

14-19 Tottenham Mews
London, W1T 4AA

Basement Impact Assessment
Audit

For
London Borough of Camden

Project Number: 13398-75
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1.0 NON-TECHNICAL SUMMARY

- 1.1. CampbellReith was instructed by London Borough of Camden, (LBC) to carry out an audit on the Basement Impact Assessment submitted as part of the Planning Submission documentation for 14-19 Tottenham Mews, London, W1T 4AA (planning reference 2020/5633/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 Basement Impact Assessment (BIA) has been prepared and reviewed by individuals with suitable qualifications in accordance with CPG Basements.
- 1.5. The site is currently occupied by a two-storey building with no basement.
- 1.6. The proposed development will involve the demolition of the existing building and construction of a new seven storey building including a single storey lower ground floor. The maximum anticipated excavation will be c.4.10m.
- 1.7. The lower ground floor will be formed adopting a contiguous piled wall and underpinning.
- 1.8. An outline construction sequence for the proposed lower ground floor is provided. In the updated submissions the construction sequence drawings are presented.
- 1.9. An impact assessment on nearby sewers may be required and Thames Water shall be consulted.
- 1.10. Screening charts and scoping sections are included in the Geotechnical BIA. The full desk study information has been provided in the updated submissions.
- 1.11. The Geotechnical Interpretative Report has been provided in the updated submissions.
- 1.12. The on-site geology comprises Made Ground over Lynch Hill Gravel Member over London Clay. Monitoring data suggest that the groundwater level is at c.5m bgl.
- 1.13. It is accepted that the proposed development is not anticipated to impact the hydrogeology of the area. Groundwater monitoring data has been provided in the updated submissions.
- 1.14. A ground movement assessment (GMA) and a damage assessment has been presented. Considering the updated submissions, the conclusions of the GMA are accepted.

- 1.15. Clarifications with regard to the proposed Observational Method were requested in the previous D1 audit. Whilst no detailed methodology is presented, considering that the conclusions of the GMA indicate damage to neighbouring structures will be within LBC's policy limits, it is accepted that a detailed monitoring plan can be agreed under the Party Wall process.
- 1.16. A combination of a blue roof system and drainage into the existing sewer is proposed. The latter will require permission from Thames Water.
- 1.17. It is accepted that there will be no impact to the surface water from the proposed development.
- 1.18. Queries are discussed in Section 4 and summarised in Appendix 2. Considering the updated submissions, the BIA complies with the requirements of CPG Basements.

2.0 INTRODUCTION

- 2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 24/12/2020 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 14-19 Tottenham Mews, London, W1T 4AA (planning reference 2020/5633/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: Basements. March 2018.
 - 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.

LBC's Audit Instruction described the planning proposal as *"Erection of a six storey building (and basement) to provide office (use Class E) at part ground and basement levels and self-contained flats (use class C3) at ground and floors one to five; with associated landscaping, cycling parking and enabling works. CONSULTATION NOTE: Application is linked to redevelopment of Network building and flats (ref 2020/5624/P)".*

The Audit Instruction clarified that the site does not involve, or is a neighbour to, any listed building.

2.5. CampbellReith accessed LBC's Planning Portal on 14/1/2021 and gained access to the following relevant documents for audit purposes:

- "Structural Engineering Report & Subterranean Construction Method Statement" (SER), 13/11/2020, Rev.P1, Elliott Wood Partnership Ltd;
- "Preliminary Basement Impact Assessment" (Geotechnical BIA), October 2020, Rev.0, Card Geotechnics Ltd. It is included as Appendix C in the SER report;
- "Surface Water Drainage Statement", 13/11/2020, Rev.P1, Elliott Wood Partnership Ltd;
- Design & Access Statement, November 2020, by Piercy & Company;
- Planning Statement, November 2020, DP9 Ltd;
- Planning Application Drawings consisting of existing, demolition & proposed plans, dated 24/11/2020, by Piercy & Company.

