CampbellReith
consulting engineers

340 Gray's Inn Road, London, WC1X 8BG

Basement Impact Assessment Audit

For
London Borough of Camden

Project No.
13693-90

Date
August 2023

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APPENDICES

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 340 Gray's Inn Road, London, WC1X 8BG (planning reference 2022/4469/P). The basement is 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 qualifications of the individuals involved in the production of the BIA are in accordance with LBC guidance.

1.5 The proposed development comprises a two-storey above ground extension of the existing building with the extension of the basement space. It also includes a localised lowering of the existing basement to create a greater headroom.

1.6 Screening and scoping assessments are presented, supported by desk study information.

1.7 A site investigation has been undertaken; final ground investigation data and groundwater monitoring are provided.

1.8 Limited groundwater may be encountered above basement excavation level. Measures will be adopted to control the likely groundwater inflows.

1.9 The site is located in a Critical Drainage Area. The flood risk assessment (FRA) has identified that the site is at a low risk from flooding from all sources, with no mitigation required from a flood risk perspective.

1.10 A range of SuDS techniques has been considered for inclusion within the scheme with the aim of providing a reduction of runoff rates from the site.

1.11 Geotechnical interpretation of the ground conditions and geotechnical parameters are provided.

1.12 A structural method statement is provided, and the construction sequence is summarised in the BIA.

1.13 A Ground Movement Assessment has been presented which predicts damage impacts of Category 0 to 1 (Negligible to Very Slight) to surrounding structures.

1.14 The BIA indicates that a movement monitoring scheme is to be adopted to ensure that the movements generated are maintained within predicted limits.

1.15 It is recommended that a Basement Construction Plan is provided confirming the detailed temporary and permanent works design, construction methodology for the substructure and impacts to surrounding structure and infrastructure. A monitoring strategy and mitigation scheme are to be submitted as part of the BCP, to ensure that a suitably robust scheme is adopted, in line with the assumptions made in the GMA.

1.16 No tree works, including pruning or felling, will be undertaken in connection with the development.

1.17 Considering the additional information presented, it can be confirmed that the BIA meets the requirements of Camden Planning Guidance: Basements, subject to a BCP being presented as described above that demonstrates a maximum Category 1 damage to neighbouring structures.

2.0 INTRODUCTION

2.1 CampbellReith was instructed by London Borough of Camden (LBC) on 8 December 2022 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 340 Gray's Inn Road, London, WC1X 8BG (Planning Reference 2022/4469/P).

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

- Camden Local Plan 2017 - Policy A5 Basements.
- Camden Planning Guidance (CPG): Basements. January 2021.
- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.

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 *"Change of use of first floor commercial floorspace to residential use and erection of a two storey (plus basement) extension along Britannia Street comprising commercial floorspace at basement and ground floors and 5 residential units at first floor; public realm works."*

2.6 The Audit Instruction confirmed 340 Gray's Inn Road neither comprises, nor is a neighbour to, listed buildings.

2.7 CampbellReith accessed LBC's Planning Portal on 19 December 2022 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment by Ed Moseley, ref: 1560, dated 12 September 2022.
- Arboricultural Method Statement by David Archer Associates dated September 2022.
- Surface Water Drainage Strategy by London Structures Lab, ref: 1560-LSL-XX-XX-RP-C-SWS Rev 0, dated September 2022.

- Flood Risk Assessment by London Structures Lab, ref: 1560-LSL-XX-XX-RP-C_FRE Rev 0, dated September 2022.
- Architectural drawings by RUFFA Architects:
  - Existing First Floor & Roof Plan, ref: 22001-RA-XX-00-DR-A-00_101 rev PL01, dated 29 September 2022.
  - Existing Basement & Ground Floor Plan, ref: 22001-RA-XX-00-DR-A-00_100 rev PL01, dated 29 September 2022.
  - Proposed Basement & Ground Floor Plan, ref: 22001-RA-XX-00-DR-A-00_150 rev PL01, dated 29 September 2022.
  - Proposed First Floor & Roof Plan, ref: 22001-RA-XX-00-DR-A-00_151 rev PL01, dated 29 September 2022.
  - Site Location Plan, ref: 22001-RA-XX-00-DR-A-00_001 rev PL01, dated 29 September 2022.
  - Existing Site Layout Plan, ref: 22001-RA-XX-00-DR-A-00_010 rev PL01, dated 29 September 2022.
  - Proposed Site Layout Plan, ref: 22001-RA-XX-00-DR-A-00_050 rev PL01, dated 29 September 2022.
  - Existing North & East Elevations, ref: 22001-RA-XX-00-DR-A-00_200 rev PL01, dated 29 September 2022.
  - Existing South & West Elevations, ref: 22001-RA-XX-00-DR-A-00_201 rev PL01, dated 29 September 2022.
  - Proposed North & East Elevations, ref: 22001-RA-XX-00-DR-A-00_250 rev PL01, dated 29 September 2022.
  - Proposed South & West Elevations, ref: 22001-RA-XX-00-DR-A-00_251 rev PL01, dated 29 September 2022.
  - Existing Sections, ref: 22001-RA-XX-00-DR-A-00_300 rev PL01, dated 29 September 2022.
  - Proposed Sections, ref: 22001-RA-XX-00-DR-A-00_350 rev PL01, dated 29 September 2022.

