CampbellReith
consulting engineers

# 10b Wavel Mews, London NW6 3AB

## Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12466-32

Revision: D1

February 2017

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## Document History and Status

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## Document Details

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| Project Number | 12466-32 |
| Project Name | 10b Wavel Mews |
| Planning Reference | 2017/3288/PRE |

## Contents



## Appendix

## 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 10b Wavel Mews (planning reference 2017/3288/PRE). On the basis of the BIA, the basement was considered to fall within Category B as defined by the Terms of Reference.

1.2. 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.

1.3. 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.

1.4. The proposal includes the demolition of an existing building and the construction of a new 2 storey dwelling over a basement which extends to a maximum 4.10m depth. Clarification is required as the BIA and Construction method statement differ on the presence of a smaller sub-basement extending to 6.7m below ground level.

1.5. The basement is indicated to be constructed by underpinning although it is unclear how the section of the basement which extends beyond the existing building footprint is to be constructed. Retaining wall calculations, construction sequence sketches indicating the proposed methodology for the entire basement together with temporary propping is requested. An underpinning bay layout is also requested.

1.6. Further investigation and evidence of the existence or otherwise of subsidence damage to neighbouring properties should be provided.

1.7. Issues relating to flooding noted in Audit paragraphs 4.9, 4.10 and 4.16 should be considered and assessed. Evidence of the input of a hydrologist or a civil engineer specialising in flood risk management with respect to the hydrological appraisal is required.

1.8. Further ground investigation to reveal the nature of the party wall foundations and to enable the derivation of geotechnical parameters should be undertaken for detailed design.

1.9. Maximum Category 1 damage is predicted for the neighbouring properties. However, there are queries on the ground movement assessment which are discussed in Audit paragraphs 4.11 to 4.15.

1.10. Movements beneath the roadway due to the construction of the proposed basement are included. However, the impacts are not discussed and no mitigation is proposed.

1.11. It is accepted there are no slope stability or wider hydrogeological issues.

1.12. An outline works duration is included. Details should be provided by the Contractor at a later date.

1.13. An outline movement monitoring proposal is presented. Details and trigger levels should be agreed as part of the party wall award.

1.14. Queries and requests for further information are discussed in Section 4 and summarised in Appendix 2. Until the additional information and assessment required has been presented, it is not possible to assess that the BIA meets the criteria of CPG4.

## 2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 22 November 2016 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 10b Wavel Mews, London NW6 3AB, Camden Reference 2017/3288/PRE.

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). Ove Arup & Partners.
- Camden Planning Guidance (CPG) 4: Basements and Lightwells.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water

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 existing dwelling house and erection of replacement two storey dwelling house with two storey basement and roof terrace; hard and soft landscaping works'*

2.6. CampbellReith accessed LBC's Planning Portal on 22 December 2016 and 9 January 2017 and gained access to the following documents for audit purposes:

- Basement Impact Assessment (BIA) J12698 BIA Report Rev01.pdf: Southern Testing, October 2016.

- 10b WM Construction Management Plan: Brickson Construction Ltd, August 2016.
- CFA_10BWM_AIA_02 Arboricultural Report: Landmark Trees, July 2016
- Design and Access Statement: Canaway Fleming Architects, October 2016
- Survey Drawing 1687 - 01.pdf: Mobile CAD, June 2016
- Wavel Mews CMS rev ii.pdf – 2nd Revision – December 2016 – Devise Engineers.
- Wavel Mews CMS.pdf – 1st Revision September 2016 - Devise Engineers.
- Canaway Fleming Architects Planning application drawings consisting of:

  Location Plan (P16-107-A-P-S1-D-001)

  Proposed Site Plan (P16-107-A-P-S1-D-002)

  Existing Front Elevation (P16-107-A-E-VA-D-030)

  Existing Side Elevation (P16-107-A-E-VA-D-032)

  Proposed Front Elevation (P16-107-A-E-VA-D-130)

  Proposed Rear Elevation (P16-107-A-E-VA-D-131)

  Proposed Side Elevation (P16-107-A-E-VA-D-132)

  Existing Ground & First Floor Plans (P16-107-A-P-VA-D-010)

  Existing Roof Plan (P16-107-A-P-VA-D-011)

  Proposed Ground & First Floor Plans (P16-107-A-P-VA-D-111)

  Proposed Roof Plan (P16-107-A-P-VA-D-112)

  Existing Section AA & BB (P16-107-A-RP-01-004 Rev P16-107-A-X-VA-D-020)
- 26 No consultation responses.