2.6. CampbellReith were provided with the following relevant documents for audit purposes, in response to the D1 audit, in March and May 2021:

- Basement Impact Assessment (Geotechnical BIA), March 2021, Rev.1, Card Geotechnics Ltd;
- Appendix B, Construction Sequence, "Structural Engineering Report & Subterranean Construction Method Statement" (SER), 13/11/2020, Rev.P1, Elliott Wood Partnership Ltd;
- CGL_09529 – Tottenham Mews: LBC Comment Tracker, Card Geotechnics Ltd;
- Site Investigation Report, Middlesex Hospital (18/3104-FR 01), 04/07/2018, Concept Consultants;
- Geotechnical and Geoenvironmental Interpretative Report, 14 – 19 Tottenham Mews, (CGL/09529, Rev 0), 25/09/2020, Card Geotechnics Ltd;
- Geotechnical and Geoenvironmental Interpretative Report, Arthur Stanley House, (CGL/09198a, Rev 0), February 2018, Card Geotechnics Ltd;
- Pile Installation Case Studies, April 2021, Card Geotechnics Ltd.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Refer to Section 4.1 of this audit for more details.
Is data required by Cl.233 of the GSD presented?	Yes	
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	
Are suitable plan/maps included?	Yes	Desk study information provided in updated submissions.
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	Refer to Section 3.3 of the Geotechnical BIA.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Refer to Section 3.2 of the Geotechnical BIA.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Refer to Section 3.4 of the Geotechnical BIA.
Is a conceptual model presented?	Yes	Refer to Figure 4 attached in the Geotechnical BIA.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Refer to Section 4 of the Geotechnical BIA.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Refer to Section 4 of the Geotechnical BIA.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	N/A	No issues were identified during the screening process.
Is factual ground investigation data provided?	Yes	Provided in the updated submissions.
Is monitoring data presented?	Yes	Provided in the updated submissions.
Is the ground investigation informed by a desk study?	Yes	Provided in the updated submissions.
Has a site walkover been undertaken?	Yes	Refer to the Geotechnical BIA report, Section 2.2.1.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Refer to Section 3.6 of the SER.
Is a geotechnical interpretation presented?	Yes	Provided in the updated submissions.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Provided in the updated submissions.
Are reports on other investigations required by screening and scoping presented?	Yes	A ground movement assessment is presented in the Geotechnical BIA report. A Surface Water Drainage Statement has been provided.
Are the baseline conditions described, based on the GSD?	Yes	Provided in the updated submissions.
Do the base line conditions consider adjacent or nearby basements?	Yes	
Is an Impact Assessment provided?	Yes	
Are estimates of ground movement and structural impact presented?	Yes	Refer to Sections 8 & 9 of the Geotechnical BIA.

Item	Yes/No/NA	Comment
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	
Has the need for monitoring during construction been considered?	Yes	However, queries have been raised in Section 4 of this audit.
Have the residual (after mitigation) impacts been clearly identified?	Yes	
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	Provided in the updated submissions.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	Provided in the updated submissions.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	Provided in the updated submissions.
Are non-technical summaries provided?	Yes	Refer to Section 1 of the SER Report and Section 11 of the Geotechnical BIA.

4.0 DISCUSSION

- 4.1. The Basement Impact Assessment (BIA) consists of a Structural Engineering Report (SER) prepared by Elliott Wood Partnership Ltd and a Preliminary Basement Impact Assessment (Geotechnical BIA) issued by Card Geotechnics Ltd (CGL). All reports have been prepared and reviewed by individuals with suitable qualifications in accordance with CPG Basements.
- 4.2. The site is located within the Charlotte Street Conservation Area, on the west side of Tottenham Mews; it is rectangular in plan and it is relatively flat. It is currently occupied by a two-storey prefabricated timber structure on mass concrete strip/pad footings believed to have been built in 1970s. There is no basement in the existing building. Three neighbouring structures namely Middlesex House to the west, Arthur Stanley House to the south and Bedford Passage Development to the north all have existing basements according to the SER. 13 Tottenham Mews is located to the immediate northeast and according to the Geotechnical BIA report has no basement.
- 4.3. The proposed development will involve the demolition of the existing building and construction of a new seven storey mixed use building, including a single storey lower ground floor extending to the full footprint of the property, comprising a reinforced concrete box. The proposed lower ground floor structural slab level will be at 23.336mOD and the formation level at c.22.39mOD. The ground level at Tottenham Mews to the east is at an elevation of c.26.50mOD, therefore the maximum anticipated excavation to accommodate the lower ground floor will be c.4.10m below the existing ground level. A deeper formation level at 20.99mOD will be required locally to accommodate the proposed lift pit.
- 4.4. Minor differences (100mm) noticed in the floor slab levels for the proposed lower ground floor and the ground floor shown in the drawings attached to the SER report and the latest architectural drawings do not influence the outcome of the BIA.
- 4.5. According to the SER, the lower ground floor will be formed with a contiguous piled wall consisting of 450mm diameter piles at 550mm centres adjacent to Tottenham Mews to the east. Underpinning installed in a 'hit and miss' sequence with underpins maximum 1m wide is proposed for the party wall with Middlesex House to the west. There will be a localised area of deeper underpinning adjacent to Middlesex House to form the proposed lift pit. High level horizontal props supported by plunge columns will be installed to resist the lateral pressures in the short term. A reinforced concrete liner wall will be constructed on all sides of the lower ground floor and the foundation is proposed to comprise a raft foundation 800mm thick. The floor slabs will permanently support the lower ground floor structure in the long term.
- 4.6. An outline construction sequence for the proposed lower ground floor, including the temporary works required, is discussed in Section 13 of the SER with further reference to drawings in

