CampbellReith
consulting engineers

465 – 467 Finchley Road
London NW3 6HS

Basement Impact Assessment
Audit

For

London Borough of Camden

Project Number: 12066-56
Revision: F1

December 2015

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Planning Reference	2015/2557/P

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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 465 - 467 Finchley Road (planning reference 2015/2557/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 Screening and Scoping (Stage 1 and 2) was undertaken by Southern Testing Limited (STL) with the Basement Impact Assessment and Construction Method Statement prepared by Abstruct Consulting Engineers. The STL report was checked and reviewed by individuals with suitable qualifications. The Abstruct report author's qualifications are broadly in agreement with the requirements of CPG4.

1.5. The BIA has confirmed that the proposed basement will be located within the London Clay and that the surrounding slopes are stable.

1.6. It is accepted that groundwater is not expected to be an issue in the London Clay, however, based on the monitoring data, ingress from perched groundwater is likely and measures such as pumping are likely to be sufficient.

1.7. It is accepted that the development will have little detrimental effect on surface water discharges to the network drainage system.

1.8. Whilst the site is in a low risk area with respect to surface water flooding, both Finchley Road and West End Lane flooded in 2002. Evidence has been provided by Abstruct in an email on 17 December 2015 to support the conclusion that it is unlikely that water will enter the basement in the event of surface water flooding.

1.9. The development site does not involve a listed building nor is it in the neighbourhood of listed buildings.

1.10. The proposed basement will be excavated and constructed utilising established techniques which include underpinning, however, proposals for the southwest boundary along West End

Lane have not been finalised and it is recommended the impact on the roadway is considered once the construction method is fully developed.

1.11. The effect of heave on the neighbouring property has been considered and estimates of ground movement have been presented with a maximum predicted damage of Category 2 on the neighbouring property.

1.12. The impacts on Finchley Road and West End Lane have been considered and these should be agreed with TFL who own the roadways and the owners of any possible utilities running beneath them.

1.13. It is noted that the site is located on a TFL red route and TFL require details of construction vehicle loading and unloading to be provided in a construction management plan. This document has been provided and construction vehicle movements should be agreed with TFL.

1.14. A works programme has not been provided and this information is requested. It is accepted that this will be provided by the Main Contractor.

1.15. Monitoring during construction is being proposed. Such a mitigation measure should be adopted.

1.16. It is accepted that the BIA has identified the potential impacts from the basement construction and proposes sufficient mitigation.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 465 – 467 Finchley Road, Camden Reference 2015/2557/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

- Guidance for Subterranean Development (GSD). Issue 01. November 2010. Ove Arup & Partners.
- Camden Planning Guidance (CPG) 4: Basements and Lightwells.
- Camden Development Policy (DP) 27: Basements and Lightwells.
- Camden Development Policy (DP) 23: Water

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; and,

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 *"basement development to create storage space for A1/A2 units at the ground floor of 465 – 467 Finchley Road".*

2.6. CampbellReith accessed LBC's Planning Portal on 8 0ctober 2015 and gained access to the following additional relevant documents for audit purposes:

- Basement Impact Assessment Stage 1 – 3 – Southern Testing Limited, dated March 2015
- Appendices to Southern Testing Limited's report

- Basement Impact Assessment and Construction Method Statement – Abstruct Consulting Engineers, dated April 2015.
- Location Plan (OS Map)
- TFL Consultation, undated
- Architect's – Milan Babic Architects Drawings Nos

  PA/BS/679/101

  PA/BS/679/102

  PA/BS/679/200

  PA/BS/679/201

  AB1115_0001

  AB1115_0008

  AB1115_0009

  AB1115_0102

2.7. Additional information was received between 21 October and 17 December 2015 in response to queries raised in the initial BIA Audit report. The documentation is as follows:

- Construction Phase Plan, City Builders Ltd, dated 10 June 2015
- Structural Engineer's – Abstruct Drawing Nos

  AB1115 0009B

  AB1115 L2 20151117

  AB1115_0008B

  AB1115_GEN_01A

  AB1115_S.I_0001A

  AB1115_SEQ_0001

  AB1115_SEQ_0002B

  AB1115_SEQ_0003A

  AB1115_SEQ_0004

  AB1115_SEQ_0005

  AB115_SK/F/01

- Letter Report on Ground Movement Analysis, Southern Testing Limited, dated 12 November 2015
- PDISP input and output combined loads (undrained)
- PDISP input and output combined loads (drained)
- Xdisp Construction Movements.pdf
- Xdisp with imported Pdisp movements (Long Term Case)
- PA_679_1001_Finchley_Topographical_Survey

