### CampbellReith consulting engineers

### 26 Netherhall Gardens

Basement Impact Assessment

Audit

For

London Borough of Camden

Project Number: 12985-51 Revision: F2

October 2020

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# 26 Netherhall Gardens, NW3 5TL BIA – Audit

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#### **Document Details**

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#### 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	12

#### Appendix

Appendix 1:	Residents' Consultation Comments
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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 audit report issued in December 2019 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.
- 1.3. 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 31<sup>st</sup> of October 2019 and the 29<sup>th</sup> of November 2019, and was audited in December 2019.
- 1.4. Comments dated 20<sup>th</sup> July 2020 by the Heath & Hampstead Society (HHS) and a document labelled 'Inventory of basements within 75m of 26 Netherhall' were forwarded to CampbellReith by LBC, and were instructed to audit the additional information in September 2020.
- 1.5. The Basement Impact Assessment (BIA) has been carried out by Sinclair Johnston and Partners and the authors are appropriately qualified.
- 1.6. The proposed development includes demolition of the existing garage block and construction of a three-storey apartment block plus basement level.
- 1.7. The revisions to the BIA that were reviewed within the previous F1 audit considered the impacts to slopes and retaining structures. The HHS have further queried the assessment of slopes, citing concerns in regard to stability and potential hydrogeological impacts, as discussed in Section 4. The BIA is considered to have addressed these potential impacts, subject to clarifications as Sections 1.8 and 1.10.
- 1.8. 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. The HHS highlight that the site is in an area with propensity for Head Deposits. The previous F1 audit accepted that the proposed basement would not impact the wider hydrogeological environment considering the absence of surrounding basements, which has been queried by the HHS and is further discussed in Section 4. The BIA and recent addendum is considered to have addressed this potential impact, subject to clarification on the depth of foundations at 24 and 24a Netherhall Gardens.



- 1.9. Geotechnical design parameters have been presented. Construction methodology and temporary works information is provided, including the length and embedment depth of the proposed secant wall piles. Whilst the HHS have queried the assessment, as discussed in Section 4, the previous F1 audit and current audit accept that the requirement for groundwater control and construction methodology to ensure stability during construction has been adequately provided.
- 1.10. A ground movement assessment (GMA) has been undertaken. It states that the current proposal will keep impacts to neighbouring structures within Burland Category 1 (Very Slight). The HHS have queried the assessment, as discussed in Section 4. The previous F1 audit and current audit accept that the assessment methodology is reasonably conservative. However, the HHS observe current structural damage to the adjacent 24a Netherhall Gardens. It should be confirmed whether the neighbouring structure is damaged and, if so, whether further mitigation and/or remediation is required in order to demonstrate damage will be restricted to within the limits predicted as a result of the proposed development.
- 1.11. An outline construction programme is provided.
- 1.12. The previous F1 audit accepted that there would be no impact to the hydrological environment, considering the proposed attenuated drainage scheme is implemented. The final drainage design should be agreed with LBC and Thames Water.
- 1.13. Discussion is presented in Section 4 and queries are summarised in Appendix 2. In light of information presented concerning structural damage to 24a Netherhall Gardens and the possible presence of a basement beneath 24 Netherhall Gardens, further clarification of queries (as Section 1.8 and 1.10) is required to confirm that the BIA complies with 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;
  - 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 *"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<sup>th</sup> 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 23<sup>rd</sup> May 2019;
- Arboricultural report prepared by Crown Consultants, dated 1<sup>st</sup> 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<sup>th</sup> September 2019 and gained access to the following relevant documents:
  - Basement Consultant Response to CampbellReith by ByrbeLooby (Reference: 8240, dated 3<sup>rd</sup> 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 31<sup>st</sup> October 2019:
  - Response to BIA audit (Reference 8240-FN 002, dated 23 October 2019);
  - Construction Programme (Revision A, dated 18 October 2019).



- 2.9. Following additional email queries, the following additional documents were forwarded to CampbellReith via email on the 25<sup>th</sup> and 29<sup>th</sup> November 2019:
  - 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).
- 2.10. The following additional documents were forwarded to CampbellReith from LBC via email in July 2020:
  - The Heath & Hampstead Society comments of 20<sup>th</sup> July 2020.
  - Inventory of basements within 75m of No.26 Netherhall Gardens.



#### 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	Concluded in F1 audit.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon stability, hydrogeology and hydrology?	Yes	Concluded in F1 audit.
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	Concluded in F1 audit.
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.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Concluded in F1 audit.

#### 26 Netherhall Gardens, NW3 5TL BIA – Audit



Item	Yes/No/NA	Comment
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?	No	Requires further confirmation with respect to 24 and 24a Netherhall Gardens.
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	Concluded in F1 audit.
Do the base line conditions consider adjacent or nearby basements?	Yes	Requires further confirmation with respect to 24 and 24a Netherhall Gardens.
Is an Impact Assessment provided?	Yes	