Appendix B of the same. However, the construction sequence drawings were missing from the original BIA submitted but have been provided in the updated submissions.

- 4.7. According to the Geotechnical BIA report, a couple of Thames Water sewers run almost parallel to the east boundary of the site, below Tottenham Mews, at distances between 3.5m and 5.0m of the proposed pile wall line. An impact assessment of the proposed excavation on these assets may be required in accordance with the respective asset owner's policies. The applicant should contact and consult separately with Thames Water to find out the requirements, as this is outside the audit remit.
- 4.8. Screening charts for the hydrogeology, land stability and hydrology of the site are included in Sections 3.2 to 3.4 of the Geotechnical BIA report. Scoping sections are included in Section 4. The information provided is supported by desk study information and site walkovers, as required by CPG Basements. Whilst the full desk study information was not provided with the original BIA submissions, it has been provided with the updated submissions.
- 4.9. According to the Geotechnical BIA, restricted access inside the existing building due to the presence of asbestos, allowed only external trial pits to be undertaken on-site, in order to identify the depth and geometry of the existing and the neighbouring buildings foundations. For the needs of the proposed development, ground data and geotechnical design parameters have been informed by adjacent site investigations undertaken by CGL at Arthur Stanley House to the south and Bedford Passage to the north. According to the Geotechnical BIA, all the site specific and nearby geotechnical information has been presented and assessed in a Geotechnical Interpretative Report that was not provided with the original BIA submissions; it has been provided with the updated submissions. A conceptual ground model has been presented in Figure 4 of the Geotechnical BIA.
- 4.10. According to the Geotechnical BIA report, the available information indicates that the on-site geology comprises Made Ground to 4.0m depth over Lynch Hill Gravel Member to 8.5m depth over London Clay. Groundwater monitoring data suggest that the groundwater level is at approximately 5.0m bgl within the Lynch Hill Gravel Member.
- 4.11. Additional site investigation in the form of a 30m borehole is proposed by the Geotechnical BIA post-demolition and prior to construction, in order to confirm the assumptions of the Geotechnical Interpretation and the BIA.
- 4.12. The GI suggests that the existing groundwater level is approximately 5.0m below ground level which is below the proposed lower ground floor formation level. The SER confirmed that for the design of the substructure an assumed water level of 1m below ground level was conservatively considered.

