

INDEPENDENT REVIEW OF BASEMENT IMPACT ASSESSMENT

DOCUMENT CONTROL				
Ver.	Date	Status	Authorised	
			Leszek Biel MEng (Hons) GMICE	Seamus Lefroy-Brooks BSc(hons) MSc CEng MICE CGeol FGS CEnv MEnvSc FRGS SiLC NQMS SQP DoWCoP QP RoGEP UK Registered Ground Engineering Adviser
1.2	12 th June 2023	Issue	LB	SRLB

FOREWORD

This document has been prepared for a specific client and to meet a specific brief. The advice provided in this document is based solely upon the agreed scope of work. LBHGEO cannot accept any liability for anything that would require the performance of services beyond the agreed scope of work.

No liability can be accepted for any inaccuracies or omissions in information provided by third parties. Should any part of this document be relied on by a third party, that party does so wholly at its own risk and LBHGEO disclaims any liability to such parties.

CONTENTS

1. INTRODUCTION	1
2. PLANNING POLICY	2
3. DESK STUDY	3
4. SITE INVESTIGATION.....	5
5. BIA SCOPE	6
6. STABILITY.....	7
7. FLOODING AND DRAINAGE	11
8. CONCLUSIONS	14

1. INTRODUCTION

It is proposed to construct a deep basement extending rearwards from the existing house to house a private underground gym and swimming pool.

LBHGEO have been commissioned to provide an independent assessment of the Basement Impact Assessment (BIA) information submitted against the requirements of

- Haringey Development Management DPD July 2017 - Policy DM18 Residential Basement Development and Light Wells.

This report commences with a description of the relevant planning requirements, and then considers the submission and details concerns in regards to the technical sufficiency of the BIA submission, the proposed construction methodology, the structural stability of the host building and the neighbouring properties, worsening flood risk and adversely affecting the water environment in the local area.

INDEPENDENT REVIEW OF BASEMENT IMPACT ASSESSMENT

The information studied includes the following:

1. Basement Impact Assessment by Symmetrys , Ref: 21066-SYM-XX-XX-RP-S-0001-Rev D dated 2nd May 2023
2. Flood Risk Assessment and SUDS Report by Symmetrys , Ref: 21066-SYM-XX-XX-RP-C-0001-Rev A dated 3rd May 2023
3. Design and Access Statement by Crawford Partnership, dated March 2023

2. PLANNING POLICY

The Haringey Local Plan Policy DM18 reads as follows:

A *Householder extensions to existing basements, and the construction of new basements, including in existing dwellings will only be permitted where it can be demonstrated that the proposal:*

- a** *Will not adversely affect the structural stability of the application building, neighbouring buildings and other infrastructure, including the adjoining highway, having regard to local geological conditions;*
- b** *Does not increase flood risk to the property and nearby properties from any source (see Policy DM24);*
- c** *Avoids harm to the appearance or setting of the property or the established character of the surrounding area;*
- d** *Will not adversely impact the amenity of adjoining properties by reason of noise or increased levels of internal or external activity;*
- e** *Will not adversely impact the local natural and historic environment;*

And, where the proposed basement extends beneath the garden area:

- f** *Will not cause loss, damage or long-term threat to trees of townscape or amenity value;*
- g** *Maintains adequate soil depth satisfactory for preservation of landscaping consistent with neighbouring properties;*

And during the construction phase:

- h** *Will not cause harm to pedestrian, cycle, vehicular and road safety, adversely affect bus or other transport operations, significantly increase traffic congestion, nor place unreasonable*

INDEPENDENT REVIEW OF BASEMENT IMPACT ASSESSMENT

inconvenience on the day to day life of those living, working or visiting nearby; and

i Will minimise construction impacts such as noise, vibration and dust for the duration of the works.

B *Proposals for basements must not include habitable rooms or other sensitive uses in areas prone to flooding where there is no reasonable means of escape.*

C *In determining applications for light wells, the Council will consider whether:*

a The architectural character of the building is protected;

b The character and appearance of the surrounding area is harmed; and

c The development results in the loss of more than 50% of the front garden or amenity area.

The accompanying guidance states that it is important that basement development is carried out in a way that does not:

- harm the amenity of neighbours
- compromise the structural stability of adjoining properties
- increase flood risk or
- damage the character of the area or natural environments.

The applicants need to submit specific information to demonstrate that the above issues can and have been addressed. This information should be contained in a Basement Impact Assessment (BIA) to be submitted as part of the planning application. The requirements and stages of the BIA will be set out in full detail in the Council's guidance note on Basement Impact Assessments.

The various stages of a BIA should be carried out by qualified and recognised independent assessors and will be paid for by the applicant.

