CampbellReith
consulting engineers

Camden Lifestyle,

7 Bayham Street London NW1 0EY

Detailed Basement Construction Plan Review

For

London Borough of Camden

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1.0 INTRODUCTION

1.1. CampbellReith was instructed by London Borough of Camden (LBC) to undertake a review of the Detailed Basement Construction **Plan (DBCP) submitted by Red Construction Group Limited for Camden Lifestyle, 7 Bayham Street, London NW1 0EY,** planning references **2018/3647/P** and the subsequent S.73 **2020/5647/P**. The DBCP is a stipulated requirement of a Section 106 Agreement between **Camden Lifestyle (UK) Ltd** and the **London Borough of Camden,** dated 6 November 2020.

1.2. The Section 106 Agreement requires the owner to appoint an independent suitably certified engineer (Basement Design Engineer) to formulate the Detailed Basement Construction Plan (DBCP) and use reasonable endeavours to ensure:

- that the design plans have been undertaken in strict accordance with the terms of the Agreement 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 Category 2 'Slight' with reference to the Burland Category of Damage;

- that the design plans have been undertaken in strict accordance with the Agreement, including a letter of professional certification confirming this and that the detailed measures set out in sub-clauses (i) to (xii) (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).

(vii) Amelioration and monitoring measures of construction traffic including procedure for coordinating vehicular movement with other development taking place in the vicinity and notifying owners and or occupiers in the residences and businesses in the locality in advance of major delivery schedules and amendments to normal traffic arrangements.

(xii) 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 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) – (vii) 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 from and has been formulated in strict accordance with the S106 agreement shall be submitted.

1.3. The applicant is also required to meet the requirements of clause 2.26 item 6 of the Section 106 Agreement and to answer any queries raised by LBC.

1.4. This report covers our review of the DBCP information submitted by Red Construction Group Limited, as described in their report (reference 7abc Bayham St_Detailed Basement

Construction Plan) in response to the Section 106 Agreement. The reviewed information includes the following key documents:

- Stage 4 Structural Report, Drawings and Specification by Meinhardt, references & dates of issue listed below:
    - 2750-MHT-S-RPT-003_P01 Stage 4 Report dated 23 September 2021
    - 2750-MHT-ST-XX-XX-DR-02008 dated 9 September 2021
    - 2750-MHT-XX-B1-DR-ST-04080 dated 9 September 2021
    - 2750-MHT-XX-B2-DR-ST-04070 dated 9 September 2021
    - 2750-MHT-XX-LG-DR-ST-04090 dated 9 September 2021
    - 2750-MHT-XX-XX-DR-ST-02001 dated 9 September 2021
    - 2750-MHT-XX-XX-DR-ST-02002 dated 9 September 2021
    - 2750-MHT-XX-XX-DR-ST-02004 dated 9 September 2021
    - 2750-MHT-XX-XX-DR-ST-02005 dated 9 September 2021
    - 2750-MHT-XX-XX-DR-ST-02006 dated 9 September 2021
    - 2750-MHT-XX-XX-DR-ST-02007 dated 9 September 2021
    - 2750-MHT-XX-XX-DR-ST-08001 dated 9 September 2021
    - 2750-MHT-XX-XX-DR-ST-08002 dated 9 September 2021
    - MHT_Concrete Works Spec dated 22 September 2021
- Site Investigation and Basement Impact Assessment, ref 200817 R JER8709 JG Phase 1 and 2 Site Investigation Report V1 R2 by RPS dated August 2018 and 211008 R JER9272 AA 7abc Bayham St V1 R2 by RPS dated October 2021 respectively.
- Review of Movement Analysis Letter Report, ref GEA Letter Report by GEA dated 2nd February 2022.
- RPS Memo regarding Basement Impact Assessment Appendix A, and a revised Ground Movement Assessment reflecting GEAs review, ref RPS BIA Analysis Output Draft Memo.
- Ground Movement Assessment, ref CG38478_CamdenLifestyleHotel_GMA_June22 by CGL dated June 2022
- Proposed Movement Monitoring & Contingency Plan, ref CG38478_CamdenLifestyleHotel_PMM&CP_June2022 by CGL dated June 2022
- Indicative Prop Monitoring Record and Quality Assurance Procedure - Temporary Prop Monitoring Plan ref Prop Monitoring QA and QAP - Temporary Prop Monitoring Plan respectively by MODEBEST dated June 2022