### 26 Netherhall Gardens, NW3 5TL BIA – Audit

Item



Are estimates of ground movement and structural impact presented?	Yes	Requires further confirmation with respect to 24a Netherhall Gardens and reported structural damage.
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?	No	Requires further confirmation with respect to: 24a Netherhall Gardens and reported structural damage; foundation / basement levels to 24 and 24a Netherhall Gardens.
Has the need for monitoring during construction been considered?	Yes	Monitoring strategy to be reviewed based on any updates to the 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?	No	Requires further confirmation with respect to 24a Netherhall Gardens and reported structural damage.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	Concluded in F1 audit.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	No	Requires further confirmation with respect to: 24a Netherhall Gardens and reported structural damage; foundation / basement levels to 24 and 24a Netherhall Gardens.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	Requires further confirmation with respect to 24a Netherhall Gardens and reported structural damage.
Are non-technical summaries provided?	Yes	

Yes/No/NA



#### 4.0 **DISCUSSION**

- 4.1. This audit specifically addresses comments in an objection to the basement application dated 20<sup>th</sup> July 2020 by the Heath & Hampstead Society (HHS) and a document labelled 'Inventory of basements within 75m of 26 Netherhall' forwarded to CampbellReith by LBC. The list of other objections/comments considered as part of previous and present audit for the proposed development are listed in Appendix 1 of this report. The following discussion summarises the conclusions of the previous audits and considers the BIA in light of any pertinent new information.
- 4.2. The Basement Impact Assessment (BIA) has been carried out by Sinclair Johnston and Partners and the authors are appropriately qualified.
- 4.3. It is proposed to demolish the existing side extension to a three-storey detached house, comprising of a two-storey garage extension and one 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).
- 4.4. Topographic plans indicate a change in elevation across the site itself of >7 degrees, currently maintained as both slopes and retaining structures. The revisions to the BIA that were reviewed within the previous F1 audit considered the impacts to slopes and retaining structures. The HHS have further queried the assessment of slopes, citing concerns in regard to stability and potential hydrogeological impacts, which are discussed in the following paragraphs.
- 4.5. The HHS comment 1 discusses the slope across the wider hillside setting and the site itself, and suggests that whilst stability impacts to upslope neighbours have been considered, neighbours to the side will still be impacted by the proposed development due to changes in "ground pressure and vibration" and that the "composition" of the hillside has not been considered. The stability impacts are considered to have been adequately addressed, as discussed in the following paragraphs and subject to clarifications requested.
- 4.6. The BIA states the underlying ground conditions comprise 0.60m of Made Ground over London Clay proven to 20.00m below ground level (bgl). The F1 audit noted the mapped close proximity of the Claygate Member, and that the Made Ground may be underlain by the Claygate Member overlying London Clay. The HHS highlight that the site is in an area with propensity for Head Deposits.
- 4.7. The Claygate Member is designated a secondary aquifer; the London Clay is designated unproductive strata. HHS have commented (Comments 1 and 3) on the adequacy of the site investigation, in terms of methodology and number of boreholes, to discern both ground and groundwater conditions, including direction of groundwater flow. Whilst it is acknowledged that

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three boreholes would comply with best practice, given the topography of the site it is clear that groundwater would be expected to flow down slope from east to west, and it is not considered that additional boreholes would alter the interpretation of groundwater flow.

- 4.8. It is unclear why HHS consider the use of rotary percussive boreholes, a standard site investigation technique, not to be suitable.
- 4.9. HHS further note the lack of groundwater monitoring data over a winter period, which is acknowledged. Monitoring of standpipes over a winter period would likely reflect recent rainfall activity and the current constraints to drainage. However, given the underlying London Clay, it is evident that perched groundwater flow can only occur within the very shallow soils of the Made Ground and Head and / or Claygate Member, where present. The existing foundations and retaining walls to 26 Netherhall Gardens already penetrate these soils forming a barrier to any groundwater flow, as indicated in the site investigation report.
- 4.10. The subject site will not have a basement across the majority of the site footprint. Considering this, and the general absence of surrounding basements (with the exception of No 28 Netherhall Gardens), the F1 audit accepted that the proposed basement would not impact the wider hydrogeological environment. This has been queried by the HHS, who indicate that (comment 6) 24 Netherhall Gardens is built over a basement whilst 24a Netherhall Gardens has shallow foundations. The depth of foundations at 24 and 24a Netherhall Gardens should be clarified in order to confirm the hydrogeological assessment, although as noted in paragraph 4.9, it appears that the existing foundations to 26 Netherhall Gardens already form a cut-off to any perched groundwater flowing which case, the introduction of the proposed basement does not change the existing conditions.
- 4.11. If it is determined that a basement exists beneath 24 Netherhall Gardens and/or the foundations of 24a Netherhall Gardens are not within the London Clay, further assessment is required to confirm that the stability of these foundations will not be adversely impacted by any changes to the groundwater flow regime.
- 4.12. It is understood that the existing foundations to main building of 26 Netherhall Gardens will 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.
- 4.13. Geotechnical design parameters have been presented. Construction methodology and temporary works information is provided, including the length and embedment depth of the proposed secant wall piles. HHS have raised the following queries:
  - (Comments 7 and 8) The use of sheet piling will cause vibrations and be de-stabilising.



The construction methodology indicates the use of propped trench sheets in order to cast retaining walls, not sheet piling. It is requested that this is confirmed. If sheet piling is to be installed, then additional assessment on the impact from vibration will be required.

• (Comment 2) The use of Oasys XDisp for the ground movement assessment (GMA) and the use of certain geotechnical parameters are unsuitable. There is a requirement for finite element analysis (FEA).

