CampbellReith
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Basement Impact Assessment Audit

154 Royal College Street, London, NW1 0TA

For
London Borough of Camden

Project No.
14006-97

Date
January 2025

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CONTENTS

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 154 Royal College Street, London, NW1 0TA (planning reference: 2024/1541/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 authors are not in accordance with the requirements of CPG: Basements. However, the lead author is a Chartered Structural Engineer with previous experience of basement construction, which is considered appropriate considering the scale of the proposals and the underlying ground conditions.

1.5 The proposed basement consists of the deepening and extension of the existing basement towards the rear garden. The updated submissions clarify the dimensions and layout of the proposed development.

1.6 The BIA states that hit and miss underpinning techniques will be used to construct the basement. Appropriate outline structural information has been provided in the updated submissions.

1.7 The updated submissions provide the further information requested in the D1 audit to support some the screening questions' responses.

1.8 Baseline ground conditions and design parameters are confirmed in the updated submissions.

1.9 The updated BIA confirms that offsite flows will be attenuated and controlled will not impact the water environment.

1.10 Utility information is provided and considered in the updated submissions.

1.11 The updated Ground Movement Assessment (GMA) confirms that impacts to neighbouring structures will be no more than Category 1 (Very Slight) in accordance with the Burland Scale.

1.12 Considering the updated submissions, the BIA complies with the requirements of CPG: Basements. Queries and comments on the BIA are described in Section 4 and Appendix 2.

2.0 INTRODUCTION

2.1 CampbellReith was instructed by London Borough of Camden (LBC) on 12/09/2024 to carry out a Category B audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 154 Royal College Street, London, NW1 0TA (Planning Reference: 2024/1541/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 "Erection of a ground floor rear extension, mansard roof extension and basement excavation including the insertion of a rear lightwell to existing residential units".

2.6 The Audit Instruction confirms 154 Royal College Street is not listed and is not a neighbour to listed buildings.

2.7 CampbellReith accessed LBC's Planning Portal on 16/09/2024 and gained access to the following relevant documents for audit purposes:

- Subsurface Flow Basement Impact Assessment: Screening and Scoping Document by Stephen Buss Environmental Consulting Ltd (SBEC), Ref: 2024-009-051-001, Dated 25/07/2024
- Basement Impact Assessment by JMS Civil & Structural Consulting Engineers (JMS), Ref: L24/055/02, Frist Issue, Dated 24/07/2024

- Planning, Design and Access Statement by Eade Planning Ltd, Version: Revised, Dated August 2024
- Planning Application Drawings consisting of:
  - Site Location Plan, Ref: PP-12983755v1, Dated 18/04/2024.
  - Existing floor plans and elevations by AJS Planning, Ref: RCS.154.EX.101 rev B, RCS.154.EX.102 rev A and RCS.154.EX.103 rev A, dated 03/04/2024.
  - Proposed floor plans and elevations by AJS Planning, Ref: RCS.154.PR.101 rev B, RCS.154.PR.102 rev B and RCS.154.PR.103 rev B, dated 03/04/2024.
- Planning consultation comments.

2.8 Following issue of the initial BIA, the following documents were provided for review:

- CV of BIA author (Daniel Staines, JMS Consulting Group).
- Excavation Plan by AJS Planning, Ref: RCS.154.EXC.101 rev 0, dated 03/04/2024.
- Basement Impact Assessment by JMS Civil & Structural Consulting Engineers (JMS), Ref: L24/055/02, Rev C, dated 31/10/2024.
- Basement Impact Assessment Supplementary Information by JMS Civil & Structural Consulting Engineers (JMS), Ref: L24/055/02, dated 09/01/2025.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	Updated information provided and supporting CV of lead author (Appendix 3).
Is data required by Cl.233 of the GSD presented?	Yes	Updated submissions.
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	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	
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Q.3 of Hydrogeology Screening is missing in the subsurface flow BIA (SFBIA). It is accepted that the site is remote from the Hampstead chain of ponds.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Updated submissions.
Is a conceptual model presented?	Yes	For subsurface flow only.
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	Updated submissions.

Item	Yes/No/NA	Comment
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	The impact assessment in subsurface flow BIA considers impact to groundwater flows.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Updated submissions.
Is factual ground investigation data provided?	Yes	Updated submissions.
Is monitoring data presented?	Yes	Site Specific ground investigation report was not submitted. However, SFBIA references two adjacent GI Reports.
Is the ground investigation informed by a desk study?	NA	No ground investigation presented.
Has a site walkover been undertaken?	No	No evidence of walkover is recorded in BIA
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	See 2.4 Local Basements of SFBIA
Is a geotechnical interpretation presented?	Yes	Updated Submissions
Does the geotechnical interpretation include information on retaining wall design?	Yes	Updated Submissions
Are reports on other investigations required by screening and scoping presented?	Yes	Supporting statements re drainage ad updated GMA presented.
Are the baseline conditions described, based on the GSD?	Yes	Updated Submissions.
Do the baseline conditions consider adjacent or nearby basements?	Yes	Updated Submissions.
Is an Impact Assessment provided?	Yes	

Item	Yes/No/NA	Comment
Are estimates of ground movement and structural impact presented?	Yes	Updated Submissions.
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	Updated Submissions.
Has the need for monitoring during construction been considered?	Yes	Updated Submissions.
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	Updated Submissions.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	Updated Submissions.
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	Updated Submissions.
Does report state that damage to surrounding buildings will be no worse than Burland Category 1?	Yes	Updated Submissions.
Are non-technical summaries provided?	Yes	See 1.0 Executive Summary in BIA

4.0 DISCUSSION

4.1 The Basement Impact Assessment (BIA) has been carried out by engineering consultants, JMS Civil and Structural Consulting Engineers (JMS) with a separate BIA covering Subsurface Flows (SFBIA) prepared by SBEC. The lead author is a Chartered Structural Engineer with previous experience of basement construction, which is considered appropriate considering the scale of the proposals and the underlying ground conditions.

