



i

Status: F1

Document History and Status

Revision	Date	Purpose/Status	File Ref	Author	Check	Review
D1	June 2019	Comment	RNgk12985- 51-140619 - 26 Netherall Gardens.doc	RN	GK	GK
F1	December 2019	Comment	RNgk12985- 51-231219 - 26 Netherhall Gardens- F1.doc		GK	GK

This document has been prepared in accordance with the scope of Campbell Reith Hill LLP's (CampbellReith) appointment with its client and is subject to the terms of the appointment. It is addressed to and for the sole use and reliance of CampbellReith's client. CampbellReith accepts no liability for any use of this document other than by its client and only for the purposes, stated in the document, for which it was prepared and provided. No person other than the client may copy (in whole or in part) use or rely on the contents of this document, without the prior written permission of Campbell Reith Hill LLP. Any advice, opinions, or recommendations within this document should be read and relied upon only in the context of the document as a whole. The contents of this document are not to be construed as providing legal, business or tax advice or opinion.

© Campbell Reith Hill LLP 2015

Document Details

23/11/2019 13:02
RNgk12985-51-231219 - 26 Netherhall Gardens-F1.doc
R Nair, BTech Msc DIC GMICE
E M Brown, BSc MSc CGeol FGS
12985-51
26 Netherhall Gardens, NW3 5TL
2019/1515/P

Structural ◆ Civil ◆ Environmental ◆ Geotechnical ◆ Transportation

26 Netherhall Gardens, NW3 5TL BIA – Audit



Contents

1.0	Non-technical summary	. 1
2.0	Introduction	. 3
3.0	Basement Impact Assessment Audit Check List	. 6
4.0	Discussion	9
5.0	Conclusions	. 11

Date: December 2019

Appendix

Appendix 1: Residents' Consultation Comments

Appendix 2: Audit Query Tracker Appendix 3: Supplementary Supporting Documents



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 26 Netherhall Gardens (planning reference 2019/1515/P). The basement is considered to fall within Category C as defined by the Terms of Reference.
- 1.2. The initial 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. This audit report is based on the latest revised documents and additional information uploaded in the planning application portal.
- 1.3. CampbellReith was able to access LBC's Planning Portal and gain access to the latest revision of submitted documentation and reviewed it against an agreed audit check list. Further information was requested and these were forwarded by email on the 31st of October 2019 an the 29th of November 2019.
- 1.4. The Basement Impact Assessment (BIA) has been carried out by Sinclair Johnston and Partners and the authors are appropriately qualified.
- 1.5. The proposed development includes demolition of the existing garage block and construction of a three storey apartment block plus basement level.
- 1.6. Although the BIA states the site is within a wider hillside setting of <7 degrees, topographic plans indicate a change in elevation across the site itself of >7 degrees, currently maintained as both slopes and retaining structures. It was recommended that impacts upon retaining structures, notably at the top of the rear garden, be considered. This has been actioned.
- 1.7. The BIA states that the development will be constructed in and founded upon unproductive strata. Published geological data indicates the site is at or close to the outcrop boundary of a secondary aquifer. Groundwater was encountered during the site investigation. Considering the size of the proposed basement and the absence of immediately neighbouring basements it is accepted that there will be no impact to the wider hydrogeological environment.
- 1.8. Groundwater is expected to be encountered during construction. It is stated that a secant piled wall will be utilised to reduce dewatering requirements. It was noted that underpinning will be undertaken and it was requested that a strategy for groundwater control to ensure stability be provided. An adequate response has now been provided and is discussed in the upcoming sections.



- 1.9. Construction methodology and temporary works information is provided. Geotechnical design parameters have been presented. The length and embedment depth of the proposed secant piles is confirmed within the responses. Detailed discussion can be found in Section 4.
- 1.10. A ground movement assessment (GMA) has been carried out for the current proposal, as requested within the previous audit report. It states that the current proposal will keep impacts to neighbouring structures within Burland Category 1 (Very Slight). Further discussion can be found in Section 4.
- 1.11. Impacts to retaining walls, slopes, the highway and underlying utilities has been discussed within the GMA. Further discussion can be found in Section 4.
- 1.12. An outline construction programme is now available.
- 1.13. It was previously requested that the increase in impermeable areas should be confirmed and sufficient assessment presented to demonstrate that impacts will be mitigated as per policy criteria. Adequate response was provided. The final drainage design should be agreed with LBC and Thames Water.
- 1.14. Details regarding the clarifications requested and subsequent information provided are discussed in Section 4 and summarised in Appendix 2. The BIA complies with the requirements of CPG: Basements.