2.8 Subsequent to the initial audit report, CampbellReith gained access to the following relevant documents:

- Basement Impact Assessment by Ed Moseley, ref: 1560 rev 04, dated 16 June 2023.
- Ground Movement Assessment PDisp and XDisp Input and Output (as part of the BIA), by A-Squared Studio Engineers Ltd, dated 03 May 2023.
- Structural Method Statement by London Structures Lab (as part of the BIA).
- Email correspondence

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Section 2.1 of the revised BIA.
Is data required by Cl.233 of the GSD presented?	Yes	Appendix 5 of the BIA. Structural method statement provided in the revised submission. Even though structural method statement mentions the use of secant piled wall, it has been confirmed that a contiguous piled wall and underpinning will be adopted. See Appendix 3 of the audit report.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	
Are suitable plan/maps included?	Yes	Embedded in the BIA report.
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	Section 4.2 of the revised BIA.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 4.1 of the revised BIA.

Item	Yes/No/NA	Comment
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Section 4.3 of the revised BIA.
Is a conceptual model presented?	Yes	Section 7.1 of the revised BIA.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 5.0 of the revised BIA.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 5.0 of the revised BIA.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Section 5.0 of the revised BIA.
Is factual ground investigation data provided?	Yes	Appendix 2 of the BIA. Final Ground Investigation data provided in the revised submission.
Is monitoring data presented?	Yes	Monitoring data provided in the revised submission.
Is the ground investigation informed by a desk study?	Yes	Section 3 of the BIA.
Has a site walkover been undertaken?	Yes	Site walkover undertaken on 18/08/2022.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Section 2.3.4 of the BIA.

Item	Yes/No/NA	Comment
Is a geotechnical interpretation presented?	Yes	Section 7.1 of the revised BIA.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Section 7.1 of the revised BIA.
Are reports on other investigations required by screening and scoping presented?	Yes	Arboricultural Method Statement, Structural Method Statement, SuDs proforma, Surface Water Drainage Strategy and Flood Risk Assessment.
Are the baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	Section 8.0 of the revised BIA.
Are estimates of ground movement and structural impact presented?	Yes	Section 7.3 of the revised BIA.
Is the Impact Assessment appropriate to the matters identified by screening and scoping?	Yes	Section 8.0 of the revised BIA.
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	Section 7.4 of the revised BIA.
Have the residual (after mitigation) impacts been clearly identified?	Yes	

Item	Yes/No/NA	Comment
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	Section 7.3 of the revised BIA.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	A range of SuDS techniques has been considered for inclusion within the scheme with the aim of providing a reduction of runoff rates from the site.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	As above.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	Section 7.3 of the revised BIA.
Are non-technical summaries provided?	Yes	Section 1.0 of the revised BIA.

4.0 DISCUSSION

4.1 The Basement Impact Assessment (BIA) has been carried out by Ed Moseley, Cham Ariyaratne, John Bartley and Joe Gomme supported by A-Squared Studio Engineers who produced the Ground Movement Assessment. The individuals concerned in its production have suitable qualifications that meet the qualifications of CPG Basements.

4.2 The Audit Instruction confirmed the property neither contains, nor is a neighbour to, listed buildings.

4.3 The site is bounded by Gray's Inn Road to the West, Britannia Street to the south and existing multi-storey developments to the north and east. The existing development comprises a 6-storey building, with commercial spaces at ground and first floor level, residential units at levels 2-6 and an electrical substation at basement level.

4.4 The proposed development comprises a two-storey above ground extension of the existing building with the extension of the basement space. It also includes a localised lowering of the existing basement to create a greater headroom. The ground floor will contain a new commercial space with a new residential space located at the first-floor level. The proposal includes the construction of a contiguous piled wall with an in-situ concrete liner wall and underpins installed in a "hit and miss" sequence. This configuration is intended to create the basement area and connect to the existing structure. The new columns will be supported on piled foundations and the basement slab will be designed as a suspended slab structure.