4.2 The BIA has partially been updated to reference and comply with the current guidance CPG: Basements (2021).

4.3 The LBC Instruction to proceed with the audit identified that the basement proposal is not listed and is not a neighbour to listed buildings. The BIA is located within Camden Broadway Conservation Area and Camden Central Neighbourhood.

4.4 The proposed basement development consists of the deepening and extension of the existing basement to the rear of the property. A single storey extension to the existing ground floor level is also proposed, along with internal layout alterations to all floors and a loft conversion.

4.5 The updated submissions confirm the layout and dimensions of the basement, which involves the deepening of the existing and extension to the rear as single storey basement.

4.6 The BIA does not provide a site specific ground investigation (GI) report but refers to a BGS borehole approximately 0.2 miles away. The SFBIA references two GI reports from properties adjacent to the subject site: to the south 152, Royal College Street and to the north 156, Royal College Street.

4.7 The SFBIA identifies 1.50m to 2.30m of made ground overlying the London Clay while the BIA reports London Clay to be present from the surface. Both adjacent GI reports record groundwater. At 152, Royal College Street, groundwater was monitored at 2.86m bgl, two weeks after excavation. At 156, Royal College Street the groundwater was measured at 1.70m bgl, nearly 2 years after excavation (initial GI was completed in September 2020 and groundwater was measured in March 2022). The BIA reports groundwater to be at c. 68m bgl. Baseline ground conditions and design parameters are confirmed in the updated submissions.

4.8 Q.3 of the Hydrogeology (groundwater) Screening is missing although it is accepted that the site is remote from the Hampstead ponds. The SFBIA records that the site is not underlain by an aquifer.

4.9 Q.4 of the Hydrology (surface water) Screening should be answered as Yes as there is an increase in hardstanding area which may alter inflows to surrounding properties and water courses.

4.10 Q.8 of the Slope Stability screening (nearby watercourse) is not forwarded to Scoping for further discussion. The screening notes that London Clay is the shallowest stratum.

4.11 The updated submissions provide the further information requested in the D1 audit to support some the screening questions' responses.

4.12 The BIA confirms that the site is in flood zone 1 and it is accepted that the risk of flooding from sea, rivers and surface water is low. The updated BIA states the increase in hardstanding will be mitigated by implementing SUDS attenuation to control and limit flows off site. The final drainage design should be approved by LBC and Thames Water.

4.13 Section 7.0 of the BIA describes the construction methodology including temporary and permanent works, the sequence of works including propping and the description of hit and mis underpinning sequence with plans and drawings.

4.14 The BIA states that hit and miss underpinning techniques will be used to construct the basement. Appropriate outline structural information has been provided in the updated submissions.

4.15 Utility plans are provided in the updated submissions.

4.16 The updated Ground Movement Assessment (GMA) confirms that impacts to neighbouring structures will be no more than Category 1 (Very Slight) in accordance with the Burland Scale.

4.17 It is noted that structural monitoring of neighbouring structures during construction is proposed. This may be agreed as part of Party Wall awards.

5.0 CONCLUSIONS

5.1 The lead BIA author is a Chartered Structural Engineer with previous experience of basement construction, which is considered appropriate considering the scale of the proposals and the underlying ground conditions.

5.2 The updated submissions clarify the dimensions and layout of the proposed development.

5.3 Appropriate outline structural information has been provided in the updated submissions.

5.4 The updated submissions provide the further information requested in the D1 audit to support some the screening questions' responses.

5.5 Baseline ground conditions and design parameters are confirmed in the updated submissions.

5.6 The updated BIA confirms that offsite flows will be attenuated and controlled will not impact the water environment.

5.7 Utility information is provided and considered in the updated submissions.

5.8 The updated Ground Movement Assessment (GMA) confirms that impacts to neighbouring structures will be no more than Category 1 (Very Slight) in accordance with the Burland Scale.

5.9 Updated supporting information is provided in Appendix 3.

5.10 Considering the updated submissions, the BIA complies with the requirements of CPG: Basements. Queries and comments on the BIA are described in Section 4 and Appendix 2.

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Appendix 1

Consultation Responses

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
Stummel	152 Royal College Street	25/09/24	Shared sewer system crosses the rear gardens of the property	The drainage strategy has been provided and reviewed as part of this audit. Final drainage design should be approved by LBC and Thames Water.

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Appendix 2

Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA	Qualifications not in accordance with requirements of CPG Basements.	Closed	January 2025
2	BIA	BIA refers to out of date guidance (CPG4).	Closed	January 2025
3	BIA	The baseline conditions are not defined (ground and groundwater conditions, scheme dimensions, position and depth relative to neighbouring properties).	Closed	January 2025
4	Screening	Screening question responses are presented inconsistently and some have not been carried forward to scoping. As noted in Section 4, further information is required to support some of the screening responses.	Closed	January 2025
5	Surface water	Proposed attenuation measures for the increase in hardstanding should be presented.	Closed	January 2025
6	BIA	No structural engineering information to support assessments and conclusions. Geotechnical soil parameters are not provided.	Closed	January 2025
7	BIA	Utility plans should be provided.	Closed	January 2025
8	Stability	Ground Movement Assessment (GMA) should consider ground movements around the excavation due to the yielding of the excavation and construction activities	Closed	January 2025
9	Stability	Further justification required to support building damage conclusions.	Closed	January 2025

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Appendix 3

Supplementary Supporting Documents

- CV of BIA Author
- Supplementary Information, January 2025

Engineering That Brings Design To Life.

Curriculum Vitae

Daniel J Staines

Position:	Group Director of JMS Consulting Group
Profession:	Structural Engineer - Chartered in 1992
	Membership No. 02025616X
Year of Birth:	1964
Nationality:	British
Present Employer:	JMS Consulting Engineers Ltd
Year joined firm:	1997

Position/specialisation: Director/Structural Engineer

Education/professional: BEng (Hons) MIStructE CEng PgDip (Const. Mgmnt)

Relevant experience/key qualifications:

My primary role is to lead teams of innovative Engineers to provide solutions to our clients across the Construction sector from the framing of high rise buildings through to the design and construction planning of 2-3 storey basements beneath properties in Central London.