- 4.13. A groundwater assessment is presented in Section 7 of the Geotechnical BIA. The proposed single storey lower ground floor is anticipated to be above the groundwater level, with localised dewatering possibly required only for the construction of the lift pit excavation. It is accepted that the proposed development is not anticipated to impact the hydrogeology of the local area. The groundwater monitoring data has been provided within the updated submissions, which supports the BIA conclusions.
- 4.14. A ground movement assessment (GMA) has been presented in the Geotechnical BIA report. The ground movements due to demolition works, installation of the proposed secant piled wall, installation of the underpins, excavation of the basement, application of the proposed structural loads, short and long term conditions have been considered in the GMA. Proprietary software (PDisp, Wallap) was used together with a modified CIRIA C760 methodology for the assessment of ground movements due to wall installation. Relevant ground movement contour plans and graphs have been produced and are attached in the Geotechnical BIA report.
- 4.15. In the GMA, horizontal and vertical ground movements due to the installation of the proposed contiguous piled wall have been assumed to be equal to 0.02% of wall length, based on a case study paper presented by Ball et al. (2014), which are lower than those suggested by CIRIA C760 curves (0.04% of wall length). The case study by Ball et al., refers to a contiguous piled wall consisting of 300mm diameter piles in similar ground conditions with the subject site, with good control of workmanship including a 'hit one miss three' installation methodology, full casing of the CFA pile shafts in the River Terrace Gravels and to the top of London Clay, and a rigorous monitoring programme in place. The above assumed reduction of ground movements compared to CIRIA C760 curves is accepted given the similarity of the ground conditions and the proposed type and size of the wall (contiguous wall with 450mm diameter piles) for the subject site. Additional case studies and information from four projects of analogous size with the subject one have been provided in the updated submissions to support the proposed (0.02% of wall depth) ground movements due to wall installation and these are accepted.
- 4.16. The D1 audit raised a number of queries in relation to the calculations presented within the GMA. These have been addressed and are accepted based on the updated submissions. A summary of the queries and accepted responses is provided in Appendix 3.
- 4.17. The GMA confirms that the anticipated structural damage to the adjacent property at 13 Tottenham Mews will be Category 1 of Burland scale while for Arthur Stanley House, Middlesex House and Bedford Passage will be Category 0. Maximum vertical and horizontal ground movements of 10.5mm and 7.5mm are suggested by the GMA for the Tottenham Mews highway to the east. In the updated submissions a statement confirms that these movements are anticipated to result in acceptable damage that will not significantly affect the highway and footpath.

- 4.18. Section 10 of the GMA proposes a monitoring strategy to be applied during construction with predefined ground movement trigger levels in accordance with the Observational Method of CIRIA Report 185. Clarifications with regard to the proposed Observational Method were requested in the previous D1 audit. Whilst no detailed methodology is presented, considering that the conclusions of the GMA indicate damage to neighbouring structures will be within LBC's policy limits, it is accepted that a detailed monitoring plan can be agreed under the Party Wall process.
- 4.19. Monitoring of all structures and infrastructure adjacent to the proposed lower ground floor is also recommended by the SER (Section 10) during excavation and construction. Although not related to basement construction, it would be prudent for monitoring to be undertaken during demolition to confirm the conclusions of the GMA.
- 4.20. The site is located within Flood Zone 1 in accordance with the Environment Agency mapping. It is also considered to be at a low probability of flooding with reference to the Camden Strategic Flood Risk Assessment. The proposed development will not affect the proportion of hard surfaced areas compared to the existing ones.
- 4.21. A Surface Water Drainage Statement has been provided which includes a SuDS strategy for the proposed development. A blue roof system is proposed over the main roof area and terraces at Level 05, in order to provide attenuation above ground level. A small area of the site at ground floor which cannot be attenuated above ground it is proposed to drain freely to the sewer. Drainage into the existing sewer will require permission from Thames Water.
- 4.22. The SuDS strategy indicates that overall the proposed surface water management will be significantly better than the existing case and will satisfy LBC's policies. It is accepted that there will be no impact to the surface water from the proposed development.

5.0 CONCLUSIONS

- 5.1. The Basement Impact Assessment (BIA) has been prepared and reviewed by individuals with suitable qualifications in accordance with CPG Basements.
- 5.2. The proposed development will involve the demolition of the existing building and construction of a new seven storey building including a single storey lower ground floor. The lower ground floor will be formed adopting a contiguous piled wall and underpinning.
- 5.3. An outline construction sequence for the proposed lower ground floor is provided. In the updated submissions, the construction sequence drawings are presented.
- 5.4. An impact assessment on nearby sewers may be required and Thames Water shall be consulted.
- 5.5. Screening charts and scoping sections are included in the Geotechnical BIA. The full desk study information has been provided in the updated submissions.
- 5.6. The Geotechnical Interpretative Report has been provided in the updated submissions.
- 5.7. The on-site geology comprises Made Ground over Lynch Hill Gravel Member over London Clay. Monitoring data suggest that the groundwater level is at c.5m bgl.
- 5.8. It is accepted that the proposed development is not anticipated to impact the hydrogeology of the area. Groundwater monitoring data has been provided in the updated submissions.
- 5.9. A ground movement assessment (GMA) and a damage assessment has been presented. Considering the updated submissions, the conclusions of the GMA are accepted.
- 5.10. Clarifications with regard to the proposed Observational Method were requested in the previous D1 audit. It is accepted that a detailed monitoring plan can be agreed under the Party Wall process.
- 5.11. A combination of a blue roof system and drainage into the existing sewer is proposed. The latter will require permission from Thames Water.
- 5.12. It is accepted that there will be no impact to the surface water from the proposed development.
- 5.13. Queries are summarised in Appendix 2. Considering the updated submissions, the BIA complies with the requirements of CPG Basements.