- Build Sequence Report, Drawings and Indicative Programme by MODEBEST references and dates of issue listed below:
    - Camden Lifestyle Build Sequence rev002 dated 22 June 2022
    - Camden Lifestyle Build Sequence Schematic rev004 dated June 2022
    - Camden Lifestyle Draft Programme rev002 dated 29 June 2022
- Temporary Works Design and Temporary Propping Layout by Conquip dated 29 June 2022
- Contiguous Piled Wall Design, Layout and Schedule by GSS Piling references and dates of issue listed below:
    - 21357 - PD01 - Contiguous Piled Wall Design - C3 dated 23 June 2022
    - 21357_DRG100_Pile Layout_C2 dated 17 June 2022
    - 21357_PS01_Contiguous Piled Wall Schedule_C3 dated 23 June 2022
- King Post Design Report ref L21088-CDL-CEG-RPT-001 (REV A) - APPENDIX 7 by BG&E Engineers dated 23 June 2022
- RC Liner Retaining wall loading and design ref Retaining_wall_loading by Meinhardt dated 28 August 2022.
- Basement Design Engineer certifying letter ref TFP-GC-2750-01 by Meinhardt dated 26 August 2022.
- DBCP Review ref 5108-RBG-ZZ-XX-DN-ST-00001 Issue 02 by Robert Bird Group dated 30 September 2022.
- DBCP Certifying Letter ref 5108-RBG-ZZ-XX-FP-ST-00001 by Robert Bird Group dated 30 September 2022.

2.0 BASEMENT CONSTRUCTION PLAN REVIEW

The following information has been reviewed and found to comply with the requirements of the Section 106 Agreement where indicated below.

Condition Surveys • Plan drawing showing extent of condition surveys • Photographic and descriptive record of existing conditions • Condition Survey to be carried out by third party independent of the design and contractor team to be carried out prior to commencement of works. • Utilities search and consultation	✓ ✓ ✓ ✓
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 & specification 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 Engineer's Report confirming BCP is in accordance with Section 106 Agreement	✓

3.0 DISCUSSION

3.1. The following comments apply to the DBCP for the 7 Bayham Street, London, NW1 0EY development.

3.2. The proposed development contains multi storey mixed use building constructed over a two-storey basement over the entirety of the site, with a partial three-storey basement to the southeast area of the site. The two-storey basement is approximately 8.4m below ground level, whilst the three-storey basement area is approximately 11.7m below ground level. The basement is to be supported via a secant piled wall to the perimeter propped by the new floors in the permanent case and temporary props installed during the construction phase.

3.3. Ground conditions are confirmed in RPS's BIA as Made Ground to a maximum thickness of 1.90m, overlying the London Clay formation. Groundwater was encountered between 1.32m and 2.45m below ground level and is considered to be perched water within the Made Ground. This is utilised in the latest BIA and subsequent GMA conducted by CGL.

3.4. The original BIA was undertaken by Southern Testing, where the original intent was for a two-storey basement only. It is confirmed by LBC that the proposals have been amended by means of a Section 73 agreement with Camden Council.

3.5. The DBCP is produced by BG&E Engineers on behalf of Camden Lifestyle (UK) Ltd; it identifies that Meinhardt is the Basement Design Engineer, who have confirmed that they are to be retained throughout the construction period. Qualifications for the Basement Design Engineer have been provided and they are suitably qualified.

3.6. A commentary on the Section 106 obligations is contained within Red Construction Group Limited's DBCP certifying the documents (Section 4.7.1 to 4.7.4). This is considered alongside email correspondence that the 'definitions' of the DBCP deliverables have been achieved (Section 2.26), including specifying the Basement Design Engineer and the Certifying Engineer.