I have extensive concept design experience in most structural design materials and building types and remain a 'hands-on' Engineer producing calculations, reports and specifications.

Previous Experience Record

1996 – 1997	Senior Engineer, MLM Consulting Engineers
1993 – 1996	Associate, Joynes Pike & Associates
1989 – 1993	Senior Graduate Engineer, Pick Everad Keay & Gimson
1987 – 1989	Graduate Engineer, Alan Marshall Partnership

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www.jmslegacy.co.uk/ (Personal)
www.jmsengineers.co.uk (Company)
jmsconsultingengineers.blogspot.co.u (Blog)

Top Skills

LinkedIn Learning
Entrepreneurship
Business Development and Strategy

Daniel Staines

CEO - JMS Legacy
Ipswich, England, United Kingdom

Summary

With over 35 years of experience in the Civil and Structural engineering sector, I am a Chartered Structural Engineer (MIStructE) and the CEO of the JMS Group Ltd. In addition to this, I lead a portfolio of companies, including MJ Consulting, GC Robertson, and Beam-Designs, that come together to provide high-quality engineering services to a diverse range of projects, from theatres and music venues to multi-storey structures, historical buildings and the aggregate industry.

My core competencies include recognising and leveraging emerging trends, fostering high-performance teams, and forging lasting relationships with key stakeholders. In establishing my corporate portfolio, I have demonstrated my unwavering commitment, industrious approach, and adeptness in overcoming complex challenges and capitalising on opportunities. I have spearheaded the implementation of advanced software solutions to refine workflows, boost team collaboration, and bolster project outcomes.

In 2024, I founded The Structural Engineering Alliance Group (SEAG), a collaborative platform for independent engineering firms. SEAG is a unique collective, where each firm contributes its distinct expertise and experience, fostering a shared network that amplifies our collective capabilities. The primary aim of SEAG is to facilitate the exchange of knowledge, resources, and opportunities among member companies. This collaborative approach empowers us to deliver superior services to our clients and navigate industry challenges with greater efficiency.

By working together, SEAG firms benefit from:

- Shared Knowledge: Leveraging the expertise and insights from various specialised areas.
- Collaborative Opportunities: Uniting on projects and expanding service offerings.

- Resource Pooling: Sharing resources, such as software or technical knowledge.
- Mentorship and Support: Fostering professional growth and development.

Experience

JMS LEGACY LIMITED
Managing Director
July 2014 - Present (10 years 7 months)
East Anglia

JMS Engineers
27 years 5 months

Group CEO
January 2022 - Present (3 years 1 month)
United Kingdom

Managing Director
September 1997 - December 2021 (24 years 4 months)
East Anglia - Midlands - London

Establishment of new consultancy to provide a civil and structural engineering service to both the domestic and commercial sector.

Responsible for the overall management of three offices and the day to day running of the structural section of JMS.

Continued ‘hands on’ engineering with respect to structural designs from domestic through to multi-million pound developments in all common structural materials.

MJ Consulting Engineers Ltd
4 years 6 months

Managing Director - MJC Consulting Engineers
August 2020 - Present (4 years 6 months)
London Area, United Kingdom

Overseeing a dedicated team of specialist structural engineers and surveyors undertaking services for theatres, music venues and historical buildings and the general event industry,

Managing Director
August 2020 - April 2023 (2 years 9 months)
West End, London

GC Robertson & Associates Ltd
Director
April 2023 - Present (1 year 10 months)
Suffolk, England, United Kingdom

SubStructural Ltd
Director Of Operations
June 2013 - October 2018 (5 years 5 months)

Providing design co-ordination of basements and other below ground structures

CMT Partners
Partner
September 2011 - September 2013 (2 years 1 month)

Partner representing the structural aspects of the practice specialising in basement design and medium rise, concrete and steel framed structures.

MLM Consulting Engineers
Project Engineer
March 1996 - March 1997 (1 year 1 month)

Project management role of £21m reinstatement of fire damaged factory including overseeing of contract works, procurement of new equipment and liaising between client and insurer.

Joynes Pike & Associates
Associate & Office Manager
June 1993 - 1996 (3 years)

Management of satellite office and overseeing both civil and structural engineering designs on projects up to £5m.

Education

Institute of Structural Engineers

Anglian Ruskin University
MSc, Construction Management · (2011 - 2013)

Liverpool John Moores University

BEng(Hons), Civil Engineering · (1984 - 1987)

University of Hertfordshire

HNC, Civil Engineering · (1982 - 1984)

Woodbridge School

· (1973 - 1982)

Engineering That Brings Design To Life.

BIA Supplementary Information

L24/055/02

154 Royal College Street,

London

NW1 0TA

Revision	Date	Issued by	Changes
-	04.12.2024	A.Ronaldson	Initial Issue
A	08.01.2025	A.Ronaldson	Updated Geotechnical Review.
B	09.01.2025	A.Ronaldson	Updated GMA Note

Preface

Following the issue of JMS L24/055/02 - Basement Impact Assessment (Rev C) for the proposed development at 152 Royal College Street, London and subsequent Audit by Campbell Reith on behalf of Camden Council, please see below the Audit Tracker Extract highlighting remaining points of clarification required. This document is to be in addendum to the original report to address/ provide clarity on the outstanding points.