Appendix 1: Residents' Consultation Comments

None pertinent to the BIA

Appendix 2: Audit Query Tracker

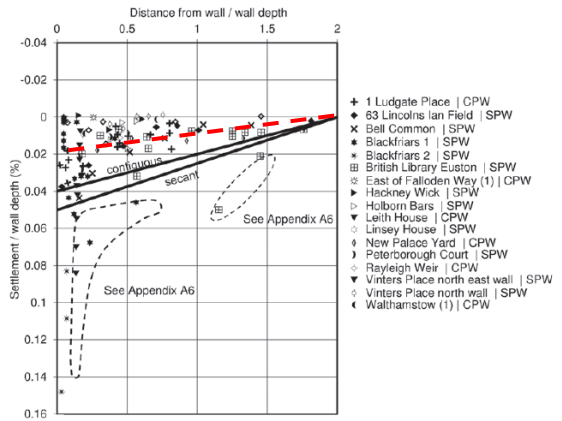
Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	The desktop study information and the Geotechnical Investigation Report are missing and are requested – audit Sections 4.8, 4.9.	Closed	March 2021
2	Stability	The construction sequence drawings referenced in the SER are missing and shall be submitted - audit Section 4.6.	Closed	May 2021
3	Stability	A statement shall be provided about the adopted construction methodology similar to that applied in the case study referenced, in order to control ground movements, in accordance with the GMA – audit Section 4.15.	Closed	March 2021
4	Stability	The GMA and building damage assessment shall be reviewed in accordance with the comments provided in Section 4 of this audit – audit Section 4.16.	Closed	March 2021
5	Stability	A statement whether the predicted ground movements are anticipated to result in any damage on the highway and footpath is requested with mitigation measures, if required – audit Section 4.17.	Closed	March 2021
6	Stability	Reference to the Observational Method shall be clarified – audit Section 4.18.	Closed	March 2021
7	Stability	Monitoring trigger levels shall be associated with the outcome of the GMA – audit Sections 4.18, 4.19.	Closed	March 2021
-	Stability	An impact assessment on nearby sewers may be required and Thames Water shall be consulted - audit Section 4.7.	Note only	N/A
-	Hydrology	Drainage into the existing sewer will require permission from Thames Water.	Note only	N/A

Appendix 3: Supplementary Supporting Documents

CGL_09529 – Tottenham Mews: LBC Comment Tracker, Card Geotechnics Ltd

Comment Ref	Date Received	LBC Comment Subject	LBC BIA Query	CGL Comment	Response Date	Status
1	10/02/2021	Stability	<p>The desktop study information and the Geotechnical Investigation Report are missing and are requested – audit Sections 4.8, 4.9.</p> <p>4.8 - <i>The full desk study information was not available at the time of this audit and are requested to confirm assumptions</i></p> <p>4.9 - <i>According to the Geotechnical BIA, all the site specific and nearby geotechnical information has been presented and assessed in a Geotechnical Interpretative Report which was not available at the time of this audit and is requested in order to confirm assumptions made</i></p>	<p>Links to the relevant CGL reports and freely available party wall SI reports are below and have been provided alongside this comment tracker for CR review.</p> <p>Reports:</p> <ul style="list-style-type: none"> LBC_Bedford Passage_Middlesex Hosp_SI LBC_Arthur Stanley House_SI <p>All the site specific and nearby geotechnical information has been presented and assessed in a Geotechnical Interpretative Report which is presented in CGL's GGIR, and is now provided as supporting documentation:</p> <ul style="list-style-type: none"> CGL09529_14-19TottenhamMews_GGIR_Sept2020 		Open
2	10/02/2021	Stability	<p>The construction sequence drawings referenced in the SER are missing and shall be submitted - audit Section 4.6.</p> <p>4.6 - <i>However, the construction sequence drawings were missing from the submitted SER and are requested</i></p>	<p>Elliott Wood have provided a detailed construction sequence. This is to be included in the relevant 'Proposed Development Drawings' revised BIA report Appendix.</p>		Open
3	10/02/2021	Stability	<p>A statement shall be provided about the adopted construction methodology similar to that applied in the case study referenced, in order to control ground movements, in accordance with the GMA – audit Section 4.15.</p> <p>4.15 - <i>horizontal and vertical ground movements due to the installation of the proposed contiguous piled wall have been assumed to be equal to 0.02% of wall length, based on a case study paper presented by Ball et al. (2014), which are lower than those suggested by CIRIA C760 curves (0.04% of wall length).</i></p>	<p>It is noted that CIRIA C760 is based on limited case study data, and therefore has selected a very conservative upper bound estimate of movements. Reviewing the actual case study data reported in CIRIA – Secant Piled Wall movements and Vintners hall were caused by 'poor drilling techniques'; Blackfriars 1 was a 1.2m diameter secant piled wall next to a very heavily loaded building. The MSc thesis upon which CIRIA C760 is based, makes the comment that 8mm is "a reasonable value which could be expected as an upper limit settlement for most wall installations". The document also notes "there does not appear to be a relationship between the type of wall construction and the measured surface settlements". Where large movements</p>		Open

