

55 Fitzroy Park  
N6 6JA

Basement Impact Assessment  
Audit

For  
London Borough of Camden

Project Number: 12985-19  
Revision: F2

February 2019

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### Document History and Status

Revision	Date	Purpose/Status	File Ref	Author	Check	Review
F1	November 2018	Comment	RNemb12985-19 - 55 Fitzroy Park 23112018-F1.doc	RN	EMB	SA
F2	February 2019	Comment	RNemb12985-19 - 55 Fitzroy Park 22022019-F2.doc	RN	EMB	EMB

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### Document Details

Last saved	22/02/2019 15:52
Path	RNemb12985-19 - 55 Fitzroy Park 22022019-F2.doc
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Project Number	12985-19
Project Name	55 Fitzroy Park, N6 6JA
Planning Reference	2018/3672/P

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## 1.0 NON-TECHNICAL SUMMARY

- 1.1. CampbellReith was instructed by London Borough of Camden, (LBC) to carry out an audit on the Basement Impact Assessment submitted as part of the Planning Submission documentation for 55 Fitzroy Park (planning reference 2018/3672/P). The proposed basement scheme is considered to fall within Category C as defined by the Terms of Reference. An addendum to the BIA was produced following the initial audit (reference: RNemb 12985-19-55 Fitzroy Park 23112018-F1, dated November 2018). This addendum document along with the information received through further correspondence with LBH Wembley were reviewed as a part of the current audit.
- 1.2. The planning application pertains to the re-development of the property to comprise three three-storey and two two-storey detached residential developments along with access paths and associated landscaping; through removal of an existing house, a tennis court and mature trees within the proposed site area. The audit considers the lowest floor of all the proposed buildings to be a basement.
- 1.3. The Audit reviewed the Basement Impact Assessment for potential impact on land stability and local ground and surface water conditions arising from basement development in accordance with LBC's policies and technical procedures.
- 1.4. The BIA (Geotechnical Assessment and the Hydrological and Hydrogeological Impact assessment) and the BIA addendum have been prepared by LBH Wembley using individuals who possess suitable qualifications.
- 1.5. A Structural and Civil Engineering Design Statement, submitted prior to the initial audit, has been prepared by Coyle Kennedy Consulting Engineers, but the qualifications of the individuals concerned with its production are still not known.
- 1.6. The BIA has confirmed that the buildings would be supported on CFA piles founded in London Clay, with the basements partially embedded within the superficial deposits for the buildings on the western site area.
- 1.7. It has been established that the site lies within a Critical Drainage Area and that the surface water flood hazard (flood risk to people) in the event of a 1 in 1000 rainfall event is 'Significant' in the area of the man-made pond. Mitigation measures have been proposed to manage this risk and is discussed in detail in Section 4.
- 1.8. It is understood that some mature high water demand trees, especially those occupying the area for the proposed building in Plot no.4, shall be removed as a part of the development. The BIA recommends piled foundations and suspended floor slabs to overcome any impacts.

- 1.9. The groundwater monitoring data is now provided within the addendum, and based on the water levels it is evident that the groundwater present on site is perched in the Made ground. Mitigation measures are described to offset any potential impact by the basements on groundwater flows.
- 1.10. It is proposed to construct sheet pile retaining walls to permit basement construction. Queries on the retaining wall design have now been addressed and are discussed in detail in Section 4.
- 1.11. Further information in the form of a technical note was provided by LBH Wembley via email correspondence on 11<sup>th</sup> February 2019. This document presented evidence regarding the distance and scale of the proposed works for Plots 1, 2 and 3 in relation to Fitzroy Park. Based on the information provided, it is accepted that the works will not adversely impact the stability of the Fitzroy Park and other neighbouring sites.
- 1.12. The previous audit report (reference: RNemb 12985-19-55 Fitzroy Park 23112018-F1, dated November 2018) stated concern over the presence of a discharge pipe understood to be present underneath Millfield lane which helps carry and discharge excess outflow from the site across the street and into to the Heath. Clarification is provided within the addendum regarding the absence of any such pipe. It is now understood that currently any excess water from the pond is directed via a weir and discharge pipe arrangement and that it finally trickles on to Millfield lane, flows over the path and then finally into the Heath. Whilst this requires further review and design, it falls outside the scope of the BIA and its audit.
- 1.13. The detailed utility survey that was requested for the area during the previous audit is now provided along with the BIA addendum and was found to be satisfactory.
- 1.14. It is accepted that the slope stability analysis and the detailed assessment of the MSE wall and any load bearing embankments constructed along the perimeter of the man-made pond are beyond the scope of the basement impact audit. However, a detailed assessment should be carried out in due course to ensure that there will be no implication on the stability of the man-made pond which forms an important catchment for the locality.
- 1.15. On the basis of the original BIA documents and additional information presented, it is accepted that the BIA meets the requirements of Camden Planning Guidance: Basements.