Query No	Subject	Query	Status	Date closed out
1	BIA	Qualifications not in accordance with requirements of CPG Basements - (page 22, Section 4.7: A Civil Engineer with the "CEng" (Chartered Engineer) qualification from the Engineering Council and a Member of the Institution of Civil Engineers ("MICE") with either demonstrable evidence that the assessments have been made in conjunction with an Engineering Geologist with the "cGeol" (Chartered Geologist) qualification from the Geological Society of London or a Registered Ground Engineering Professional, Specialist or Advisor as defined by the Register of Ground Engineering Professionals (RoGEP).) – open.	Open – See 4.1	
2	BIA	BIA refers to out of date guidance (CPG4). - Now updated – closed.	Closed	November 2024
3	BIA	The baseline conditions are not defined (ground and groundwater conditions, scheme dimensions, position and depth relative to neighbouring properties). - Scheme dimensions – clarified – closed. - Ground and groundwater conditions – clarified – closed. - Depth of neighbouring foundations at 156 unclear – a basement is referred to but also that underpinning of Party Wall will be required. Understood that 152 demolished. Is it assumed that 156 and 154 have the same basement depth currently? If unknown, state conservative assessment criteria – open.	Open – See 4.5	
4	Screening	Screening question responses are presented inconsistently and some have not been carried forward to scoping. As noted in Section 4, further information is required to support some of the screening responses. - Now updated – closed.	Closed	November 2024
5	Surface water	Proposed attenuation measures for the increase in hardstanding should be presented. - No detail of substance presented; a summary of calculations and size of attenuation / discharge rate to be achieved would be sufficient - open	Open – See 4.13	
6	BIA	No structural engineering information to support assessments and conclusions. Geotechnical soil parameters are not provided. - Outline structural information provided – closed. – provide information as Arup GSD Appendix G3 geotechnical parameters - open	Open – See 4.15	
7	BIA	Utility plans should be provided. - provided - closed	Closed	November 2024
8	Stability	Ground Movement Assessment (GMA) should consider ground movements around the excavation due to the yielding of the excavation and construction activities - Current assessment indicates up to Category 2 damage – this is not allowable under CPG Basements – open. - Current assessment is not considered conservative; a minimum of 5mm vertical / horizontal movement per stage of underpinning would be anticipated in dry, stable conditions. Its noted that underpinning through Made Ground with perched water is likely with dewatering to be implemented, which may further impact movements – open.	Open – See 4.17	
9	Stability	Further justification required to support building damage conclusions. - Current assessment indicates up to Category 2 damage – this is not allowable under CPG Basements – open. - Current assessment is not considered conservative; a minimum of 5mm vertical / horizontal movement per stage of underpinning would be anticipated in dry, stable conditions. Its noted that underpinning through Made Ground with perched water is likely with dewatering to be implemented, which may further impact movements / damage category – open.	Open – See 4.18	

Query 1 – Clarification of Qualifications

It is evident from Camden Local Plan (2017) Policy A5 that suitably qualified chartered structural engineers must be appointed to carry out the respective components of the Basement Impact Assessment, the policy document then refers to more specific requirements outlined in Camden Planning Guidance: Basements (2021).

The following authors contributed directly to this report..

Surface Flow and Flooding	– David Brunning – Beng, CWEM, MICWEM (Chartered Civil Engineer)
Hydrology	– Provided Separately
Land Stability	– Daniel Staines (CEng, MIStructE, Beng, PgDip (Construc. Management)

Based on the guidelines for qualified professionals it would therefore appear to be the section of the report regarding land stability which requires further clarification.

I would refer you to section 4.47 of CPG:2021 with respect to the qualifications required for Land Stability appraisals.

- A Civil Engineer with the "CEng" (Chartered Engineer) qualification from the Engineering Council and specialising in ground engineering;
- A Member of the Institution of Civil Engineers ("MICE") and a Geotechnical Specialist as defined by the Site Investigation Steering Group; or
- A Chartered Member of the Institute of Structural Engineers with some proof of expertise in engineering geology, with demonstrable evidence that the assessments have been made by them in conjunction with an Engineering Geologist with the "cGeol" (Chartered Geologist) qualification from the Geological Society of London.

It is advised that the BIA and supplementary report has been provided by a suitably qualified Chartered Member of the Institute of Structural Engineers with 20 year's experience in basement developments across London, and in accordance with the specific geotechnical recommendations contained within a number of interpretive reports accessed via the Camden planning records for relevant neighbouring sites, to ensure accuracy of geotechnical information, appropriate assessment of land stability, and consideration of reporting/recommendations from adequately qualified geotechnical specialists.

It should also be noted that the level of specialist consultant input and extent of information required by Camden Council is/ should be 'commensurate with the scale and location of the scheme' (Paragraph 6.115 Camden Local Plan (2017). It is argued given the limited nature of the scheme involving a minimal increase in largely existing basement footprint as part of a small residential scheme, this standard has been met at a minimum.

Query 3 – Clarification of Foundation depth to Neighbouring Properties.

It is apparent from visible construction and historic mapping that the properties of 152,154&156 were/ are a row of terraced houses of same age and construction. No.156 has been historically demolished but No.152 is still present sharing a party wall to the North.

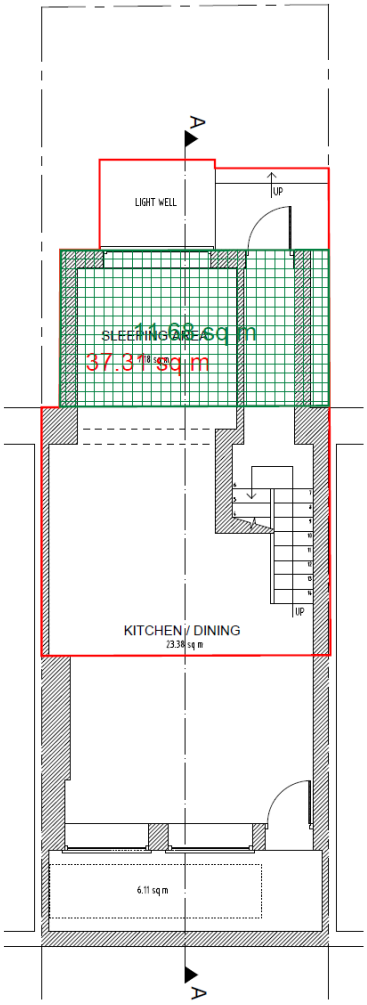
Given that the properties were constructed in the same manner and in the same configuration it would be prudent to presume that the existing foundation provision to No.152 is comparable to that of No.154, with a limited height basement and brick corbelled foundation extending beneath, internal floor levels to the basement are therefore anticipated to be the same/similar

It is understood from a ground movement assessment perspective that this construction represents the greatest level of excavation/ potential source of movement to the properties during the proposed works to No.154, as such has formed the worst-case approach to our assessments.

