PROOF OF EVIDENCE

of

JACEK GABRIELCZYK
BSc(CivEng) Hons, CEng, MIStructE, MICE, MIHT, MCIWEM, CWEM

Appeal against Refusals by Camden Council
of Planning Permission and Conservation Area Consent
for Redevelopment at 29 New End, Hampstead, London NW3 1JD

(Camden Refs: 2012/3089/P and 2012/3092/C)

Planning Inspectorate Ref: APP/X5210/A/14/2218243

on behalf of Karawana Holdings Limited

JRG/PC/8082 OCTOBER 2014

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Proof of Evidence of Jacek Gabrielczyk BSc(CivEng) Hons, CEng, MIStructE, MICE, MIHT, MCIWEM, CWEM

1.00 QUALIFICATIONS and EXPERIENCE

1.01 My name is Jacek Gabrielczyk and I have approximately 34 years experience in the fields of structural and civil engineering, highway and transportation and water and environmental management. I became a partner with Taylor Whalley & Spyra (London) in 1992 and a director of Taylor Whalley & Spyra Limited in 1996.

1.02 Other appointments:

1994-99: Member of the Institution of Structural Engineers International Affairs Panel

1994-99: Member of the Institution of Structural Engineers Clubs Task Group

1996-98: Member of RCC/CONSTRUCT Steering Group for Hybrid Structure Research

2000-01: Member of ACE London Region Health and Safety Panel

2001-02: Consultee for CIRIA Good Practice Guide for the Retention of Masonry Facades

1.03 My postgraduate professional qualifications:

CEng	Chartered Engineer
MIStructE	Member of the Institution of Structural Engineers
MICE	Member of the Institution of Civil Engineers
MIHT	Member of the Institution of Highways & Transportation
MCIWEM	Member of the Institution of Water and Environmental Management
CWEM	Chartered Member of the Institution of Water & Environmental Management.

1.04 My primary profession is Chartered Structural Engineer engaged in the design of new-build projects, modern and historic structural refurbishments together with associated temporary works and including the investigation of building movement and construction defects.

1.05 Since 1990 I have been involved in providing expert witness reports and opinions concerning methodology and adequacy of workmanship, design and materials relating to forensic engineering, stability of partially demolished/complete structures and facades in loadbearing timber, brickwork, concrete and stone including historic and listed churches and buildings, underpinning, drainage, basement waterproofing, subsidence, settlement and damage to properties/drains due to ground conditions and nearby or adjacent construction work. My work has been mainly in the UK but also in Poland, Israel and France and instructed by private and corporate bodies, the British Foreign Office and the Polish Ministries of Foreign and Home Affairs.

1.06 I have been involved in the design of permanent and/or temporary works for complex basements at Richmond House London SW1, Middle Temple London EC4, The Radisson Blu Edwardian Hotel (formerly The Swiss Centre) Leicester Square London WC2, the Clifton

Ford Hotel (now Jurys Marylebone) London W1 and the Park Plaza Hotel Westminster Bridge Road London SE1.

2.00 APPOINTMENT AND SCOPE OF EVIDENCE

2.01 I appear at this inquiry in support of the Appeal Scheme to provide evidence of the adequacy of the Basement Impact Assessment (BIA) and its underlying analysis prepared by Taylor Whalley & Spyra Limited (TWS) with regard to structural/civil engineering matters raised by objectors in the Rule (6) Parties' Statement of Case dated 20th August 2014.

3.00 BACKGROUND SUMMARY

3.01 TWS were appointed in November 2008 by the appellant Karawana Holdings Limited to provide structural engineering services for the development of the 29 New End site, to provide residential housing including basement construction with a SSL of 106.535m. As was usual for the time, TWS prepared a Construction Management Plan and a Hydrogeological Report which were issued in May 2009. This was not the first hydrogeological review of the 29 New End site; one having been carried out in 2007 for a proposed development with a basement structural slab level of c. 106.00m.

3.02 Through a process of consultation with the London Borough of Camden Planning Department, public exhibitions and consultation with appropriate consultants, the original scheme has evolved into the subject of this appeal. During the same period the initial TWS Construction Management Plan and Geotechnical Consulting Group (GCG) Hydrogeological Report went through a similar developmental process, being reviewed by Arups as instructed by the Appellant, being amended and supplemented to include the additional level of information becoming required at Planning Stage for "New Basement Development and Extensions to Existing Basement Construction", beginning with LBC Guidance Notice of 2008 and culminating with the current LBC Camden Planning Guidance "Basements and Lightwells" (CPG4) of September 2013 (please see Core Document B7).