Comment Ref	Date Received	LBC Comment Subject	LBC BIA Query	CGL Comment	Response Date	Status
				<p>behind the wall are noted, it is stated that these are due to adverse ground conditions, poor drilling techniques, and/or effects from adjacent footings. This site has 'standard' ground conditions with the London Clay present at the relatively shallow depth; therefore provided construction is appropriately controlled and monitored, significant displacements are not anticipated.</p> <p>It is further noted that CGL has another case study, pending publication – also demonstrating installation movements in line with the majority of CIRIA C760/580 case study data:</p>  <p>b Vertical movements</p> <p>Figure 6.8 Ground surface movements due to bored pile installation in stiff clay (normalised)</p>		
			<p>4.15 - it is requested that a statement is included in the Geotechnical BIA that a construction methodology similar to that applied in the case study ('hit one miss three' pile installation and full casing of piles) will be applied in the subject site too, in order to control ground movements), in accordance with the GMA</p>	<p>By necessity a contiguous piled wall is constructed in a hit and miss fashion. This is so that the wet concrete in recently constructed nearby piles is not damaged during the construction process. This process is set out in the ICE Specification for piling and embedded retaining walls (SPERWall) document, which will form the basis of the piling method for</p>		

Comment Ref	Date Received	LBC Comment Subject	LBC BIA Query	CGL Comment	Response Date	Status
				this development. Movements will be monitored during pile installation such that additional control measures can be adopted if required.		
4	10/02/2021	Stability	<p>The GMA and building damage assessment shall be reviewed in accordance with the comments provided in Section 4 of this audit – audit Section</p> <p>4.16a For No. 13 Tottenham Mews contradictory references are noted with regard to the maximum anticipated settlement below footing foundation; Section 9.2 states 6mm, Plate 5 indicates 7mm, Section 8.8.2.2 reports 9.8mm.</p> <p>4.16b Calculation of the critical deflection values shown on Plates 5, 8, 10, 12 does not consider the full length (L) of the wall elements evaluated. However, the damage calculation considers the full length of those walls and this inconsistency shall be justified.</p> <p>4.16c The Wallap analysis assumes a piled wall installed at 26.5mOD with a temporary prop installed at a higher elevation (26.65mOD). A clarification is required whether it is intended to install a temporary support at a higher level than the level of installation.</p> <p>4.16d Convergence errors are noted in the output of Wallap analysis and these should be reviewed.</p>	<p>4.16a: Worst-case vertical movements at 13 Tottenham Mews formation level are anticipated to occur during Stage 3 (net loading due to demolition, excavation and loading, inclusive of pile installation and deflection movements in the long-term condition) where approximately 6mm of settlement is expected below the 13 Tottenham Mews footing adjacent to the northeast basement wall perimeter. Plate 5 indicating 7mm is the maximum value which is predicted to occur 2-3m from the northern basement wall line, not below the party wall footing. Section 8.8.2.2 is a typo and will be corrected to 6mm.</p> <p>4.16b: The deflection ratio shown on the Plates are the worst case scenario. i.e. taking the maximum settlement value, and drawing a line to where the vertical movement becomes zero, then measuring the vertical critical deflection vertically (parallel with the y-axis) to where the settlement profile curve it met.</p> <p>4.16c: Yes, it is intended to install a temporary support at a higher level (i.e. on a RC corbel) than the level of installation to <u>avoid</u> a temporary prop (26.65mOD) & permanent slab (SSL 26.386mOD) clash. The temp prop can therefore be removed once the GF slab has been installed.</p> <p>4.16d: Convergence error amended and new detailed reports included in the Report Appendix. No change in WALLAP displacement output.</p>		Open

