

**Basement Impact
Assessment and Basement
Construction Plan Audit**

2-6 St Pancras Way, London
NW1 0TB

For
London Borough of Camden

Project No.
14006-09

Date
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1.0 INTRODUCTION

- 1.1 CampbellReith was instructed by the London Borough of Camden (LBC) to carry out an audit on a revised Basement Impact Assessment (BIA) and a newly produced Detailed Basement Construction Plan (DBCP) relating to 2-6 St Pancras Way, London NW1 0TB. The original BIA was submitted as part of the Planning Submission documentation for the scheme (planning reference 2017/5497/P) which was granted permission in March 2020. The amended documents have been submitted under planning reference 2023/1335/P. The basement is considered to fall within Category B as defined by the Terms of Reference for BIA audits.
- 1.2 The Detailed Basement Construction Plan (DBCP) was submitted by GD Partnership Ltd as a stipulated requirement of a Section 106 (S106) Agreement between St Pancras Way Trustee 1 Limited and St Pancras Way Trustee 2 Limited and the London Borough of Camden, dated 7 November 2022.
- 1.3 The changes to the original scheme comprise a significant decrease of the lower-level basement area under plots B and C. It is understood the footprint and level of first level upper basement will be unchanged, while the lower basement level will now be constructed under the southwest corner of Plot C only. The Audit reviewed the updated BIA (including the Ground Movement Assessment (GMA)) and potential impacts on land stability arising from the amended basement development proposal in accordance with LBC's policies and technical procedures. This is discussed in Section 2.0 and Section 4.0 below.
- 1.4 A ground investigation was undertaken and informed ground models and associated geotechnical parameters used in the preliminary retaining wall, bearing piles, temporary works design and in the Ground Movement Assessment (GMA).
- 1.5 Groundwater was encountered as seepage during the site investigation. Assumption on groundwater level in the geotechnical design are considered conservative. The BIA confirms that there will not be any impact on the wider hydrogeological environment.
- 1.6 A construction sequence has been presented and will comprise demolition of the existing building on site followed by the installation of the working platform and installation of contiguous piled retaining wall to facilitate the basement excavation. The GMA confirmed damage to neighbouring buildings can be restricted to be within the limits set by the CPG for basements.
- 1.7 Impacts to surface water conditions are considered unchanged and are presented in the original audit report by CampbellReith, ref. GKemb13693-06-141021-2-6 St Pancras Way-F1.
- 1.8 The updated status of the queries raised in the original BIA is presented in Appendix 2.
- 1.9 The review compared the submitted DBCP against the S106 requirements as described in Section 3.0 below. It can be confirmed that the DBCP is generally compliant with the S106 requirements.

2.0 BASEMENT IMPACT ASSESSMENT

2.1 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.

2.2 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.

2.3 The BIA should demonstrate that schemes:

- maintain the structural stability of the building and neighbouring properties;
- avoid adversely affecting drainage and run off or causing other damage to the water environment;
- avoid cumulative impacts upon structural stability or the water environment in the local area;

and evaluate the impacts of the proposed basement considering the issues of hydrology, hydrogeology and land stability via the process described by the GSD and to make recommendations for the detailed design.

2.4 LBC's Audit Instruction described the planning proposal as "Non-material amendment for planning permission 2021/2671/P dated 14/11/2022 for 'Demolition of existing building, and redevelopment to provide a nine-storey building with two basement levels for flexible Class E and Sui Generis Use, a two-storey Pavilion for flexible Class E and Drinking Establishment (Sui Generis Use), along with associated cycle parking, servicing, hard and soft landscaping, public realm, and other ancillary works.' Amendments include reduction in the extent of the basement, removing a large quantum of the basement level 2 and creating a mezzanine space on basement level 1. No external above ground level works are proposed."