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	The reviewers of the STL screening and scoping report have suitable credentials. The Abstruct BIA and Construction Method Statement report author is a Chartered Structural Engineer and clarification was received on the suitability of his credentials (see Audit paragraph 4.1)
Is data required by Cl.233 of the GSD presented?	No	BIA and construction method statement contains most of the information required, however, a programme of works is not provided. It is stated that this will be presented by the Main Contractor under a separate cover (see Audit paragraph 4.11)
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	Abstruct BIA Section 9
Are suitable plan/maps included?	Yes	STL Stage 1 and 2 report and supplementary drawings.
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	STL Stage 1 and 2 report Section G-14
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	STL Stage 1 and 2 report Section G-13 and Abstruct report Section 12 and 13.

Item	Yes/No/NA	Comment
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Justification for the 'No' answers provided in Abstruct report Section 12 and 13.
Is a conceptual model presented?	Yes	STL Stage 3 report
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	STL Stage 2 report, however, the scoping only identified the issues and not the impact as required by Cl.245 of the GSD.
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	STL Stage 2 report, however, the scoping only identified the issues and not the impact as required by Cl.245 of the GSD.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	STL Stage 2 report, however, the scoping only identified the issues and not the impact as required by Cl.245 of the GSD.
Is factual ground investigation data provided?	Yes	STL Stage 3 Site Investigation Report Appendix A
Is monitoring data presented?	Yes	STL Stage 3 report Section F-17
Is the ground investigation informed by a desk study?	Yes	STL Stage 3 report Section B-5.1 to 5.5 although contamination issues were not considered in the report.
Has a site walkover been undertaken?	Yes	STL Stage 3 report Section B-6
Is the presence/absence of adjacent or nearby basements confirmed?	No	STL Stage 1 and 2 report notes the need to confirm the presence of a basement beneath the adjacent property but further states no planning applications were noted for the immediate adjacent properties.
Is a geotechnical interpretation presented?	Yes	STL Stage 3 Section F
Does the geotechnical interpretation include information on retaining	Yes	STL Stage 3 Section F-21 although it should be noted that the

Item	Yes/No/NA	Comment
wall design?		suggested undrained shear strength value for the London Clay is considered optimistic.
Are reports on other investigations required by screening and scoping presented?	Yes	STL Stage 3 and Abstruct BIA and Construction Method Statement.
Are baseline conditions described, based on the GSD?	Yes	
Do the base line conditions consider adjacent or nearby basements?	No	The STL report does not confirm the presence or absence of nearby basements but notes the need for an inspection to confirm.
Is an Impact Assessment provided?	Yes	The Abstruct report Sections 12 & 13 gives a brief discussion on drainage and surface water flooding but this was considered inadequate. Supplementary information has been provided.
Are estimates of ground movement and structural impact presented?	Yes	STL ground movement assessment letter report
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	Abstruct report Section 10 gives mitigation measures to control heave and possible effects of groundwater. Abstruct have indicated flood mitigation measures are not required (see Audit paragraph 4.5).
Has the need for monitoring during construction been considered?	Yes	Abstruct report Section 14.
Have the residual (after mitigation) impacts been clearly identified?	Yes	Abstruct report Section 10 gives contingency measures with regards to stability during construction
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	STL ground movement assessment letter report

Item	Yes/No/NA	Comment
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	
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	STL ground movement assessment letter report
Are non-technical summaries provided?	No	

4.0 DISCUSSION

4.1. The Basement Impact Assessment (BIA) has been carried in part by Southern Testing Limited (Screening and Scoping Study, Site Investigation Report and Ground Movement Analysis Letter Report) with the Impact Assessment and Construction Method Statement undertaken by Abstruct Consulting Engineers. The individuals concerned in the production of the STL reports have suitable qualifications. The Basement Impact Assessment and Construction Method Statement was prepared by a Chartered Structural Engineer and Abstruct have stated in a letter dated 17th November 2015 in response to queries raised following the initial review that the author has appropriate experience and that the geotechnical aspects of the report were reviewed by a Chartered Geologist (CGeol) from STL.

4.2. It is acknowledged that the basement will be founded within the London Clay, which based on the ground conditions presented in the STL Stage 3 report extends to within 0.26 metres of the existing site surface. We accept that although groundwater was monitored between 3.60 and 3.70m bgl within the London Clay, groundwater is not expected to be an issue and pumping is likely to be sufficient to deal with any perched groundwater.

4.3. It is accepted that the BIA has shown that the development will have no significant effect on slope or ground stability of the surrounding area and will not affect the hydrogeology of the surrounding area.