## 3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

| Item | Yes/No/NA | Comment |
|---|---|---|
| Are BIA Author(s) credentials satisfactory? | No | See Audit paragraph 4.1 |
| Is data required by Cl.233 of the GSD presented? | Yes | Provided within BIA Construction Method Statement and Design and Access Statement. Indicative works duration included in construction management plan. |
| Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology? | No | No indication of construction methodology for the section of the basement which extends into the garden. |
| Are suitable plan/maps included? | Yes | BIA includes the relevant map extracts and proposed drawings are provided. |
| Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail? | Yes | As above. |
| Land Stability Screening:<br>Have appropriate data sources been consulted?<br>Is justification provided for 'No' answers? | Yes | See BIA Section G and appendix A. |
| Hydrogeology Screening:<br>Have appropriate data sources been consulted?<br>Is justification provided for 'No' answers? | Yes | See BIA Section G and appendix A. |
| Hydrology Screening:<br>Have appropriate data sources been consulted?<br>Is justification provided for 'No' answers? | No | Response to Q6 of the screening question is incorrect. Reference to Figures 5a and 5b of the Camden SFRA indicates the site is in a high risk area for both internal and external sewer flooding. |
| Is a conceptual model presented? | Yes | Stage 3, Section O of the BIA. |

| Item | Yes/No/NA | Comment |
|---|---|---|
| Land Stability Scoping Provided?<br>Is scoping consistent with screening outcome? | Yes | See BIA Section H. |
| Hydrogeology Scoping Provided?<br>Is scoping consistent with screening outcome? | Yes | See BIA Section H. |
| Hydrology Scoping Provided?<br>Is scoping consistent with screening outcome? | No | One issue from the screening (Q6) should have been carried forward. |
| Is factual ground investigation data provided? | Yes | See BIA Appendices B,C and D. |
| Is monitoring data presented? | Yes | See Stage 3, Section P of the BIA. |
| Is the ground investigation informed by a desk study? | Yes | Section K of the BIA. |
| Has a site walkover been undertaken? | Yes | Section K of the BIA. |
| Is the presence/absence of adjacent or nearby basements confirmed? | No | Not confirmed. See Audit paragraph 4.9. |
| Is a geotechnical interpretation presented? | Yes | See Stage 3 of the BIA. |
| Does the geotechnical interpretation include information on retaining wall design? | Yes | Section P of the BIA although horizontal stiffness/Young's Modulus (E) values are not included. |
| Are reports on other investigations required by screening and scoping presented? | Yes | Ground investigation and a tree survey |
| Are baseline conditions described, based on the GSD? | No | Presence of basements beneath neighbouring properties not confirmed. |
| Do the base line conditions consider adjacent or nearby basements? | No | Considered but not confirmed. |

| Item | Yes/No/NA | Comment |
|---|---|---|
| Is an Impact Assessment provided? | Yes | See Stage 4 of the BIA. |
| Are estimates of ground movement and structural impact presented? | Yes | See Stage 4 of the BIA. |
| Is the Impact Assessment appropriate to the matters identified by screening and scoping? | Yes | |
| Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme? | Yes | See Construction Method Statement and BIA however this is incomplete (see Audit paragraph 4.22) |
| Has the need for monitoring during construction been considered? | Yes | Section 8 of the Construction Method Statement. |
| Have the residual (after mitigation) impacts been clearly identified? | N/A | None identified. |
| Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained? | No | Not demonstrated (see audit paragraphs 4.19 to 4.23) |
| Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment? | No | Not demonstrated (see audit paragraph 4.10) |
| Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area? | No | As above. |
| Does report state that damage to surrounding buildings will be no worse than Burland Category 2? | Yes | Negligible to Very Slight (Category 0 to 1) damage predicted |
| Are non-technical summaries provided? | No | However, the BIA has generally been written in a way that is easy to understand. |

## 4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been produced by Southern Testing and two of the individuals involved have CGeol qualifications. The preparation of a BIA also requires the input of a hydrologist or a civil engineer specialising in flood risk management with respect to the hydrological appraisal. Evidence of this is requested.

