

BASEMENT IMPACT ASSESSMENT
51-52 TOTTENHAM COURT ROAD
LONDON W1T 2EH
LONDON BOROUGH OF CAMDEN

REF: 15606-c20160712bia



ISSUE STATUS

Issue No.	Date of issue	Details	Produced By	Checked by
1	22.02.2016	IFC	SV	HM
2	12.07.2016	IFA	HM	PD

H. Mourdjis
BSc Msc CEng MStructE
Ellis and Moore Consulting Engineers Ltd.

P. Deane
BEng CEng MICE MStructE
Ellis and Moore Consulting Engineers Ltd.



CONTENTS

1. Introduction
2. Stage 1 – Screening
3. Stage 2 – Scoping
4. Stage 3 – Site Investigation and Study
5. Stage 4 – Impact Assessment
6. Non – Technical Summary
7. Conclusions

Appendices:

1. Site Location Plan
2. Hydrological Maps
3. Site Investigation Report



1.0 Introduction

As instructed by Atlas Property Company on behalf of Dome Assets Limited, Ellis and Moore Consulting Engineers Ltd have undertaken a Basement Impact Assessment (BIA) in accordance with the Planning Guidance CPG4 prepared by Camden Council.

The wording in the Camden document is as follows:

Subterranean development of the site would trigger the need for a Basement Impact Assessment (BIA) prepared in accordance with Camden CPG4 (Basement and Lightwells). The policy DP27 sets out that applications should demonstrate (by Methodologies appropriate to the site) that schemes comply with the criteria (A) to (H). The BIA should address the impact of the proposals in terms of the stability and water environment, using the screening flow chart set out in the CPG. In particular, structural stability of the existing building on the site would be of concern and so the issue of slope stability will require attention.

This report follows the Camden Council requirements at the following Stages.

Stage 1	Screening
Stage 2	Scoping
Stage 3	Site Investigation and Study
Stage 4	Impact Assessment.

Finally conclusions have been drawn to aid the consideration by the Local Planning Authority (LPA).

In preparing the report, the following information sources have been relied on to provide information.

Geotechnical Site Investigation Report.

Thames Water Sewer Records

EA and Camden Geological, Hydrogeological and Hydrological Maps.

This report has been prepared by Ellis and Moore Consulting Engineers Ltd. staff holding the required qualifications relevant to the matters being considered as detailed in CPG 4 Basements and Lightwells.

The Report answers the stage questions in a non-technical precis format with statements provided where required giving justification for not carrying forward any matters not of concern.



The Report assumes the reader also has access to the following documents for reference purposes.

Site Location and boundary plan –	Squires & Partners
Design and Access Statement inclusive of existing and proposed Site development plans-	Squires & Partners
Geotechnical Site investigation – Ground Engineering	
Construction Management Plan	M.E.F.C.S.
Construction Traffic Management & Access plan	M.E.F.C.S.
Construction Environmental Impact Assessment and Control plan	M.E.F.C.S.



2.0 Stage 1 - Screening

A Basement Impact Assessment has been requested for this development to determine if the proposed works will result in possible flooding in future either due to ground or surface water.

Currently there are two existing buildings 51 is a three storey and 52 is a four storey brick building on the site both buildings have an existing small 2.40m deep basements. The general topographical profile of the land slopes down gently to the River Thames approximately 1.5km south refer to Ground Engineering (GE) Geotechnical Site investigation (GT SI) section on Location, Topography, Geology and Hydrogeology of the site issued as part of the BIA submission.

A full description of the proposed development plans, maps and or photographs to show location of basement relative to surrounding structures together with the Plan showing boundary of development can be found in the Design and Access Statement inclusive of existing and proposed Site development plans.

The flow charts Figures 3, 4 and 5 in the Camden Planning Guidance CPG4 document have been considered and it has been decided that a Basement Impact Assessment is necessary because of surrounding structures and proximity of public highway.

The following pages provide the responses to the screening flow chart queries together with the justification statements for not progressing those items that are not matters of concern.