4.5 Screening and scoping assessments are presented and informed by desk study information. Most relevant figures/maps and other guidance documents are reference within the BIA to support responses to screening questions.

- The Land Stability screening and scoping in the revised BIA mention that there will be an increase in differential depth of foundations relative to neighbouring buildings. Potential ground movements and damage category assessments are covered in the Ground Movement Assessment.
- Question 14 of the Land Stability screening states that London underground line runs in open cut with the edge of the exclusion zone about 65m to the north-east of the site. The BIA mentions that underground infrastructure present beneath/close to the site includes Thames Water. A sewer passing beneath the building was identified; Thames Water have been contacted for a diversion. Further consideration of this is outside the scope of this audit.

- The revised BIA submission states that the site is located near to a historical watercourse identified as the River Fleet. It is assumed that it now runs entirely below ground. Barton and Myers (2016) show that the watercourse runs past the north end of Gray's Inn Road and then follows the western side of King's Cross Road. At its closest point King's Cross Road is 119m from the site. Between the course of the Fleet and the site run both the Circle Line (London Underground) and Thameslink rail line from King's Cross to Farringdon. Both of these lines run in cuttings more than 8m below the original ground level and would intercept any water that might percolate from the Fleet towards the site.
- According to Figure 15 Flood Map – Camden Geological Hydrogeological and Hydrological study. The site falls in an area with the potential to be at risk of surface water flooding. Question 6 of the Hydrology screening should be answered as "Yes" and carried over to scoping. However, a Flood Risk Assessment has been undertaken and the risk of Flooding on site has been determined as low.

4.6 A site investigation was undertaken by London Structures Lab. Site works comprised two boreholes, BH01 to 25m depth and BH02 to 2.50m, and five trial holes. A conceptual ground model is presented in the revised BIA and accepted.

4.7 Groundwater data has been provided and is recorded at 14.42m OD at its shallowest with the proposed basement formation level of 13.80m OD. The BIA mentions that limited groundwater may be encountered above basement excavation level. The proposed construction will incorporate a contiguous pile retaining wall and adequate measures will be adopted to control the likely groundwater inflows. Mitigation measures include:

- Trial excavations in front of the wall following installation to assess flow rates, flow duration and possible washout.
- Bailing tests in borehole installation to assess recharge rates.
- Control measures such as localised sump pumping to localised pressure will be used based on observations made during the trial excavations and borehole testing, and a suitable contingency should be in place.
- Watching brief should be maintained to assess ongoing inflows (if any) to ensure that excessive washout does not occur. Temporary suspension of the main excavation with temporary backfilling should be undertaken if required.

4.8 The BIA states that site is underlain by London Clay that has typically low permeability, with only pockets and partings of sandier material and no continuous layer that is able to transmit water. There will be no significant movement of groundwater through the soils beneath the site, and no significant impact on groundwater levels or flows in the local area.

4.9 The site is likely located in a Critical Drainage Area. The flood risk assessment (FRA) has identified that the site is at a low risk from flooding from all sources, with no mitigation required from a flood risk perspective.

4.10 The proposal will not increase the proportion of hardstanding across the site. However, a range of SuDS techniques has been considered for inclusion within the scheme with the aim of providing a reduction of runoff rates from the site. The proposed site will discharge the surface water from the development via existing Thames Water sewer. In addition, an attenuation tank will provide the required storage for the extension.

4.11 Geotechnical interpretation of the ground conditions and geotechnical parameters are provided in the revised BIA and are accepted.

4.12 The construction sequence has been summarised in Section 7.2 of the revised BIA. The construction of the proposed basement will use a contiguous piled wall with concrete liner wall and underpins installed in a "hit and miss" sequence. New piled foundations will support new columns, which in turn support reinforced concrete slabs at ground, 1st and 2nd floor levels. Section 1.1.2 of the BIA notes that of deepening the basement is proposed to create more headroom. This will be formed by creating saw cuts in the existing slab and excavating with a mini excavator (Email correspondence – Appendix 3).

4.13 A Ground Movement Assessment (GMA) and damage assessment are provided to demonstrate that ground movements and consequential damage to neighbouring properties will be within the LBC's policy requirements. The analyses were carried out using the Oasys programmes PDisp and XDisp.

