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8a Belmont Street
London, NW1 8HH

Basement Impact Assessment Audit

For

London Borough of Camden

Project Number: 12336-42
Revision: F1

August 2016

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Appendix

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 (BIA) submitted as part of the Planning Submission documentation for 8a Belmont Street, London NW1 8HH (planning reference 2016/0896/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 proposed development is the demolition of the existing structure and its redevelopment to provide two residential structures of two storeys plus a single level basement. In the original BIA submission the nature of the proposed development was unclear; this has been clarified in the revised submission.

1.5. The original BIA submission comprised four documents that inconsistently referenced each other. The revised BIA submissions comprise a main BIA document prepared by Croft Structural Engineers with supporting documentation.

1.6. The qualifications of the authors were not demonstrated in the original BIA submission. However, the qualifications of the authors of the revised BIA do meet LBC's requirements.

1.7. The revised BIA submissions now includes screening and scoping assessments for Surface Flow and Flooding and a desk study broadly in accordance with the GSD Appendix G1, which were both absent from the original BIA submission.

1.8. The original BIA documents were inconsistent with respect to basement depth and current site level. In the revised BIA, site and foundation levels are now consistently presented.

1.9. The ground investigation is extremely limited. The geotechnical interpretation presented originally was inconsistent between the Ground Investigation Report and the Land Stability Report, and consequently the assumptions used in the Ground Movement Assessment (GMA) were inconsistent. A revised and consistent geotechnical interpretation has now been presented.

1.10. An outline structural methodology statement for planning purposes is presented, including construction sequence, temporary works requirements and recommendations for contractors.

The BIA states that the advice of a dewatering contractor should be sought prior to excavation to plan for mitigation measures in case groundwater is encountered.

1.11. The proposed basement excavation may encounter groundwater seepages. Groundwater monitoring has only been carried out on one occasion and the level should be confirmed by either longer term monitoring and/or by the contractor in advance of excavation.

1.12. The original BIA presented a GMA indicating predicted damage impact in line with the Burland Scale of Very Slight (Category 1) to Slight (Category 2) to 2no surrounding structures, 2 and 10a Belmont Street. In the revised BIA submissions the ground movement assessment has been provided for review, which includes ground movement contour plans indicating a zone of influence. The GMA has been updated indicating Very Slight (Category 1) to Slight (Category 2) damage impact to 4, 6 and 8 Belmont St. The ground movement contour plans indicate that a number of other properties on Chalk Farm Road will be affected by ground movements. These have not been assessed for damage impact, however it is accepted that since these properties are subject to smaller predicted ground movements than the properties on Belmont St then the damage impact should be lower.

1.13. In line with CPG4, where Category 1 or a higher damage category is assessed, the BIA should provide mitigation measures to address ground movement, and the ground movement assessment should be re-evaluated and new net consequences determined. Mitigation measures are discussed in the revised BIA submission and should be referenced in the GMA. It is accepted that detailed propping arrangements will be presented by the Contractor to the Structural Engineer prior to construction and that ground movements, and consequential damage, should be kept to minimum. It is stated that sufficient monitoring will be undertaken and contingency actions agreed if movement trigger levels are breached to ensure ground stability.

1.14. The BIA has not identified any impact relating to slope stability, subterranean flow or surface water and flooding.

1.15. Queries and matters that required further information or clarification are summarised in Appendix 2. With the information provided in the revised BIA and in the Supplementary Supporting Documents (Appendix 3) it is accepted that the criteria contained in CPG4 and DP27 have been met.

2.0 INTRODUCTION

2.1. CampbellReith was instructed by London Borough of Camden (LBC) on 30th March 2016 to carry out a Category B Audit on the Basement Impact Assessment (BIA) submitted as part of the Planning Submission documentation for 8a Belmont Street, London NW1 8HH, Camden Reference 2016/0896/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 "*Partial demolition of the existing building … and its redevelopment with a 3-storey building including a basement excavation to provide 2 x 2-bed self-contained units on the lower ground floor, ground and first floor levels*".