The following are the answers to the
CPG 4 Figure 3 Subterranean (ground water) Flow Screening Chart

- 1A No the site is not located directly above an aquifer.
The site is underlain by approximately 10.0m of Gravel above a London Clay layer of at least 16.0m thick or more, as stated in GE GT SI Comments on the Ground conditions in relation to Foundation Design and Construction section.
- 1B No the proposed level of the basement floor will not extend beneath the water table surface.
The water table level found in the borehole as part of the site investigation is about 2.50m below the proposed basement development as stated in GE GT SI Excavations/Groundwater section.
2. No the site is not within 100 metres of a water course, well or spring line.
Refer to GE GT SI Groundsure search information section 6 Hydrogeology and Hydrology
3. No the site is not within the catchment of the pond chains on Hampstead Heath.
Refer to GE GT SI Groundsure search information section 6 Hydrogeology and Hydrology
4. No the proposed basement development will not result in a change to the proportion of hard surfaced/paved areas.
The developed site will have the same amount of hard surfaced areas as the existing site refer to the Architects existing and proposed plans as submitted.
5. No the proposed surface water run-off drainage will remain as existing so there will be no additional discharge.
The developed site will have the same amount of hard surfaced areas as the existing site refer to the Architects existing and proposed plans as submitted.
6. No the excavation will not affect the mean water level of any local pond or spring line.
Refer to GE GT SI Groundsure search information section 6 Hydrogeology and Hydrology

Summary

There are no matters of concern arising from the CPG 4 Figure 3 Subterranean (ground water) Flow Screening Chart.



The following are the answers to the
CPG 4 Figure 4 Slope Stability Screening Flow Chart.

1. No the existing site is almost level and does not include any slopes natural or manmade greater than 1 in 8.
Refer to the OS Mapping contours and Topographic Survey information.
2. No the site is not proposed to be re-profiled.
Refer to Architects proposed development drawings and sections.
3. No the development is not close to a railway cutting or any slopes steeper than 1 in 8
This can be proved by reference to the OS Mapping contours and Topographic Survey information
4. No the site is not within a wider hillside setting
This can be proved by reference to the OS Mapping contours and Topographic Survey information
5. No London Clay is not the shallowest strata on the site.
The site is underlain by approximately 10.0m of Gravel above a London Clay layer of at least 16.0m thick or more, as stated in GE GT SI Comments on the Ground conditions in relation to Foundation Design and Construction section.
6. No there are no trees on the site.
This can be proved by reference to the OS Mapping contours and Topographic Survey information and the Architects proposal.
7. No there is no history or evidence of shrink-swell or tree root subsidence in the area.
Refer to GE GT SI Information and Historical mapping contained within.
8. No the site is not within 100 metres of the water course or a potential spring line.
Refer to the OS Mapping contours and Topographic Survey information.
9. No the site is not within an area of previously worked ground.
The site has been developed in the past and the records are included in the GE GT SI.
10. The site is not within an aquifer.
There is a possibility of finding ground water if the weather is inclement during the construction period and localised pumping may be required during construction.
11. No the site is not within 50 metres of the Hampstead Heath Ponds.
Refer to the OS Location Mapping.
12. Yes the site is within 5 metres of the highway
There is a Public Highway immediately outside the front of the building.
13. Yes the proposed basement will significantly increase the differential depth of foundations relative to the neighbouring properties.
14. Yes the site may be over tunnels either railway, underground or other.

Summary

There are three matters of concern arising from the CPG 4 Figure 4 Slope Stability Flow Screening Chart that are carried forward to be dealt with in the scoping stage.



The following are the answers to
CPG 4 Figure 5 Surface Flow and Flooding Screening Flowchart.