4.2. A Construction Method Statement (CMS) has been produced by Devise Engineers and the authors hold CEng and MIStructE qualifications.

4.3. The design and access statement produced by Canaway Fleming Architects identified that the basement proposal did not involve a listed building.

4.4. The proposed development comprises the demolition of the existing building and the construction of a new 2 storey dwelling over a basement by underpinning. The BIA indicates the formation level of the basement is to be generally 4.10m bgl with a small area extending to 6.70m bgl. However, the Construction Method Statement indicates no small sub-basement. The section of the basement beyond the existing building footprint cannot be underpinned and there is no indication of how this would be formed. This is required together with structural details and retaining wall calculations. Although the CMS includes a construction sequence, sketches (plans and sections) indicating each stage together with temporary propping should be provided. An underpinning bay sequence is also required.

4.5. The proposed reinforced concrete underpins are considered 'special foundations' under the Party Wall act and are subject to the neighbours' agreement.

4.6. The BIA undertook screening and scoping for each of the elements noted in the Camden guidance namely surface flow, ground water flow and land stability. The only items deemed necessary to carry through to impact assessment was land stability.

4.7. The response to Question 9 of the land stability screening which relates to whether or not the site is within an area of worked ground is 'unknown' and it is further stated that one of the maps consulted indicates 'London Clay formerly dug pit 2-3m deep'. This issue was carried forward to scoping.

4.8. The land stability screening also indicated that trees are to be removed. This issue was carried forward to scoping where it is stated that effects of tree removal are considered to be minimal due to the size of the trees. It is not stated how the effects of tree removal may affect nearby shallow foundations. It is noted that the consultation responses (see Audit paragraphs 4.16 and 4.18) indicate issues relating to subsidence. A tree survey and an arboriculture report, which is recommended in the BIA, is presented under a separate cover.

4.9. It is stated that the proposed development will not result in changes to the area of hardstanding and thus to the flows of surface water. A 'No' response is given to Question 6 of the surface flow and flooding screening which relates to whether or not the site is in an area at risk from flooding. Wavel Mews is not indicated to have been flooded in either the 1975 or 2002 flood events although the roads in the vicinity previously flooded.

4.10. Reference to Figures 5a and 5b of the Camden SFRA indicates the site is in an area with a high risk of both internal and external sewer flooding. The proposal is to pump water from the basement level, including the new lowered courtyard into the public foul water mains. Although non-return valves are proposed to protect against public sewer surcharging, the issue of sewer flooding should have been identified in the screening and carried forward to scoping and/or impact assessment as necessary. Additionally, numerous residents' consultation residents indicate the presence of standing surface water to be an issue most months of the year.

4.11. The site is not located above an aquifer. The site is not within 100m of a watercourse and is not to be within the catchment of the Hampstead Heath pond chains.

4.12. The site is indicated to be located in an area where the slopes are less than 7°. It is accepted that there are no slope stability concerns or wider hydrogeological issues as a result of the proposed development.

4.13. A ground investigation was undertaken in June 2016 comprising 3 boreholes and 4 trial pits indicates the site is underlain by Made Ground over Head Deposits which are in turn underlain by the London Clay. It is stated that although a variable thickness of Made Ground was encountered in the investigation, the site is not considered to be underlain by worked ground as the Made Ground is deemed to relate to the construction of the existing building.

4.14. Groundwater was not encountered during the investigation and it was recorded at between 0.77 and 1.20m bgl during the monitoring visits. This is indicated to be perched water in the Made Ground and/or the Superficial Deposits. The BIA further states that limited inflows should be anticipated in the excavation that could be dealt with by sump pumping. This is accepted. The BIA recommends the inclusion of suitable tanking measures in the long term. It is further stated that tension piles could be considered to address hydrostatic uplift.

4.15. The presence or absence of basements beneath the neighbouring properties was not fully established. The BIA states that the adjacent property 10a Wavell Mews does not comprise a basement. The Design and Access Statement indicates that Camden's planning section has been consulted and permission for a single story basement was granted to no 10a in January 2010. There is mention of some works which may have been undertaken, however, it is indicated the

extent is unknown. Foundation inspection pits were undertaken which reveal information to the property itself (No 10b) but yield insufficient information on the foundations and presence or otherwise of a basement to No 10a.