2.6. CampbellReith accessed LBC's Planning Portal on 20 April 2016 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment: Land Stability, February 2016 by Ground and Project Consultants Ltd.
- Basement Impact Assessment: Groundwater, Draft 14 March 2016 (ref 30110R1D1) by H Fraser Consulting Ltd.
- Ground Investigation Report, March 2016 by Ground and Water Limited.
- Structural Scheme for Planning, 3 March 2016 by Croft Structural Engineers.
- Design and Access Statement, February 2016 by Martin Evans Architects.
- Demolition Plans, Existing and Proposed Plans, Elevations and Sections, 18 June 2015 by Martin Evans Architects.

2.7. CampbellReith accessed LBC's Planning Portal to access the revised BIA submission documents on 23 June 2016 and gained access to the following relevant documents for audit purposes:

- Basement Impact Assessment, Reference 160215, First Issue, 26 May 2016, by Croft Structural Engineers.
- Desk Study Report, Reference GWPR1534/GIR/May 2016, Final V1.01, May 2016 by Ground and Water Limited.
- Basement Impact Assessment: Land Stability Report, Reference 20094, Revision 1, February 2016 by Ground and Project Consultants Ltd.
- Basement Impact Assessment: Groundwater, Final, 25 May 2016 (ref 30110R1) by H Fraser Consulting Ltd.
- Ground Investigation Report, Reference GWPR1534/GIR/May 2016, Final V2.01, May 2016 by Ground and Water Limited.

2.8. CampbellReith was issued with the following revised BIA submission documents on 20 and 27 July 2016 for audit purposes:

- Basement Impact Assessment, Reference 160215, Revision 1, 18 July 2016, by Croft Structural Engineers.
- Basement Impact Assessment: Land Stability Report, including Ground Movement Calculations and Ground Movement Contour Plots, Reference 20094, Revision 2, February 2016 by Ground and Project Consultants Ltd.

2.9. CampbellReith was issued with the following revised BIA submission documents on 10 August 2016 for audit purposes:

- Ground Investigation Report, Reference GWPR1534/GIR/Aug 2016, Final V4.01, August 2016 by Ground and Water Limited.

- Basement Impact Assessment: Land Stability Report, including Ground Movement Calculations and Ground Movement Contour Plots, Reference 20094, Revision 5, February 2016 by Ground and Project Consultants Ltd.

- Email from Francis Williams (Ground and Water) to Liz Brown (CampbellReith) of 10 August 2016 including Consistency Checklist – GWPR 1534 -8a Belmont St.

3.0 BASEMENT IMPACT ASSESSMENT AUDIT CHECK LIST

Item	Yes/No/NA	Comment
Are BIA Author(s) credentials satisfactory?	Yes	In the revised submission the author's qualifications are in accordance with CPG4 guidelines.
Is data required by Cl.233 of the GSD presented?	Yes	In the revised submissions a desk study broadly in line with the requirements of GSD Appendix G1 has been provided.
Does the description of the proposed development include all aspects of temporary and permanent works which might impact upon geology, hydrogeology and hydrology?	Yes	In the revised submission, hydrological aspects have now been considered in line with CPG4.
Are suitable plan/maps included?	Yes	Provided in the revised submission.
Do the plans/maps show the whole of the relevant area of study and do they show it in sufficient detail?	Yes	Provided in the revised submission.
Land Stability Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Inconsistencies in the original BIA documents. Updated in the revised submission.
Hydrogeology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Provided in revised submission. Previous submission contained contradictory information on the distance to a tributary of the River Fleet.
Hydrology Screening: Have appropriate data sources been consulted? Is justification provided for 'No' answers?	Yes	Provided in the revised submission.
Is a conceptual model presented?	Yes	Conceptual models in the original BIA documents were inconsistent. Updated in the revised submission.