## 2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 11<sup>th</sup> October 2018 to carry out a Category C Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 55 Fitzroy Park, N6 6JA.
- 2.2. An initial Audit was carried out in accordance with the Terms of Reference set by LBC in November 2018. It reviewed the Basement Impact Assessment for potential impact on land stability and local ground and surface water conditions arising from basement development. A BIA addendum and updated information were provided by LBH Wembley based on the initial audit, the final correspondence being on 11<sup>th</sup> February 2019. This audit considers the additional and revised information submitted following the previous audit report.
- 2.3. A BIA is required for all planning applications with basements in Camden in general accordance with policies and technical procedures contained within
- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.
  - Camden Planning Guidance: Basements, March 2018.
  - Camden Development Policy (DP) 27: Basements and Lightwells.
  - Camden Development Policy (DP) 23: Water.
  - Local Plan Policy A5 Basements.
- 2.4. The BIA should demonstrate that schemes:
- a) maintain the structural stability of the building and neighbouring properties;
  - b) avoid adversely affecting drainage and run off or causing other damage to the water environment;
  - c) avoid cumulative impacts upon structural stability or the water environment in the local area;
- and evaluate the impacts of the proposed basement considering the issues of hydrology, hydrogeology and land stability via the process described by the GSD and to make recommendations for the detailed design.
- 2.5. LBC's Audit Instruction described the planning proposal as *"Demolition of all existing buildings on site and their replacement with five detached homes (Class C3) (three x part 2 part 3 storey houses at front facing Fitzroy Park and two x part 1 part 2 storey houses at rear adjoining*

*Millfield Lane) plus associated driveways, access paths, carparking, landscaping and pond enhancements.”*

2.6. During the initial audit, CampbellReith accessed LBC's Planning Portal in October 2018 and gained access to the following relevant documents for the initial audit:

- Hydrological & Hydrogeological Impact Assessment prepared by LBH Wembley, (Reference: LBH4480 Ver.2.0, dated July 2018);
- Construction Management Plan prepared by Montway;
- Geotechnical Assessment prepared by LBH Wembley (Reference: LBH4480 Ver.2.0, dated July 2018);
- Design and Access Statement prepared by Piercy and Company (dated August 2018);
- Site Investigation Report by Concept Site Investigations, dated September 2018;
- Structural and Civil Engineering Design statement (Reference: 16-254-181025-01RP, by Coyle Kennedy Consulting Engineers;
- Arboricultural Impact Assessment & Tree Protection Plan prepared by BoskyTrees (dated 11 July 2018);
- Planning Application drawings consisting of;
  - Site Location Plan (Dwg no: 010 prepared by Piercy & Company, dated August 2018)
  - Existing site plan (Dwg no: 005 prepared by Piercy & Company, dated September 2018)
  - Proposed plans and sections (Dwg no: A1000, A2000, A2010, A2011, A2201, A2200, A2300-2301 prepared by Fathom Architects, dated April 2018)
  - Proposed Plans and sections (Dwg no: 100 – 150 prepared by Piercy & Company, dated August 2018)
- Planning comments and response.

2.7. CampbellReith accessed LBC's Planning Portal in December 2018 and gained access to the following relevant documents for the current audit:

- Addendum to BIA submission (Reference: LBH4480biaa Ver.1.1, dated December 2018);
- Addendum to BIA submission (SuDS) (Reference: LBH4480suds Ver 1.1, dated December 2018);
- Comments from Alan Baxter (Reference: 1675/118/DR/msk, dated December 2019);
- Comments from Nexus Planning (dated December 2019).

2.8. The following additional information was provided via email correspondence, and is included under Appendix 3 of this report:

- Notes on Plot 1, 2 & 3 Fitzroy Park Carriageway Impacts from LBH Wembley (dated February 2019).