3.7. It has been confirmed that Robert Bird Group are the Certifying Basement Engineer. Their certification is based on the review of all the necessary CGL reports, alongside information from the relevant permanent works and temporary works designers.

3.8. A Ground Movement Assessment (June 2022) carried out by CGL is presented in which five adjacent buildings have been considered. The assessment considers the deepened basement option. All but one of the adjacent properties are predicted to fall into the Burland Category 0 limit of damage (negligble) or less, with one adjacent property predicted to fall into the Burland Category 1 limit of damage (very slight).

3.9. Temporary works designs and drawings are provided by Conquip Engineering Group, GSS Piling and BG&E Engineers. The construction sequence has been defined by Modebest. Qualifications from the Temporary Works Design Engineers have now been provided. They too are suitably qualified.

3.10. Permanent work designs calculations for the basement piled raft slab have not been produced by Meinhardt as the Basement Design Engineer proposes to undertake the final design within RIBA Stage 5 period. The certifying engineer anticipates that the proposed slab thickness is reasonable for the development.

3.11. Condition surveys of neighbouring properties have been completed by CGL and are referenced within the Certifying Engineer's report.

3.12. Detailed proposals to monitor adjacent structures along with target trigger levels and frequency are detailed in the Proposed Movement Monitoring Strategy and Contingency Plan ref CG38478_CamdenLifestyleHotel_PMM&CP_June2022 produced by CGL.

3.13. Measures to ensure the on-going maintenance and upkeep of the basement and associated drainage are detailed within Meinhardt's Stage 4 Report and within the Certifying Engineer's report. It is stated that the basement should not require ongoing maintenance as the waterproofing proposed is an additive in conjunction with integral structural waterproofing (i.e. limiting crack widths within the basement slab and liner walls).

4.0 CONCLUSIONS

4.1. We are satisfied that the detailed information provided for our review of the Detailed Construction Plan pack for Camden Lifestyle complies with the requirements of the relevant clauses of the Section 106 Agreement.

4.2. It is generally accepted that the professional requirements of the Geotechnical Consultants (CGL) are in accordance with the requirements of the Section 106 Agreement. The Basement Design Engineer has been confirmed as Meinhardt and their qualifications are confirmed. The qualifications of the Temporary Works Design Engineer (JFH) have been confirmed and they are recognized as reputable engineers in regard to temporary works design.

4.3. Robert Bird Group have been assigned as Basement Certifying Engineer (BCE) and have issued the BCE's certification report required by the S106 Agreement.

4.4. It is noted that the Basement Design Engineers are to be retained through the construction phase.

4.5. The BIA on Camden's planning website, undertaken by Southern Testing Ltd and audited by CampbellReith, considers a two level basement whilst the BCP shows a partial third basement level. This is due to a subsequent S.73 application to LBC.

4.6. The Ground Movement Assessment contained in the DBCP considers the deepened basement and indicates the anticipated impact on the Neighbouring Properties as no worse than Category 1: very slight, with reference to the Burland Category of damage.

4.7. Condition surveys of neighbouring properties have been undertaken.

4.8. It is accepted the DBCP contains a detailed method statement and phasing of the temporary works proposed to construct the basement, together with a monitoring action plan. Monitoring target locations are not shown in the specification.

4.9. It is accepted the DBCP contains detailed basement design drawings and structural calculations prepared by the relevant members of the design team and the Temporary Works Engineer.

4.10. Permanent work design calculations have been partially provided by Meinhardt, with the remaining element (the raft slab) to be designed during the next RIBA Stage of works.

4.11. The DBCP does not contain reference to the hydrology and hydrogeology, and the site investigations confirm the local ground conditions as Made Ground over London Clay Formation. Whilst no information has been provided in the DBCP, the original BIA provided screening, scoping and noted the basement should not have any impact on the local water environment.

4.12. A certification letter has been provided by the Basement Design Engineer.

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