Item	Yes/No/NA	Comment
Land Stability Scoping Provided? Is scoping consistent with screening outcome?	Yes	
Hydrogeology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Provided in revised submission. Previous submission contained contradictory information on the distance to a tributary of the River Fleet.
Hydrology Scoping Provided? Is scoping consistent with screening outcome?	Yes	Provided in the revised submission.
Is factual ground investigation data provided?	Yes	Ground and Water Ltd report. The site investigation data is extremely limited and does not comply with minimum Eurocode or LBC guidance (GSD Section 7.2.2).
Is monitoring data presented?	Yes	Only 1 round of groundwater monitoring is presented.
Is the ground investigation informed by a desk study?	Yes	Provided in the revised submission.
Has a site walkover been undertaken?	Yes	Provided in the revised submission.
Is the presence/absence of adjacent or nearby basements confirmed?	Yes	Single level basements are indicated to be present in adjacent properties.
Is a geotechnical interpretation presented?	Yes	The original BIA presented inconsistent interpretations between documents and a shear strength profile that was not credible. Updated in revised submission.
Does the geotechnical interpretation include information on retaining wall design?	Yes	Within the Structural Scheme for Planning. Detailed calculations for the internal liner walls are provided. Outline assumptions on the contiguous pile wall provided in the revised submission.
Are reports on other investigations required by screening and scoping presented?	Yes	A desk study and ground movement calculations and ground movement contour plots have been provided. Updated in the revised submission.

Item	Yes/No/NA	Comment
Are baseline conditions described, based on the GSD?	Yes	Provided in the revised submission.
Do the base line conditions consider adjacent or nearby basements?	Yes	Single level basements indicated in adjacent properties.
Is an Impact Assessment provided?	Yes	Provided in the revised submission. However, not all properties predicted to be affected by ground movements have undergone an impact assessment.
Are estimates of ground movement and structural impact presented?	Yes	In the revised submission calculations have been provided. Geotechnical interpretation has been updated in the revised submissions.
Is the Impact Assessment appropriate to the matters identified by screen and scoping?	Yes	Updated in the revised submission.
Has the need for mitigation been considered and are appropriate mitigation methods incorporated in the scheme?	Yes	Updated in the revised submission.
Has the need for monitoring during construction been considered?	Yes	Movement monitoring is discussed in the Land Stability report and Structural Scheme for Planning. Additional detail provided in the revised submission.
Have the residual (after mitigation) impacts been clearly identified?	Yes	Updated in the revised submission.
Has the scheme demonstrated that the structural stability of the building and neighbouring properties and infrastructure will be maintained?	Yes	Updated in the revised submission. It is accepted that the properties on Chalk Farm Road are likely to be subject to smaller ground movements and that damage impacts should be lower than for the properties assessed on Belmont Street.
Has the scheme avoided adversely affecting drainage and run-off or causing other damage to the water environment?	Yes	Provided in the revised submission.

Item	Yes/No/NA	Comment
Has the scheme avoided cumulative impacts upon structural stability or the water environment in the local area?	Yes	Updated in the revised submission. It is accepted that the properties on Chalk Farm Road are likely to be subject to smaller ground movements and that damage impacts should be lower than for the properties assessed on Belmont Street.
Does report state that damage to surrounding buildings will be no worse than Burland Category 2?	Yes	Ground movement assessment calculations have been provided in the revised submission. It is accepted that the properties on Chalk Farm Road are likely to be subject to smaller ground movements and that damage impacts should be lower than for the properties assessed on Belmont Street.
Are non-technical summaries provided?	Yes	Provided in the revised submission.

4.0 DISCUSSION

4.1. The original BIA submission was prepared by a number of sources and did not address all the requirements of CPG4 in a single, coherent document. The revised BIA submissions have addressed these issues, with a main BIA document authored by Croft Structural Engineers which summarises all the presented information in supporting documents provided by a number of sources: Ground and Project Consultants Ltd, Ground and Water Ltd and H Fraser Consulting Ltd. Additional Supporting Documentation is presented in Appendix 3 which clarifies statements presented within the BIA documents.

4.2. There were several omissions and inconsistencies in the original BIA submission that have been suitably addressed in the revised BIA submission: the screening and scoping process to address surface flow and flooding is provided; the BIA has been informed by a desk study broadly in accordance with GSD Appendix G1; and, the credentials of the authors in line with CPG4 have been established. The previous submission also referred to the presence of a local tributary to the River Fleet which has now been revised.

4.3. The extent of the ground investigation does not follow the guidance provided by LBC's Guidance for Subterranean Development (Section 7.2.2) or Eurocode 7 and further investigation will be required for detailed design. The ground investigation and subsequent geotechnical interpretation presents a range of undrained shear strength values for the London Clay that should be confirmed by the Contractor in advance of construction. It was noted that the London Clay undrained shear strength was inconsistently interpreted in the original BIA submissions, but this has now been addressed in the revised BIA submission and Supporting Documents.