2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 16 April 2019 to carry out a Category C Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 26 Netherhall Gardens, NW3 5TL.
- 2.2. The Audit was carried out in accordance with the Terms of Reference set by LBC. It reviewed the Basement Impact Assessment for potential impact on land stability and local ground and surface water conditions arising from basement development.
- 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;
 - avoid adversely affecting drainage and run off or causing other damage to the water environment;
 - 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 "Erection of 3 storey extension plus basement to existing property to provide 4 flats (2x1-bed and 2x2-bed) (Class C3) with rear roof terraces and refuse and cycle store at the front, following demolition of 2 storey garage extension and 1-bed flat."
- 2.6. CampbellReith previously accessed LBC's Planning Portal on 10 June 2019 and gained access to the following relevant documents for audit purposes:



- Basement Impact Assessment Parts 1-8 prepared by Sinclair Johnston and Partners (Reference 8240, latest revision D dated March 2018);
- Structural Design and Construction Statement prepared by Sinclair Johnston and Partners (Reference 8240, latest revision E dated March 2018);
- Arboricultural Assessment undertaken by Gifford Tree Service, dated 23rd May 2019;
- Arboricultural report prepared by Crown Consultants, dated 1st February 2019;
- Design and access statement by Squire and Partners (Reference 18059, dated March 2019)
- Planning Application Drawings consisting of

Existing Plans and Elevations dated June 2019 (Reference: G100_P_AL_001, JA12_P_00_001, JA12_P_LG_001, JA12_P_01_001, JA12_P_02_001, J12_E_W_001, JA12_E_W_002, JA12_E_S_001, JA12_E_N_001, JA12_E_E_001, JA12_S_AA_001)

Demolition Plans and sections dated May 2019 (Reference: JC20_P-00-001, JC20_P_LG_001, JC20_E_W_001, JC20_E_S_001, JC20_E_N_001, JC20_E_E_001)

Proposed Plans and Elevation dated May 2019 (Reference: C645_P_00_001, C645_P_LG_002, C645_P_01_001, C645_P_02_001, C645_P_RF_001, C645_E_W_001, C645_E_W_002, C645_E_S_1, C645_E_N_1, C645_E_E_1, C645_S_AA_001, C645_S_BB_001, G251_BS_W_001)

- Planning Comments and Response.
- 2.7. Following the initial audit, CampbellReith accessed LBC's Planning Portal on 25 September 2019 and gained access to the following relevant documents:
 - Basement Consultant Response to CampbellReith by ByrbeLooby (Reference: 8240, dated 3rd September 2019);
 - Ground Movement Assessment Report (Reference: J15344, dated August 2019);
 - Arboricultural Report (Reference: 09552a, dated July 2019);
 - Additional Drawings consisting of

Tree Constraints Plan (Reference: CCL09552 (Rev3)).

- 2.8. The following additional documents were forwarded to CampbellReith via email on 31st October 2019:
 - Response to BIA audit (Reference 8240-FN 002, dated 23 October 2019);
 - Construction Programme (Revision A, dated 18 October 2019).



- 2.8. Following additional email queries, the following additional documents were forwarded to CampbellReith via email on the 25th and 29th November 2019 and these have been included in Appendix C;
- Attenuation tank capacity assessment by Byrne Looby (Reference: 8240, dated 29th August 2019);
- Plan indicating location of attenuation tank prepared by Squire and Partners (Reference: C645_P_LG_001, dated 15th May 2018).

Date: December 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 CI.233 of the GSD presented?	Yes	Outline construction programme is available as requested; A sketch indicating location of utilities (in plan view) are now included within the response to BIA.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon stability, hydrogeology and hydrology?	Yes	Outline groundwater control strategy was requested previously. The applicants' response states that sump pumping would be carried out if necessary.
Are suitable plan/maps included?	Yes	
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	It was requested that consideration of the site topographic plan and the change in elevation across the site indicating a general slope of >7 degrees be given during assessment. Response indicates that this has been considered in the GMA.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	
Is a conceptual model presented?	Yes	Section 8.2 of the BIA.