3. DESK STUDY

Desk Study screening is used to identify which matters of potential concern should be addressed using a BIA:

- Hydrogeology: subterranean (groundwater) flow
- Ground stability
- Hydrology: surface flow and flooding

INDEPENDENT REVIEW OF BASEMENT IMPACT ASSESSMENT

The desk study has in this case identified potential hydrological and hydrogeological risks to the extent that a site-specific flood risk assessment was deemed to have been required. The Environment Agency considers the site to be at medium risk of up to 300mm depth of flooding. Past comments to the council from the neighbouring Cricket Club would appear to confirm the presence of a serious overland surface water flood route, indicated below, through this and the neighbouring properties and there are past attestations from long term nearby residents of Cranley Gardens to worsening flooding and garden drainage issues in the location.



However, the BIA includes the following non-sequitur statement: “*Haringey Council Strategic Flood Risk Assessment (Figure 6) shows that the site is in the vicinity of a watercourse, the Moselle Brook now culverted. Therefore, it is unlikely that the proposed development will have a detrimental impact on the local hydrology.*”

The site lies within a critical drainage area and the above BIA statement suggests a worrying lack of understanding by the applicant of hydrological matters. Even a cursory study of the surface water flood risk plan above shows that the flood risk along Cranley Gardens is ameliorated by means of the flow down through the gardens of this and the adjacent properties. Stopping up this flow will drive the flood water eastwards further down Cranley Gardens towards the already high flood risk area around Park Road and will only exacerbate the flood risk in that area.

No information on the adjacent properties seems to have been presented despite their proximity to the proposed excavation. The submission does not include any topographical survey detail and there are no sections drawn to show the relationship between the proposed excavation and the high-level adjacent foundations to either the host property or the neighbouring properties

Where the desk study identifies potential issues, these matters should be carried forward for specific assessment. In this case it seems that the BIA has failed to properly recognise both the potential hydrological impacts and the potential stability impacts and that can be identified from the desk study. As a result, the BIA has not properly investigated these issues.

INDEPENDENT REVIEW OF BASEMENT IMPACT ASSESSMENT

4. SITE INVESTIGATION

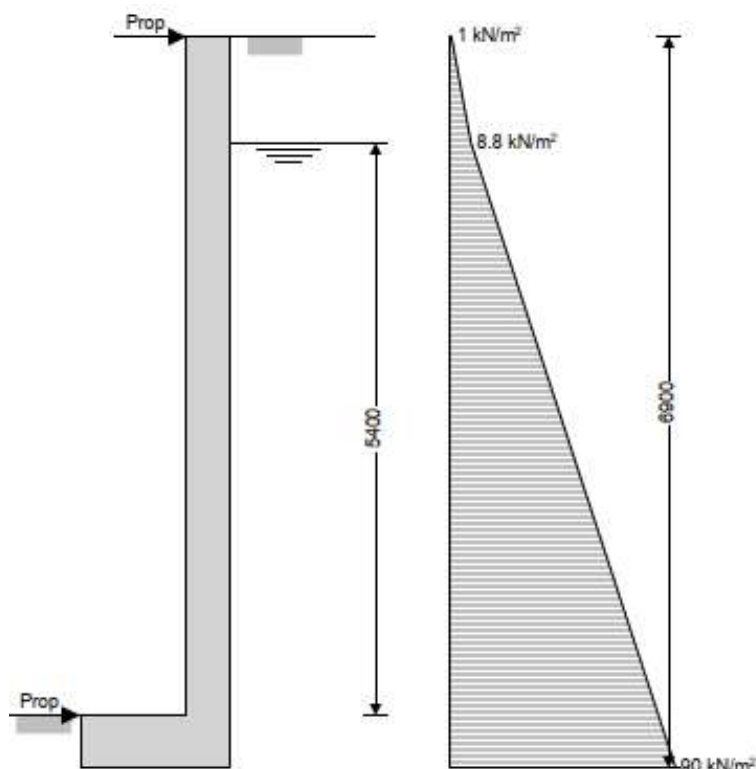
Site investigation is undertaken to establish the baseline ground conditions and the existing foundation details.

The site investigation submitted comprised a single borehole extended to 12m depth. Information regarding the configuration of the existing foundations to the host and to the neighbouring properties is a key input to any assessment of their stability and of the ground movements that will be associated with the proposed deep basement excavation. However, the required hand-dug structural trial pits to expose the foundations do not appear to have ever been dug. It may not be an unrelated fact that no analysis or modelling of the ground has been undertaken to assess the extent of the movements to these foundations that will be caused by the excavation.

The borehole recorded silty and sandy clay containing partings of sand. Only one measurement of groundwater has been taken, on 13th May 2021 when water was recorded at 0.85m depth and the following warning was given *"It should be noted that the comments on groundwater conditions are based on observations made at the time of the investigation (April and May 2021) and that changes in the groundwater level could occur due to seasonal effects and also changes in drainage conditions."*

The BIA has not undertaken groundwater monitoring and has discarded this evidence of water noted in the borehole at 0.85m depth.