1. No the site is not within the catchment area of the pond chains on Hampstead Heath.
The site location map and OS mapping contours show the statement is fact.
2. No the surface water flows from the site volume or run-off will not materially changed from existing
The existing site is totally developed and the proposal is to retain and refurbish the existing buildings altering above ground level and extending the basement to create the proposed layouts as shown on the drawings submitted by the architect.
3. No the proposed development will not result in a change in the proportion of hard surfaced external areas.
The existing site is totally developed and the proposal is to retain and refurbish the existing buildings altering above ground level and extending the basement to create the proposed layouts as shown on the drawings submitted by the architect.
4. No the proposal will not result in changes to the profile of inflows surface water.
The existing site is totally developed and the development proposals are within the proposed layouts as shown on the drawings submitted by the architect.
5. No the quality of the surface water will not be changed.
The proposal will not result in changes to the quality of surface water being discharged from the site as the surface water will be collected in a similar fashion to the existing SW collection system albeit with new pipework .
6. No the site is not in an area known to be at risk from surface water flooding.
This can be seen by referring to the EA Flood Mapping reproduced in the appendix and also from the SFRA mapping available on the LB Camden website. The site is in a Flood Zone 1 and has a site area less than 1.0 Ha therefore a Flood Risk Assessment will not be required due to the limited size of the development. However it is clear from a review of LB Camden`s SFRA and the EA website mapping that the site has a low possibility of flooding.

Summary

There are no matters of concern arising from the CPG 4 Figure 5 Surface Flow and Flooding Screening Flowchart.



3.0 Stage 2 – Scoping

This section deals with the points raised in Stage 1 Screening which require further investigation.

This Section Scope's those matters that have been answered as yes or unknown as part of the Flow Screening exercise which are identified as :-

1. The requirement to consider the proximity of the public highway.
2. The differential depth of the foundation relative to the neighbouring properties.
3. The possibility that the site may be over tunnels either railway, underground or other.

To scope point 1 the proximity of the public highway.

Any Structure abutting and upholding the public highway will be required to support the highway during and after construction so there is no impact on the support of the Highway. Therefore the developer will be required to apply to Camden Highways for approval in principal (AIP) for construction of a structure abutting the highway during the detailed design period which must be approved before the works commence on site.

To scope point 2 the differential depth of the foundation relative to the neighbouring properties.

The proposed development works and proposed structure is likely to have a basement depth that is 0.90m deeper than the neighbouring basements.

The excavation required may have some impact on the neighbouring properties therefore a structural monitoring regime before, during and after construction of the proposed development should be implemented as set out below.

The structural monitoring will be rated against the Burland Categories and have a category 1 Very slight limit set to avoid any unacceptable impacts on the neighbouring properties.

The developer will also be notifying, consulting and entering into party wall agreements with the owners of the neighbouring properties.

The contractor carrying out the work is likely to set up a working group with local residents and amenity groups to understand and address their concerns.

Monitoring will be undertaken as follows with target points on the Party walls.

Vertical movements of the party walls will be measured with the limits set as follows:

<0.1 mm green – OK

0.5mm amber – review working methods

1.0mm red – stop work.

Relative measurements will also be taken between set points.

The limit set should mitigate the damage to any adjacent properties to Burland Category 1.



A Ground Movement Analysis (GMA) taking into account the properties of the clay and the information in the soils investigation to estimate predicted ground movements is to be undertaken once the design loads have been calculated when the technical design is developed.

CPG 4 indicates that this movement may equate with Category 2 on the Burland Scale which is crack widths of less than 5mm which can easily be filled. This would be in keeping with the council policy DP27 and the Burland statement that the major objective of design and construction is to maintain a level to only risk aesthetic damage to buildings, by setting limits to Burland Category 1 this will mitigate any effects that may cause damage to any adjacent properties.

Using the working methods proposed it is considered that this is realistic in conjunction with the proposed monitoring however a Detailed design and Method statements will be required prior to construction for both the underpinning and the proposed structural works to form the basement.

To scope point 3 the possibility that the site may be over tunnels either railway, underground or other.

The position of all subterranean structures has been subject to a detailed record search. The major subterranean structures such as the statutory service providers and LUL tunnels with the shelter have been identified as under Tottenham Court Road refer to the sewer and LUL plans in the GE GT SI Report and will not be impacted on once the Highway Approval has been obtained as dealt with in point 1.

The site is in a Flood Zone 1 and has a site area less than 1.0 Ha therefore a Flood Risk Assessment will not be required due to the limited size of the development. However it is clear from the GE GT SI Groundsure information section and a review of LB Camden's SFRA and the EA website mapping that the site has a low possibility of flooding.