Date: December 2019

26 Netherhall Gardens, NW3 5TL BIA – Audit



Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	It is stated in the response to BIA (dated 3 September 2019), that the variations in elevation across the site has been considered in the GMA.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Is factual ground investigation data provided?	Yes	
Is monitoring data presented?	Yes	
Is the ground investigation informed by a desk study?	Yes	
Has a site walkover been undertaken?	Yes	
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	No immediately adjacent basement structures.
Is a geotechnical interpretation presented?	Yes	
Does the geotechnical interpretation include information on retaining wall design?	Yes	
Are reports on other investigations required by screening and scoping presented?	Yes	
Are the baseline conditions described, based on the GSD?	Yes	Consideration of slopes / retaining structures: clarification of changes in impermeable site area – adequately addressed within the response letter to the BIA audit.

26 Netherhall Gardens, NW3 5TL BIA – Audit



Item	Yes/No/NA	Comment
Do the base line conditions consider adjacent or nearby basements?	Yes	No immediately adjacent basement structures.
Is an Impact Assessment provided?	Yes	
Are estimates of ground movement and structural impact presented?	Yes	
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	Monitoring strategy to be reviewed based on updated GMA.
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	
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	Changes in impermeable site area and SUDs strategy to be clarified – adequate response provided in the letter dated 3 September 2019 from Byrne Looby.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	
Are non-technical summaries provided?	Yes	



4.0 DISCUSSION

- 4.1. The Basement Impact Assessment (BIA) has been carried out by Sinclair Johnston and Partners and the authors are appropriately qualified.
- 4.2. It is proposed to demolish the existing side extension to a three storey detached house, comprising of a 2 storey garage extension and 1-bed flat, to construct a new three storey extension and a single storey basement under half the footprint of the new extension. The lowest basement level will be at +66.22m OD (3.20m bgl).
- 4.3. The site level varied between approximately + 72.00m and +78.00m OD. Although the BIA states the site is within a wider hillside setting of <7 degrees, topographic plans indicate a change in elevation across the site itself of >7 degrees, currently maintained as both slopes and retaining structures. Impacts upon retaining structures, notably at the top of the rear garden, have now been considered in the revised submissions.
- 4.4. The BIA states the underlying ground conditions comprise 0.60m of Made Ground over London Clay proven to 20.00m below ground level (bgl). However, the ground investigation data presented indicates that the Made Ground on site may be up to 1.50m in thickness. It should also be noted that from the soil description and in-situ testing provided in the borehole records, and published geological records indicating the close proximity of the Claygate Member, the Made Ground may be underlain by the Claygate Member overlying London Clay.
- 4.5. Groundwater was monitored at 1.14m bgl (shallowest). This groundwater is expected to flow in an east-west direction toward Netherhall Gardens, given the topography of the site. The Claygate Member is designated a secondary aquifer; the London Clay is designated unproductive strata. Considering the size of the proposed basement and the absence of immediately neighbouring basements, and the direction of groundwater flow, it is accepted that there will be no impact to the wider hydrogeological environment.
- 4.6. It is understood that the existing foundation to main building of 26 Netherhall Gardens would be supported using underpinning. A bottom-up method of construction is proposed for basement construction and for construction into the rear garden slope utilising embedded secant piled retaining walls.
- 4.7. It was noted in the previous audit that whilst geotechnical design parameters have been provided, the embedment depth of the secant pile wall for the current proposal was not provided. It was unclear whether the previously proposed pile lengths of 8.60m and 11.10m (with an embedment length of 4.5m) were still applicable. It was requested that an indicative design for the wall be provided, to validate that the design is sufficient to resist any slope

RNgk12985-51-231219 - 26 Netherhall Gardens-F1.doc Date: December 2019 Status: F1 9



instability in the short and long term, and to allow sufficient ground movement assessment (GMA) to be undertaken.

- 4.8. Adequate response have now been provided by Byrne Looby to the queries raised in 4.7. It is stated that 450mm diameter piles of lengths between 7.60m and 9.60m, and an embedment ratio of 1:1 shall be used.
- 4.9. Groundwater is expected to be encountered during construction. It is stated that a secant piled wall will be utilised to reduce dewatering requirements. In the responses to BIA dated September 2019, it is stated that sump-pumping would be carried out during underpinning operations.
- 4.10. A ground movement assessment (GMA) has now been carried out for the current proposal. The assessment presented states that the current proposal will keep impacts to neighbouring structures within Burland Category 1 (Very Slight).
- 4.11. Impacts to adjacent structures has now been confirmed within the GMA.
- 4.12. An outline construction programme is now available.
- 4.13. The BIA states there will be an increase in impermeable site area and that SUDs will be adopted to mitigate impacts to the hydrological environment. The change in impermeable site area has been confirmed within the responses to BIA audit (Response No.7, Appendix 2). It is stated that an attenuation tank will be accommodated within the hard landscaping area at the front of the house to mitigate the impact due to additional flow (2m³). A preliminary calculation for the attenuation tank was provided upon request and was found to be satisfactory. The final drainage design should be agreed with LBC and Thames Water.
- 4.14. It is accepted that the proposed development is not in an area prone to flooding.