2.5 CampbellReith was able to access LBC's Planning Portal and gain access to the following relevant documents for audit purposes:

- Ground Investigation, Basement Impact Assessment (including Ground Movement Analysis by CGL) by GD Partnership Ltd, ref unknown, rev G, dated 4 March 2023.
- Basement Construction Plan by GD Partnership Ltd, ref unknown, rev 1, dated 4 March 2023.
- Geo-environmental and Geotechnical Site Investigation by RSK, ref. 371654-01 (01), dated Aug 2019.

- Ground Movement and Building Damage Assessment Report by RSK, ref. 371654-01 (01), dated August 2020.
- Tribeca, Camden - Plot C, Geotechnical, Geo-environmental Factual and Interpretive Report by Card Geotechnics Limited, ref. CGL/09751, Rev. 0. dated February 2023.
- Tribeca, Camden - Plot C Ground Movement Analysis and Highway & Building Impact Assessment by Card Geotechnics Limited, ref. CGL/0751A, Rev. 0, dated 22 December 2021.
- Tribeca, Camden - Plot C Supplementary Ground Movement Analysis and Highway & Building Damage Assessment – Oriel Hospital Site by Card Geotechnics Limited, ref. CGL/09751E, Rev. 0, dated 24 July 2023.
- Tribeca, Camden - Plot C Ground Movement Analysis and Canal Wall Impact Assessment by Card Geotechnics Limited, ref. CGL/0751, Rev. 0, dated 22 December 2021.
- Tribeca, Camden - Plot C Ground Movement Analysis and Thames Water Impact Assessment by Card Geotechnics Limited, ref. CGL/09571A, Rev. 1, dated 15 June 2023.
- Tribeca, Camden - Plot B & Plot C Tender Stage Preliminary Temporary Work Design to Enable Basement Excavation and Construction by Card Geotechnics Limited, ref. CGL/09751D, Rev. 0, dated 23 February 2023.
- Proposed Architectural Drawings by Tribeca – Reef Group:
 - TRI-PWA-PL-B1-DR-A-01098, rev C01, dated 27/02/2023
 - TRI-PWA-PL-B2-DR-A-01097, rev C01, dated 27/02/2023
 - TRI-PWA-PL-ZZ-DR-A-02101, rev C01, dated 08/03/2023
 - TRI-PWA-PL-B2-DR-A-02103, rev C01, dated 08/03/2023

3.0 DETAILED BASEMENT CONSTRUCTION PLAN

3.1 The DBCP and associated documents have been submitted to satisfy a requirement of a Section 106 Agreement between St Pancras Way Trustee 1 Limited and St Pancras Way Trustee 2 Limited and the London Borough of Camden, dated 7 November 2022. The DBCP, its contents and obligations are described in the Section 106 Agreement in Section 2, Definitions, Item 2.57.

3.2 The Section 106 Agreement requires the owner should appoint an independent suitably certified engineer (Basement Design Engineer) to formulate the DBCP and use reasonable endeavours to ensure:

- that the design plans have been undertaken in strict accordance with the terms of the Agreement and in accordance with the Party Wall Act 1996 incorporating proper design and review input into the detailed design phase of the Development and ensuring that appropriately conservative modelling relating to the local ground conditions and local water environment and structural condition of the Neighbouring Properties has been incorporated into the final design;
- that the result of these appropriately conservative figures ensure that the Development will be undertaken without any impact on the structural integrity of the Neighbouring Properties beyond 'Very Slight' (Category 1) with reference to the Burland Category of Damage;
- that the design plans have been undertaken in accordance with the Agreement, including a letter of professional certification confirming this and that the detailed measures set out in sub-clauses 2.57 – 1.(c) (i)-(vi) (presented below) have been incorporated correctly and appropriately and are sufficient in order to achieve the objectives of the Detailed Basement Construction Plan.

(i) Reasonable endeavours to access and prepare a detailed structural appraisal and condition survey of all Neighbouring Properties to be undertaken by an independent suitably qualified and experienced chartered surveyor (and for details to be offered if this is not undertaken in full or part).

(ii) A method statement detailing the proposed method of ensuring the safety and stability of all Neighbouring Properties throughout the Construction Phase including temporary works sequence drawings and assumptions with appropriate monitoring control risk assessment contingency measures and any other methodologies associated with the basement and the basement temporary works.