3.03 The current LBC guidance CPG4 (please see Core Document B7). has itself evolved through a process of consultation with external consultants, public consultation and monitoring/reviews of basement developments within the borough. The documentation that makes up the Basement Impact Assessment that forms part of this appeal and listed in Section 4.09 was issued prior to September 2013 and during its developmental process the BIA was also amended to incorporate and cover suggestions made by the LBC Planning Department that are now included in the September 2013 CPG4. The BIA was independently verified, recommended as acceptable by planning officers and accepted as such by the planning committee who did not raise a basement impact reason for refusal.

3.04 Although the BIA was accepted by LBC and is not a reason for refusal of the appellants planning application, Rule 6(6) Parties objecting to the appeal have also raised objection to

matters within the BIA that have already been examined in depth and found to be acceptable by the planning authority who are very experienced and used to dealing with such submissions.

4.00 BASEMENT IMPACT ASSESSMENT – PURPOSE AND STATUS

Purpose

4.01 The London Borough of Camden (LBC) Local Development Framework (LDF) is a collection of planning documents that (in conjunction with national planning policy and the Mayor's London Plan) set out the Borough's strategy for managing growth and development in the borough, including where new homes, jobs and infrastructure will be located.

4.02 As its central core the LBC LDF is a Core Strategy (please see Core Document B2) which sets out the key elements of the Council's planning vision and strategy for the borough and which with the Mayor's London Plan (please see Core Documents A1, A2 and A3) forms the statutory "development plan" for Camden and the basis for planning decisions in the borough.

4.03 The LBC Core Strategy (please see Core Document B2) comprises a series of objectives for which Core Strategy Policies have been developed that contribute towards each objective and which are themselves supported by Development Policies that set out detailed planning policies that the LBC uses when determining applications for planning permission in the borough to achieve the vision and objectives of the Core Strategy.

4.04 The proposed construction of a basement is covered by a number of Core Strategy Policies and Development Policies, the primary ones being CS14 (please see Core Document B2) "Promoting high quality places and conserving our heritage", and DP27 (please see Core Document B3) "Basements and Lightwells". The latter sets out the LBC's detailed approach to assessing planning applications for the subjects in its title.

4.05 As a further planning aid the LBC have prepared guidance for planning applicants proposing new basement development in Camden Planning Guidance Note CPG4 (please see Core Document B7) "Basements and Lightwells" which is a supplementary planning document that supports the LBC's policies and is an additional material consideration in planning decisions.

4.06 CPG4 (please see Core Document B7) Sec. 2.6 states that a basement or other underground development will only be permitted where the applicant can demonstrate the development will not cause harm to the built and natural environment, ground conditions and bio-diversity. CPG4 Sec. 2.9 refers to Chapter 6 of the Camden Geological, Hydrogeological and Hydrological Study prepared for Camden by Ove Arup and Partners (Arup) at LBC request with the objective of providing the Borough with technical guidance to assist in ensuring developers met the requirements of DP27 (please see Core Document B3). In CPG4 Sec. 2.7-2.30 inclusive the document gives guidance on the extent and level of information

required in a Basement Impact Assessment (BIA) to achieve this. CPG4 Sec. 2.31 confirms the final stage of the BIA is a "review and decision making" undertaking by the LBC.

4.07 The BIA as defined in the LBC documents has evolved into a vehicle to "assess whether any predicted damage to neighbouring properties and the water environment is acceptable or can be satisfactorily ameliorated by the developer" (DP27.3 and CPG4 2.8) (please see Core Documents B3 and B7) by:

a) Screening

The identification of any matters of concern which should be investigated and thereby determining whether or not a full BIA is required. Matters of concern include the presence of groundwater and its flow, land stability, surface flow and flooding.

b) Scoping

The identification of the potential impacts of the matters of concern identified in the Screening stage.

c) Site Investigation and Study

In order to develop an understanding of the site and its immediate surroundings. The degree of investigation varying depending upon the matters identified in the Screening and Scoping stages.

d) Impact Assessment

The evaluation of the direct and indirect implications of the proposed project including consideration of the implications of ground conditions and hydrogeological and hydrological factors to arrive at predicted ground movements and structural impact. Should the identified consequences not be acceptable then mitigation measures should be incorporated into the proposed scheme and the new net consequences determined.

e) Review and Decision Taking

This final stage is to be undertaken by LBC who conduct an audit of the total information supplied and decide on the acceptability of the impacts of the basement proposed.