The geology of the area indicates that the site is underlain by made ground and gravel overlaying London Clay of substantial thickness.

The Thames Water (TW) Sewer Record plan indicates that there is a combined sewer serving the property positioned in the Highway outside the site.

The desk study and intrusive soils investigation is included in this report and should be read and referred to in conjunction with this report.

Scoping Summary

The three items identified in the screening stage as which require further investigation have been scoped and the necessary future actions and requirements have been indicated. Additional site information has also been given for complete coverage of relevant items.



4.0 Stage 3 – Site Investigation and Study

A geotechnical site investigation has been undertaken and issued separately but should be considered as an appendix to this report. The report was carried out to comply with current standards and guidance available at the date of issue.

The Ground Engineering (GE) geotechnical (GT) site investigation (SI) report C13604 can be summarised as follows.

An initial desk study was undertaken together with an historical and environmental search of records to include as part of the SI.

A limited intrusive field investigation was then carried out by GE by means of a window sampling (WS) borehole (BH) to surmise the actual geological makeup of the strata's to 10.0m below the site ground level.

The groundwater levels during the site investigation were recorded with later monitoring of levels taking place to form a baseline the monitoring and recording of water levels prior to commencement of works on site and during the construction period.

GE then carried out laboratory analysis of the samples obtained from site to prepare an interpretive report with recommendations from which relevant information has been extracted.

The information is included in within this BIA where applicable as well as detailed in the GE GT SI Report that should be referred to as required. The reader is recommended to refer to the Introduction and Location, Topography, Geology and Hydrogeology sections through to the Comments on the Ground Conditions in relation to Foundation Design and Construction as this serves as the geotechnical ground model. The site contained no trees, landscape or biodiverse features of note due to its location.

It is further concluded given recent experience of projects in this area that the groundwater water found in the borehole is a seasonally variable perched water table that fluctuates along the top of the clay strata the date of the information collected will indicate the likely variation expected.

Drainage from the site will be as existing utilising the existing drainage connections to the local public sewer network running below the Highway.

Site Investigation Summary

The initial desk study was undertaken together with an historical and environmental search of records and service plans to identify any constraints to the development. A limited intrusive field investigation was then carried out to discover the sub – surface geology of the site.



5.0 Stage 4 – Impact Assessment

From the information gathered in the previous Stages Screening, Scoping and Site Investigation an impact assessment can now be undertaken.

This stage should describe and quantify the effects of the development on the surrounding environment and explain any mitigation measures that may be required.

The existing surrounding environment is a built environment with no natural surface features.

The Screening stage flow chart on Hydrological surface flow showed there are no matters of concern arising either from the existing or proposed development therefore there is unlikely to be any impact upon the surrounding environment from this source.

It should also be noted the site flow patterns would be unchanged and the site is in an EA FRA Zone 1 area not liable to flooding.

The below ground drainage under the site will be redesigned to accommodate the development proposals but will impose no additional flow to the public sewer system in the Highway outside the site. The existing connections from the site to the sewer will be reutilised if the condition survey indicates that the existing pipes are serviceable.

The Screening stage flow chart on Subsurface groundwater flow showed there are no matters of concern arising either from the existing or proposed development therefore there is unlikely to be any impact upon the surrounding environment from this source. It should also be noted that the groundwater information obtained from the intrusive site investigation confirms this and provides the required information for detailed design of the proposal. Also from the Soils Investigation it is concluded that this building will not impose any restrictions on the flow of ground water as the underside of the basement is above the water level that was measured even allowing for a seasonal variation.

The Screening stage flow chart on Slope Stability showed there were three matters of concern arising either from the existing or proposed development however the likely impact of the proposed development will be mitigated by the measures described within stage 2 Scoping.

The proximity of the public highway will be mitigated by the detailed design of a retaining wall that will be submitted to the Local Highway Authority (LHA) for approval in principal (AIP) in accordance with the Highway Act requirements for a structure abutting and up - holding the Highway .

This should minimise any impact that the proposed development has on the Highway abutting the site.



The differential depth of the foundation relative to the neighbouring properties will be mitigated by the detailed design of the basement walls that will be fully designed and submitted for Building Control Approval.