It is relevant to note that the water monitoring standpipe installed by SAS to a maximum depth of 5m will be of limited usefulness in assessing the risk of groundwater ingress to an excavation that is planned to extend to almost 7m depth. (see BIA applicants submitted retaining wall section below)



INDEPENDENT REVIEW OF BASEMENT IMPACT ASSESSMENT

5. BIA SCOPE

The BIA appears to rely heavily upon comments made by the site investigation contractor on the basis of a single borehole constructed in May 2021. It should be noted that the engineering observations and recommendations provided in the submitted SAS report were not made by someone who is professionally chartered and to be fair it is also noted that they were not appointed to prepare a basement impact assessment.

Although the SAS brief included “Interpretative reporting on foundation options for the proposed building and infrastructure” the SAS report does not even mention, let alone discuss or assess, the potential hydrological and geotechnical impacts of the proposed basement. The SAS report does not provide any basement impact assessment or basement construction advice. The advice provided in the SAS report refers generically to foundations and retaining walls but does not take account of the BIA requirements or indeed even register the need to take any account of presence of the existing building or neighbouring structures.

The SAS report, prepared in 2021, stated *“It is recommended that the water levels in the monitoring borehole be periodically measured immediately prior to and during, the development. Should groundwater levels rise to within the excavation volume, or should significant groundwater inflow be observed during excavation, professional advice should be sought.”* Alas there does not seem to have been any recognition by the design team of the need to follow even this advice. Two years have passed without any water level monitoring.

The report provided some standard design parameters for retaining walls that would arguably be suitable for a standard situation not affected by any existing structures and where it is safe to allow sufficient wall yielding for an “active” pressure distribution to develop behind the retaining wall. Of course, where the wall is required to prevent movement of any nearby high-level foundations then the amount of soil movement associated with this design approach cannot be tolerated. The retaining wall calculations subsequently provided by the structural engineer do not appear to have recognised this.

To be fair the SAS report does state *“The designer should use these parameters to derive the active and passive earth pressure coefficients k_a and k_p . The determination of appropriate earth pressure coefficients, together with factors such as the pattern of the earth pressure distribution, will depend upon the type/geometry of the wall and overall design factors.”*

It is not essential for the site investigation contractor to provide the specialist hydrogeological or geotechnical input required for these assessments as long as the engineering consultant is qualified and competent to fulfil this role.

In this case the structural engineer has compiled the basement impact assessment without any additional geotechnical input and has referred to SAS as being *“specialist geotechnical engineers”* who they understood to have been appointed to provide *“specialist assessment of the ground conditions.”*

The architect has recently (March 2023) prepared a design and access statement that states

“On request we will be able to provide a full method statement for the structural design and the impact of building works on the neighbouring properties. The structural stability of the neighbouring properties will be maintained at all times.”

INDEPENDENT REVIEW OF BASEMENT IMPACT ASSESSMENT

This statement simply cannot be made without the proper support of a geotechnical consultant following sufficient ground movement analysis and associated quantified damage assessment. (e.g. Burland method).

6. STABILITY

The submitted Stage 2 drawings (REV P1) include the following two conflicting basement construction sequences (both dated 26.04.2023).

Proposed method statement/suggested sequence of works

- 1 - *Temporary prop boundary wall of existing outbuilding.*
- 2 - *Demolish existing outbuilding except propped boundary wall.*
- 3 - *Install CFA piles.*
- 4 - *Underpin existing building walls where located above the proposed basement footprint, and install retaining walls in underpinning sequence down to proposed mezzanine / existing outbuilding basement level (*).*
- 5 - *Extend underpinning below gable wall and party wall to prevent the occurrence of differential settlements.*
- 6 - *Install temporary struts and walers to allow soil level to be reduced (*).*
- 7 - *Excavate proposed basement area down to proposed mezzanine / existing outbuilding basement level.*
- 8 - *Cut piles to proposed mezzanine / existing outbuilding basement slab cut-off level.*
- 9 - *Demolish existing outbuilding walls at basement level.*
- 10 - *Cast RC beams at ground floor level.*
- 11 - *Cast RC slab at ground floor level.*
- 12 - *Cast second stage underpinning to reach pool side formation level.*
- 13 - *Cast RC slab above heave protection at basement mezzanine and pool side level.*
- 14 - *Dismantle temporary works at basement mezzanine and pool side level.*
- 15 - *Cast second stage underpinning to reach swimming pool formation level.*
- 16 - *Install temporary struts and walers to allow soil level to be reduced (*).*
- 17 - *Cut piles to proposed swimming pool slab cut-off level.*
- 18 - *Cast RC slab above heave protection at basement swimming pool level.*
- 19 - *Dismantle temporary works and proceed with installation of superstructure, which steps are not*

INDEPENDENT REVIEW OF BASEMENT IMPACT ASSESSMENT

covered in this section.