### 3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	
Is data required by Cl.233 of the GSD presented?	Yes	
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	
Are suitable plan/maps included?	Yes	Refer Addendum to BIA submission dated December 2018.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	Refer Addendum to BIA submission dated December 2018.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Refer Geotechnical Assessment prepared by LBH Wembley, dated July 2018.  Although not relevant to the BIA, it is suggested the stability of the embankment slopes under proposed surcharge/vehicular loads be assessed in due course.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Refer to Hydrological & Hydrogeological Impact Assessment, dated July 2018.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Refer to pages 26-37 of Hydrological & Hydrogeological Impact Assessment, dated July 2018
Is a conceptual model presented?	Yes	It is suggested that model be revised to include the presence of perched groundwater, although it is accepted that the conclusions of the impact assessment are justified.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Refer to pages 20-21 of the Geotechnical Assessment, dated July 2018 and Notes on Plot 1, 2 & 3 Fitzroy Park Carriageway Impacts from LBH Wembley, dated February 2019.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Refer to Hydrological & Hydrogeological Impact Assessment, dated July 2018 and Geotechnical Assessment prepared, dated July 2018.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Refer to Hydrological & Hydrogeological Impact Assessment, dated July 2018 and Geotechnical Assessment prepared by LBH Wembley, dated July 2018.
Is factual ground investigation data provided?	Yes	Refer to Site Investigation Report by Concept Site Investigations, dated September 2018.
Is monitoring data presented?	Yes	Refer to addendum to BIA submission, dated December 2018.
Is the ground investigation informed by a desk study?	Yes	Refer to Hydrological & Hydrogeological Impact Assessment, dated July 2018.
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	
Is a geotechnical interpretation presented?	Yes	Refer to page no. 22 of Geotechnical Assessment, dated July 2018.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Refer to Geotechnical Assessment, dated July 2018.
Are reports on other investigations required by screening and scoping presented?	Yes	Arboricultural Impact Assessment, Construction Management Plan etc are presented.
Are the baseline conditions described, based on the GSD?	Yes	Groundwater monitoring details are now included in BIA addendum,

Item	Yes/No/NA	Comment
		dated December 2018.
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	
Are estimates of ground movement and structural impact presented?	No	However, it is accepted that the neighbouring properties will not be affected by ground movements as a result of the basement development. Refer to section 4.7 of this report for further details.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	
Has the need for monitoring during construction been considered?	Yes	It is accepted that the proposed basement development will have no adverse impact on the neighbouring properties. Refer to section 4.7 of this report for further details.
Have the residual (after mitigation) impacts been clearly identified?	Yes	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	Refer to the Geotechnical Assessment, dated July 2018, the BIA addendum and Notes on Plot 1, 2 & 3 Fitzroy Park Carriageway Impacts from LBH Wembley.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	Refer to the Geotechnical Assessment, dated July 2018, the BIA addendum and Notes on Plot 1, 2 & 3 Fitzroy Park Carriageway Impacts from LBH Wembley.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	Refer to the Geotechnical Assessment, dated July 2018, the BIA addendum and Notes on Plot 1, 2 & 3 Fitzroy Park Carriageway

Item	Yes/No/NA	Comment
		Impacts from LBH Wembley.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	No	However, it is accepted that the proposed development will have no adverse impact on the neighbouring properties with regard to the development of basements.
Are non-technical summaries provided?	Yes	Refer to Page 16 of the Geotechnical Assessment, dated July 2018.