A detailed design and method statement will be prepared to accompany the working drawings during the developed and technical design stages.

The adjacent structures will also be monitored for possible structural movement as described in the Stage 2 Scoping section within the Burland category measurement of possible structural damage.

This should minimise any impact that the proposed development has on the adjacent properties.

The client will also be negotiating and entering into Party Wall Agreements with the adjacent buildings freeholder owners.

The possibility that the site may be over tunnels either railway, underground or other has been mitigated by the position of all subterranean structures being subject to a detailed record search. The majority of the subterranean structures such as the statutory service providers and LUL tunnels have been identified as under Tottenham Court Road and will not be impacted on if the records are accurate. However as this area has been subject to development during WW2 notably with a subterranean bomb shelter within close proximity of Goodge Street Underground Station the foundation design will need to take this into consideration. This will be mitigated at design stage by using a steel box Frame to ensure a safe margin is maintained between the depth of the foundation and any possibility of impacting any subterranean structures.

The structural solution considered the most applicable would be to construct a series of L shaped reinforced retaining walls, underpinning the existing walls of the building. The outline sequence of works is subject to design development and will be issued at design stage.

The depth of the made ground below existing ground level and the level of the groundwater that was found in the standpipe implies the excavation will require propping during the construction.

This is likely to involve the use of sacrificial steel sheets at the rear of the excavation to prevent damage to the adjacent properties and to uphold the public highway.

A detailed design and method statement including an agreed sequence of works will be prepared to accompany the working drawings during the developed and technical design stages.

It is likely that the ground slab and walls would be formed in waterproof concrete using proprietary waterproofing materials and systems, such as Caltite or Pudlo and a drained cavity membrane.



Due to the depth of the new basement it is likely that the foul water may have to be pumped up to the existing sub-surface level and fed into the existing drainage system which discharges into the local public sewerage system. It will be necessary to undertake a drainage CCTV survey of the existing sub – surface drainage pipes prior to the works commencing so that access can be achieved into the existing drainage system for the foul drainage.

The proposed surface water drainage will be adequate to deal with any rainfall and runoff as it will be similar to the existing in flow path and nature.

During the site works, it is likely that temporary localised pumping of excavations may be required as a result of possible rainfall runoff collecting in the temporary excavation.

The limited demolition, excavation and construction works are likely to have a temporary impact upon the sites surrounding area. However these impacts will be mitigated by the methods and techniques explained in M.E.F Construction Services Documents provided as part of the submission. These are The Construction Management Plan, Construction Traffic Management & Access plan, and Construction Environmental Impact Assessment and Control plan.

Impact Assessment Summary

The impact assessment deals with the matters of concern arising from the screening stage and deals with the methods of mitigating against these items at design and construction stage. The impact assessment also deals with the temporary requirements of the demolition, excavation and construction works are likely to have upon the site and the surrounding area



6.0 Non – Technical Summary

The screening flow charts Figures 3, 4 and 5 in the Camden Planning Guidance CPG4 document have been considered and it has been decided that a Basement Impact Assessment is necessary because of surrounding structures and proximity of public highway.

There are no matters of concern arising from the CPG 4 Figure 3 Subterranean (ground water) Flow Screening Chart.

There are three matters of concern arising from the CPG 4 Figure 4 Slope Stability Flow Screening Chart that are carried forward to be dealt with in the scoping stage.

There are no matters of concern arising from the CPG 4 Figure 5 Surface Flow and Flooding Screening Flowchart.

Those matters that have been answered as yes or unknown as part of the Flow Screening exercise which are identified as :-

1. The requirement to consider the proximity of the public highway.
2. The differential depth of the foundation relative to the neighbouring properties.
3. The possibility that the site may be over tunnels either railway, underground or other.

The Scoping section deals with the points raised in Stage 1 Screening Stages which require further investigation.

The three items identified in the screening stage as which require further investigation have been scoped and the necessary future actions and requirements have been indicated. Additional site information has also been given for complete coverage of relevant items.