() Sequence of works to be read in conjunction with typical multi-stage underpinning sequence highlighted in drawing 21066-SYM-XX-XX-SK-S-0201/0202/0203-REV P1*

Proposed method statement/ suggested sequence of works

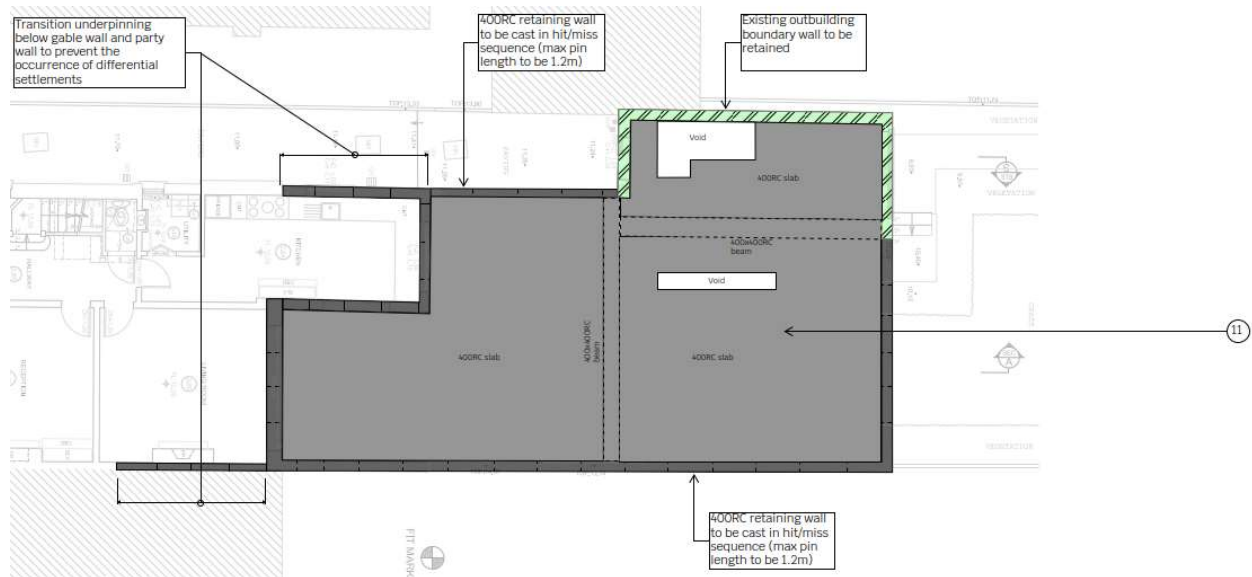
- 1 - Locally underpin walls at positions marked to be used to support temporary works*
- 2 - Install trench sheets*
- 3 - Excavate to existing foundation soffit*
- 4 - Prop from existing wall to trench sheet*
- 5 - Excavate to half depth*
- 6 - Install cement board to back of excavation*
- 7 - Install mid height prop*
- 8 - Excavate to underside of first-stage basement slab level*
- 9 - Install toe of rc underpin with mass concrete. Cordec to rear to match existing foundation arrangement*
- 10 - Leave 150mm kicker with starter bars for upstand (min.lap 40 dia.)*
- 11 - Prop underside of existing foundation back onto new rc toe*
- 12 - Install water bar at construction joint*
- 13 - Install underpin*
- 14 - Dry pack to underside of existing foundation*
- 15 - Insert horizontal prop from wall to wall at ground level*
- 16 - Excavate centre berm, introducing additional horizontal prop from wall to wall at mid height*
- 17 - Proceed with sequence 1 to 16 for second stage underpinning*
- 18 - **Cast basement slab***

Given that there are piles shown on the drawings it is presumed that the second version is in error and the following discussion therefore relates to the first version. It is noted that this versions states that it should be read in conjunction with drawings 21066-SYM-XX-XX-SK-S-0201/0202/0203-REV P1. Given that this version is shown on drawings 21066-SYM-XX-XX-DR-S-0201/0202/0203-REV P1 this cross reference is presumed to also be in error.

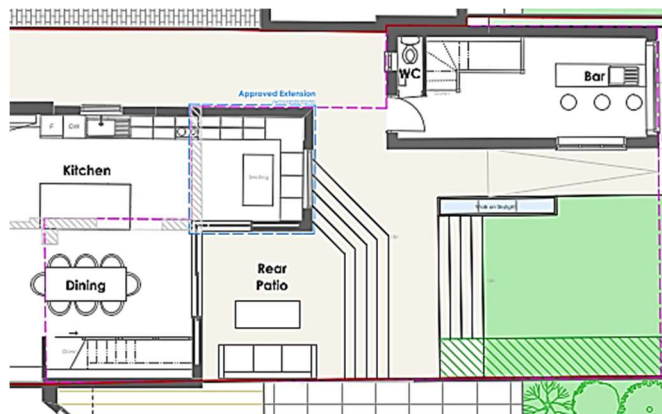
However, if this first version is to be taken as any indication or assurance of the proposed basement construction methodology then it must be rejected. It is not a basement construction method statement. It is no more than a list.