## 4.0 DISCUSSION

- 4.1. The initial Basement Impact Assessment (BIA) comprised two documents, namely a Geotechnical Assessment and a Hydrological & Hydrogeological Impact Assessment. The assessments have carried out by LBH Wembley Engineering and the individuals concerned in its production have suitable qualifications.
- 4.2. The Basement Impact Assessment (BIA) addendum and further information, received by email, were prepared by LBH Wembley. Again, the individuals concerned with its production have suitable qualification.
- 4.3. The proposed redevelopment will take place in a site which lies within the Highgate Conservation Area, on the west side of Fitzroy Park and backs onto Hampstead Heath. The site is roughly trapezoidal in shape with a gross area of 0.35ha and slopes from +84m OD adjacent to Fitzroy Park in the east, down to about +77.50m OD adjacent to Millfield Lane in the west. A man-made pond is present in the northern area of the site.
- 4.4. It is proposed to redevelop the property through removal of existing structures to form two two-storey houses in the west (plots 4 and 5) and three three-storey houses in the east (plots 1, 2 and 3) along with associated soft and hard landscaping. The proposed works will lead to the demolishing of an existing two storey residential building towards the eastern side of the property, and the removal of a hard-surfaced tennis court in the western corner and mature trees in the south-west corner.
- 4.5. It is understood that plots 1, 2 and 3, near Fitzroy Park road, will require up to 1.50m of excavation from the existing level to facilitate the lower ground floor. Plot 5, planned near the pond in the western end of the site, will require excavation up to 1.40m and Plot 4 will require an excavation of up to 2.50m to facilitate construction of the ground floor. The building planned on Plot 5 will be constructed at a distance of 4.40m away from the man-made pond.
- 4.6. The BIA has identified that the site is underlain by Made Ground to variable depths of 1m to 1.50m below which lies the London Clay Formation. Along the western portion of the site, the BIA has identified the presence of Superficial Deposits overlying the London Clay beneath the Made Ground increasing in thickness from 1m to 2m in an east-west direction. The Hydrological and Hydrogeological Impact Assessment report also presents evidence for the possible presence of an infilled channel running across the man-made pond in a northeast to southwest direction.
- 4.7. The Geotechnical Assessment states that due to the variable ground conditions present throughout the site, a bored or CFA pile foundation 300mm in diameter and up to 25m long, founded in the London Clay would be the preferred foundation solution. The proposed development also considers the use of suspended floor slabs to avoid possible ground

movement. It is accepted that a piled foundation solution with suspended floors will address any issues caused due to heave and shrinkage of soil.

- 4.8. The existing layout plan (Drawing no: 005, dated 27<sup>th</sup> September 2018) and the landscape masterplan (Drawing no: 010, dated 16<sup>th</sup> July 2018) were studied, and it was understood that access paths with associated earthworks are also planned as a part of the re-development. The access paths would require the introduction of a retaining wall and shallow embankments with their side slopes ranging from 1:2.5 to 1:1.6 along the southern and eastern perimeter of the man-made pond.
- 4.9. It is mentioned in the CMP document that a 'Mechanical Stabilizing Earth Retaining Wall System' is planned for the southern edge of the pond for supporting the permanent access pathway. It is understood that the path may be used by construction vehicles. It is accepted that the slope stability analysis and the detailed assessment of the MSE wall (or any other form of wall) and any load bearing embankments constructed along the perimeter of the man-made pond are beyond the scope of the BIA and its audit. However, a detailed assessment should be carried out in due course to ensure that the final design will have no adverse implications on the stability of the man-made pond, which forms an important catchment for the locality.
- 4.10. It is stated in the BIA that temporary sheet pile retaining walls will be constructed to allow the basements to be formed. It was noted during the initial audit that the drawings provided are mostly schematic in nature. No engineers' drawings were presented. Outline calculations and sketches demonstrating the proposal for retaining walls and foundations were requested. These have since been presented and found to be satisfactory.
- 4.11. Details regarding an existing sheet pile wall located along the site boundary with Fitzroy Park road are not available. Additional information provided in the technical note received via email (see Appendix 3), shows that the closest excavations planned (basements to Plots 1-3) are located 7m away from the existing wall. Hence it is accepted that that the proposed basement scheme has negligible impact on the retaining wall and Fitzroy Park road during the course of works.
- 4.12. Groundwater monitoring data has now been presented within the BIA addendum and a contour plan of the indicative groundwater table across the site has been presented within the Geotechnical Assessment report. It is evident from the information provided that the ground water in the site is perched within the Made Ground at c.0.50m below ground level. The BIA acknowledges that the basements may interrupt the flow of groundwater across the site and mitigation comprising a network of drainage around the proposed houses has been described. It has been confirmed that the drainage 'trenches' are modest in nature and do not require significant excavations. Whilst this scheme will have to be developed into detailed design, it is accepted as a suitable mitigation strategy.