An initial desk study was undertaken together with an historical and environmental search of records and service plans to identify any constraints to the development. A limited intrusive field investigation was then carried out to discover the sub – surface geology of the site.

The impact assessment deals with the matters of concern arising from the screening stage and deals with the methods of mitigating against these items at design and construction stage. The impact assessment also deals with the temporary requirements of the demolition, excavation and construction works are likely to have upon the site and the surrounding area

7.0 Conclusions

The following conclusions are drawn based on the investigative work undertaken to date and can be drawn from the text within the report.

The BIA has been carried out in accordance with Camden's Planning Guidance CPG4 Basements and lightwells with all four stages covered.

The proposed development has been screened, scoped, the site has been subject to an intrusive site investigation with an interpretive report and its impacts fully assessed.

It can be seen from the stage progressions that the proposed site development detailed in the Architects design and access statement has no impact on the local natural or built environment and will only have limited temporary impact on the local amenities for a temporary period whilst the works are in operation.

The proposed site development will not result in an increased risk of local flooding or lead to any ground instability.

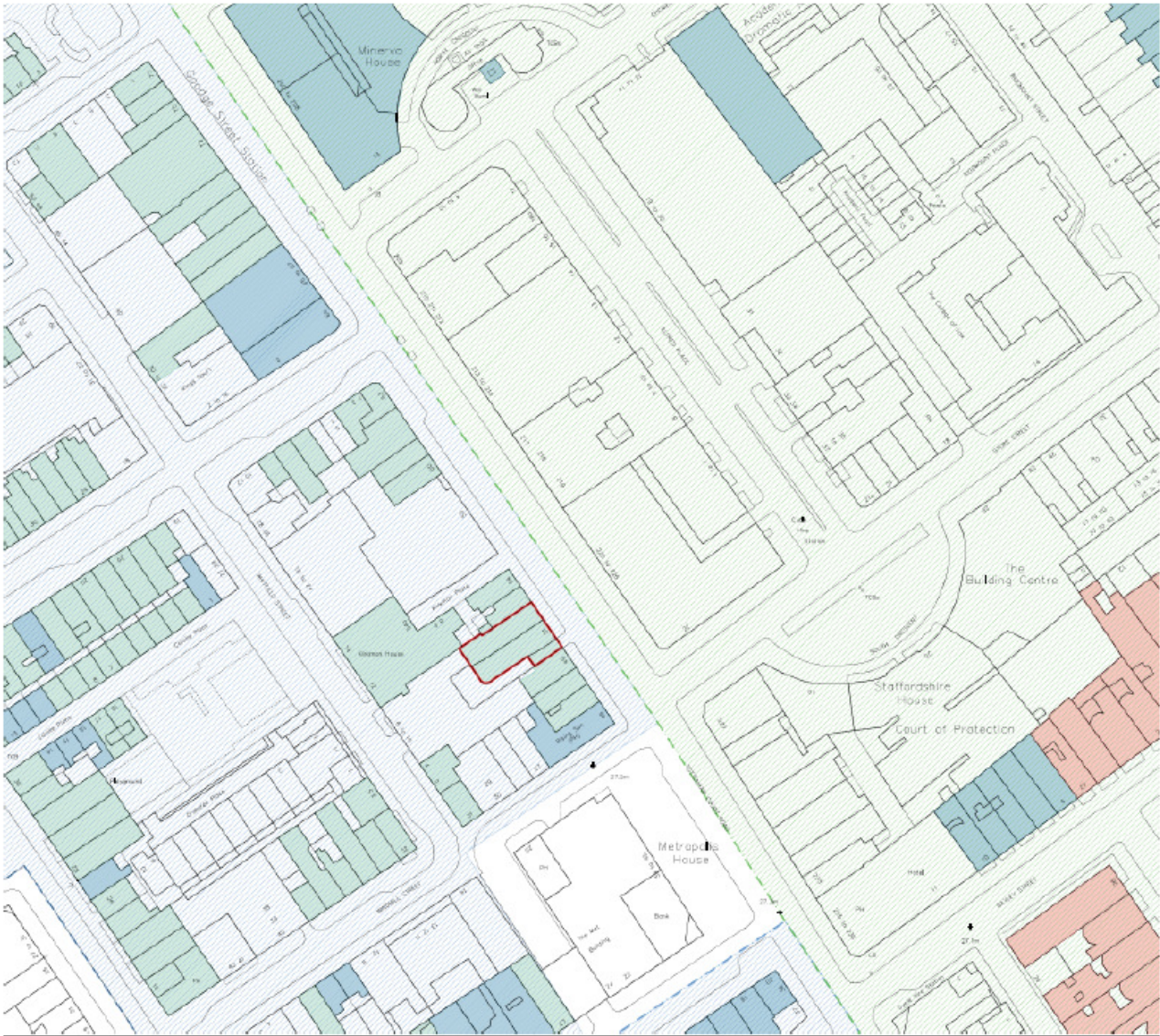
The development proposal fully complies with LB Camden's Planning policies and requirements and is submitted for approval as a permitted development.