(iii) Detailed design drawings incorporating conservative modelling relating to the local ground conditions and local water environment and structural condition of Neighbouring Properties prepared by the Basement Design Engineer for all elements of the groundworks and basement authorised by the Planning Permission together with specifications and supporting calculations for both the temporary and permanent basement construction works.

(iv) The Basement Design Engineer to be retained at the Property throughout the Construction Phase to inspect approve and undertake regular monitoring of both permanent and temporary basement construction works throughout their duration and to ensure compliance with the plans and drawings as approved by the building control body.

(v) Measures to ensure the on-going maintenance and upkeep of the basement forming part of the relevant phase of the Development and any and all associated drainage and/or ground water diversion measures in order to maintain structural stability of the Property the Neighbouring Properties and the local water environment (surface and groundwater).

(vi) Measures to ensure ground water monitoring equipment shall be installed prior to Implementation and retained with monitoring continuing during the Construction Phase and not to terminate monitoring until the issue of the Certificate of Practical Completion (or other time agreed by the Council in writing).

3.3 The Section 106 Agreement also requires that:

- the Owner appoints a second independent suitably certified engineer (qualified in the fields of geotechnical and/or structural engineering) from a recognised relevant professional body having relevant experience of sub-ground level construction commensurate with the relevant phase of the Development (the Certifying Engineer) and for details of the appointment of the Certifying Engineer to be submitted to the Council for written approval in advance;
- the Certifying Engineer reviews the design plans and offers a 2 page review report to the Council confirming the design plans have been formulated in strict accordance with the terms of this Agreement and have appropriately and correctly incorporated the provisions of sub-clauses (i) – (vi) above and are sufficient to achieve the objectives of the Detailed Basement Construction Plan AND should any omissions, errors or discrepancies be raised by the Certifying Engineer then these to be clearly outlined in the report and thereafter be raised directly with the Basement Design Engineer with a view to addressing these matters in the revised design plans;
- A letter of professional certification from the Certifying Engineer with the DBCP confirming that it is in an approved form and has been formulated in strict accordance with the S106 agreement shall be submitted.

3.4 The applicant is also required to meet the requirements of clause 2.57 of the Section 106 Agreement and to answer any queries raised by LBC.

3.5 CampbellReith was able to access LBC's Planning Portal and gain access to the following relevant documents for audit purposes:

- Ground Investigation, Basement Impact Assessment (including Ground Movement Analysis by CGL) by GD Partnership Ltd, ref unknown, rev G, dated 4 March 2023.

- Basement Construction Plan by GD Partnership Ltd, ref unknown, rev 1, dated 4 March 2023, including all appendices (A to J).
- Geo-environmental and Geotechnical Site Investigation by RSK, ref. 371654-01 (01), dated Aug 2019.
- Ground Movement and Building Damage Assessment Report by RSK, ref. 371654-01 (01), dated August 2020.
- Tribeca, Camden - Plot C, Geotechnical, Geo-environmental Factual and Interpretive Report by Card Geotechnics Limited, ref. CGL/09751, Rev. 0. dated February 2023.
- Tribeca, Camden - Plot C Ground Movement Analysis and Highway & Building Impact Assessment by Card Geotechnics Limited, ref. CGL/0751A, Rev. 0, dated 22 December 2021.
- Tribeca, Camden - Plot C Supplementary Ground Movement Analysis and Highway & Building Damage Assessment – Oriel Hospital Site by Card Geotechnics Limited, ref. CGL/09751E, Rev. 0, dated 24 July 2023.
- Tribeca, Camden - Plot C Ground Movement Analysis and Canal Wall Impact Assessment by Card Geotechnics Limited, ref. CGL/0751, Rev. 0, dated 22 December 2021.
- Tribeca, Camden - Plot C Ground Movement Analysis and Thames Water Impact Assessment by Card Geotechnics Limited, ref. CGL/09571A, Rev. 1, dated 15 June 2023.
- Tribeca, Camden - Plot B & Plot C Tender Stage Preliminary Temporary Work Design to Enable Basement Excavation and Construction by Card Geotechnics Limited, ref. CGL/09751D, Rev. 0, dated 23 February 2023.
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 - TRI-PWA-PL-B2-DR-A-02103, rev C01, dated 08/03/2023

3.6 The following information has been reviewed and found to comply or not with the requirements of the Section 106 Agreement where indicated below.