- 4.13. It was understood that as per the Camden SFRA, the risk of flooding from surface water around the area of the man-made pond was high and that the entire site lies within a 'Critical Drainage area Group3\_001'. A hazard mapping created by the EA indicates that the site lies in an area which comes under a 'Significant' flood hazard in the event of a 1 in 1000 rainfall event. It is stated within the BIA that the proposed landscaping shall direct any surface floodwater away from houses to the existing discharge run-off route originating from the weir present towards the western section of the pond. It is also mentioned that " *Plots 4 and 5 will manage the residual risk of flooding, through specific drainage of the proposed hard-surfaced courtyards placed below pond water level through flood resistant design.* " It is accepted that suitable measures have been proposed to mitigate the effects of such a flood event.
- 4.14. It is stated within the BIA that the proposed development will decrease the overall extent of hard-surfaced areas. Although this statement may be accepted with regard to the five new basements, the same cannot be said for the overall scheme, due to the complexity of the scheme and the number of alterations proposed to the existing layout.
- 4.15. The above statement is based on the assumption that the tennis court present towards the west of the site has an impermeable hard-surface, and was not validated within any of the information presented. However, given that any change to impermeable surface areas is driven by the overall development rather than the basements (the basements sits almost entirely beneath the footprint of the proposed houses), it is accepted that the surface water will not be considerably altered by the basements.
- 4.16. It was noted during the previous audit that the storage calculations were carried out by considering the 'Standard percentage of run-off coefficient for the soil category' and the area of the catchment, without factoring the water feature already present within the site area. Within the updated documentation a clarification regarding the cumulative impacts of the change to surface water management is included as a separate addendum for SuDS Management. This is beyond the scope of the BIA and it is understood that a detailed assessment of SuDS for the scheme is being prepared by others.
- 4.17. The detailed utility survey that was requested for the area during the previous audit is now provided along with the BIA addendum and was found to be satisfactory.
- 4.18. The additional information provided clarifies that the existing weir arrangement will direct any excess outflow flow from the man-made pond on site to a discharge pipe proposed to be constructed underneath Millfield Lane which will act as a conduit for this excess outflow to be taken across the path. Again, this falls outside the remit of the BIA and its audit.

## 5.0 CONCLUSIONS

- 5.1. The BIA addendum has been prepared by well-known firms of engineering consultants using individuals who possess suitable qualifications.
- 5.2. The BIA has confirmed that the proposed basement will be founded on London Clay and that the basement of buildings on Plot no. 4 and no.5 will be embedded in the Superficial Deposits.
- 5.3. The BIA states bored or CFA piled foundation as the viable foundation solution with suspended floor slab. It is accepted this will address any issues caused due to heave and shrinkage of soil.
- 5.4. It is accepted that the stability of slope and retaining wall next to the man-made pond, particularly under proposed surcharge loadings, is beyond the scope of the BIA. However, the pond being an important catchment for the locality, it is suggested that a detailed assessment be carried out for any such proposals to eliminate any adverse impact on the pond.
- 5.5. Based on the additional information provided, it can now be confirmed that the stability of Fitzroy Park road and other neighbouring sites will not be affected as a result of the basement works.
- 5.6. Groundwater monitoring data has been presented within the BIA addendum and it is accepted that the groundwater present is perched in the Made Ground. Mitigation measures to offset the potential for the basements to impact groundwater flows are presented. It can now be confirmed that the basement proposal will not have any impact on the local hydrology and hydrogeology.
- 5.7. A detailed review of the SuDS proposal is beyond the scope of the audit. It is strongly suggested that a detailed assessment and review be carried out for the SuDS proposal for incorporation within the detailed design.
- 5.8. Queries and requests for additional information are summarised in Appendix 2. Whilst significant engineering measures require to be developed in detail, on the basis of the original BIA documents and additional information presented, it is accepted the BIA meets the requirements of Camden Planning Guidance: Basements.



## Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Barber, Sue Barber, Steve Kennedy, Caroline Kenedy, John Lambie, Bruce Thompson, Kathy	Fitzroy Park London N6 6HX	12/10/18	Impact of development on Fitzroy Park and the rural area etc.	Clarifications requested in Audit.
Fitzroy Park Residents Association	49 Fitzroy Park Highgate London N6 6HT	18/10/18	Regarding lack of necessary information.	Clarifications requested in Audit.

Nexus Planning		17/12/2018	Objection to proposed development based on potential detrimental impacts on the adjoining Hampstead Heat and the Bird Sanctuary Pond.	The key issues pertaining to the basement construction have been discussed within the audit.
Alan Baxter Ltd		December 2018	Further comments and objection regarding the proposal based on documents available on the planning website as of November 2018.	The issues identified as potential basement impacts have been addressed in the BIA audit.

## Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	Groundwater monitoring data	Groundwater monitoring data has to be provided.	Closed	12/12/2018
2	Design of retaining wall	Require outline design of temporary and permanent retaining walls to assess their suitability.	Closed  The distance of the works planned are ~7m away from Fitzroy park road, hence it is accepted that there will be negligible impact on the road. The design of the proposed retaining walls were also found to be satisfactory.	11/02/2019
3	Cumulative Impact assessment	Assessment or calculations showing the overall difference in the inflow and outflow with respect to the site, before and after construction has to be presented.	It is accepted that the basement proposals have a negligible impact on surface water. Mitigation measures are described to offset potential impacts to groundwater	12/12/2018
4	Utility survey	A detailed utility survey for the area is required, along with details regarding the existing drainage pipe running underneath the Millfield Lane.	Closed	12/12/2018
5	Slope stability analysis/design of the MSE retaining wall	The slope stability analysis or the design of the MSE wall is required to confirm the stability of the embankments constructed south of the man-made pond.	N/A  The assessment of such structures are beyond the scope of the audit.	N/A
6	Further clarification on SuDS statement	Flow rates and storage volumes provided have discrepancies between the report, pro-formas and calculations. It is unclear which flow-rates have been applied to the development. Further clarification is required.	N/A  Detailed assessment of the SUDS proposal for the overall scheme is beyond the scope of the audit.	N/A

## Appendix 3: Supplementary Supporting Documents

Note on Plots 1, 2 & 3 Fitzroy Park Carriageway Impacts, dated 11<sup>th</sup> February 2019

# Note on Plots 1, 2 & 3 Fitzroy Park Carriageway Impacts

## 55 Fitzroy Park, Highgate, Camden

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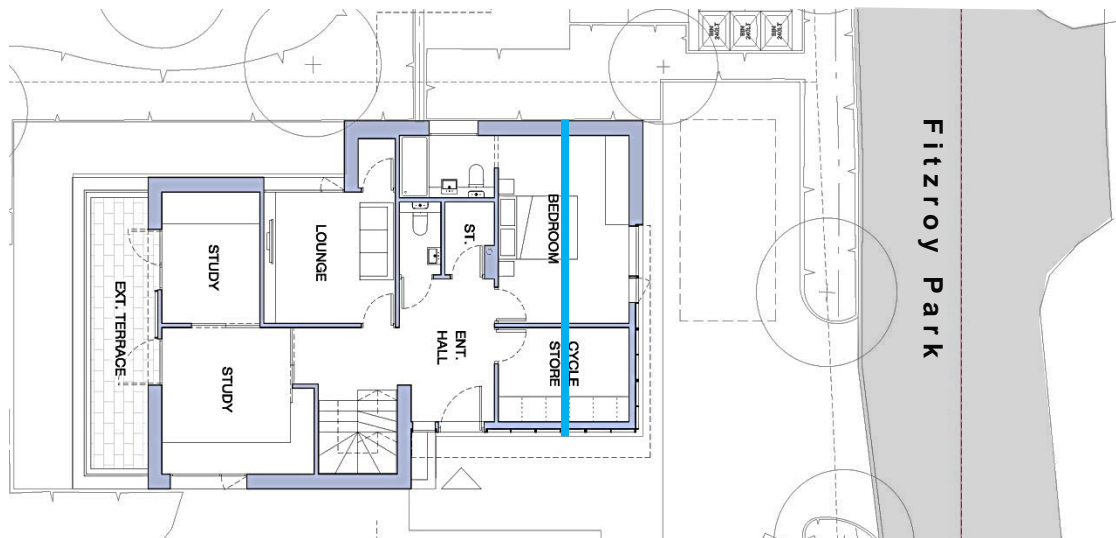
DOCUMENT CONTROL			
Report Ref: LBH4480			
Version	Date	Comment	Seamus Lefroy-Brooks BSc(hons) MSc CEng MICE CGeol FGS CEnv MEnvSc RoGEP UK Registered Ground Engineering Adviser
1.0	11 <sup>th</sup> February 2019	Issue	

The purpose of this technical note is to provide a statement on the stability impacts on Fitzroy Park of the proposed activities at Plots 1, 2 and 3.