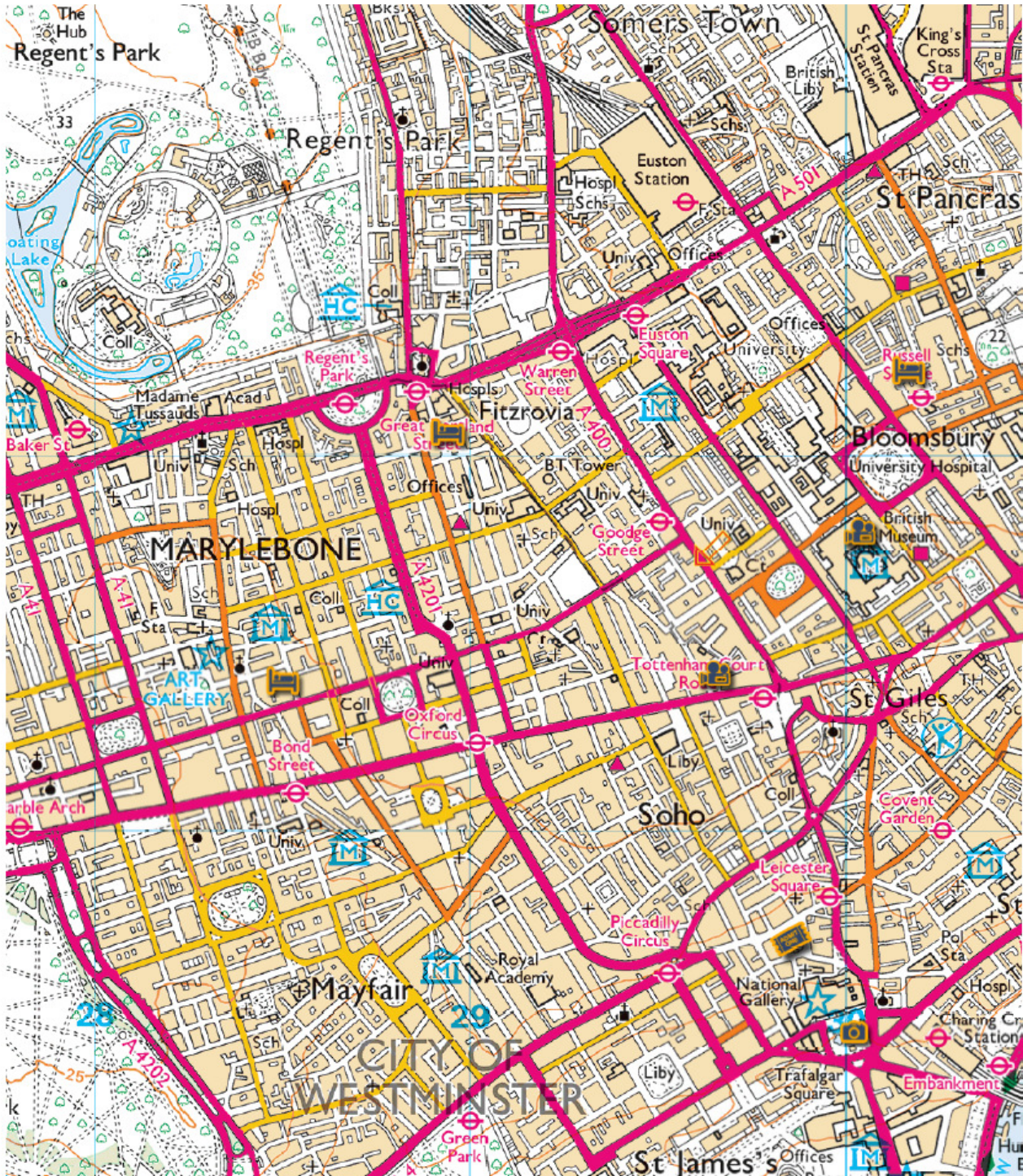
APPENDIX 1

SITE LOCATION PLAN









APPENDIX 2

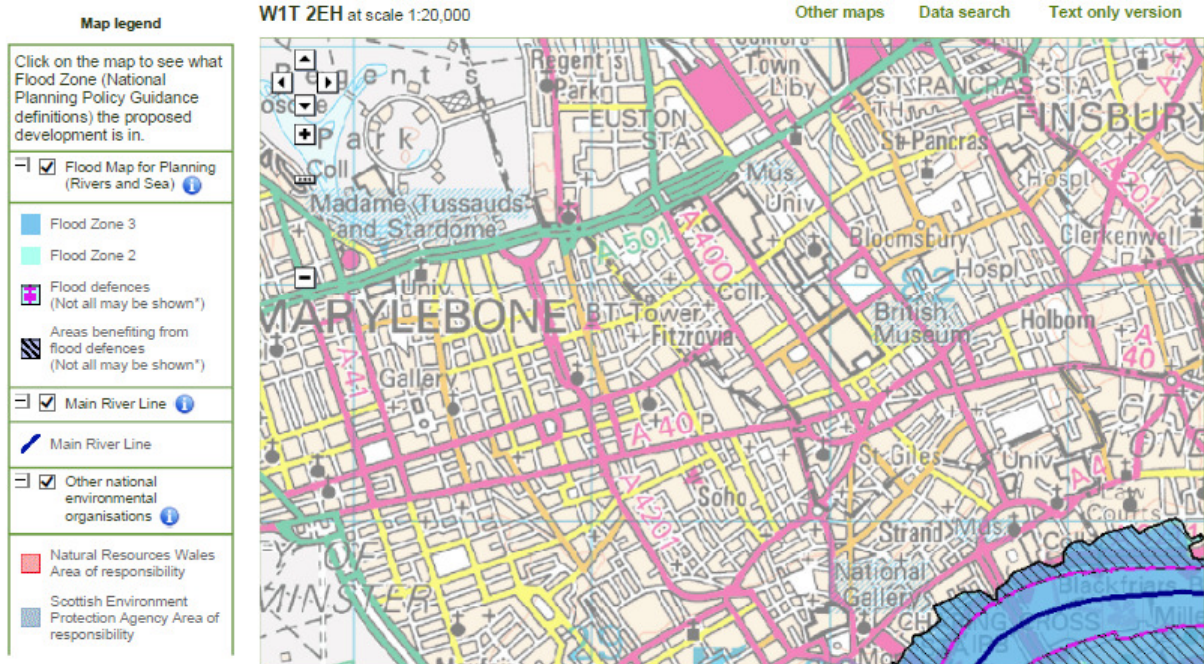
HYDROLOGICAL MAPS



EA FLOOD MAP

FLOOD ZONE 1

Enter a postcode or place name: Other topics for this area...



Customers in Wales - From 1 April 2013 Natural Resources Wales (NRW) has taken over the responsibilities of the Environment Agency in Wales.
© Environment Agency copyright and database rights 2015. © Ordnance Survey Crown copyright. All rights reserved. Environment Agency, 100026380.
Contains Royal Mail data © Royal Mail copyright and database right 2015.
This service is designed to inform members of the public, in line with our [terms and conditions](#). For business or commercial use, please [contact us](#).

APPENDIX 3

SITE INVESTIGATION REPORT

REPORT IS ISSUED AS A SEPARATE DOCUMENT