- The contiguous piled wall has been modelled with a length of 9.00m to represent an upper bound movement due to the installation of the wall. It is understood that in reality, the wall will be between 7.50m and 9.00m in length. The retaining wall supports the ground to first floor façade and a nominal load from the floor. This has been assessed to be 15kN/m, pending detailed confirmation of the façade design (Email Correspondence, Appendix 3).
- CIRIA C760 normalised ground movement curves were adopted to assess ground movements due to retention system installation and excavation works. The installation of planar diaphragm wall in stiff clay CIRIA curve has been modified to give a vertical and horizontal movement of 5mm immediately in front of the wall to represent the underpin installation movements.
- Ground movements resulting from wall installation have been reduced compared to what is suggested by CIRIA C760 and are accepted as being reasonable. Installation movement for a contiguous bored pile wall in stiff clay CIRIA curve have been reduced by 50% in alignment with the findings published by Ball and Langdon (2014). It is accepted that, with suitable site controls, installation movement can be controlled to be less than predicted in CIRIA C760.
- Segments of facades WS1.4, WS1.5 and WS1.8 have been combined where appropriate and were found to have a damage of Category 1 or less. By inspecting the wall segments CampbellReith accepts this is a reasonable approach.

- Façade GIR1.3 was found to experience unrealistic peaks in movement due to the limitations of the software. The displacement line associated with this facade has been smoothed and re-assessed. Upon examining the wall segment, CampbellReith acknowledges this is a reasonable approach.
- The ground movements along the nearby roads reported in the table in Section 7.3.6 of the revised BIA do not reflect the contour movement plots provided in the GMA. However, it is accepted that damage to the adjacent roads and highways, should it occur, will be minor.

4.14 The results of the Building Impact Assessment, using the reduced ground movement CIRIA curves and displacement data smoothing, indicate damage to neighbouring buildings will not exceed Category 1 (Very Slight).

4.15 The BIA indicates that a movement monitoring scheme is to be adopted to ensure that the movements generated are maintained within predicted limits. It is recommended that a monitoring strategy and mitigation scheme are submitted as part of a Basement Construction Plan (BCP), to ensure that a suitably robust scheme is adopted, in line with the assumptions made in the GMA.

4.16 The arboricultural method statement indicates that no tree works, including pruning or felling, will be undertaken in connection with the development.

5.0 CONCLUSION

5.1 The qualifications of the individuals involved in the production of the BIA are in accordance with LBC guidance.

5.2 The proposed development comprises a two-storey above ground extension of the existing building with the extension of the basement space. It also includes a localised lowering of the existing basement to create a greater headroom.

5.3 Screening and scoping assessments are presented, supported by desk study information.

5.4 A site investigation has been undertaken; final ground investigation data and groundwater monitoring are provided.

5.5 Limited groundwater may be encountered above basement excavation level. The proposed construction will incorporate a contiguous pile retaining wall and measures will be adopted to control any groundwater inflows.

5.6 The site is located in a Critical Drainage Area. The flood risk assessment (FRA) has identified that the site is at a low risk from flooding from all sources, with no mitigation required from a flood risk perspective.

5.7 A range of SuDS techniques has been considered for inclusion within the scheme with the aim of providing a reduction of runoff rates from the site.

5.8 Geotechnical interpretation of the ground conditions and geotechnical parameters are provided in the revised BIA and are accepted.

5.9 A structural method statement is provided, and the construction sequence is summarised in the BIA.

5.10 A Ground Movement Assessment using reduced CIRIA curves has been presented which predicts damage impacts of Category 0 to 1 (Negligible to Very Slight) to surrounding structures.

5.11 The BIA indicates that a movement monitoring scheme is to be adopted to ensure that the movements generated are maintained within predicted limits.

5.12 The GMA assumes particular controls on site in order to restrict ground movements. For this reason, and the complexity of having a combination of piled and underpinned retaining walls, it is recommended that a Basement Construction Plan is provided confirming the detailed temporary and permanent works design, construction methodology for the substructure and impacts to surrounding structure and infrastructure. A monitoring strategy and mitigation scheme are to be submitted as part of the BCP, to ensure that a suitably robust scheme is adopted, in line with the assumptions made in the GMA.

5.13 No tree works, including pruning or felling, will be undertaken in connection with the development.

5.14 Considering the additional information presented, it can be confirmed that the BIA meets the requirements of Camden Planning Guidance: Basements, subject to a BCP being presented as described above that demonstrates a maximum of Category 1 damage to neighbouring structures.