4.4. It is accepted that the BIA has shown that the development will have little detrimental effect on surface water discharges to the network drainage system.

4.5. Finchley Road and West End Lane were both flooded in the 2002 flood event. It is stated in the BIA that the risk of surface water flooding is unlikely and topographical information indicating surface water as a result of flooding is likely to move away from the site down West End Lane and Finchley Road is presented. Abstruct have further stated in an email on 17 December 2015 that flood mitigation measures are not required as part of the proposed works because the site levels, pavement and road levels together with the proposed layout do not provide a viable route for flood water to penetrate the new basement. A sketch (AB1115_SK/F/01) denoting the anticipated flood water route around the building has been included in Appendix 3.

4.6. The proposed basement will be constructed using established techniques which include underpinning. Plans of each stage of basement excavation and construction, including temporary prop positions and detailed sections indicating the propping arrangement have been provided as requested. An assessment of loadings for temporary foundations is also presented.

4.7. It is noted on drawing no AB1115_0001 and section 9 of the Abstruct report that the foundations along West End Lane in the southwest may be formed either in mass concrete or a

contiguous pile wall. The impact of the construction method on West End Lane should be considered once proposals in this area have been fully developed.

4.8. Analyses were undertaken to predict heave as a result of excavation on the neighbouring properties and the surrounding roadways and also horizontal and vertical movements as a result of the underpinning. The STL ground movement assessment letter report states that the long term damage to the neighbouring property is limited to Category 2 (slight). The input and output information has been provided as requested and has allowed this prediction to be validated. It should be noted however that this assumes good control of workmanship and that the affected buildings are in good condition.

4.9. The effect of basement excavation and construction on the adjacent roads has been considered. Transport for London (TFL) who own the Finchley Road highway and footpath, as well as part of West End Lane, highlighted the need to obtain an agreement in principle from them prior to the commencement of construction activities.

4.10. It is noted that the site is on a TFL red route with both Finchley Road and West End Lane surrounded by double red and double yellow lines. TFL require details on construction vehicle loading and unloading to be provided in a construction management plan (CMP). This document has been provided and the construction vehicle loading and unloading should be agreed with TFL.

4.11. It is noted that a works programme has not been submitted as required by Cl.233 of the GSD. In response to queries raised following the initial review of the BIA documents, Abstruct have indicated that this document will be provided by the Main Contractor under a separate cover.

5.0 CONCLUSIONS

5.1. The screening and scoping was carried by Southern Testing Limited (STL) who are a well-known firm of geotechnical consultants. The checker and reviewer have suitable qualifications. The impact assessment and construction method statement were prepared by Abstruct Consulting Engineers and the author is a Chartered Structural Engineer. Additional information has been provided to demonstrate that the author's qualifications are broadly in accordance with the requirements and that the geotechnical sections were reviewed by a Chartered Geologist (CGeol) from STL.

5.2. The BIA states that the development will have a negligible impact on slope or ground stability of the surrounding area and will not affect the hydrogeology of the surrounding area and the risk is accepted as being very low.

5.3. It is accepted that although groundwater could be encountered, this is likely to be perched groundwater within the London Clay and simple mitigation measures such as pumping should effectively control potential variations to the groundwater regime.

5.4. The BIA has stated that the development will have little detrimental effect on surface water discharges to the network drainage system and this is accepted.

5.5. Topographical information has been provided to demonstrate that the risk of surface water flooding the basement in the event of a storm is unlikely as stated in Section 13 of the Abstruct report. Abstruct have also stated that flood mitigation measures are not required.

5.6. The proposed basement will be constructed by carrying out mass underpinning with a reinforced concrete retaining wall in front of the underpins. Additional information indicating the propping arrangement and the loadings on the temporary foundations was requested to demonstrate the structural stability of the neighbouring property will be maintained and this has been provided.

5.7. Proposals for the southwest boundary wall have not been finalised and it is recommended that the impact of the construction method on West End Lane be considered once proposals in this area have been fully developed.

5.8. The effect of heave on the neighbouring property has been considered and estimates of ground movement have been presented as requested. The predicted extent of damage to the neighbouring property is Category 2.

5.9. The impacts on Finchley Road and West End Lane have also been considered. These should be agreed with TFL who own the roadways and the owners of any possible utilities running beneath them.

5.10. Details on construction vehicle loading and unloading are required by TFL in a construction management plan as both Finchley Road and West End Lane are surrounded by double red and double yellow lines. This has been provided and construction vehicle movements should be agreed with TFL.