RNgk12985-51-231219 - 26 Netherhall Gardens-F1.doc Date: December 2019 Status: F1 10



5.0 CONCLUSIONS

- 5.1. The BIA authors are appropriately qualified.
- 5.2. The proposed development includes demolition of the existing garage block and construction of a three storey apartment block plus basement level.
- 5.3. The BIA states the site is within a wider hillside setting of <7 degrees. Topographic plans indicate a change in elevation across the site itself of >7 degrees. Impacts upon slopes and retaining structures, notably at the top of the rear garden, have now been assessed.
- 5.4. Groundwater was encountered during the site investigation. Considering the size of the proposed basement and the absence of surrounding basements it is accepted that there will be no impact to the wider hydrogeological environment.
- 5.5. It is proposed to carry out a bottom-up construction facilitated by the installation of secant piled retaining walls. The existing main building would be supported by underpinning existing foundations. Outline secant pile wall design has been presented.
- 5.6. In the revised submissions, calculations and impact assessment to adjacent structures and utilities has been undertaken.
- 5.7. An outline construction programme has been provided.
- 5.8. The change in impermeable site area has been confirmed within the revised submissions. Adequate mitigation measures have been considered. The final drainage design should be agreed with LBC and Thames Water.
- 5.9. The BIA meets the requirements of CPG: Basements.

11 Date: December 2019 Status: F1



Appendix 1: Residents' Consultation Comments

RNgk12985-51-231219 - 26 Netherhall Gardens-F1.doc

26 Netherhall Gardens, NW3 5TL BIA – Audit



Residents' Consultation Comments*

Surname	Address	Date	Issue raised	Response
Amery, Mark	-	29.05.19	Concern regarding subsidence caused by the construction of a double basement and related structural stability of surrounding buildings and impact on hydrogeology	The current proposal although not a double basement, would require considerable amount of excavation. Appropriate information has been requested within the audit and reviewed to address issues causing concern.
Bacall, Billie	-	24.05.19	Slope stability, stability.	Relevant issues were addressed in the audit and further information requested where necessary. Information supplied were found to be adequate.
Williams, Stephen	-	03.05.19	Scale of development and loss of greenery	The impact due to the scale of the development is addressed in the audit, and further information requested where relevant. The responses provided were found to be adequate.

^{*}Kindly note that other objections raising concern over similar issues to the above and those that are beyond the scope of the BIA are not listed.



Appendix 2: Audit Query Tracker

RNgk12985-51-231219 - 26 Netherhall Gardens-F1.doc Date: December 2019

Status: F1

Appendices



Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	Utility information to be provided and assessed for impacts.	Closed	31.10.2019
2	BIA	Outline construction programme to be provided.	Closed	31.10.2019
3	Land Stability	Assessment of overall change in elevation across the site and consideration of: slope stability issues; impacts upon existing retaining structures.	Closed	31.10.2019
4	Land Stability	Indicative design of the proposed secant piled retaining walls required.	Closed	31.10.2019
5	Land Stability	A GMA should be carried out that considers the specific development, including secant piled retaining walls, underpinning and the cantilevered RC wall adjacent to 24 Netherhall Gardens. Impacts to retaining walls, the highway and underlying utilities should be confirmed within the GMA.	Closed	31.10.2019
6	Land Stability	The strategy for groundwater control to ensure stability (during underpinning) should be provided. Consideration of any settlement issues cause by dewatering should be addressed in GMA.	Closed	31.10.2019
7	Hydrology	The increase in impermeable areas is inconsistently presented between documents. The change in impermeable site area should be confirmed and sufficient assessment presented to demonstrate that the proposed SUDs is feasible and will mitigate impacts to within policy criteria.	Closed	29.11.2019

Date: December 2019



Appendix 3: Supplementary Supporting Documents

Preliminary Calculations for the capacity of proposed attenuation tank

Location (on plan) of the proposed attenuation tank

Basement Consultant Response to CampbellReith, dated 3rd September 2019

RNgk12985-51-231219 - 26 Netherhall Gardens-F1.doc

Status: F1

Date: December 2019

Appendices

26 Netherall Gardens					
Project No	8240				
Date	29/08/2019				
Prepared by	RT				



Assume existing drainage has capacity for run off from existing hard surfacing under a 1 year event and assume time of concentration of 5 minutes.