The geotechnical parameters questioned by HHS (Harris & Alvaredo, 'm') have no relevance to the assessment, given that they relate to very specific settlement for the assessment of tunnels rather than the analysis of building movements at ground level. The use of XDisp, and the underlying empirical data set is considered to be more conservative than an equivalent FEA, including as it does allowance for construction movements. The methodology is widely accepted where embedded retaining walls toe into stiff London Clay, even where shallower soils are classified as firm.

- 4.14. The previous F1 audit and current audit accept that the requirement for the construction methodology to ensure stability during construction has been adequately provided.
- 4.15. The GMA states that the current proposal will limit danage to neighbouring structures to within Burland Category 1 (Very Slight). The previous F1 audit and current audit accept that the assessment methodology is reasonably conservative. However, the HHS observe (Comment 6) current structural damage to the adjacent 24a Netherhall Gardens which has not been stated within the BIA. It should be confirmed whether the neighbouring structure is damaged and, if so, whether further mitigation and/or remediation is required in order to demonstrate damage will be restricted to within the limits predicted as a result of the proposed development.
- 4.16. An outline construction programme is available.
- 4.17. The previous F1 audit accepted that there would be no impact to the hydrological environment, considering the proposed attenuated drainage scheme is implemented. The final drainage design should be agreed with LBC and Thames Water.
- 4.18. It is accepted that the proposed development is not in an area prone to flooding.



#### 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 revisions to the BIA that were reviewed within the previous F1 audit considered the impacts to slopes and retaining structures. The BIA is considered to have addressed these potential impacts, subject to the clarifications requested.
- 5.4. The F1 audit accepted that the proposed basement would not impact the wider hydrogeological environment. The BIA and recent addendum are considered to have addressed this potential impact, subject to clarification on the depth of foundations to 24 and 24a Netherhall Gardens.
- 5.5. If the foundations to 24a Netherhall Gardens are not within the London Clay, further assessment is required to demonstrate that the stability of these foundations will not be adversely impacted by any changes to the groundwater regime.
- 5.6. Geotechnical design parameters, construction methodology and temporary works information are provided. The previous F1 audit and current audit accept that the requirement for groundwater control and construction methodology to ensure stability during construction has been adequately addressed.
- 5.7. A ground movement assessment (GMA) has been undertake stating that damage to neighbouring structures will not exceed Burland Category 1 (Very Slight). The F1 audit and current audit accept that the ground movement and building damage assessment methodology is reasonably conservative. However, it should be confirmed whether the neighbouring structure is damaged and, if so, whether further mitigation and/or remediation is required in order to demonstrate damage will be restricted to within the limits predicted as a result of the proposed development.
- 5.8. The previous F1 audit accepted that there would be no impact to the hydrological environment, considering the proposed attenuated drainage scheme is implemented. The final drainage design should be agreed with LBC and Thames Water.
- 5.9. Discussion is presented in Section 4 and response to queries summarised in Appendix 2. In light of information presented by the HHS, further clarification is required to confirm that the BIA complies with CPG: Basements.



Appendix 1: Residents' Consultation Comments

#### 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.
Harris, Catrien	-	23.07.20	Presence of basement to No. 24 Netherhall and impact on Hydrogeology.	This is queried and pending assessment. It is noted that all other queries by the Consultant have been addressed by the applicant.
The Heath and Hampstead Society	-	20.07.20	Concern regarding landslide, impact on hydrogeology, land stability, damage to neighbours.	Further clarifications have been requested.

\*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



#### 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
8	Hydrogeology and Land Stability	The depth of foundations at 24 and 24a Netherhall Gardens should be clarified in order to confirm the hydrogeological and land stability assessments.	Open	
9	Land Stability	It should be confirmed whether the neighbouring structure (24a NG) is damaged and, if so, whether further mitigation and/or remediation is required in order to demonstrate damage will be restricted to within the limits predicted as a result of the proposed development.	Open	
10	BIA	It is to be confirmed whether propped trench sheets retaining wall or sheet piling is the proposed construction method for the retaining wall.	Open	



### Appendix 3: Supplementary Supporting Documents

Inventory of Basements within 75m of No.26 Netherhall Gardens

The Heath and Hampstead Society Objection letter, dated July 2020

### Inventory of Basements within 75m of 26 Netherhall Gardens

8240/INV

Street Name	Property Numbers within 75m of 26 NG	Description of Works	Date Permission Granted
Netherhall Gardens	11	Building comprising basement, ground and first to third floor plus roof (following demolition of the existing building except party wall to 9 Netherhall Gardens)	2011
	59	Partial demolition, basement excavation, extension including the west wing, extended to the rear, to the existing building (comprising 9 flats) to provide 8 residential units	2011
	44	Excavation of a new basement with proposed lightwells to front and rear of house	2007
	19	Erection of single storey rear extension (adjacent to No. 21) and single-storey extension to the rear/side adjacent to Netherhall Way and alterations to rear/side basement level windows.	2007
	28	Change of use of two self-contained flats (part basement, ground and part first floor level) to one self-contained flat.	2006
	35	Enlargement of rear basement level window and installation of decking and wooden bike shed in rear garden all in connection with existing basement and ground floor level maisonette	2006
	45	Erection of a 3 storey building with semi-basement to provide 4 x 3 bedroom flats	1994
	38	Felling a Cherry tree and plant a suitable tree in its place in the main garden because the roots is damaging and lifting the paving and takes light from the basement.	1994
	34	the formation of a self-contained bed-sitting toom and the erection of a ground floor and basement rear extension.	1970
	27	To convert the existing dwelling house of 5 floors, including basement, into a boarding house.	1957

Frognal	1A	Erection of a building comprising lower ground and ground floor level for the addition of a new basement level	2015
	2	Excavation of a basement extension with rear lightwell and lowering of the rear garden level	2015
	13	Change of use of existing basement flat to provide two self-contained dwelling units	1976
	11	The use of the basement of No. 11, Frognal, Hampstead, as a school of dancing.	1948
Maresfield Gardens	45	Extension of existing basement level	2014
	43	The erection of extension at rear basement first and second floors	1991





The Society examines all Planning Applications relating to Hampstead and Hampstead Heath Fringes, and assesses them for their impact on conservation and on the local environment.