Query 5 – Surface Water Proposals

Assessment Summary.

Further to previous correspondence it is understood and agreed that the increase in surface water runoff will be minimal (please see calculations below). As discussed, levels of attenuation will be dependent on the agreed connection flow rate with the local water authority, however the inclusion of SUDs features can limit this requirement notably. Any attenuation crates etc. will be proportionate to the minor increase and can be positioned to the rear of the plot without detriment to the adjacent structures or underlying hydrology.



Proposed Basement Floor
Scale 1:100

Approximate increase in surface area to the rear catchment of the property is 30%

The Modified Rational Method can be used to consider the existing runoff rate for the 60 minute storm duration as set out in the equation:

Q (l/s) = Cv x Cr x 2.78 x I (mm/hr) x A (ha)

Rainfall Intensity (mm/hr) per Storm Event:

1:1yr - 48.163
1:30yr - 115.996
1:100yr - 152.499

Existing Run-off Rate per Storm Event:

1:1yr - 0.339
1:30yr - 0.817
1:100yr - 1.075

Increased Run-off Rate per Storm Event:

1:1yr - 0.480
1:30yr - 1.163
1:100yr - 1.530

In accordance with the published Advice Note on contents of a Surface Water Drainage Statement in London Borough of Camden; Section 2.1 states "Camden Planning Guidance 3 (CPG3) requires developments to achieve a greenfield run off rate once SuDS have been installed. Where it can be demonstrated that this is not feasible, a minimum 50% reduction in run off rate across the development is required."

On that basis, where greenfield run-off rates are unfeasibly low for such a small catchment area, the proposed run-off rate during the 1 in 100yr + 40% climate change would need to be set at: 0.75 l/s

Due to the small orifice plate required, upstream source control will be required in the form of SuDS. The proposals could include a small attenuation tank, bio-retention plants/pods on the rainwater downpipes, and silt traps ahead of the flow controls.

Query 6 – Geotechnical Parameters

It is understood from adjacent investigations/ borehole logs documented within the BIA that the soil profiles outlined below are anticipated.

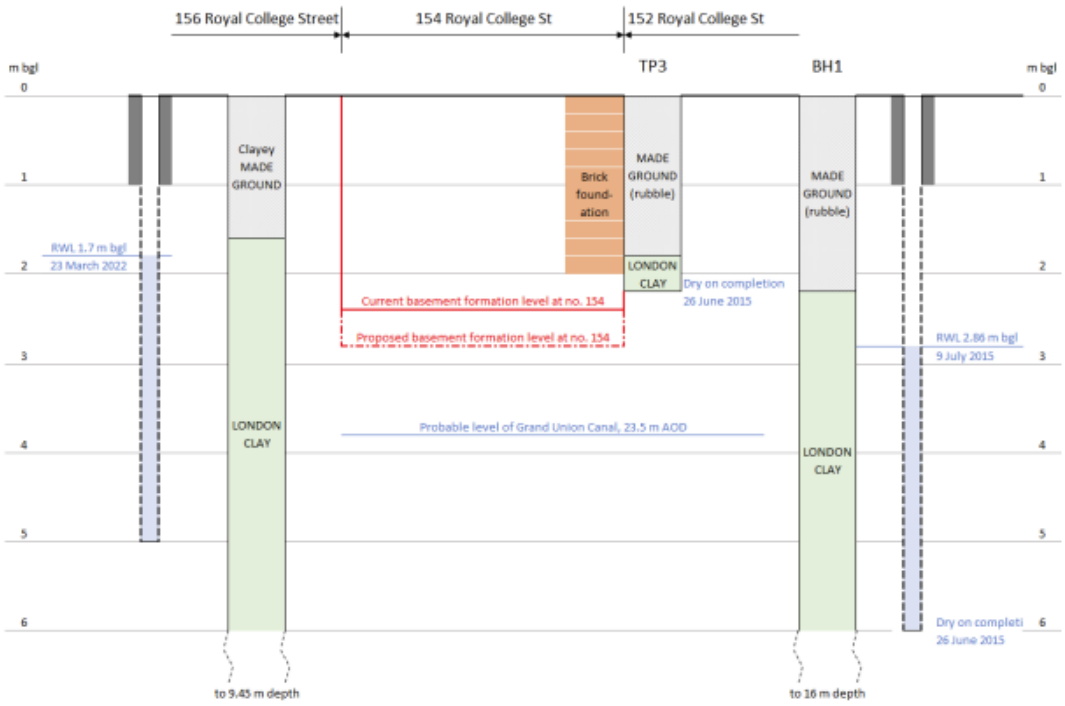


Figure 2.1 Borehole logs from 152 and 156 Royal College Street (looking north-eastwards)

It would appear that the made ground to No.152 is associated/ indicative of the historic demolition of the previous basement/ building, as such it would be prudent to presume that the properties of the soils to No.154 are in keeping with the prevailing conditions documented for No.156 and at depth for No.152 underlying the rubble layer.

The following geotechnical parameters are therefore expected/ advised.

Depth	Stratum	Effective Angle of Friction	Effective Cohesion (c')	Bulk Unit Density (kN/m^3)
0.00 - 1.80m	Made Ground	Conservatively 25º	0 kN/m^2	20 kN/m^3
1.80m - 9.45m +	London Clay	Typically, 20º	0 kN/m^2: 5kN/m^2 After 5.0m	20 kN/m^3

The above values are in keeping with standard information for the soil type and are consistent with those encountered during intrusive investigations/soil testing carried out for No.152 detailed in Soils Consultants SI detailed in planning application 2015/4396/P.

The basement permanent works designer should use these parameters to establish suitable active and passive earth pressure coefficients.