Sketch sections are provided, with 1:1 Vertical: Horizontal scaling and an indication of the proposed drainage location and dimensions.

### Plot 3

The proposed lower ground floor excavation will be some 7m back from Fitzroy Park, recessed below the ground floor.



Ground Floor Plan of Plot 3 showing the recessed location of the lower ground floor excavation (Blue line)

# Note on Plots 1, 2 & 3 Fitzroy Park Carriageway Impacts

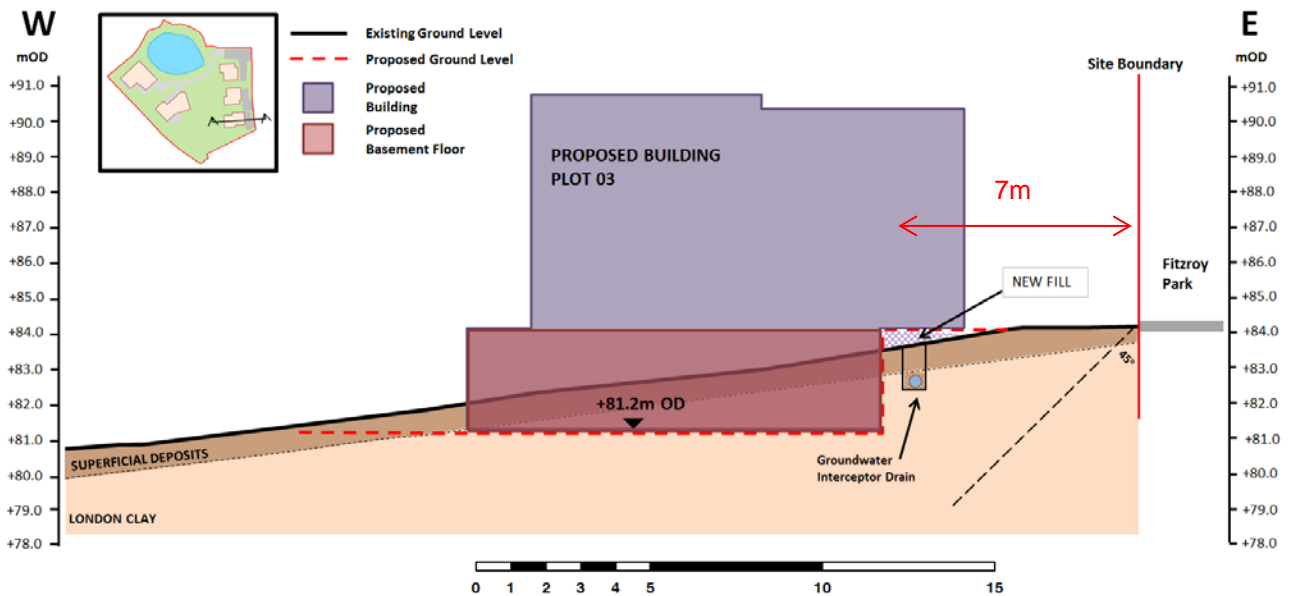
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The groundwater interceptor drain will be installed on the London Clay at around 1m below the present ground surface. As can be seen the arrangement, presented to scale on the section below, will result in the excavations taking place sufficiently far away from the carriageway not to infringe on a 45° theoretical line of support to the road.

Therefore, no stability impact is predicted on the Fitzroy Park carriageway.