#### To London Borough of Camden, Development Control Team

L9/1515/P
Netherhall Gardens
vid Peres Da Costa
AFT 20th July 2020

While investigating the causes of subsidence in Hampstead, I came across this application, not yet determined, which shows inaccuracies and omissions in the Basement Impact Assessment: either ignorance of the tendency of parts of Hampstead to be susceptible to landslide or deliberate ignoring of the known risks. Looking at this application in greater detail I have found serious omissions and inaccuracies that from my experience are counter to the evidence I have gathered in the area, and I know could put neighbouring properties and some historic material on the site at significant risk.

In CPG - Basements March 2018 it is stated:

4.23 It is important to recognise as stated in Paragraph 287 and 288 of the Camden Geological, Hydrogeological and Hydrological Study (CGH&HS) that Local Plan policy A5 on basements is particularly concerned with the potentially significant impact a development can have *beyond the site boundary*.

- yet I see no evidence that the neighbours have been considered for this at all. Data is ignored or deliberately misrepresented. Also,

4.4 The purpose of a BIA is to enable the Council to 'assess whether any predicted damage to neighbouring properties and the water environment is acceptable or can be satisfactorily ameliorated by the developer' as stated in Local Plan policy A5 on basements.

- I see very little evidence for this. The following back up my assertions:

#### A. Risk of Landslide and silt erosion via the action of groundwater.

#### 1) Actual steepness of the hillside and influence of road carriageway construction.

Up until Campbell Reith called them out Sinclair Johnston (SJ) reported the hillside was <7 degrees, a 'gentle' slope.



The drawings do not accurately portray the hillside. While the carriageway of Netherhall Gardens (NG) has been flattened out, this level does not continue. The houses on this other side of the road are considerably deeper and stepped both east-west and north-south.



23-25 27-29 29-31A Gaps between the houses opposite number 26 in Netherhall Gardens, demonstrating the angle of the hillside here with stepping down between houses and a steep drop from the road to the rear gardens.



Flattening out of the contour lines along the western, down-hill side of the carriageway opposite 26 NG demonstrates how the carriageway has been built up rather than cut into the side of the hill, adding to its vulnerability to silt erosion by the action of groundwater and to landslip.

Campbell Reith's BIA Audit F dated December 2019 has forced an acknowledgement by SJ that the change in elevation across the site itself is >7 degrees, currently maintained as both slopes and retaining structures, and appropriately considered the retaining wall on the hillside above (1.6). This apparent change of heart by the developers on paper is not born out in any attempt to ensure safety for the neighbours, and Campbell Reith have not considered the impact of landslide on the neighbours to the side. The neighbours are already moving in that direction, but a retaining wall at 90° to the slope will not limit further progression caused by the ground pressure changes and vibration of the project. While variations in elevation across the site are said to have been considered in the GMA, they haven't taken the *composition* of the hillside into account.

#### 2) Ground composition

From the BIA part 1 3.2. Geology 'The 1:50000 Geological Survey of Great Britain (England and Wales) covering the area (Sheet 256, 'North London', Solid and Drift Edition) indicates the site to be underlain by the London Clay Formation with deposits of the Claygate member located immediately to the north of the site.'

In fact, this whole area is overlain by superficial deposits of 'Head': a solifluction deposited at the end of the last Ice Age and clearly marked on the very map they report to have used which can be found at http://www.largeimages.bgs.ac.uk/iip/mapsportal.html?id=1001750 :



- a) The boring and testing methods used in 2014 left an extremely limited set of reliable data. Stiffness was measured using the Standard Penetration Test in one of the only two boreholes, meaning the samples were highly disturbed and only one borehole remained available for monitoring or further testing where undisturbed samples are required. Having performed the Standard Penetration Test, because it confirmed the ground was only moderately firm and not stiff down to 11 metres, it was ignored. The ground was still described as stiff, and the crucial to their argument that no damage would occur Oasys X-Disp analysis of predicted movement was performed erroneously based on the supposition that only stiff clays were present throughout the entire set of calculations, invalidating the results. It would also not be surprising if the person doing the calculations using Oasys X-Disp put in a value of 0.5 for m as recommended by Harris & Alvaro for 'typical London clay'. Sadly this is not appropriate in this area.
- b) Neither the thick (down to 1.5m), permeable and relatively unstable Head superficial deposit a solifluction from the last Ice Age - and the potential acquifer at its base, nor the relevance of erodible silt and watercarrying sand partings within the Claygate Beds/Unit D of the London Clay Formation transition zone here with its Spring line have been recognised.