Query 8 & 9 – Anticipated Structural Movement/ Damage Categorisation

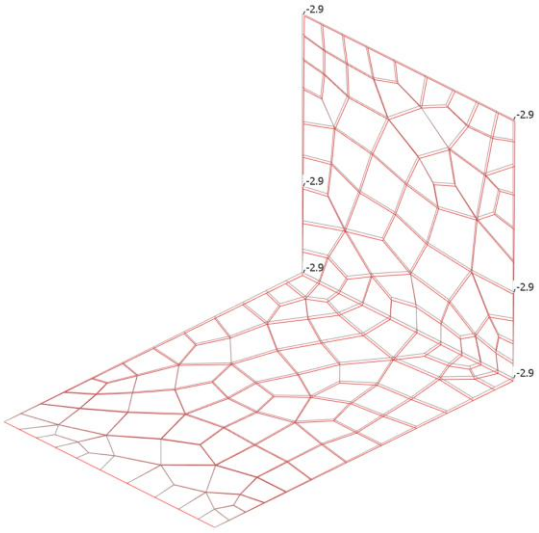
It is apparent from the proposals that there are two basement configurations present to the development, these have been discussed individually below for clarity to establish extent of estimated ground movement and subsequent residual damage characterisation in accordance with Ciria C760.

Main Underpin to Existing Footprint

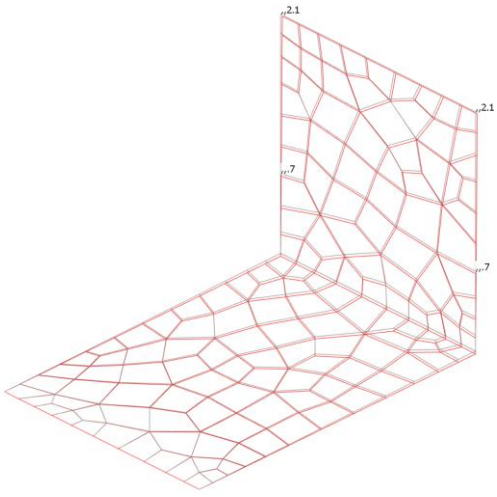
It is proposed to increase the depth of the existing basement to the remaining historic element of the property by approximately 1.0m to increase floor to ceiling clearance, it is understood that this will take the form of a reinforced concrete basement slab and external retaining wall.

Preliminary analysis of a typical 300mm thick slab/ wall construction using soils parameters outlined in query 6 has been carried out to examine wall displacement/settlements. It should be noted that this construction is to extend into the London Clay stratum underlaying the site as such design values have been selected accordingly.

Vertical Movement (within acceptable tolerances)



Horizontal Movement (within acceptable tolerances)



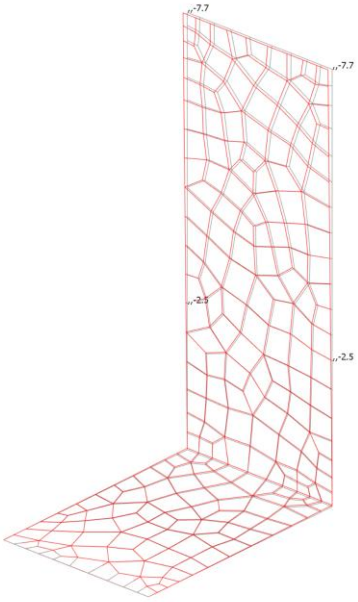
Based on general procedures for Stage 2 Damage Category Assessments outlined in section 6.3 of CIRIA C760 an effective horizontal tensile strain of approximately 0.05% is anticipated. As such the shorter underpin to the main property is likely to result in Damage Category 1 – Very slight in keeping with point 4.33 of Camden Planning Guidance: Basements (2021).

It should be noted that our estimate is based on effective methods of controlling ground water should it be encountered, and suitable back propping employed by the proposed contractor to engineer's design.

New Full Height Basement to Rear

The only full height component of basement excavation/retaining wall is to be located to the rear of both No.154 and No.156, extending through the made ground layer and founding into the London Clay beneath. An assessment has been made on worst case geotechnical parameters for made ground.

Horizontal Movement



The wall detailed above is typically remote from the foundations of the adjacent, any horizontal/ vertical movement will therefore have minimal impact to the rear garden and will not be of significance to the structures onsite.

Additional Geotechnical Review

Further to our assessment of the wall construction we have provided an additional review of the soil behaviours in both the unloading phase during basement excavations and in the permanent condition once the permanent structure has been completed, in order to establish/ quantify heave/ settlement and the subsequent effect on adjacent structures.

Heave

Given the nature of the clay subsoils vertical heave is anticipated where net bearing stresses are reduced from their current loading conditions, based on the previously defined bulk density of overburden soils of 20kN/m^2. A net unloading of 20kN/m^2 and 60kN/m^2 respectively to the internal basement area and new build element to the rear.

Using Skempton-Bjerrum a simplified one-dimensional method for estimating heave/ settlement values has been carried out as detailed in Appendix 1.1-1.4.

Short Term Vertical Heave/ Settlement

The full depth basement excavation to the rear will involve the removal of 3.0m of overburden from the clay layer in the temporary condition. Consideration of heave in the short-term undrained condition show a maximum vertical movement of +17.32mm.

To the party walls with 152 and 152 where foundation loads are in excess of the removed overburden a short-term vertical movement of 1.93mm is anticipated from the reduced stress during excavation.

All anticipated heave values present are within an industry accepted 25mm for normal construction tolerances.

Long Term Vertical Gound Movements (Drained Conditions)

To the rear full depth basement (once construction is complete) long term settlement will result in final vertical movement of +11.55mm. It should be noted that short term vertical heave movements will be reduced in the final preparation of the formation layer prior to placing of the concrete base slab. As long-term vertical movement will be notably less than this conservative value.

Final long-term settlement to the party walls is as illustrated in the graph on sheet 09, that is to say +1.93mm short term vertical heave (during excavation) -4.75mm long term settlement i.e. net settlement of -2.82mm.