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Appendix 1 -
Consultation Responses

None

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Appendix 2 - Audit Query Tracker

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Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	The qualifications of the individuals involved in the production of the BIA are not in accordance with LBC guidance.	Closed – See Section 4.1	13/03/2023
2	Land Stability/ Hydrology/ Hydrogeology	Screening and scoping assessments to be reviewed following the comments provided in Section 4.	Closed – See Section 4.5	13/03/2023
3	Land Stability	Conceptual ground model not provided and is requested.	Closed – See Section 4.6	13/03/2023
4	Hydrogeology	Groundwater monitoring data not provided and is required. Mitigation measured to control the groundwater flow into the excavation should be identified.	Closed – See Section 4.7	09/05/2023
5	Hydrogeology	Impact to wider hydrogeological environment to be considered.	Closed – See Section 4.8	13/03/2023
6	Land Stability	Geotechnical parameters not provided and are requested.	Closed – See Section 4.11	09/05/2023
7	Land Stability	Clarification regarding basement depth is required.	Closed – See Section 4.12	20/06/2023
8	Land Stability	Further detail of the construction sequence, including the method and sequence to be used in the area where the basement floor is to be lowered, is requested.	Closed – See Section 4.12	20/06/2023
9	Land Stability	Structural Method Statement not provided and is required	Closed – See Section 4.12	26/05/2023
10	Land Stability	Ground Movement Assessment to be reviewed following the comments provided in Section 4.	Closed – See Section 4.13	20/06/2023
11	Land Stability	Damage assessment to be reviewed following the comments provided in Section 4.	Closed – See Section 4.14	20/06/2023
12	Land Stability	Monitoring points and monitoring strategy to be reviewed subject to GMA revision	Closed – See Section 4.15	20/06/2023

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consulting engineers

Appendix 3 - Supplementary Supporting Documents

Email Correspondence

Audit Query Tracker

FW: 340 Gray's Inn Road (2022/4469/P)Kristina Smith to MarittaElias@campbellreith.com, KatharineBarker@campbellreith.com 26/05/2023 10:08
Cc "camdenaudit@campbellreith.com"

1 Attachment

340 Grays Inn Road- BIA pro forma (Rev 03)[2].pdf

Hi Maritta, Katharine -

Please find attached further information to address the omissions.

Thanks,
--
Kristina Smith
Principal Planning Officer

Telephone: 020 7974 4986

From: Ben Kelly <ben@westgreenplanning.co.uk>
Sent: 25 May 2023 17:01
To: Kristina Smith <Kristina.Smith@camden.gov.uk>
Subject: Re: 340 Gray's Inn Road (2022/4469/P)

Hi Kristina,

See attached updated BIA (minus appendices). Tracker updated below to highlight amends.

8	Land Stability	Further detail of the construction sequence, including the method and sequence to be used in the area where the basement floor is to be lowered, is requested.	This will be saw cuts to the existing slab and excavation works with a mini excavator

9	Land Stability	Structural Method Statement not provided and is required	Included
10	Land Stability	Ground Movement Assessment to be reviewed following the comments provided in Section 4. • Outline calculations are required to support the assumptions regarding embedded retaining wall pile length. • The deflection profile obtained from Geo5 resembles that of a cantilever wall instead of a high stiffness wall with props; even though it has been stated that the GMA is based on an assumed temporary works strategy which has props. Clarification is requested regarding the wall type adopted and propping arrangement. • The assessment predicts movements due to the excavation; installation movements of a contiguous piled wall have not been considered and should be included. • Ground movements associated with the construction to lower the floor of the existing basement floor should be included in the assessment. • It is unclear whether the assessment in Geo5 has been undertaken according to Section 6.2.2 of CIRIA C760. Clarification is required to show how the calculated displacements in Geo5 have been used to validate the ground movements in the GMA. • Input and output data from the Geo5 assessment is requested to confirm the model geometry, ground model and soil parameters used to carry out the assessment. • The neighbouring property 46 Britannia Street has only been considered in the GMA. The existing property, all neighbouring properties and road pavements within the zone of influence should be included in the GMA and subsequently the damage assessment.	Updated in the BIA
11	Land Stability	Damage assessment to be reviewed following the comments provided in Section 4.	Updated in the BIA
12	Land Stability	Monitoring points and monitoring strategy to be reviewed subject to GMA revision	Updated in the BIA

Ben Kelly
Director
t: 07872590069
a: Another Place, 3-9 Belfast Road, London, N16 6UN
e: info@westgreenplanning.co.uk

From: Kristina Smith <Kristina.Smith@camden.gov.uk>
Date: Friday, 19 May 2023 at 09:08
To: Ben Kelly <ben@westgreenplanning.co.uk>
Subject: FW: 340 Gray's Inn Road (2022/4469/P)

Hello Ben,

A few BIA-related queries remain as shown on the attached tracker.