INDEPENDENT REVIEW OF BASEMENT IMPACT ASSESSMENT

Despite being difficult to interpret in the absence of complete site sections and relevant drawings, it becomes apparent that the presented methodology and sequence is flawed. For example, only after excavation has proceeded down to basement level (Stage 7) is it proposed to cast the 400mm thick reinforced concrete slab at ground floor level (Stage 11) shown below.

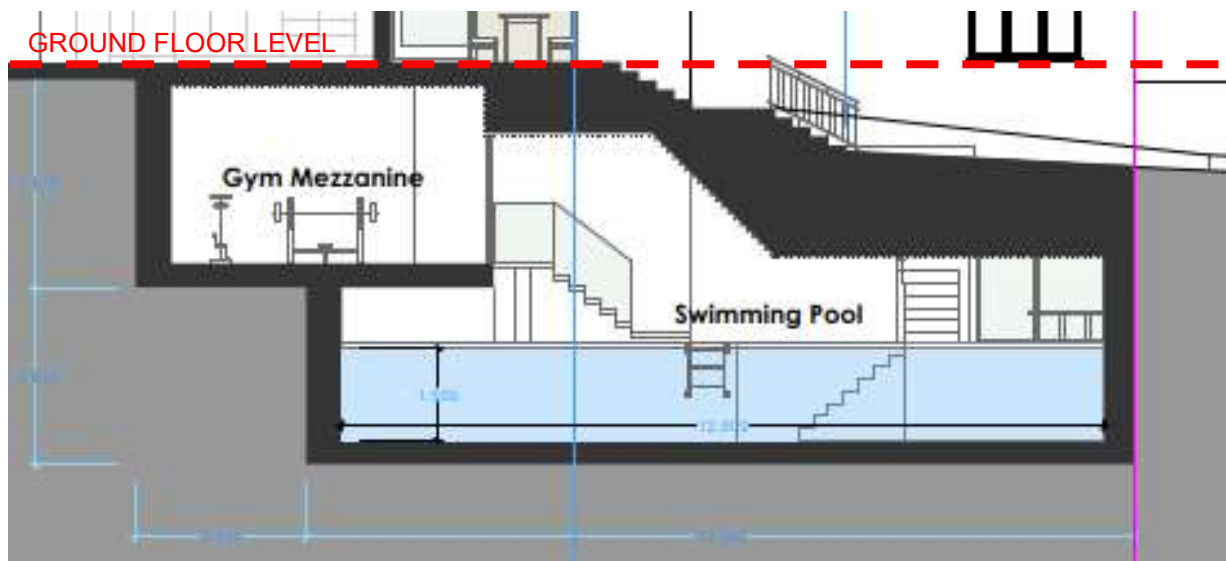


However this 400mm thick slab will obviously block the proposed stairs shown on the ground floor plan shown below.



More importantly, it can be seen from the section on the next page that there can be no such slab at ground floor level as the roof of the basement will step down progressively.

INDEPENDENT REVIEW OF BASEMENT IMPACT ASSESSMENT



In the absence of relevant temporary works sections there is absolutely no indication of how the western site boundary and the rear patio of No. 137 is supposed to be supported.

The drawings sequence indicates two stage underpinning beneath the party wall and adjacent excavation of the basement. This does not correlate with the plans, which suggest that the basement will not extend beneath the existing house.

The submission does not include any topographical survey detail and there are no sections drawn to show the relationship between the proposed excavation and the high-level adjacent foundations to either the host property or the neighbouring properties. It may not be an unrelated fact that the stability impacts upon any of these foundations do not appear to have been analysed or properly assessed.

Transitional underpinning of the existing flank wall and of the party wall to No. 137 is shown on the proposals, but this mitigation detail appears to be an arbitrary design and to not have any analytical basis or supporting calculation.

It is a testament to the applicant's apparent lack of understanding of the need for temporary works design that the BIA states *"The structure will have adequate stiffness to ensure that the lateral deflections do not exceed the appropriate limits recommended by British Standards Codes of Practice in order to ensure that potential ground movements be kept to acceptable limits."*

The above statement entirely misses the point that it is the actual construction period that risks movement or collapse of the nearby structures. The stiffness of the final reinforced concrete building structure will have positively no bearing upon the amount of damage occurring during its construction.

It is of no comfort to the neighbours or to the council for the applicant to state that the appointed contractor will be required to submit proposals for whatever temporary works are required to safely install the new building without causing any loss of stability to the nearby structures.

At this stage and in order to pass the planning test of demonstrating that the construction proposal will not adversely affect the stability of the application building and neighbouring buildings, a viable scheme of

INDEPENDENT REVIEW OF BASEMENT IMPACT ASSESSMENT

temporary works must be proposed, designed and analysed in sufficient detail to show that it will prevent any unacceptable movements and damage. The BIA has not presented any Burland scale damage analysis.

In conclusion the BIA has not sufficiently assessed the potential for ground movements associated with the development and has applied some wholly inappropriate analysis. The BIA does not appear to have even considered the possibility of any basement heave.