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5	10/02/2021	Stability	<p>A statement whether the predicted ground movements are anticipated to result in any damage on the highway and footpath is requested with mitigation measures, if required – audit Section 4.17.</p> <p>4.17 <i>A statement whether these movements are anticipated to result in any damage on the highway and footpath is requested, with mitigation measures if required</i></p>	<p>The worst-case design condition along the Tottenham Mews boundary is Critical Section A1 (CS-A1) where locally piles are to be 18m long pile to, where the contiguous pile wall is carrying axial load from the two columns located on the pile wall line.</p> <p>Worst-case vertical movements at street level are anticipated to occur during Stage 2 (short-term net loading due to demolition, excavation and loading, inclusive of pile installation and deflection movements) where approximately 10.5mm of settlement is expected below the Tottenham Mews carriageway approximately 2.5m adjacent to the proposed pile wall line.</p> <p>Horizontal movements due to contiguous pile wall installation, for an 18m long pile, conservatively combined with pile wall deflection movements derived from empirical calculations and validated through WALLAP analysis due to excavation and propping, at the Tottenham Mews highway ground level 2.5m adjacent to the eastern site boundary, are anticipated to be approximately 7mm to 7.5mm.</p> <p>These values are not expected to significantly affect the roadway and are considered to be within acceptable limits.</p> <p>Add that we will add a statement that the road is unaffected and that where specific utilities/assets require assessment this will be carried out in accordance with their requirements following planning.</p>		Open
6	10/02/2021	Stability	Reference to the Observational Method shall be clarified – audit Section 4.18.	It is recognised that monitoring is essential to confirm movements during construction, however the details of the methodology will be developed with the party wall (PW) surveyors prior to		Open

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			<i>4.18 The trigger levels adopted during construction should be associated with the ground movements predicted by the GMA and this should be stated. Clarifications and amendments are requested.</i>	construction commencing. It is not appropriate at this stage to incorporate a detailed methodology for monitoring, which for practical reasons may ultimately conflict with that proposed and agreed between the PW surveyors. This approach has been agreed with CR previously.		
7	10/02/2021	Stability	<p>Monitoring trigger levels shall be associated with the outcome of the GMA – audit Sections 4.18, 4.19.</p> <p><i>4.18 The trigger levels adopted during construction should be associated with the ground movements predicted by the GMA and this should be stated. Clarifications and amendments are requested.</i></p> <p><i>4.19 Although not related to basement construction, it would be prudent for monitoring to be undertaken during demolition to confirm the conclusions of the GMA.</i></p>	<p>Monitoring can be undertaken through installing survey targets along the top of the secant piled wall and ideally on the façade of the neighbouring properties/structures.</p> <p>Baseline values should be established prior to commencement of works as outlined below:</p> <ul style="list-style-type: none"> Monitoring targets installed on the facade of the neighbouring structures and baseline reading established prior to demolition and/or enabling works and piles installation. Monitoring targets installed along the capping beam once constructed and baseline readings established prior to the main basement excavation/construction works commencing. <p>It is likely that party wall engineers will require monitoring during demolition, and this would be recommended at construction stage in any case as a safeguard. However, as indicated above, the more specific details of the methodology and trigger values will be developed with the party wall surveyors prior to the works commencing.</p>		Open
8	10/02/2021	Stability	An impact assessment on nearby sewers may be required and Thames Water shall be consulted - audit Section 4.7.	CGL acknowledged the need for impact assessments on third party assets in the Preliminary Basement Impact Assessment (PBIA). Comment noted, will be carried out and agreed with the relevant authorities.		

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			<i>4.7 An impact assessment of the proposed excavation on these assets may be required in accordance with the respective asset owner's policies. The applicant should contact and consult separately with Thames Water to find out the requirements, as this is outside the audit remit.</i>			
9	10/02/2021	Stability	Drainage into the existing sewer will require permission from Thames Water	Noted. Relevant discharge licences to be sought by the contractor/Client.		

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