Kind regards,
--
Kristina Smith
Principal Planning Officer

Telephone: 020 7974 4986

From: MarittaElias@campbellreith.com <MarittaElias@campbellreith.com>
Sent: 18 May 2023 14:48
To: Kristina Smith <Kristina.Smith@camden.gov.uk>
Cc: camdenaudit@campbellreith.com
Subject: 340 Gray's Inn Road (2022/4469/P)

Hi Kristina,

Having reviewed the revised BIA for 340 Gray's Inn Road, we have a number of queries and clarifications that need to be resolved before we can close out the audit. Kindly find attached the audit query tracker below.

Kind regards,

Maritta Elias
Project Geotechnical Engineer

CampbellReith
consulting engineers

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From:	"Kristina Smith" <Kristina.Smith@camden.gov.uk>
To:	"KatharineBarker@campbellreith.com" <KatharineBarker@campbellreith.com>
Cc:	"camdenaudit@campbellreith.com" <camdenaudit@campbellreith.com>
Date:	09/05/2023 08:45
Subject:	FW: BIA - 2022/4469/P - 340 Gray's Inn Road

Hello Katharine,

Hopefully it's OK to send the additional info through via a we transfer link but let me know if not.

Thanks,

Kristina Smith
Principal Planning Officer

Telephone: 020 7974 4986

From: Ben Kelly <ben@westgreenplanning.co.uk>
Sent: 05 May 2023 15:50
To: Kristina Smith <Kristina.Smith@camden.gov.uk>
Subject: BIA - 2022/4469/P - 340 Gray's Inn Road

Please take extra care with any links, attachments, requests to take action or for you to verify your password etc. Please note there have been reports of emails purporting to be about Covid 19 being used as cover for scams so extra vigilance is required.

Hi Kristina,

As per my recent email, we have now responded on all of the queries raised with regards to the BIA. The revised document is 20mb so I have included in a link below. I can send via any other format if required.

[Suspicious URL detected]

In terms of the queries raised, the engineer has provided the following summary:

Query 4: More detail included in the BIA on measures to be undertaken

Query 6: Included in the BIA

Query 8: The reports have been aligned to reflect the proposed contig piled wall design.

The wall is about 38m long on plan and is toed circa 7.5m below ground level- pending final design confirmation from the specialist supplier.

The statement regarding the submission of proposal from the contractor is regarding the specific method statement, final prop design and proposed demolition and excavation machinery. The design has established the temporary works requirements/ strategy and has assumed the existing structure will be saw cut and broken out.

Query 9: See response above and below.

Query 10: GMA has been updated and included in appendix 4 to reflect the proposed contig pile design.

Query 11 & 12: See updated GMA.

I trust that this can be forwarded directly to your consultants for review. Please do let us know if you need any further information or detail.

Ben Kelly
Director
t: 07872590069
a: Another Place, 3-9 Belfast Road, London, N16 6UN
e: info@westgreenplanning.co.uk

13614880).

FW: 340 Gray's Inn Road - BIA revisionKristina Smith to MarittaElias@campbellreith.com, KatharineBarker@campbellreith.com 20/06/2023 09:33

3 Attachments

340 Grays Inn Road Query Tracker - WGP Comments 19th June.xlsx

340 Gray's Inn Road - BIA (Rev04).pdf

10765 BIA Appendix 4_(04_06_23)_compressed.pdf

Good morning,

Further information to address the outstanding items.

Thanks,

--

Kristina Smith
Principal Planning Officer

Telephone: 020 7974 4986

From: Ben Kelly <ben@westgreenplanning.co.uk>
Sent: 19 June 2023 11:11
To: Kristina Smith <Kristina.Smith@camden.gov.uk>
Subject: 340 Gray's Inn Road - BIA revision

Hi Kristina,

Please see responses below to the latest BIA comments which I have included in the attached tracker. The new document is attached along with the appendix referred to below.

- *Please confirm that the embedded retaining wall is not taking any axial loads. If it is taking axial load, outline calculations are required to support the assumptions regarding the retaining wall length.*
    - The retaining wall supports the ground to first façade and a nominal load from the floor. This has been assessed to be 15kN/m, pending detailed confirmation of the façade design.

- *Ground movements presented in section 7.3.6 have been modified compared to the previous BIA revision. Please provide software input and output to support these results.*
    - This was submitted previously as appendix 4. Please find resubmitted for information and convenience.