4.16. A consultation response from the current residents of 10a Wavel Mews states that permission was granted for a basement extension to the property but they did not proceed with the works due to the number of residents' concerns about subsidence and flooding.

4.17. Retaining wall parameters are included in the geotechnical interpretation although horizontal stiffness (Young's Modulus), E, values are not included. The undrained shear strength (Cu) value at the top of the London Clay is considered to be optimistic given that it appears the ground investigation only included hand penetrometer testing to give an indication of the soil strength. Further ground investigation to investigate the party wall foundations which are to be underpinned and to enable the derivation of geotechnical parameters should be undertaken for detailed design.

4.18. The geotechnical laboratory test results indicate high volume change potential in the London Clay. Heave protection is proposed beneath the basement slab. The BIA authors state they have no evidence of seasonal shrink/swell subsidence in the area. However, resident's objections indicate subsidence is an issue in the mews and remedial works to a number of houses have been carried out.

4.19. A Ground Movement Assessment (GMA) is presented in Stage 4 of the BIA which makes reference to Section 5 makes to the use of Oasys Pdisp to predict heave movements due to demolition of the existing building and excavation and settlement due to the new building load. It is stated that the London Clay has been assumed to extend from below 1m bgl in this assessment. It is however noted that one of the boreholes indicates the Made Ground extends to a maximum depth of 1.45m bgl. Although contour plots and displacement graphs from this assessment has been provided, the full tabular input and output from the Pdisp should be provided.

4.20. It is further stated in the GMA that '*in the absence of underpinning specific guidance, the underpinned sections of the new basement have been treated as piles. It has been assumed that the movements resulting from the excavation in front of the underpins also incorporate movements from the installation of the underpins.*' Oasys Xdisp has been used to calculate ground movements and the resulting neighbouring building damage.

4.21. The above statement is not accepted. Whilst it is acknowledged that CIRIA C580 relates to embedded walls, the CIRIA C580 methodology for the calculation of horizontal and vertical movements due to installation of a planar diaphragm wall could be used to estimate the movements due to the installation of the underpins. This should be considered with movements

due to excavation. It is noted that the ground investigation indicates the ground conditions to be initially soft to firm or firm before being described as stiff with depth. The CIRIA C580 curves are for excavations and installation in stiff clay. There are two levels of underpinning proposed and it is unclear if underpinning on to soils described as soft to firm or firm has accounted for. It is also unclear how the movements from the section of the basement outside the existing building footprint have been accounted for in the ground movement assessment as these cannot be underpinned. It is stated that the deeper excavation depth has been used in the analysis. Although the output from the programme has been included, the full input is required.

4.22. Category 1 (Slight) damage has been predicted for No 10a Wavell Mews with Category 0 (Negligible) damage indicated for the remaining properties. Regardless of the above comments, CPG4 requires mitigation where damage of Category 1 or higher is predicted.

4.23. The proposed basement will be within 5m of the Wavel Mews roadway. The GMA includes an assessment of the likely heave as a result of the basement construction activities but makes no mention of the impact or mitigation of these effects, if any.

4.24. The need for movement monitoring is highlighted in the BIA and the CMS includes an outline proposal with suggested trigger levels. Details and trigger levels should be agreed as part of the Party Wall process.

4.25. An outline works duration as required by Cl. 233 of Arup GSD is included in the construction management plan. A detailed programme should be provided by the appointed contractor in due course.

## 5.0 CONCLUSIONS

5.1. Although two of the individuals involved have CGeol qualifications, evidence of the input of a hydrologist or a civil engineer specialising in flood risk management with respect to the hydrological appraisal is required.

5.2. The proposal includes the demolition of an existing building and the construction of a new 2 storey dwelling over a basement which extends to a maximum 4.10m depth. Clarification is required as the BIA and Construction method statement differ on the presence of a smaller sub-basement extending to 6.7m below ground level.

5.3. The basement is indicated to be constructed by underpinning although it is unclear how the section of the basement which extends beyond the existing building footprint is to be constructed. Retaining wall calculations, construction sequence sketches indicating the proposed methodology for the entire basement together with temporary propping is required. An underpinning bay layout is also required.