5.11. A works programme as required by Cl. 233 of the GSD has not been provided. It is accepted that this may be submitted by the Main Contractor.

5.12. Proposals are provided for a movement monitoring strategy and contingency measures during excavation and construction and such measures should be adopted.

5.13. It is accepted that the BIA has adequately identified the potential impacts from basement construction and proposes sufficient mitigation.

Appendix 1: Resident's Consultation Comments

Residents' Consultation Comments

Surname	Address	Date	Issue raised	Response
TFL	Transport for London Tunnels and structures Palestra (8TH FLOOR – Zone Y5) 197 Blackfriars Road London SE1 8NJ	Not provided	Details on construction vehicles loading and unloading lawfully on West End Lane and Finchley Road	Refer to Audit paragraph 4.10 and 5.10

Appendix 2: Audit Query Tracker

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Audit Query Tracker

Query No	Subject	Query	Status	Date closed out
1	BIA author qualifications	Evidence of Abstruct authors' experience in engineering geology	Closed - Provided in Abstruct letter dated 17 November 2015 to Planning Officer	17/12/15
2	BIA format	Non technical summaries not provided	Closed – Agreed that existing documents clearly describe outcomes.	17/12/2015
3	BIA format	A works programme has not been submitted as required by Cl.233 of the GSD	Closed - Abstruct letter states this is to be provided by the Main Contractor	17/12/15
4	Stability	Detailed cross sections to better indicate propping arrangement is required. Loadings on temporary foundations are also requested.	Closed - Provided in Abstruct supplementary drawings	17/12/15
5	Stability	No explicit confirmation that damage to adjacent property will not exceed Burland Category 2	Closed - Provided in Southern Testing Limited (STL) Ground Movement Assessment letter report dated 12 November 2015	17/12/15
6	Stability	BIA offers monitoring of existing building walls	Monitoring regime and trigger levels to be agreed with Party Wall Surveyor	N/A
7	Stability	No impact assessment of West End Lane and Finchley Road	Provided in STL Ground Movement Assessment letter report - to be agreed with TFL	N/A
8	Surface water flooding	Topographical information for West End Lane to determine the direction of flow in the event of flooding is needed. Mitigation measures should also be provided.	Closed - Topographical information provided together with email (17 December 2015) response stating flood mitigation measures are not required.	17/12/15
9	TFL red route – construction vehicle loading and unloading	Details on construction vehicle loading and unloading is required by TFL as both Finchley Road and West End Lane are surrounded by double red and double yellow lines.	Closed - Provided in City Builders Limited Construction Phase Plan dated 10 June 2015 - to be agreed with TFL	N/A

10	Construction management plan	The TFL response refers to a construction management plan (CMP), however , this was not available on the LBC's planning portal.	Closed - Provided in City Builders Limited Construction Phase Plan dated 10 June 2015	17/12/15

Appendix 3: Supplementary Supporting Documents

Email response from Abstruct (17/12/15) on surface water flood risk query
Abstruct sketch (AB1115_SK/F/01) showing anticipated flood water flow route

AB1115 - 2015.2557.P_465-467 Finchley Road_Basement Impact Assessment Audit Report
Helen Jenkins ABSTRUCT
to:
fatimadrammeh
17/12/2015 14:01
Hide Details
From: "Helen Jenkins ABSTRUCT" <helenjenkins@abstruct-llp.com>
To: <fatimadrammeh@campbellreith.com>

1 Attachment

AB1115 SKF01.pdf

Dear Fatima,

With reference to our recent telephone conversation regarding flood mitigation measures, we would respond as follows:

Additional flood mitigation measures are not required as part of the proposed works, as the site levels, external pavement and road levels and proposed layout do not provide a viable route for external surface flood water to be able to penetrate the new basement area.

Please see the attached sketch mark-up plan AB1115_SK/F/01 for reference.

The external ground levels fall away from the building - West End Lane falls away from the site and downhill towards the west, Finchley Road falls away to the south. From the front (south-east) corner of the building (taken as datum 0.00) West End Lane falls rapidly in level by almost 1.0m reaching the most western end of the building.

There are only two entrances to the building.

The first is the main entrance on the corner of West End Lane and Finchley Road. The existing pavement/road levels here run downhill away from this entrance. A very significant flood event would need to occur before any water might penetrate into the building at ground floor level at this location. Should this occur, any water which entered the building at this location would then need to take a convoluted route towards the back of the building, involving a stair down to the existing rear sub-basement before water can penetrate the new basement area.