Ben Kelly
Director
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e: info@westgreenplanning.co.uk

Audit Query Tracker

340 Gray's Inn Road (2022/4469/P)

CampbellReith
consulting engineers

Query No	Subject	Query
1	BIA	The qualifications of the individuals involved in the production of the BIA are not in accordance with LBC guidance.
2	Land Stability/ Hydrology/ Hydrogeology	Screening and scoping assessments to be reviewed following the comments provided in Section 4.
3	Land Stability	Conceptual ground model not provided and is requested.
4	Hydrogeology	Groundwater monitoring data not provided and is required. Mitigation measured to control the groundwater flow into the excavation should be identified.
5	Hydrogeology	Impact to wider hydrogeological environment to be considered.
6	Land Stability	Geotechnical parameters not provided and are requested.
7	Land Stability	Clarification regarding basement depth is required.
8	Land Stability	Further detail of the construction sequence, including the method and sequence to be used in the area where the basement floor is to be lowered, is requested.
9	Land Stability	Structural Method Statement not provided and is required
10	Land Stability	Ground Movement Assessment to be reviewed following the comments provided in Section 4. • Outline calculations are required to support the assumptions regarding embedded retaining wall pile length. •The deflection profile obtained from Geo5 resembles that of a cantilever wall instead of a high stiffness wall with props; even though it has been stated that the GMA is based on an assumed temporary works strategy which has props. Clarification is requested regarding the wall type adopted and propping arrangement. •The assessment predicts movements due to the excavation; installation movements of a contiguous piled wall have not been considered and should be included. •Ground movements associated with the construction to lower the floor of the existing basement floor should be included in the assessment. •It is unclear whether the assessment in Geo5 has been undertaken according to Section 6.2.2 of CIRIA C760. Clarification is required to show how the calculated displacements in Geo5 have been used to validate the ground movements in the GMA. •Input and output data from the Geo5 assessment is requested to confirm the model geometry, ground model and soil parameters used to carry out the assessment. •The neighbouring property 46 Britannia Street has only been considered in the GMA. The existing property, all neighbouring properties and road pavements within the zone of influence should be included in the GMA and subsequently the damage assessment.
11	Land Stability	Damage assessment to be reviewed following the comments provided in Section 4.
12	Land Stability	Monitoring points and monitoring strategy to be reviewed subject to GMA revision
13	Note Only	

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Status	**CRH Comments 31.03.23**
Open – See Section 4.1	Closed out
Open – See Section 4.5	Closed out
Open – See Section 4.6	Closed out
Open – See Section 4.7	Groundwater data has been provided and is recorded at 14.42mOD at its shallowest. The BIA mentions that it is likely that the groundwater is perched water, however the basement will be founded at 13.80mOD and is likely to encounter groundwater. The BIA only mentions the need to mitigate against the water seepages. But no mitigation measures are provided and are requested.
Open – See Section 4.8	Closed out
Open – See Section 4.11	Bearing capacity is not provided and is required.
Open – See Section 4.12	Closed out
Open – See Section 4.13	Structural method statement mentions that the basement extension is to be formed using a secant piled system, whilst the BIA mentions the use of a contiguous piled wall. Clarification is requested regarding the wall type of the basement extension. The structural method statement states that the retaining wall will be 9m in length, whilst the BIA adopted a wall height of 1.5 the retained height (5.13m). Clarification is requested. In section 1.1.2 of the BIA deepening the basement is proposed to create more headroom. The structural method statement states that the construction methods are to be agreed with Structures Lab prior to foundation design. Construction methods for this area of the basement development should be clearly identified
Open – See Section 4.13	Structural method statement provided. Clarifications requested as per Query No 8 and 10.
Open – See Section 4.14	The structural method statement states that the basement extension is proposed to be formed using a secant piled system, the GMA is undertaken on the basis that the retaining walls installed are a combination of underpinning in a hit and miss sequence and contiguous piled walls. Clarification is requested, GMA or structural method statement to be updated to reflect the correct wall type. The structural method statement states that the retaining wall will be 9m in length, whilst the BIA adopted a wall height of 1.5 the retained height (5.13m). Clarification is requested, and the GMA and/or the structural method statement to be updated to reflect the correct wall depth. Outline calculations are required to support the assumptions regarding embedded retaining wall pile length. The length chosen should be a cautious estimate to allow a conservative assessment to be undertaken. Reduction in ground movements have been applied for the contiguous piled wall installation compared with the C760 published values. It is requested that the analysis be undertaken using the full Ciria C760 curves. Following the Ciria C760 installation curves for a planar diaphragm wall adopted for an underpinning depth of c. 2m is going to underestimate the ground movements. Typically movements for underpinning are anticipated to be in the range of 5mm to 10mm vertically and horizontally per lift.
Open – See Section 4.15	Subject to GMA revision
Open – See Section 4.16	Subject to GMA revision
	The BIA states that the contractor will produce a detailed temporary works, construction methodology and c within a Basement Construction Plan (BCP) as part of the detailed design, in accordance with the assumptio