Flow rate for a 5 minute storm from S EN 12056-3

Figure NB1 r = 0.022

Table NB1 for 5 min storm factor = 1.86 rainfall rate = 0.022x1.86x2/5 = 0.0164l/s/m2

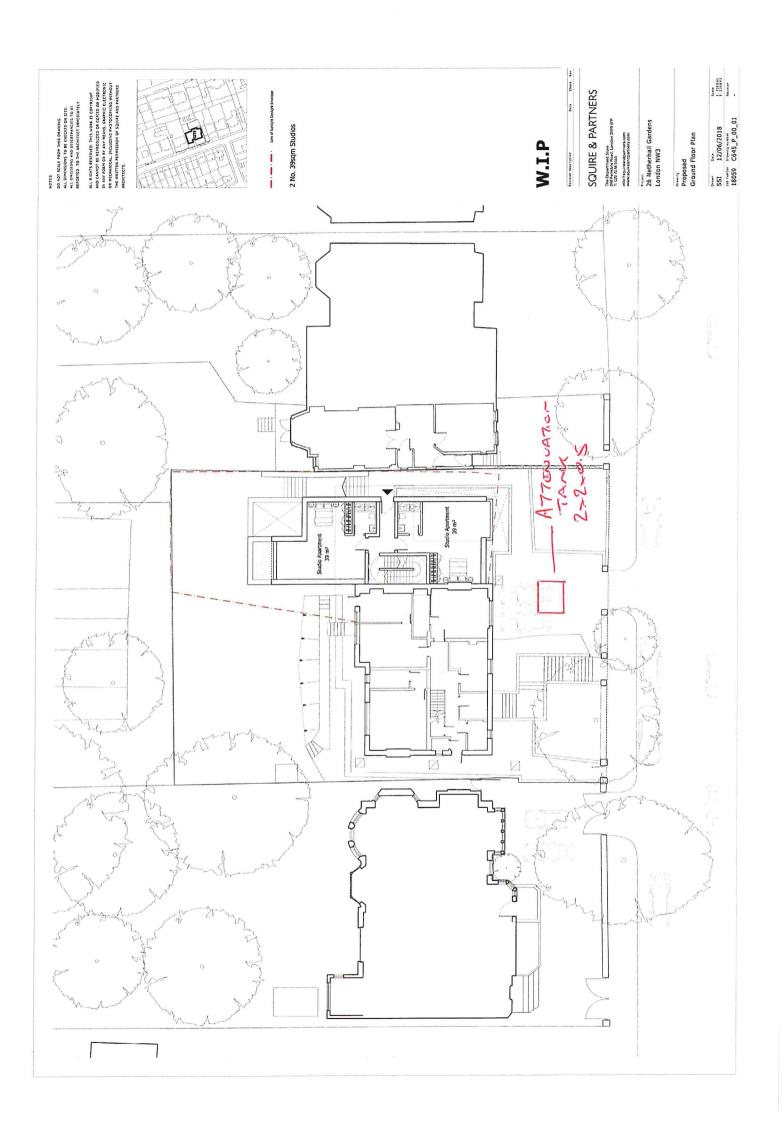
Original impermeable area = 470 m2

Outflow = $470 \times 0.0164 = 7.7 \text{ l/s}$

Consider additional flow for increased impermeable area of 550 m2

Storm durati	on	Intensity	intensity	Inflow	+ 30%	Outflow	Storage	in m3
minutes		factor	l/s/m2		climate		litres	
2		1.00	0.02	1452	1888	924	964	0.96
5		1.86	0.02	2701	3511	2310	1201	1.20
10		2.74	0.01	3978	5172	4620	552	0.55

Take attenuation volume 2m3 (>1.2)





Job Number: 8240

Reference: 8240 – FN 001

Title: 26 Netherall Gardens- Response to BIA audit

Date: 3rd September 2019

Introduction

Sinclair Johnston Partners Ltd (now trading as Byrne Looby) prepared a revised basement impact for the proposed development at 26 Netherall Gardens. This was reviewed by Campbell Reith who prepared an Audit report ref 12985-51 rev D dated June 19. Appendix 2 of this report listed seven queries to be closed out. The responses top these queries are set out below.