The BIA report still lives in a cloud cuckoo land of "its London Clay" i.e. uniform, when in fact their own studies demonstrate its known laminated, erodible and fissured nature, weathered down to the respective depths of 6.00m and 9.20m bgl in Boreholes 1 & 2: highly, highly complex on a steep hillside well beyond the sliding/rolling angles of pure London Clay, and even more so on a steep hillside of Claygate/Unit D transition zone overlain by unstable irregularly deposited and thus laminated 'Head' with potential slip surfaces within and below it. Analysis by Oasys X-Disp can actually cater for different layers, but it hasn't been done here and this alone is inadequate in any case. Oasys cannot cope with dynamic conditions and so represents ideal circumstances - they don't cater for vibrations from construction, landslides that are creeping as a result of excavation and consolidation from the reduction of pore water pressures. Finite Element Analyses (FEA) are needed for that. It may be assumed that conditions are reasonable BEFORE excavation commences, but these will change with time to conditions that would not produce predictions of displacements that are acceptable. Conditions such as this are far far far from present here.

Being forced to acknowledge the previously ignored evidence later when it was noticed by the independent examiner Campbell Reith by placing a 'Y' in the 'tick boxes' of the BIA Audit Instruction Parts ABC, is not sufficient. The information is not just to be collected, it is to be used, and in an appropriate way, and Campbell Reith should have the expertise to demand this and protect the neighbours. It seems they don't.

#### 3) Groundwater

The standard of investigation into groundwater at this site can only be described as lamentable.

a) the boreholes dug in 2014 used methods unlikely to discover groundwater, and when it was found, this was deliberately ignored. The BIA part 1 admits there are 'deposits of the Claygate member located immediately to the north of the site' yet fails to point out that this is a spring line! This makes their statement in 3.3. Hydrogeology *'The Bedrock geology underlying the site (London Clay) is classified as Unproductive Strata*' even more ridiculous. While it may be true that (from 9. Identification of Unacceptable risks) there is no secondary A acquifer between the Claygate and Unit D of the London Clay Formation here since this is now on the surface as springs, the boundary line of the Claygate and the LCF below is not exact, and this property is almost virtually on it. There is also likely to be an intermittent acquifer between the superficial permeable Head layer and unit D below, which I've yet to see Envirocheck look for. While the Boreholes and Trial Pits did not hit groundwater exactly where they were drilled this was all done during a lengthy period of dry weather in a month experiencing only 47% of the 30-year average rainfall for the month of April:

Ŧ			nw	'3 v	vea	hthe	er	Ha	ampsto ndon	ead			
Wind Speed: 2.1 mph Last Full Update: 20 Jul 2020, 15:05 BST													
Navigation	Dail	/ Data	Tables	- Rain	fall / m	nm							
Home			i dibito d										
webcam Caraba	Daily	Monthly Weather Variable: Dainfall											
Graphs Decende	Daily	Monuliy											
Forecast	Dav	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Astronomy	1	7.9	6.7	0.0	1.8	14.5	0.0	0.0	0.0	4.2	1.5	0.0	0.0
Photos	2	4.5	0.0	8.6	0.0	0.0	0.4	0.0	0.0	0.0	0.0	7.6	0.6
About	3	6.5	0.0	2.4	0.0	0.0	2.9	0.0	0.0	0.0	0.0	5.0	0.1
	4	6.9	2.4	0.0	0.0	0.0	5.6	0.1	0.0	0.0	5.9	5.4	0.7
Detailed Data	5	3.3	7.6	0.0	0.0	0.0	2.1	5.4	0.0	0.0	0.0	0.2	0.2
Rain	6	16.8	7.9	0.0	3.3	0.1	0.0	0.7	13.3	0.0	3.9	0.6	0.0
Wind	7	7.6	7.6	0.0	3.9	0.6	4.0	0.1	0.0	0.0	4.9	4.1	0.5
Temperature	8	0.9	4.3	0.0	0.0	5.9	0.0	3.3	4.9	0.0	2.9	16.3	0.0
Humidity	9	1.0	0.1	0.0	0.0	0.3	3.9	0.0	4.5	0.0	2.8	0.0	0.9
Charts	10	0.6	1.5	0.0	0.0	6.3	0.0	0.2	26.9	0.0	3.3	0.0	1.1
Climate	11	2.4	2.2	0.0	0.0	0.5	0.0	4.4	7.3	0.0	0.0	0.2	1.5
Pressure	12	1.8	6.7	0.0	0.0	3.7	0.0	0.0	0.9	0.0	7.4	4.1	10.7
Historical	13	4.5	0.0	0.0	0.0	2.8	0.0	7.4	0.0	0.0	40.7	0.0	0.0
Data Tables	14	2.5	8.5	0.0	0.0	0.0	0.2	0.0	3.3	0.0	0.2	12.2	0.4
Rankings	15	2.5	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	9.4	1.1	0.4
Daily Reports	16	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.3	3.1
Monthly	17	7.6	1.8	0.0	0.0	0.0	0.0	0.0	2.1	0.0	1.1	7.3	5.7
Reports	18	0.1	7.2	0.1	0.0	0.0	0.2	11.7	0.6	0.0	0.0	0.7	0.0
Annual Reports	19	1.5	0.3	0.0	0.0	0.0	0.0	3.9	0.0	5.4	2.6	0.0	2.6
Custom Graphs	20	0.0	0.9	2.4	6.2	0.0	0.0	0.1	0.0	29.3	0.0	0.0	0.0
Other	21	0.3	0.0	2.4	4.4	0.4	0.0	0.0	0.0	0.0	2.0	0.5	0.0
Blog	22	6.4	0.0	3.0	0.2	7.8	0.0	0.0	0.0	0.0	0.0	1.5	0.0
System	23	3.0	0.0	0.1	1.2	0.2	2.0	0.0	0.0	0.0	0.0	29.8	0.0
External	24	4.3	0.3	0.0	0.0	6.9	0.1	0.0	0.0	2.4	2.2	0.0	0.7
Site Options	25	6.1	2.4	1.5	1.5	0.0	0.0	9.8	38.5	0.0	0.0	0.9	0.0
Units	26	5.1	0.0	2.4	0.6	8.9	2.4	0.0	12.5	0.0	0.0	4.8	10.7
	27	0.6	2.1	0.0	0.1	6.5	0.0	0.0	0.0	0.0	0.0	2.5	1.3
©ик	28	3.7	8.1	0.0	0.0	4.5	3.5	0.0	1.7	0.0	0.0	0.0	0.0
OMetric	29	12.6		0.0	0.0	0.4	0.9	0.0	0.0	1.3	2.7	0.0	0.0
	30	2.4		0.0	0.0	0.0	0.7	0.0	1.7	0.0	0.0	0.0	0.0
	31	8.7		0.0		0.0		0.0	0.0		0.0		0.0
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	High	16.8	8.5	8.6	6.2	14.5	5.6	11.7	38.5	29.3	40.7	29.8	10.7
	Total	141.5	78.9	22.9	23.2	70.3	28.9	47.1	118.3	42.6	94.2	106.1	41.2
	Count	(237%)	20	(32%)	(47%)	(130%)	(33%)	(11276)	(225%)	(73%)	(140%)	(189%)	(7476)
	Cumu-	141.5	20	243.3	266.5	336.8	365.7	412.8	531.1	573.7	667.9	774.0	815.2
	lative	(257%)	(232%)	(175%)	(142%)	(141%)	(124%)	(123%)	(137%)	(129%)	(131%)	(137%)	(131%)