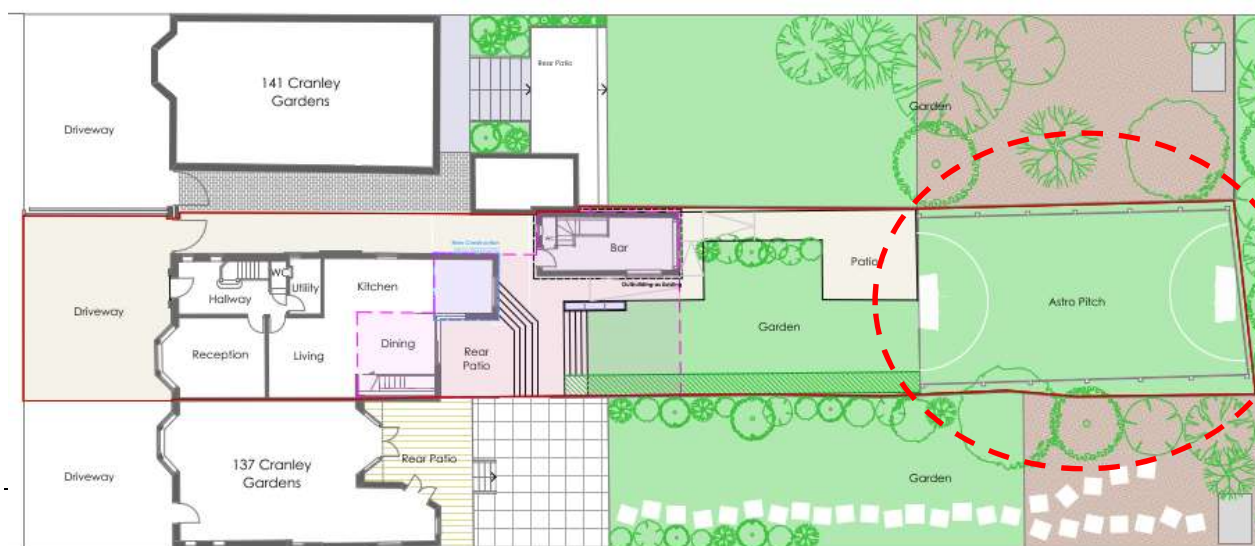
7. FLOODING AND DRAINAGE

The BIA has not undertaken any assessment of the impacts on the local environment and neighbouring properties associated with potentially obstructing water flow.

The Haringey Local Plan states that back gardens are an important ecological resource and play a significant role in drainage and flood mitigation. The Council therefore considers back garden development to be inappropriate.

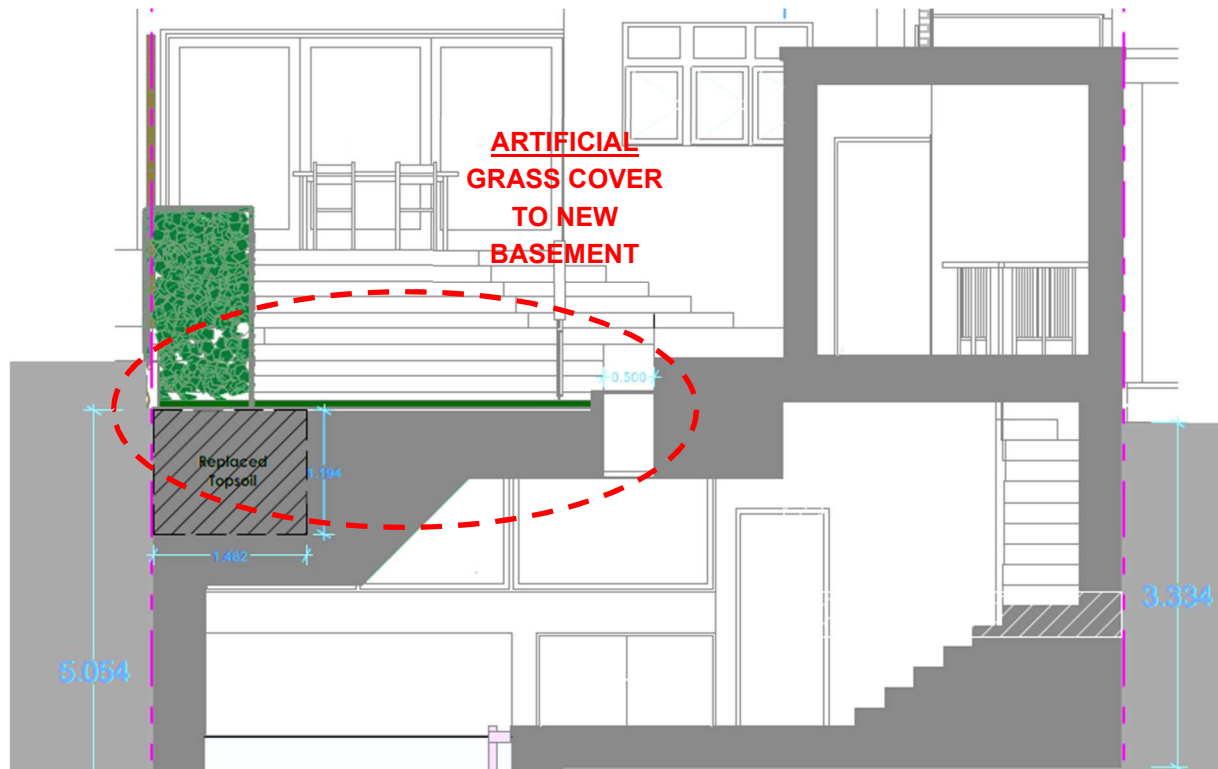
There are no trees in the garden and the rearmost part of the garden of this property has already been converted to a 0.2 Hectare games court with an artificial surface leaving no space for any natural soil or planting. The proposed development will lead to a further loss of infiltration potential so that what would have been some 250m² of rear garden when the house was originally built will have been reduced to some 60m² of natural permeable soil following this development. The development is hence contributing to increased run-off rather than reducing run-off.