Audit Query Tracker Responses

1 Utility information

The location of services and the 1mm settlement contour from the Ground movement assessment are shown on Sketch 8240 SK018. This shows that the services are outside the zone of influence of the basement works.

2 Outline construction programme

A construction sequence is shown in the Structural Design and Construction Statement. The anticipated start on site date is September 2020 with a twelve month programme to completion.

3 Assessment of overall change in elevation across the site

The design proposals allow for the changes in elevation and the GMA has incorporated these level changes into the modelling. The assessment shows that the impact on the existing retaining structures is negligible.



4 Indicative design of the secant wall

The initial design is based on 450mm diameter piles with pile lengths of 7.6m and 9.6m as set out on section 4.1.1 of the GMA.

5 Ground movement assessment

This has been updated to the revised basement layout.

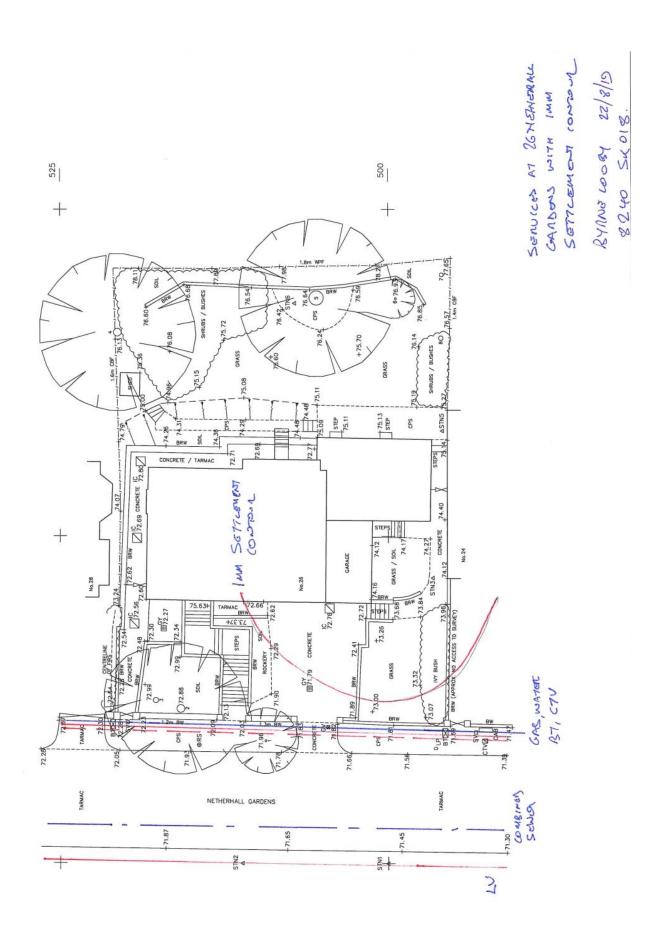
6 Groundwater control strategy

The site investigation showed the ground to be clay overlain with made ground. This the excavations are expected to be dry. Any runoff rom the made ground will be dealt with by sump and pump. Dewatering is not expected and so there should be no impact on ground movements.

7 Impermeable areas

The reduction in permeable area is around 80m2. The impermeable area increases from around 470m2 to 550m2. Preliminary calculations show that the storage to provide attenuation for the additional flows would be less than 2m3 which can easily be accommodated within the hard landscaping area at the front of the house.





Birmingham London Chantry House High Street, Coleshill Birmingham B46 3BP 15 Bermondsey Square London SE1 3UN T: +44 (0)1675 467 484 T: +44 (0)20 7340 1700 E: london@campbellreith.com E: birmingham@campbellreith.com Manchester Surrey No. 1 Marsden Street Raven House 29 Linkfield Lane, Redhill Surrey RH1 1SS Manchester M2 1HW T: +44 (0)1737 784 500 E: surrey@campbellreith.com T: +44 (0)161 819 3060 E: manchester@campbellreith.com **Bristol** Wessex House Pixash Lane, Keynsham Bristol BS31 1TP T: +44 (0)117 916 1066 E: bristol@campbellreith.com Campbell Reith Hill LLP. Registered in England & Wales. Limited Liability Partnership No OC300082 A list of Members is available at our Registered Office at: 15 Bermondsey Square, London, SE1 3UN VAT No 974 8892 43