Rainfall for every available day of 2014 along with monthly summary: lowest, highest, total, count (values > 0), and the cumulative value for the year to the month's end. Figures in brackets refer to departure from average conditions.

Campbell Reith actually noted in their BIA AUDIT F1 of December 2019 that there was a spring line immediately to the north but the *relevance* of this fact for this site and what is planned for it seems to have gone unrecognised and un-requested by them.

- b) There was an inadequate number and siting of boreholes performed in 2014 to determine the direction of groundwater, though this is frankly certain here. What is much more concerning is that
- c) Checking for groundwater within the one borehole was merely done once more on 19th June 2014; there was no continuous monitoring. This day was also during a long dry period, with June's rainfall being only 53% of the 30-year average for June. This is contrary to CPG Basements March 2018 4.25 and paragraphs 291 to 294 of the CGH&HS which state that groundwater and rainfall monitoring should be across a period of time related to high levels of groundwater i.e. across both a dry and a wet month and a period of intense rainfall. It is essential that the potential for groundwater surges and their timing in relation to the amount of ground above that they are charged by is established *prior to opening up the site* and prior to blocking up and diversion of groundwater flow by deep secant piled walls and basement construction.

While Netherhall Gardens does not benefit from a Neighbourhood Plan where local knowledge can add to that of Camden's, nevertheless those of Redington Frognal and Hampstead are instructive:

#### RedFrog NP

The boreholes measurements may need to be conducted in periods of contrasting rainfall and over a period of several months covering wet and dry seasons. In some cases, when boreholes measurements show a groundwater risk, an automatic log water measurements recorder may need to be left activated in the boreholes over a sustained period of contrasting rain cycles to demonstrate local groundwater and water table levels and the local extent of groundwater surges / flooding during and immediately following storms.

#### Hampstead NP

5.10 As a result of the conditions found in Hampstead, as noted in Camden Local Plan 6.132, basements in Hampstead may pose a particular risk to neighbouring properties and require close investigations, as required by Policy A5 of the Local Borough of Camden Local Plan and its supporting Camden Planning Guidance - Basements, to ensure that risks can be identified and damage mitigated at the planning stage. These conditions include unusual and unstable soils, subsoil water movement, hilly areas liable to slippage, and dense development in which many house are conjoined.

5.12 .... a. CPG – Basements and the Camden Geological, Hydrogeological and Hydrological Study (paragraphs 285-294) should be studied whenever hydrological borehole measurements are to be carried out. Soil samples, including those near boundaries with neighbours must be taken to a depth below the footing of the proposed base of the basement. The boreholes measurements may need to be conducted in periods of contrasting rainfall and over a period of several months covering wet and dry seasons.
b. In some cases, when boreholes measurements show a groundwater risk, an automatic log water measurements recorder may need to be left activated in the boreholes over a sustained period of contrasting rain cycles to demonstrate local groundwater and water table levels and the local extent of groundwater surges during and immediately following storms.