5.4. Temporary dewatering measures as well as basement waterproofing in the permanent case are recommended in the BIA.

5.5. Further investigation and evidence of the existence or otherwise of subsidence damage to neighbouring properties should be provided.

5.6. Issues relating to flooding noted in Audit paragraphs 4.9, 4.10 and 4.16 should be considered and assessed.

5.7. The presence or absence of basements beneath the neighbouring properties together with the nature of the party wall foundations has not been established fully. The foundations to the party wall have also not been determined.

5.8. The retaining wall parameters are considered incomplete as discussed in Audit paragraph 4.9. Further ground investigation to reveal the nature of the party wall foundations and to enable the derivation of geotechnical parameters should be undertaken for detailed design.

5.9. Maximum Category 1 damage is predicted for the neighbouring properties; however, there are queries on the ground movement assessment which are discussed in Audit paragraphs 4.11 to 4.15. Details on the mitigation measures to limit damage are requested once the GMA is reconsidered. Full input and output from the software used should be provided.

5.10. Movements beneath the roadway due to the construction of the proposed basement are included. However, the impacts should be discussed and suitable mitigation proposed.

5.11. It is accepted there are no slope stability or wider hydrogeological issues.

5.12. An outline works duration is included. Details should be provided by the Contractor at a later date.

5.13. An outline movement monitoring proposal is presented. Details and trigger levels should be agreed as part of the party wall award.

5.14. Queries and requests for further information are summarised in Appendix 2. Until the additional information and assessment required has been presented, it is not possible to assess that the BIA meets the criteria of CPG4.

# Appendix 1: Residents' Consultation Comments

Residents' Consultation Comments

| Surname | Address | Date | Issue raised | Response |
|---|---|---|---|---|
| Sarner | 10 Wavel Mews | 7th December 2016 | 'Digging down in this area could be problematic due to the water table. Also there are already huge drainage problems in the area and fears that flooding could occur as a result.' | See 5.6 |
| Poston | 5 Wavel Mews | 7th December 2016 | 'The main row of houses in the Mews has been subject to subsidence historically due to the expansion and contraction of the underlying clay soil. Selective underpinning work has been carried out over the years to minimize its impact but all the houses in the Mews continue to suffer from cracking due to soil movement.' | See 5.5 |
| Abram | Unclear | 7th December 2016 | 'The wall of 15 Acol Road is particularly vulnerable and is identified as such within the Basement Impact Assessment Report.' | See 5.9 |
| Abram | Unclear | 7th December 2016 | 'The area is Known to have a flood risk and this affects 10A and 10B quite substantially.' | See 5.6 |
| Berry | 9 Wavel Mews | 2nd December 2016 | 'Excavation work would have severely negative implications as there is a drainage system running close to the site and we have concerns this could impact ours and our neighbors properties.' | See 5.6 |
| Berry | 9 Wavel Mews | 2nd December 2016 | 'The type of deep excavation that has been proposed would put surrounding houses at structural risk and has not been successfully carried out in other buildings in the Mews.' | See 5.5 and 5.9 |
| Rael-Brook | Unclear | 2nd December 2016 | 'These are Mews houses without deep foundations and cannot structurally handle such a great amount of changes to them.' | See 5.5 and 5.9 |
| Unclear | 10a Wavel Mews (Suspected based on contents of objection) | Unclear | 'Our elderly neighbors being extremely anxious and all others very concerned with local subsidence and garden flooding.' | See 5.5, 5.6 and 5.9 |
| Sturman | 24A Acol Road | 20th November 2016 | 'The risk should not be taken of creating disturbance and subsidence in an area where subsidence is in any event a factor all of us who are resident have to live with because of the London Clay soil upon which our houses are built.' | See 5.5 |