Condition Surveys:	
▪ Plan drawing showing extent of condition surveys	X
▪ Photographic and descriptive record of existing condition of neighbouring properties	X
▪ Condition survey of neighbouring properties to be carried out by third party independent of the design and contractor team to be carried out prior to commencement of works.	✓
GMA Report:	
▪ Ground Movement Assessment using appropriately conservative modelling	✓
▪ Building damage assessment	✓
▪ Damage no worse than "Slight" according to Burland Category of Damage	✓
Movement Monitoring Proposals including drawings & specifications to include:	
▪ The trigger and action levels for horizontal, vertical and tilt movements	✓
▪ Monitoring targets to be indicated on the elevation drawings	✓
▪ The monitoring frequency	✓
Temporary and Permanent works proposals	
▪ Method statement for basement works throughout construction phase including temporary works drawings, monitoring measures and contingency measures.	✓
▪ Detailed design drawings for all elements of groundworks and basement with specifications and supporting calculations for temporary and permanent case.	✓
▪ Measures for ongoing maintenance including groundwater monitoring and construction traffic	✓
▪ Measures to monitor groundwater until issue of Practical Completion Certificate	✓

Engineering Review	
▪ Confirmation of suitably qualified Basement Design Engineer.	✓
▪ Confirmation of Temporary Works Engineer professional qualifications.	✓
▪ Basement Design Engineers Certification that the DBCP is formulated in accordance with the Section 106 Agreement	✓
▪ Provision to retain the Basement Design Engineer throughout the Construction Phase	✓
▪ Details of review by suitably qualified and experienced certifying engineer who is independent of the design team	✓
▪ Evidence of comments raised by certifying engineer on design and review of calculations	✓
▪ Certifying Engineers Report confirming BCP is in accordance with Section 106 Agreement	✓

4.0 DISCUSSION

- 4.1 The changes to the original scheme comprise a significant decrease of the lower-level basement area under plots B and C. It is understood the footprint and level of the upper basement will be unchanged (at c. 15.75m AOD), while the lower basement will now be constructed under the southwest corner of Plot C only at an elevation of c. 11.50m AOD.
- 4.2 The previous CampbellReith audit considered the original BIA to meet the requirements of the CPG for Basements subject to the presentation of a Detailed Basement Construction Plan (DBCP) including the following information:
- site specific site investigation around Plot C to confirm ground conditions, inform the ground model and geotechnical design and confirm the impacts on hydrology, hydrogeology and land stability;
 - construction methodology including construction sequence and temporary works proposal;
 - ground movement assessment to demonstrate damage to neighbouring properties occurring due to the proposed development will not exceed limits set by the CPG for basements;
 - identification and location of any underground asset and confirmation of any asset protection agreement with the asset owners.
 - confirmation of the structural monitoring strategy.
- 4.3 All the outstanding information listed above has been provided as part of this application as detailed below.
- 4.4 A ground investigation was undertaken on Plot B by RSK in January 2019 and on Plot C by CGL in February 2023. The site investigations indicate the site to be underlain by Made Ground to a maximum depth of 3.20m bgl, which in turn is underlain by Weathered London Clay and London Clay to a depth of between 23m and 29m bgl, below which, deposits of the Lambeth Group were encountered.
- 4.5 Ground models and associated geotechnical parameters used in the preliminary retaining wall, bearing piles, temporary works design and in the Ground Movement Assessment (GMA) have been presented and are accepted.
- 4.6 Groundwater was encountered as seepage within the Made Ground and London Clay. Assumption on groundwater level in the geotechnical design are considered conservative. The BIA confirms that there will not be any impact on the wider hydrogeological environment.

