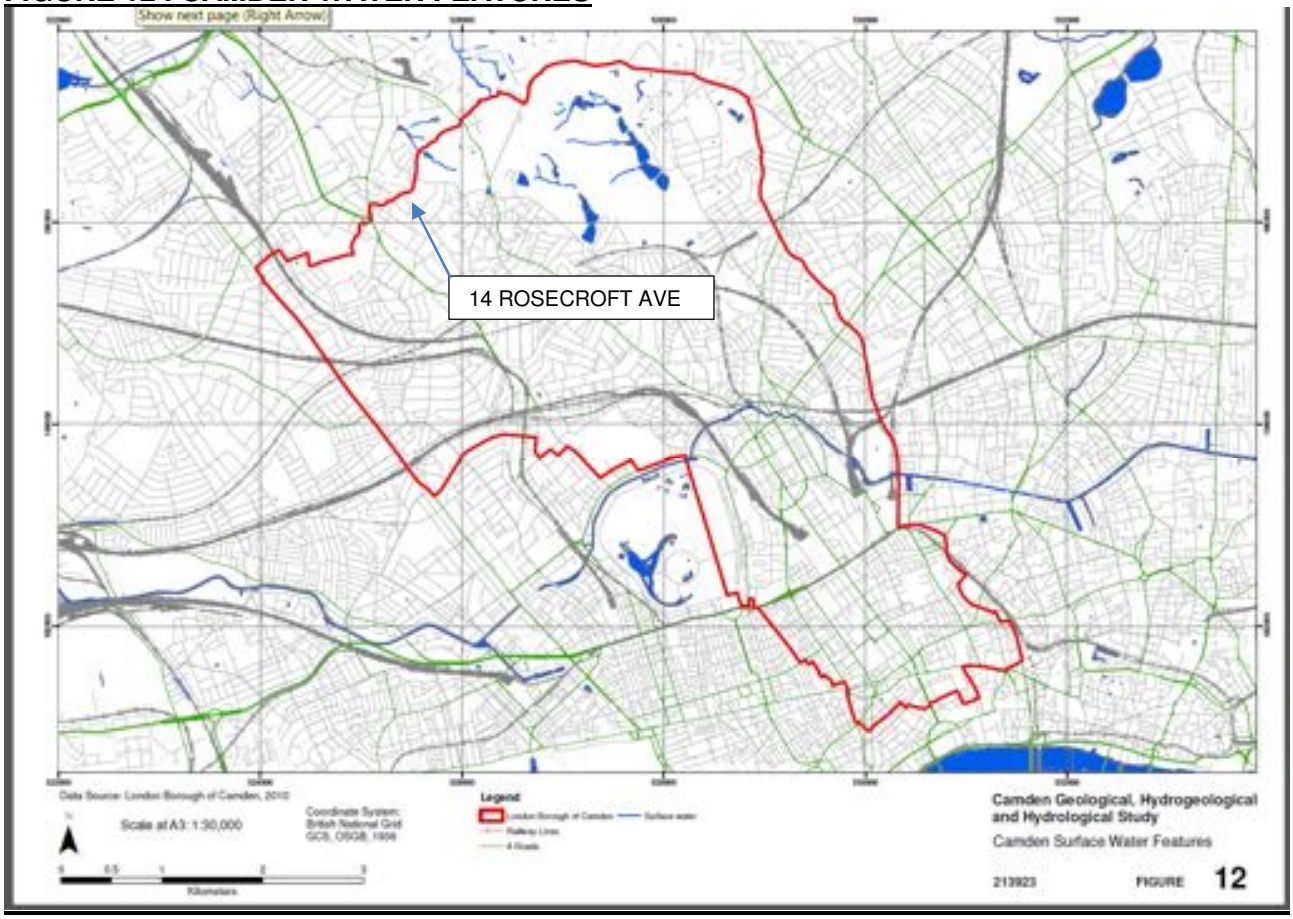
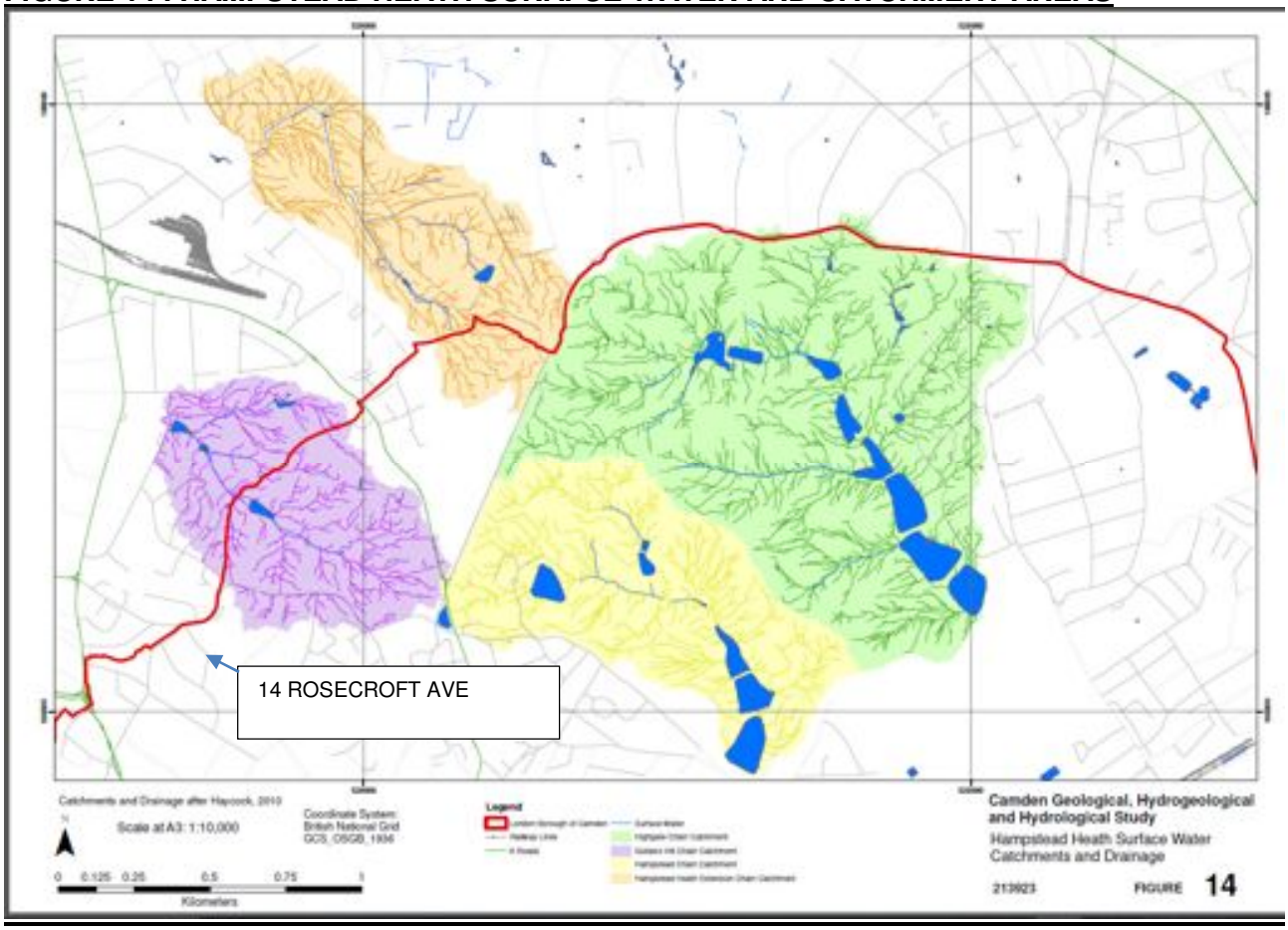


FIGURE 14 . HAMPSTEAD HEATH SURAFCE WATER AND CATCHMENT AREAS



CAMDEN GEOLOGY – Extract from FIGURE 4 Camden Geological, Hydrogeological and Hydrological Study