4.4. The original BIA inconsistently reported existing site levels, the proposed foundation levels and geotechnical interpretation. This has now been addressed in the revised BIA submission and Supporting Documents.

4.5. The proposed basement excavation may encounter groundwater seepages in the Made Ground or within sandy partings of the London Clay Formation. The monitoring data suggests that perched groundwater is present approximately 2.1m below ground level. However, only one round of monitoring has been undertaken. Ideally longer term groundwater monitoring should be carried out to establish a baseline and / or proven in advance of construction by the contractor.

4.6. The proposed development is the demolition of the existing structure and its redevelopment to provide two residential structures of two storeys plus a single level basement. In the original BIA submission the nature of the proposed development was unclear, which has been clarified in the revised submission.

4.7. The BIA indicates basement retaining walls to be formed by contiguous bored piles with a ground bearing basement slab and strip foundations for internal supporting walls. An outline structural methodology statement for planning purposes is presented, including construction sequence, temporary works requirements and recommendations for contractors. Outline assumptions in regards to the proposed contiguous bore piles are provided for the GMA calculations in the revised submission, which will need to be confirmed by the Contractor. The BIA states that the advice of a dewatering contractor should be sought prior to excavation to plan for mitigation measures in case groundwater is encountered.

4.8. The revised BIA states there will be Very Slight (Category 1) to Slight (Category 2) impact to 2, 4, 6, 8 and 10a Belmont Street. The revised BIA submission includes a ground movement contour plan, indicating predicted vertical and horizontal movements caused by the excavation and construction of the proposed development. The contour plans indicate that movements will affect the properties at 72, 73 and 74 – 77 Chalk Farm Road. Although no impact assessment has been presented for these properties it is accepted that the ground movements will be smaller and therefore the likely damage impact lower than for properties assessed on Belmont St.

4.9. The ground movement assessment assumes that 'stiff' clay is present, which was inconsistent with the geotechnical interpretations presented in the original BIA documents, notably with differences between the Ground Investigation Report and the Land Stability Report. In the revised BIA documents submitted, and clarified further in the Additional Supporting Documents, the geotechnical interpretations are now consistently presented and it is stated that in the GMA that 'a 16m deep embedded retaining wall has been assumed and this will largely be installed in stiff clay'.

4.10. In line with CPG4, where Category 1 or a higher damage category is assessed, the BIA should provide mitigation measures to address ground movement, and the ground movement assessment should be re-evaluated and new net consequences determined. The revised BIA submission does include recommended mitigation measures for the reduction of ground movements, and these should be considered within the GMA. It is accepted that detailed propping arrangements will be presented by the Contractor to the Structural Engineer prior to construction and that ground movements, and consequential damage, should be kept to minimum. It is stated that sufficient monitoring will be undertaken and contingency actions agreed if movement trigger levels are breached to ensure ground stability.

4.11. The BIA has not identified any impacts relating to slope stability, subterranean flow or surface water and flooding.

5.0 CONCLUSIONS

5.1. The original BIA submission comprised four documents that inconsistently referenced each other. The revised BIA submissions comprise a main BIA document prepared by Croft Structural Engineers with supporting documentation

5.2. In the revised BIA submission, the qualifications of the authors have been demonstrated to meet LBC's requirements.

5.3. In the revised BIA submission, the screening and scoping requirements for Surface Flow and Flooding have been carried out.

5.4. In the revised BIA submission, a desk study broadly in accordance with the GSD Appendix G1 has been provided for the proposed development.

5.5. The original BIA documents were inconsistent with respect to basement depth and current site level. In the revised BIA, site and foundation levels are now consistently presented.

5.6. The ground investigation is extremely limited. The geotechnical interpretation presented originally was inconsistent between the BIA and GMA. A revised and consistent geotechnical interpretation has now been presented.

5.7. An outline structural methodology statement for planning purposes is presented, including construction sequence, temporary works requirements and recommendations for contractors. The BIA states that the advice of a dewatering contractor should be sought prior to excavation to plan for mitigation measures in case groundwater is encountered.