- 4.7 A construction sequence has been presented in the DBCP and comprises demolition of the existing building on site followed by the installation of the working platform and installation of contiguous piled retaining wall to facilitate the basement excavation. A preliminary temporary works design has been presented in the DBCP which includes external and internal buttress piles, waler beams and corner head props on thrust blocks to limit ground movements due to the excavation. Final detailed design of all the temporary works will be responsibility of the temporary works contractor.
- 4.8 The GMA estimates ground movements to neighbouring structures and infrastructure. Ground movements due to demolition, basement excavation and construction works have been modelled using the software PLAXIS considering both the short and long term. The assessment includes Plot A, Oriel Hospital Site to the south of Granary Street, Travis Perkins buildings (considered to be founded on piles) opposite to St Pancras Way and adjacent highways St Pancras Way and Granary Street.
- 4.9 The GMA indicates that with good construction control, high level of workmanship and robust temporary propping system, the movements predicted at Plot A building, Oriel Hospital Site and Travis Perkins buildings can be restricted to damage category 0 and 1 of the Burland Scale ('Negligible' and 'Very Slight' damage).
- 4.10 Estimated ground movements occurring along Granary Street Highway are in the region of 10-20mm, while ground movements along St Pancras Highway are expected to be between 7 and 13mm. The assessment considered these values to be within acceptable limits and to not have any significant impact on the highway.
- 4.11 The DBCP confirms the culverted course of the former River Fleet runs below St Pancras Way c. 6.5m to the west of the proposed development. A separate ground movement assessment has been produced for this. Similarly a separate assessment for the canal wall of the Regent's Canal has been produced. Liaison with the assets owners is ongoing. The audit of those assessments is outside the scope of this report.
- 4.12 A monitoring strategy has been presented in the DBCP which confirms that following demolition works and prior to any main construction works, monitoring systems will be installed and provide live reporting during the construction works together with the trigger limits. The monitoring strategy indicates green limits of 0-5mm, amber of 5-12mm and red of >12mm for adjoining buildings.
- 4.13 A plan showing the extent of the initial condition survey and photographic and descriptive record of existing condition of the land surrounding the site (footpath and canal wall) has been presented. However no information on neighbouring buildings was presented. The applicant has confirmed that a photographic condition survey of all the buildings fronting the site on St Pancras Way and Granary Street will be produced in due course as part of the main contract.
- 4.14 Detailed review of the DBCP by a suitably qualified and experienced certifying engineer who is independent of the design team has been provided. A certifying Engineers Report confirming the DBCP is in accordance with Section 106 Agreement has been also provided.

5.0 CONCLUSIONS

5.1 We are satisfied that the updated Basement Impact Assessment generally complies with the requirements of the CPG for Basement.

5.2 We are satisfied that the Detailed Basement Construction Plan by GD Partnership, dated March 2023 and listed Appendices A-J, generally complies with the requirements of the relevant clauses of the Section 106 Agreement. However, as discussed in paragraph 4.13., the following information appears not to have been provided:

- Plan drawing showing the extent of Condition Surveys
- Photographic and descriptive record of existing condition of neighbouring properties.

Appendix 1

Consultation Responses

None

Appendix 2

Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	Author's qualifications	The authors' qualifications should be demonstrated in accordance with CPG Basements for the hydrogeological assessment.	Closed	June 2023
2	Hydrogeology	Further groundwater monitoring to be undertaken as per the recommendations of the site investigation report.	Closed – See section 4.5. – 4.6.	June 2023
3	Land stability	Temporary works strategy and design with associated monitoring strategy for control of construction should be confirmed.	Closed – See Section 4.7. – 4.12.	June 2023
4	Land stability	Clarification on neighbouring properties to be included in the GMA is required. Trigger limits to be reviewed in the monitoring strategy	Closed – See Section 4.9. – 4.12.	November 2023

Appendix 3

Supplementary Supporting Documents

None

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