The second entrance to the building is on the south elevation along West End lane. This entrance is set at a higher level to the external pavement and road levels and only provides access to the upper floors of the building (not the basement). It is therefore highly unlikely that water can ingress the building here and if it does, it cannot access the basement.

We trust that the above and attached satisfies the queries that you had, however, should you have any further queries, please do not hesitate to contact us.

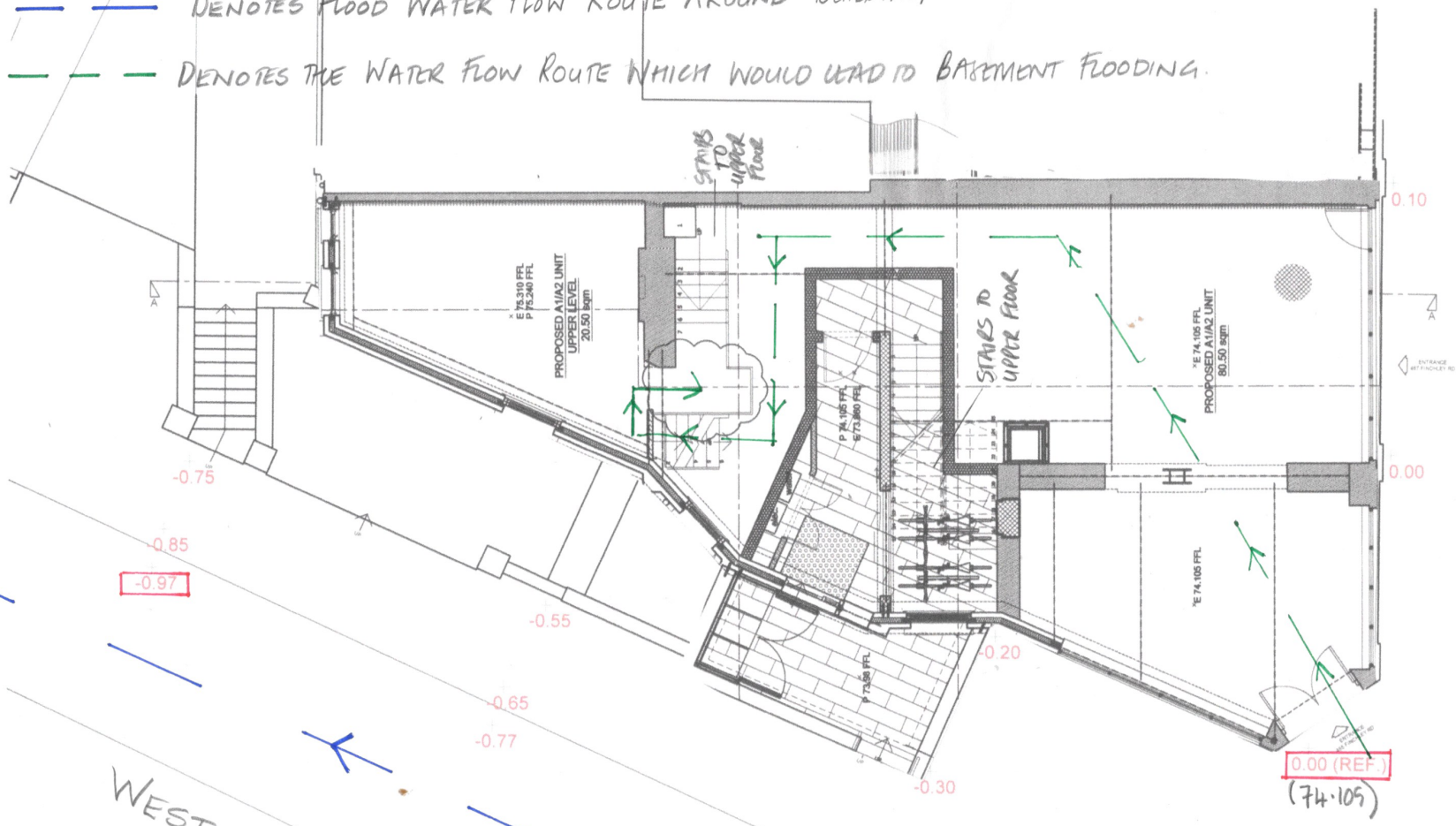
Kind Regards,

Helen Jenkins
BEng (Hons) CEng MIStructE
Senior Engineer

KEY

DENOTES FLOOD WATER FLOW ROUTE AROUND BUILDING

DENOTES THE WATER FLOW ROUTE WHICH WOULD LEAD TO BASEMENT FLOODING



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AB1115_ SK/F/01

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