Sketch section for Plot 3



# Note on Plots 1, 2 & 3 Fitzroy Park Carriageway Impacts

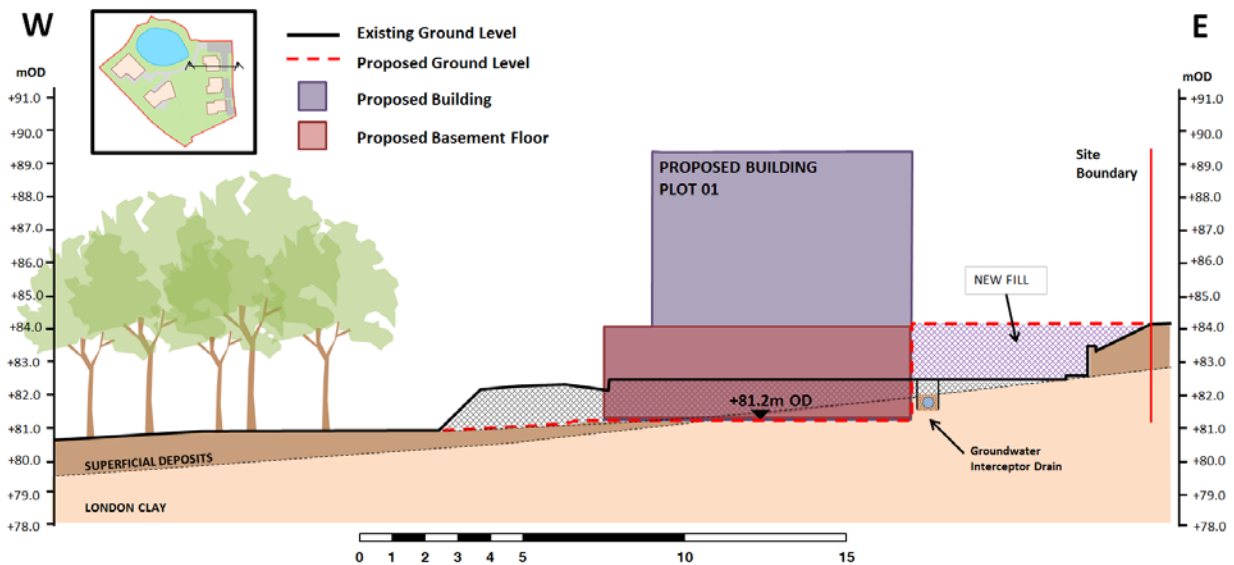
## 55 Fitzroy Park, Highgate, Camden

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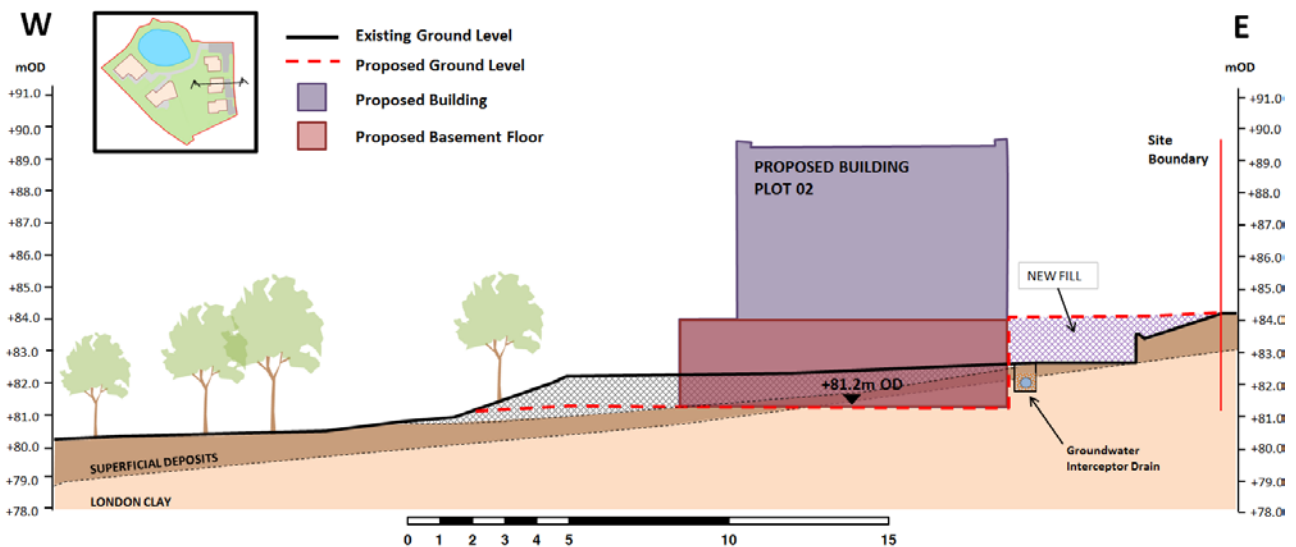
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### Plots 1 & 2

The proposed excavations at Plots 1 and 2 will take place further away from Fitzroy Park than the Plot 3 situation and hence no impact on the carriageway is also predicted here.



Proposed section sketch for Plot 1



Proposed section sketch for Plot 2

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