	West Green Planning
Status as of 31.03.23	**Response 09.05.23**
Closed out	Closed out
Closed out	Closed out
Closed out	
Open	More detail included in the BIA on measures to be undertaken
Closed out	Closed out
Open	Included in the BIA
Closed out	Closed out
Open	The reports have been aligned to reflect the proposed contig piled wall design. The wall is about 38m long on plan and is toed circa 7.5m below ground level- pending final design confirmation from the specialist supplier. The statement regarding the submission of proposal from the contractor is regarding the specific method statement, final prop design and proposed demolition and excavation machinery. The design has established the temporary works requirements/ strategy and has assumed the existing structure will be saw cut and broken out.
Open	See response above and below.
Open	GMA has been updated and included in appendix 4 to reflect the proposed contig pile design.
Open	See updated GMA.
Open	See updated GMA.
ontrols which will be presented ons of the GMA (Page 39).	

CampbellReith	
CRH Comments 18.05.23	**Status as of 18.05.23**
Closed out	Closed out
Closed out	Closed out
Closed out	Closed out
Closed out	Closed out
Closed out	Closed out
Closed out	Closed out
Closed out	Closed out
Section 7.3.3 of the revised BIA states that a retaining wall of 1.5 x retained height (5.13m) will be adopted in the GMA. Whilst the email response on 09.05.23 states that the contiguous piles wall is toed at 7.5m bgl. However, the GMA adopts a contiguous retaining wall length of 9m. Clarification is requested regarding the contiguous piled wall length. Clarification as to whether the embedded retaining wall is taking axial load is requested. If so outline calculations are required to support the assumptions regarding the embedded wall length.	Open
Section 3.0 of the structural method statement still mentions the use of secant piled wall of 9m length. Information should be presented consistently across the reports.	Open
A retaining wall length of 9m has been adopted in the GMA. However, the installation movements for the contiguous piled wall are reduced by 50%. It is requested that case studies are provided to justify the adoption of reduced ground movement curves, or that the analysis be undertaken using the full Ciria C760 curves. Clarification is required relating to the combining/smoothing exercises undertaken to address the high damage categories predicted in the XDisp assessment. Section 7.3.3 of the revised BIA states that a retaining wall of 1.5 x retained height (5.13m) will be adopted in the GMA. Whilst the email response on 09.05.23 states that the contiguous piles wall is toeing at 7.5m bgl. However, the GMA adopts a contiguous retaining wall length of 9m. Clarification is requested regarding the contiguous piled wall length.	Open
Subject to GMA revision	Open
Subject to GMA revision	Open
The BIA states that the contractor will produce a detailed temporary works, construction methodology and controls which will be presented within a Basement Construction Plan (BCP) as part of the detailed design, in accordance with the assumptions of the GMA (Page 39).	

West Green Planning	CampbellReith	
Response 26.05.23	**CRH Comments 07.06.23**	**Status as of 07.06.23**
Closed out	Closed out	Closed out
Closed out	Closed out	Closed out
Closed out	Closed out	Closed out
Closed out	Closed out	Closed out
Closed out	Closed out	Closed out
Closed out	Closed out	Closed out
Closed out	Closed out	Closed out
Further detail of the construction sequence, including the method and sequence to be used in the area where the basement floor is to be lowered, is requested. --> This will be saw cuts to the existing slab and excavation works with a mini excavator	Please confirm whether the embedded retaining wall is taking axial load. If so outline calculations are required to support the assumptions regarding the embedded wall length.	Open
Included	Closed out	Closed out
Updated in the BIA.	Ground movements presented in section 7.3.6 have been changed compared to the previous BIA revision. Please provide software input and output to support these results.	Open
Updated in the BIA.	Subject to GMA revision	Open
Updated in the BIA.	Closed out	Closed out
	The BIA states that the contractor will produce a detailed temporary works, construction methodology and controls which will be presented within a Basement Construction Plan (BCP) as part of the detailed design, in accordance with the assumptions of the GMA (Page 39).	

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Response 19.06.23	**CRH Comments 10.07.23**	**Status as of 14.08.23**
Closed out	we kindly request the applicant to consolidate all relevant information, findings and appendices into a final BIA report that can be uploaded to Camden Planning website. This will allow us to undertake a final review of the information provided before finalising our audit report.	Closed out
Closed out		
Closed out		
Closed out		
Closed out		
Closed out		
Closed out		
The retaining wall supports the ground to first façade and a nominal load from the floor. This has been assessed to be 15kN/m, pending detailed confirmation of the façade design.		
This was submitted previously as appendix 4. Please find resubmitted for information and convenience.		
GMA Revised		
Closed out		

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