The architects design and access statement states that *"the existing garden will be fully planted and landscaped in order to provide an enhanced garden aspect to be enjoyed by the owners of No.139 Cranley Gardens alongside their neighbours."* However, the proposed plans clearly show the existing Astro turf pitch being retained and there being only a strip of topsoil positioned to support a hedge along the boundary with No. 137.



Proposed plan

INDEPENDENT REVIEW OF BASEMENT IMPACT ASSESSMENT

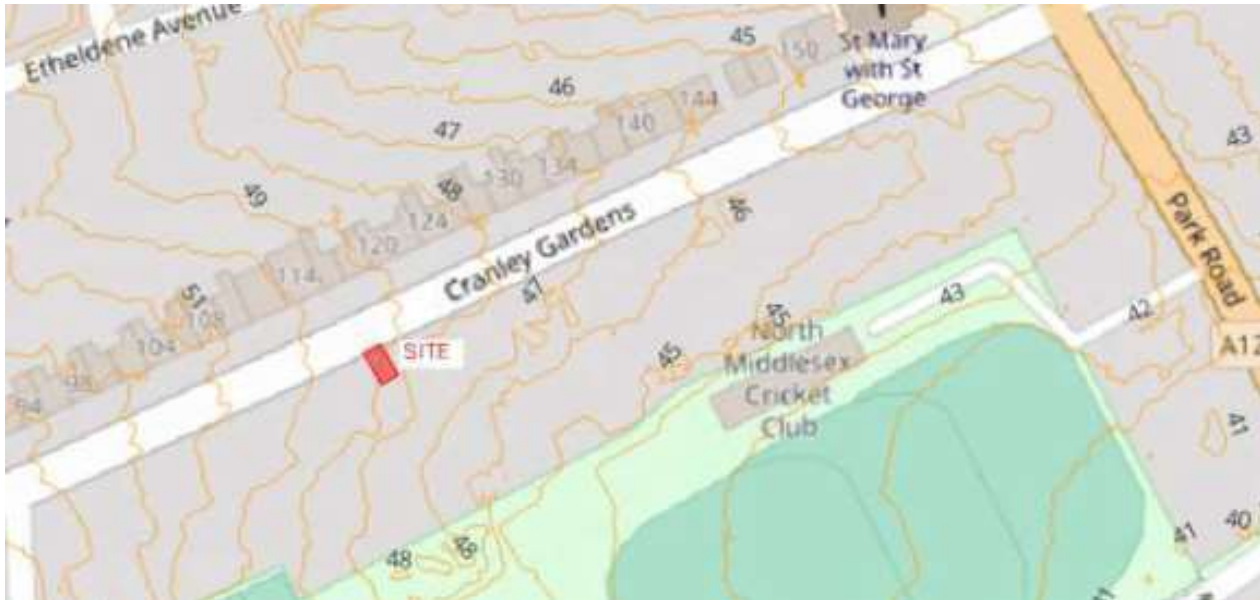


If the above drawing is incorrect and the basement is to be set 1m deeper in order to allow space for a restored garden above then this will require a rethink and re-design of the proposed stair layouts and of the proposed construction methodology.