Vertical And Horizontal Movement from Underpin Installation

Underpinning will take the form of stiff reinforced concrete walls with limited potential for deflection as highlighted on sheet 6 &7 of this report. However, it is recognised that any deflections that do occur will likely result in surface settlements with may impact neighbouring properties.

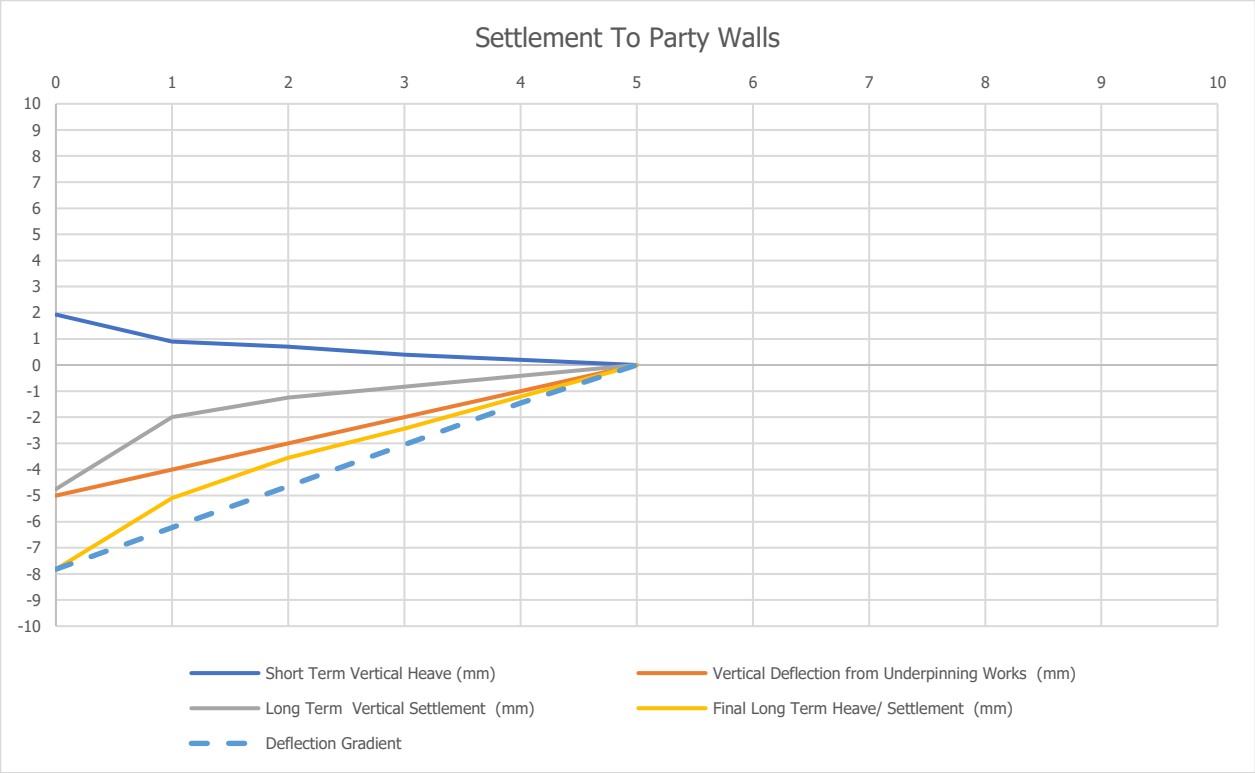
It is therefore advised to make a 5.0mm additional allowance to both vertical and horizontal settlements in consideration of ground movements, in keeping with the single stage underpinning methodology.

It should be noted that the presence of existing basement to the adjacent properties limits the excavation depth to approx. 1.0m, this will likely further restrict movements.

Updated Ground Movement Assessment Information.

A review of the structures adjoining the site indicate that the most susceptible properties to ground movements associated with the works are the neighbouring properties of 152& 156 Royal College Street.

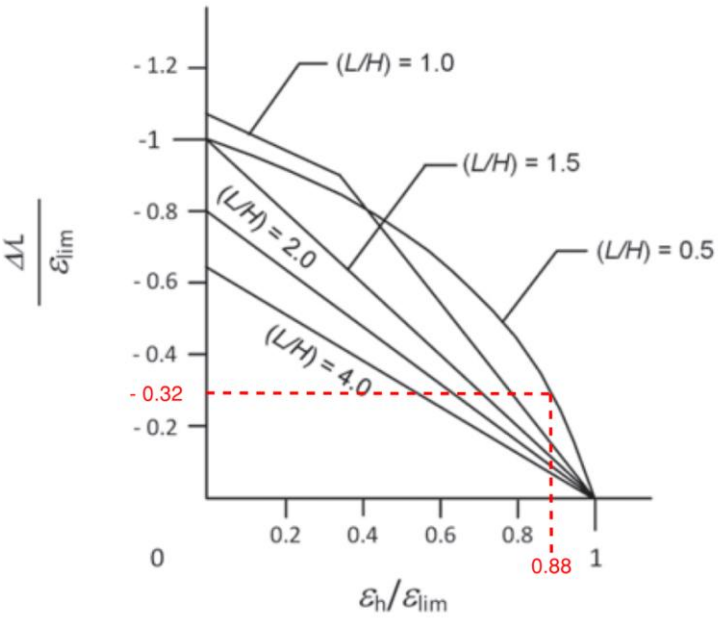
From analysis the following settlement graph demonstrates the anticipated soil movements within a 5.0m susceptible zone to the excavation/basement construction relative to each party wall line. Given that 154 is a mid-terrace property with similar construction present each side, similar movements would therefor be anticipated to each side.