Campbell Reith and Camden should be aware of this. Why has this not been required here when there is so much evidence that this would be wise?

d) When Campbell Reith picked up on the fact that groundwater was encountered in 2014 at 1.14m and 1.88m below the existing ground level, no further boreholes, even to achieve the required level of testing were done in 2019 for the present application. The boring method was rotary percussive so it is amazing that even this was found, and the water levels can't be deemed accurate. After SJ denied its existence despite finding it, now its *relevance* is denied:

SDCS 5.2: 'These readings are likely due to minor seepages of ground water within permeable Silty lens present within the Clay.' *also* 'A secant piled wall provides a high degree of resistance to any potential inflows of ground water during construction.'

While the secant piled wall around the basement will allow the Contractor to construct the basement in a relatively 'dry' environment without the need for significant de-watering, no concerns are expressed about the effects of this constrained water upon the historic side wall or the rear boundary wall or the building 24A NG. 24A NG is merely an unmeasured 'gnat's whisker' from this proposed piled wall and the developers of 26 NG have not yet approached *any* of the neighbours to determine the depth of their foundations; all are 'TBC', though presumed shallow. While this reduces the cumulative impact of basements on other properties further away, it actually means the immediate neighbours and boundary walls are themselves more at risk of the impact of increased, newly diverted and constrained groundwater on *their* foundations and the ground beneath.

The unrestrained heave from excavation and the subsequent loading are acknowledged, yet the impact of these changing ground pressures on this particularly unstable hillside are not considered.

#### 4) Risk of landslide

Desk top studies of the risk of landslide, required by Camden, seem to have deliberately misinterpreted and omitted some evidence:

It is stated in the BIA part 1, 3.2. Geology: 'The records of the British Geological Survey indicate that there is a Very Low risk of landslide and running sand.' This is just **NOT TRUE.** 

The BGS 'Areas for Greatest Potential for Slope Instability' is also Figure 17 of Arup's 'CGH&HS: Guidance for subterranean development' and shows 26 NG to be right over an area of High/Very High risk for slope instability as calculated by Forster A, Wildman G & Poulton C. (2003) Landslide potential modelling of North London. British Geological Survey Internal Report, IR/03/122R.



26 Netherhall Gardens

#### 5) Evidence of landslide caused by excavation in the locality

Neither Campbell Reith nor the BIA have considered the ground *beneath* those neighbours who don't have basements. Both silt erosion and landslide lubrication from increased water pressure during storms need to be considered. These are both pertinent during dig-out and during construction. The contemporary experience reported by local people of the widening of Finchley Road in the 1960s, and our experience of more recent excavations for 120, 252, 256-258A and 272 Finchley Road are very pertinent. They confirm significant landslides, garden and tree collapses, and serious subsidence of neighbouring buildings with cracks of nearly 2 inches wide in places including beneath walls as they separate from the dropping and sliding foundations. Reports of on-going silt erosion post construction and further movement makes us extremely concerned that none of these factors have been measured adequately, noticed or considered.

#### 6) Visible evidence of past landslide and subsidence in the immediate vicinity missed/ignored

The SDCS states: 'A visual inspection of No's 24, 24A and 28, undertaken from street level, did not identify any apparent defects or evidence of historic movement.'

This is an astonishing statement for what has been described as part of the 'subsidence capital of the world'! As a result of my investigations I am aware of hundreds of cases of subsidence in this neighbourhood. In Netherhall

Gardens alone I have been alerted to subsidence claims or statements that it is or has been present at the following properties:

1 (1995\*); 1A (2003\* & 2010), 2 (1993\* & 2012), 3 (2005), 5 (1998\*); 6 (2000\*); 10 (2019), 11 (2003), 12 (2000\* & 2010); 13 (on-going many years), 14 (1999\*); 19 (1998\*); 22 (2003\*); 24A (1998 and on-going), 34 (2020); 53 (1994\*); 55-57 (2020 and in the past). \* the year underpinning was completed

I am finding new cases almost every day in Hampstead now I am talking to people about it more. Many clearly go unreported, such as: "We know all the houses in Langland Gardens are sliding down the hill so we don't bother to report our cracks, we just live with them".

Subsidence and its consequences are equally prevalent in Maresfield Gardens (MG). The garages behind 47 MG - the rear structures directly above 26 NG that have been more carefully considered by CR were demolished and completely re-built as before in 1997-8 due to subsidence. Rear walls of garages between 28&30 NG are cracked.



Crack across kitchen floor front of 24A NG

Detail of crack



Horizontal mortar joints open as ground under 24A drops; the joint between 24A & 24 shows vertical shear

24A NG itself suffers from significant cracking, that shown here in the kitchen floor evident throughout the front part of the house on all floors. The house - built in the 50s or 60s will have modern foundations but they are not as deep as those of the Victorian 24 or 26 NG so a vertical shearing crack from differential subsidence has appeared between 24 and 24a. 24 & 26 were built over basements to deal with the groundwater flowing down the hill, and

causing preferential flow of groundwater between 24 and 26 i.e. under the side garden between 24 & 26 then under 24A itself when it was built, with severe dampness appearing in the front garden & steps of the house when the groundwater is surcharged from upper Hampstead by storms . The pattern and severity of cracking in the kitchen - an opening crack and a step *up* from rear to front as the floor also drops away from the front wall it is bonded to - indicate the likely mechanism to be silt erosion by the action of groundwater in the ground beneath the foundations at the front of the house along with a longstanding tendency to slide down the hill. If this situation was to be compounded by vibration and ground pressure changes it will be likely to instigate a degree of further downhill landslide. The depth of 26 NG's proposed basement might prevent 26 NG from moving downhill, but its creation will mean that other gardens, properties and structures without deep foundations and within influencing distance of vibration and ground pressure changes are likely to be subject to landslide. This has happened time and time again in the north of Finchley Road regions along this BGS line of High and Very High Risk of Landslide with disastrous results, and the effects of basement construction on their buildings must be recognised.