Residents' Consultation Comments

| Surname | Address | Date | Issue raised | Response |
|---|---|---|---|---|
| Brown | Acol Road (Number unclear) | Unclear | '…would greatly impact the water table...' | See 5.6 |
| Brown | Acol Road (Number unclear) | Unclear | 'I also did not note any consideration being made for the age and construction methods for the surrounding buildings.' | See 5.5 |
| Brown | Acol Road (Number unclear) | Unclear | '…when fragility of the existing building became apparent as they had issues even without compromising the integrity of the supporting substrates.' | See 5.5 and 5.9 |
| Azarian | 11a Acol Road | Unclear | 'The risk of movement and cracks on a longer term is not negligible for us neighbors.' | See 5.5 and 5.9 |
| Symonds | CRASH – 48 Canfield Gardens | 2nd December 2016 | '…it is highly unlikely 10A can possibly remain undamaged once the other half, of what was built as a single construction, is demolished....' | See 5.9 |
| Symonds | CRASH – 48 Canfield Gardens | 2nd December 2016 | 'Additionally, this association has become increasingly concerned about rising water levels in the neighbourhood.' | See 5.6 |
| Sajjadi | 12 Wavel Mews | 2nd December 2016 | '…,destabilizing the old Mews structures further' | See 5.5 and 5.9 |
| Abram | 15A Acol Road | 29th November 2016 | 'Detrimental effect of the excavation on other buildings' | See 5.9 |
| Abram | 15A Acol Road | 29th November 2016 | 'The area is known for flood risk and this affects 10a and 10b quite substantially.' | See 5.6 |
| Malialis | 11 Wavel Mews | 6th December 2016 | 'This proposed development, can potentially create a flood and subsidence problem for 10a and neighboring properties.' | See 5.5, 5.6 and 5.9 |
| O'Keefe | The Lodge 17 Acol Road | 6th December 2016 | '..Likely to cause major structural problems for nearby properties. ' | See 5.9 |

Residents' Consultation Comments

| Surname | Address | Date | Issue raised | Response |
|---|---|---|---|---|
| Beddow | Flat 1, 15 Acol Road | 25th October 2016 | 'Unacceptable risk to the stability of surrounding properties from a basement excavation in soils that are highly shrinkable clay and known to be prone to movement.' | See 5.9 |
| Brick | 13 Acol Road | 2nd January 2017 | '…on issues that have been noticed by neighbouring owners, such as ground water levels and structural stability.' | See 5.5, 5.6 and 5.9 |
| Sarch | 17 Acol Road | 21st November 2016 | 'The depth of excavation will alter the water table and thus be prejudicial to the nearby properties…In an area where clay soil can lead to settlement it is unwise to build the basement.' | See 5.5, 5.6 and 5.9 |
| Ezekiel | 7 Wavel Mews | 22nd November 2016 | 'Due to the clay soil in this area and the weakness of the foundation, this could cause problems to the adjoining properties.' | See 5.5, 5.6 and 5.9 |
| Fryer | 9a Acol Road | 2nd December 2016 | 'There has been subsidence in the area and we have a high water particularly during the winter.' | See 55 and 5.6 |
| Abram | 11 Dresden Road | 8th December 2016 | 'Detrimental effect of the excavation on other buildings.' | See 5.9 |

# Appendix 2: Audit Query Tracker

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Audit Query Tracker*

| Query No | Subject | Query | Status | Date closed out |
|---|---|---|---|---|
| 1 | BIA format | BIA author qualifications. | Open – Input of individuals with qualifications as discussed in Audit paragraph 4.1 requested. | |
| 2 | Hydrology | Screening did not identify that the site is located in an area at risk from sewer flooding. Consultation comments indicate issues related to surface water flooding issues. | Open – to be considered and addressed as necessary. | |
| 3 | Stability | Proposed construction methodology not sufficiently detailed. No construction sequence sketches, no temporary works proposal and no structural calculations | Open – to be provided. | |
| 4 | Stability | Subsidence (see Audit paragraphs 4.16 and 4.18) | Open – to be considered and addressed as necessary | |
| 4 | Stability | Ground movement assessment | Open – Approach to GMA to be reconsidered as discussed in Audit paragraphs 4.19 to 4.23. Full input and output from software used to be provided. | |
| 5 | Stability | Retaining wall parameters incomplete | Open – adequate investigation to enable the derivation of the required parameters to be undertaken prior to detailed design. | N/A |
| 6 | Stability | Depth and nature of party wall foundations not determined. | Open – to be investigated prior to construction | N/A |
| 7 | Stability | Movement monitoring | Outline proposal provided. Details and trigger levels to be agreed as part of Party Wall award. | N/A |

* Please provide clear and complete responses to the above queries. If the BIA and/or supporting documents are amended, please provide a covering email/letter to indicate the amended sections.

## Appendix 3: Supplementary Supporting Documents

None

## London

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