5.8. The proposed basement excavation may encounter groundwater seepages. Groundwater monitoring has only been carried out on one occasion and the level should be confirmed by either longer term monitoring and/or by the contractor in advance of excavation.

5.9. The original BIA presented a GMA indicating predicted damage impact in line with the Burland Scale of Very Slight (Category 1) to Slight (Category 2) to 2no surrounding structures, 2 and 10a Belmont Street. In the revised BIA submissions the ground movement assessment has been provided for review, which includes ground movement contour plans indicating a zone of influence. The GMA has been updated indicating Very Slight (Category 1) to Slight (Category 2) damage impact to 4, 6 and 8 Belmont St. The ground movement contour plans indicate that a number of other properties on Chalk Farm Road will be affected by ground movements. These have not been assessed for damage impact, however it is accepted that since these properties are subject to smaller predicted ground movements than the properties on Belmont St then the damage impact should be lower.

5.10. In line with CPG4, where Category 1 or a higher damage category is assessed, the BIA should provide mitigation measures to address ground movement, and the ground movement assessment should be re-evaluated and new net consequences determined. Mitigation measures are discussed in the revised BIA submission and should be referenced in the GMA. It is accepted that detailed propping arrangements will be presented by the Contractor to the Structural Engineer prior to construction and that ground movements, and consequential damage, should be kept to minimum. It is stated that sufficient monitoring will be undertaken and contingency actions agreed if movement trigger levels are breached to ensure ground stability.

5.11. The BIA has not identified any impacts relating to slope stability, subterranean flow or surface water and flooding.

5.12. Queries and matters that required further information or clarification are summarised in Appendix 2. With the information provided in the revised BIA and in the Supplementary Supporting Documents (Appendix 3) it is accepted that the criteria contained in CPG4 and DP27 have been met.

Appendix 1: Residents' Consultation Comments

None

Appendix 2: Audit Query Tracker

Audit Query Tracker

Query No	Subject	Query	Status/Response	Date closed out
1	BIA	The authors' credentials in line with CPG4 have not been substantiated.	Addressed in revised BIA	June 2016
2	BIA	The BIA should be presented as a single report with supporting documents appended or with a clear non-technical summary.	Updated in the revised BIA and Additional Supporting Documents	August 2016
3	BIA	A desk study in accordance with the GSD Appendix G1 has not been provided for the proposed development e.g. historical land use review, infrastructure / utility asset review etc.	Addressed in revised BIA	June 2016
4	BIA	Non-technical summaries should be provided in line with CPG4.	Addressed in revised BIA	June 2016
5	Surface Flow and Flooding	Screening and scoping assessments should be undertaken.	Addressed in revised BIA	June 2016
6	Hydrogeology	Only 1 round of groundwater monitoring has been undertaken.	Open - The baseline should be confirmed by longer term monitoring and / or by the contractor in advance of the works.	N/A
7	Hydrogeology / Land stability	Site level, foundation formation levels and groundwater levels should be presented consistently (elevations AOD would aid clarity). The presence or absence of local tributaries should be established and discussed if relevant.	Updated in the revised BIA and Additional Supporting Documents	August 2016
8	Hydrogeology / Land stability	The BIA should propose appropriate additional ground investigation prior to construction in line with LBC's GSD (Section 7.2.2) sufficient to confirm ground and groundwater conditions.	Updated in the revised BIA and Additional Supporting Documents	August 2016

9	Land Stability	Geotechnical interpretation to be updated.	Updated in the revised BIA and Additional Supporting Documents	August 2016
10	Land Stability	Ground movement calculations should be provided for review. Nearby basements should be identified. A zone of influence should be identified. The presence or absence of nearby Listed structures should be identified. The BIA should provide mitigation measures to address ground movement, and the ground movement assessment should be re-evaluated and new net consequences determined.	Updated in the revised BIA and Additional Supporting Documents	August 2016

Appendix 3: Supplementary Supporting Documents

1. Consistency Checklist – GWPR 1534 – 8a Belmont St
2. Email Francis Williams (Ground and Water) to Liz Brown (CampbellReith) 10 August 2016.