#### 7) Construction methods proposed likely to cause landslide and silt erosion around and beyond the site

The Proposed Sequence of Works indicates temporary trench sheets will be installed to retain the earth locally in the temporary case and allow the walls to be formed (g). This is very concerning as the installation of trench sheets produces vibration at a level likely to cause ground movement and neighbouring building damage as is likely to have been caused to Rotunda Studios rear of 116-118 Finchley Road and 11 Maresfield Gardens when sheet piling was installed for 120 Finchley Road (currently under investigation), and caused further garden collapse with tree collapse/falls to 262 Finchley Road to the side and 25 Bracknell Gardens to the rear plus building subsidence of 262 Finchley Road when land to the rear of 264-270 Finchley Road was excavated and sheet piled.

To merely include "*reducing*" the need to adopt percussive and vibrating machinery as part of general construction measures to be adopted by the Contractor to reduce vibration is completely inadequate. At this site with the neighbouring buildings and hillside as they are, NO percussive and vibrating machinery should be used. Frankly, NO deeper basements should be built.

All this potential damage in order to achieve 50m<sup>2</sup> of space below ground that is half a 2-bedroom flat.



#### 8) Methods to help reduce damage?

Screw piling is proposed, which is more vibration-free, though one suspects this is meant as a noise-reducing factor on Camden's insistence, rather than a serious attempt to reduce damage that the authors of the BIA seem to be doggedly denying or completely unaware of. However they are still advocating the driving in of temporary sheets thus adding vibration to ground pressure changes with this. Their only means of stopping landslide is to monitor building movement then determine what is to be done to the stable door after the horse has bolted. While Movement Monitoring may be appropriate for level stable ground, here it will merely indicate "Too late!!" as happened in Finchley Road in 2016. There had already been predictions of this by an expert and warnings as the neighbouring dig-out prompted a landslide into their own excavation. In any case the contractors of that development ignored red warnings for 10 days until forced to acknowledge them, then merely said that since it had already happened, there was no point in stopping. The results below are a fraction of the extensive severe damage throughout the entire building:



Landslide

Dropping sliding foundations

The only purpose of *weekly* movement monitoring would in any case seem to be to prevent the developer from diagnosing the cause of movement, since they should be able to do this with continuous monitoring.

This experience also points out the lack of understanding of the ground here and the futility of doing tests for the sake of doing them, and box-ticking rather than actually being aware of the risks and avoiding them. It is proposed that the monitors be placed at 1m above ground and 1m below eaves. However, this would not pick up all the current movement patterns nor the likely movement: ground volume loss and/or forwards and downwards landslide and hence floor drop. That monitoring on a *weekly basis* is proposed, beggars belief.

#### ADDITIONALLY

#### Removal or uncertain future for historic material

Clinker bricks are an historic feature of many boundary walls in Hampstead. During the construction of 24A NG great care was taken to preserve the side boundary wall with 26 NG which is formed from clinker bricks.



Front boundary wall of 26 Netherhall Gardens with its clinker brick panels



Clinker bricks were used for decoration in many boundary walls in wider Hampstead:



West Heath Road

Admirals Walk





Branch Hill

Maresfield Gardens



Heysham Lane





**Chesterford Gardens** 

Off Frognal

**Redington Road** 

The clay from the geological band of Claygate Beds that runs across Hampstead and Highgate contains a lot of silt making it ideal for brick making (see 'Brick making': https://www.ucl.ac.uk/earth-sciences/impact/publicengagement/londons-geology/londons-geology-fieldwork/hampstead-heath/geology-hampstead and http://londongeopartnership.org.uk/wp/wp-content/uploads/2018/08/The-Geology-of-Highgate-Wood-and-Queens-Wood-AGS-final.pdf) Bricks were made in the many brick kilns that dotted parts of the Heath, north of Finchley Road near Holy Trinity church and the Briardale Road area west of Platts Lane.

There is a newly discovered painting of a brick kiln by Constable on the reverse of one of his paintings of Branch Hill pond, now exhibited at the V&A: https://www.hamhigh.co.uk/etcetera/art/undiscovered-constable-oil-sketch-of-hampstead-heath-to-display-in-new-v-a-exhibition-1-3779948 and https://www.vam.ac.uk/blog/caring-for-our-collections/unknown-sketch-constable

These bricks are therefore of immense historical interest for the wider Hampstead area and great care should be taken to both restore the walls and to rebuild using the retained bricks. This should be a condition if consent is given.

There are some concerns about SUDs, the trees for removal and what the future landscaping will consist of. I will be sending in my concerns in a separate document.

#### **IN SUMMARY**

This project has been wisely refused twice at Appeal in the past, and should be again. Please refuse.

Evidence of the damage basements have caused in our area in the past is now gathering, as well as the usual case of developers' experts having inadequate local experience and Camden's independent experts being unwilling to adequately protect neighbours.

#### Dr Vicki Harding, Society Tree Officer, Heath & Hampstead Society Planning Sub-Committee

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