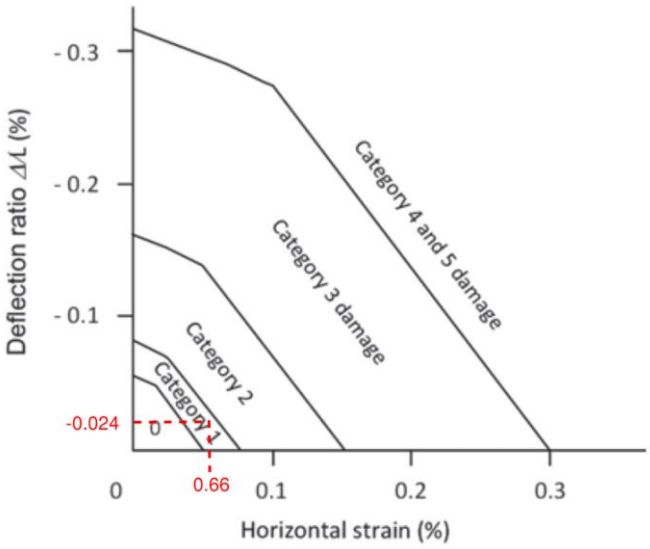
Summary of ground Movements and Corresponding Damage category (152&156 Royal College Street)

Adjacent Property	**152 Royal College Street**	**156 Royal College Street**
Building Width – L (m)	5.00	5.00
Building Height – H (m)	10.50	10.50
L/H = 0.476	0.50	0.50
Max Deflection	0.012	0.012
ΔL (%)	0.024	0.024
εlim	0.075	0.075
Δ/L/εlim	0.32	0.32
Length to Negligible Horizontal Movement (4x)	4	4
δh_{max} (m)	0.004	0.004
δh (m)	0.0021	0.0021
Δh/L (%) = εh	0.10	0.10
Damage Category	**<1**	**<1**

Influence on Horizontal strain on Δ/L/εlim



Relationship Between Damage Category and Deflection Ratio and Horizontal Tensile Strain (L/H=0.50)



Residual Risks from Ground Movement Assessment

It is evident from our assessments that the most likely cause of damage to adjacent structures associated with the works is not a result of the permanent works/ retaining wall design, but in the temporary soil stability of excavations given the potential presence of limited ground water and made ground.

It is therefore proposed to install all basement pins in careful sequence with the contractor to provide a robust design for the installation of temporary shoring during each pin installation to ensure stability of excavations at all times; as per the construction methodology outlined in the BIA.

Additionally, the temporary works engineer must also consider temporary dewatering strategies in case of encountering groundwater. Ground water encountered appears to be limited to perched water within the stratum of made ground to the rear. It is anticipated that water levels can be controlled by pumping into the adjacent sewer, appropriate approvals will need to be sought.

Appendix 1.1 – Heave/ Settlement Calculations – Unloading Phase (Rear)

Overburden Removed – 20kN/m^2 x 3.0m = 60kN/m^2

Initial

H / B = 7 / 5 = 1.4

D / B = 3 / 5 = 0.6

L / B = 5 / 4 = 1.25

Coefficients For Vertical Displacement

μ_0 = 0.95

μ_1 = 0.45

S_i = 0.95 x 0.45 x (60 x 5) /55 = **2.33mm**

Secondary

m = 3.5 / 7 = 0.5

n = 2.5/7 = 0.35

I_r = 0.075

$\Delta\sigma'$ = 4 x 60 x 0.075 = 18kN/m^2

S_{od} = 0.14 x 18 x 7 = 17.64

μ = 0.85

S_c = 0.85 x 17.64 = **14.99mm**

Total Heave/Settlement Predicted = 2.33 + 14.99 = 17.32mm

Appendix 1.2 – Heave/ Settlement Calculations – Long Term (Rear)

Overburden Removed – 20kN/m^2 x 3.0m = 60kN/m^2

Proposed Building Load = 20kN/m^2

Resultant Change in Stress = 40kN/m^2

Initial

H / B = 7 / 5 = 1.4

D / B = 3 / 5 = 0.6

L / B = 5 / 4 = 1.25

Coefficients For Vertical Displacement

μ_0 = 0.95

μ_1 = 0.45

S_i = 0.95 x 0.45 x (40 x 5) /55 = **1.55mm**

Secondary

m = 3.5 / 7 = 0.5

n = 2.5/7 = 0.35

I_r = 0.075

$\Delta\sigma'$ = 4 x 40 x 0.075 = 12kN/m^2

S_{od} = 0.14 x 12 x 7 = **11.76mm**

μ = 0.85

S_c = 0.85 x 17.64 = **9.99mm**

Total Heave/Settlement Predicted = 1.55 + 9.99 = 11.55mm

Appendix 1.3 – Heave/ Settlement Calculations – Unloading Phase (Party Wall)

Overburden Removed – 20kN/m^2 x 1.0m = 20kN/m^2

Existing Building Load = 110kN/m^2

Resultant Change in Stress = 130kN/m^2

Initial

H / B = 7 / 0.6 = 11.66

D / B = 1 / 0.6 = 1.52

L / B = 7 / 0.6 = 11.66

Coefficients For Vertical Displacement

μ_0 = 0.94

μ_1 = 1.45

S_i = 0.94 x 1.45 x (130 x 0.6) /55 = **1.93mm**

Appendix 1.4 – Heave/ Settlement Calculations – Long Term (Party Wall)

Permanent Building Load = 150kN/m^2

Resultant Change in Stress = 40kN/m^2

Initial

H / B = 7 / 0.6 = 11.66

D / B = 1 / 0.6 = 1.52

L / B = 7 / 0.6 = 11.66

Coefficients For Vertical Displacement

μ_0 = 0.94

μ_1 = 1.45

S_i = 0.94 x 1.45 x (140 x 0.6) /55 = **2.08mm**

Secondary

m = 3.5 / 7 = 0.50

n = 0.6/7 = 0.09

I_r = 0.02

$\Delta\sigma'$ = 4 x 40 x 0.02 = 3.20kN/m^2

S_{od} = 0.14 x 3.20 x 7 = **3.14mm**

μ = 0.85

S_c = 0.85 x 17.64 =**2.67mm**

Total Heave/Settlement Predicted = 2.08 + 2.67 = 4.75mm

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