GWPR 1534 - 8A Belmont Street

Consistency Checklist				
	Croft Basement Impact Assessment (BIA)	Croft (BIA) Land Stability Report	BIA Groundwater Report (H Fraser)	Ground Investigation Report (Ground & Water)
Level	>30m AOD	~30m AOD	~30m AOD	
Form of Construction	RC Slab with Contiguous piled wall.	Contiguous bored pile wall		Contiguous piles wall
Excavation Depth (max)		3.5m	3.5m	3.50m
Basement Footprint		108m^2	Footprint of existing building.	
Settlement	1.5mm			<25mm
Trees	Not within range of damage	Noted in the vicinty		Noted nearby
Highest Groundwater Level	2.1m bgl	2.10m bgl	2.10m bgl	2.10m bgl
Highest London Clay Level		2.20m bgl	2.20m bgl	2.20m bgl
Bearing Capacity	125 kN/m^2			125 kN/m^2
Site Area			0.01ha (GroundSure)	300m^2
Heave		Long term 20mm		
Neighbours	Property east has basement.			
Underground		Northern Line ~95m south-west. Or site is to north-east.		Northern Line ~95m south-west
Slope Direction		Rises towards north-west ~1 in 20.	Falls from north-west to south-east.	Falls towards south-east
River Fleet Surface Water Features		Site located ~150m south-west of River Fleet. River Fleet 150m north-east.	~150m south-west of former route of River Fleet	
Other	F = 20	F = 20		F = 20

From: Francis Williams <francis.williams@groundandwater.co.uk>
To: LizBrown@campbellreith.com
Cc: "Skelli-Yaoz, Tania" <Tania.Skelli-Yaoz@camden.gov.uk>, Alejandro Fernandez <ale@martinevansarchitects.com>, eli nathenson <enathenson@me.com>, Julian Bier <julian@anx.co.uk>, Martin Evans <martin@martinevansarchitects.com>
Date: 10/08/2016 13:28
Subject: Re: 8A Belmont Street BIA feedback 2016/0896/P

Dear All,

In response to Liz's e-mail:

1. The aim of the previous reports was to highlight the e-mail discussions we have been having, over the interpretation of the undrained shear strength of the London Clay Formation, and try and discuss it and move forward.

It was our view that although there may be slight discrepancies in interpretation of the shear strengths of the soils at shallow depth, the overall view was that the contiguous piled wall would be embedded in stiff clay. We put in a number of comments to such an extent. We have the issue that the Consistency Index and probes do not match up exactly and therefore this has to be reported and discussed.

However, we have revised the strength profiles in both the land stability and our GI to hopefully show this better. These revisions are attached. The amendments in the land stability report relate to the comments on page 11 and 12 and now tie in with the Table on page 10 of our GI. The amendments to the GI are highlighted in yellow and discussed in the text.

2. Mitigation measures are provided in the overriding BIA by Crofts on page 25/26 and in the Basement Method Statement.

With regard to the specifics of the Land Stability Report and the Structural Proposals;

- Ensuring that adequate propping is in place at all times during construction
Refer to method statement in Appendix B-section 3.1.21.1 and the drawing SL-30 in Appendix C.
• Installation of the first (stiff) support quickly and early in the construction sequence.
Refer to method statement in Appendix B-section 3.1.21.1 and the drawing SL-30 in Appendix C.
• Avoidance of ground loss through the gaps between the piles.
The gap between the piles is only 100mm and also the contiguous piles are not the permanent structure. The ground is London Clay Formation which is not loose to flow between the gaps. Hence immediately after placing the piles we are going to construct internal Rc walls with temporary propping in place during construction.
• Avoid leaving ground unsupported.
After placing the piles, the excavation is done as a whole and walls will be built. So no ground support is needed. The contiguous piled wall is proposed to make the whole internal exaction possible without disturbing the outside soil mass.
• Minimise deterioration of the central soil mass by the use of blinding/ covering with a waterproof membrane.

In this process as said above there is no central soil mass.

- Avoid overbreak

Over break of piles? If so, in detailed design stage we will give the pile cut off levels.

- Control dewatering to minimise fines removal and drawdown.

Refer to method statement in Appendix B-section 3.4 and Section 1.8.

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