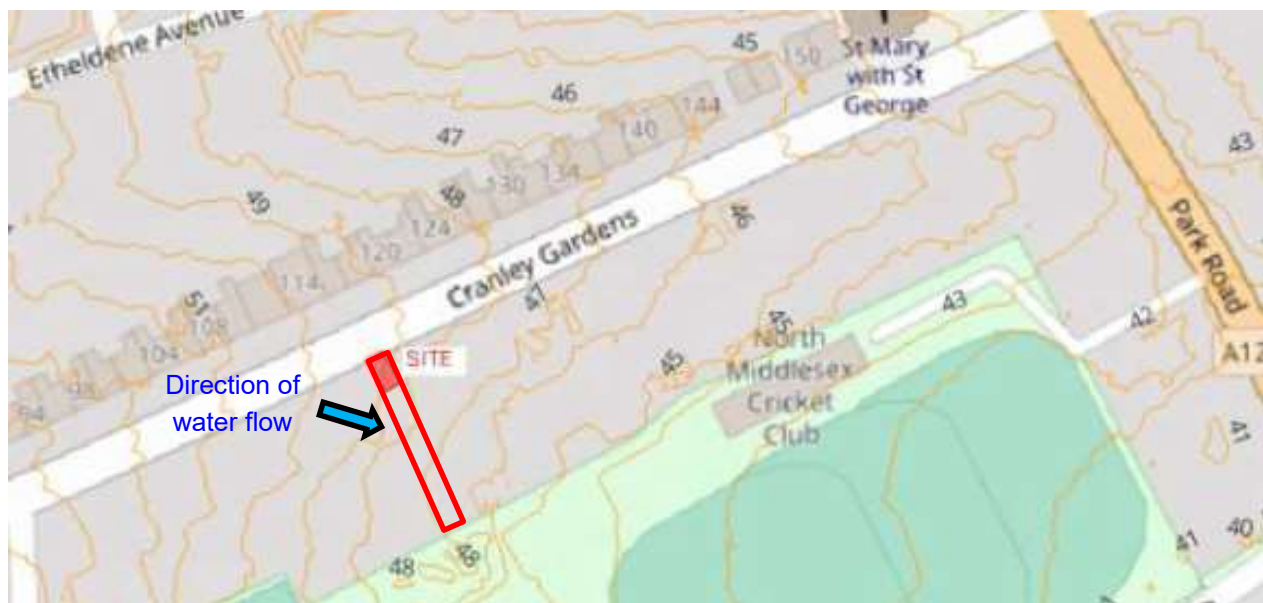
The section above clearly shows that the full width of the property is to be excavated and replaced by the new basement. This will in effect cause the development to act as an impermeable dam to any water travelling from Cranley Road to the Cricket Ground, forcing it instead to travel down the road to the junction with Park Road, where it is understood street flooding occurred in 2021.

INDEPENDENT REVIEW OF BASEMENT IMPACT ASSESSMENT

The SuDS report suggests the site to be a negligibly small area in the context of the problem area of overland flooding slope whereas the site is larger and may play a more important role in terms of hydrological impact.



The site as presented in the submitted Lidar assessment (above) and as it actually is (below)



It is apparent the basement will interrupt or interfere with the downslope flow of surface or near surface flow of water passing under the adjacent properties. This would inevitably affect the availability of water to the trees in the neighbouring garden to the east (No. 141) and would be expected to increase the risk of waterlogging to the rear garden of the property immediately to the west (No. 137).

INDEPENDENT REVIEW OF BASEMENT IMPACT ASSESSMENT

It is also noted that the design and access statement (21.2) refers to the incorporation of an existing pond in the rear garden into the SuDS proposals. The location of this feature has not been indicated.

8. CONCLUSIONS

As a result of the limited and conflicting details that have been provided it is not entirely clear what is being proposed and how this new structure is being proposed to be constructed.

The application submission presents information variously conflicting in and between the design and access statement, the design drawings, the structural engineers BIA report and the structural engineers calculations.

The design and access statement rather sets the scene by incorrectly referring to the superceded Haringey 2010 DM8 policy on Basements and Lightwells rather than to current policy requirements.

In short, the BIA fails on at least five Haringey (current) Policy DM18 issues. The BIA does not demonstrate that the development:

a *Will not adversely affect the structural stability of the application building, neighbouring buildings and other infrastructure, including the adjoining highway, having regard to local geological conditions;*

No ground movement analysis appears to have been undertaken to assess the effect of underpinning, basement heave, or retaining wall yielding upon excavation. No damage assessment has been provided.

b *Does not increase flood risk to the property and nearby properties from any source (see Policy DM24);*

The FRA and SuDS assessments do not properly identify and inadequately address the flooding and drainage impacts associated with the proposal.

e *Will not adversely impact the local natural and historic environment;*

There will clearly be an impact upon the near surface water regime but the arboricultural impacts in terms of soil moisture availability have not even been assessed. An appropriate arboricultural assessment should be provided.

f *Will not cause loss, damage or long-term threat to trees of townscape or amenity value;*

The potential hydrological impacts of the development upon the neighbouring cricket club do not appear to have even been analysed. How will the existing pattern of drainage and waterlogging be affected by the development?

g *Maintains adequate soil depth satisfactory for preservation of landscaping consistent with neighbouring properties;*

This requirement appears to have been entirely ignored.

INDEPENDENT REVIEW OF BASEMENT IMPACT ASSESSMENT

The issues detailed above regarding movement of the building and neighbouring properties and regarding worsening the flood risk are considered sufficient by themselves to require outright refusal of the application for being in contravention of planning policy.

.