In summary, the BIA should identify parameters and a method of construction for a basement proposal that will lead to its construction and use without unacceptable consequences. Consequences identified in CPG4 (please see Core Document B7) as being unacceptable are: a) predicted structural damage to neighbouring property greater than the Burland category of "slight" and b) predicted water ingress to neighbouring gardens or properties to be damaging to residential amenity.

The TWS BIA in this case shows the predicted structural damage to be no greater than "slight" and proposes a method for dealing with groundwater flow to avoid significant increases in flow velocities that would be likely to cause increased internal erosion. There is no indication that water ingress to neighbouring gardens or properties would result as a consequence of the proposed basement.

The TWS BIA is not the final design but is intended to demonstrate that each of the aspects of the design and construction have been carefully considered to a degree appropriate to the grant of planning permission. All aspects will be subject to detailed design progression once planning is approved (TWS BIA Section 1.0).

Status

4.08 The BIA proposed by Taylor Whalley & Spyra and accepted by LBC has evolved since its original issue to reflect changes and amendments to the architectural scheme and in particular in January 2010 the omission of a basement level and in April 2013 realignment of the basement wall further away from Grade 2 listed Lawn House so as to reduce the potential for harm to the existing masonry buttresses and adjacent wall. Objections had been raised that the existing masonry buttresses would be at risk from the development and that the buttresses were listed because they abutted a boundary wall that was adjacent to the listed building Lawn House and therefore subject to listed building consent. In order to better address the objector's concerns an attempt was made to carry out some shallow trial holes by the buttresses to enable the type, depth and extent of their footings to be determined. The attempt was interrupted by, I understand, a representative of LBC Planning Department who arrived and suggested to the labourers that they may have been acting in breach of planning regulations.

4.09 The TWS BIA submission accepted by LBC consists of

The Basement Impact Assessment: 29 New End for Karawana Ltd by Taylor Whalley Spyra (TWS) revision 1.1 of May 2012 (including Appendices A to K and detailed further here).

Appendix A: related examples of similar works in London.

Appendix B: Construction management Plan incorporating drawings 8082/CM01 to 03.

Appendix C: Site location plan indicating adjacent properties 8082/TM06, Party Wall drawings 8082/P01 & 02.

Appendix D: Construction Methodology incorporating drawings 8082/CSWOl to 12.

Appendix E: Geotechnical Consulting Group (GCG) Hydrogeological Review, April 2012 with WJ Groundwater Ltd letter report, April 2012.

Appendix F: GCG Assessment of the effects of the Proposed Basement Construction on the adjacent properties, May 2012.

Appendix G: TWS Planning Stage Structural Calculations, including MGF Design Services temporary propping details, slope stability analysis & Summary of retaining wall analysis.

Appendix H: TWS Site Borehole & Trial Hole Location Plan drawing 8082/SI/O1 and MRH Geotechnical Ground Investigation Reports 101206 of July 2010 & 101206/A of January 2011.

Appendix I: TWS, Camden Geological, Hydrogeological and Hydrological Study extracts Figures 11, 12, 14, 15 & 16.

Appendix J: TTP Consulting Construction Traffic Management Plan, April 2012.

Appendix K: TWS Planning Stage Designer's Hazard & Risk Identification.

Addendum to Basement Impact Assessment issued 25th September 2012 by TWS, ref GB/8082-Revision 1.0.

Letter from Arup to Charles Thuaire at Camden Planning Dept dated 12th June 2012 and titled 'Review of Basement Impact Assessment' for 29 New End.

Revised exploratory hole location plan drawing 8082-SI-01 rev. B with added water measurement data.

Addendum to the Basement Impact Assessment by Taylor Whalley Spyra (TWS) dated 29th April 2013.

Addendum to report on potential effects on construction by GCG dated April 2013.

Set of revised architectural drawings by KSR illustrating the proposed project, reference NEN-PL-090 rev P, 100 rev M, 110 rev, L, 120 rev L, 130 rev L, 140 rev K, 150 rev J, 160 rev I, 210 rev N.

Set of TWS drawings 8082/PW01 rev F, PW02 rev. B, PW03, CSW01 to CSW12 all rev F, CM03 rev C and revised exploratory hole location plans (with water level readings updated) 8082-SI-01 rev E (new TH7 added).

Letter from Arup (Paul Morrison) to Camden Planning Department dated 3rd May 2013 titled "29 New End Hampstead NW3 1JD" and referencing information above.

4.10 The BIA (contents as point 4.09 above) was reviewed and found adequate by RKD Consultants Ltd (RKD) and Card Geotechnics Ltd (CGL) in independent assessments carried out at the instruction of Camden Development Management Planning Services as an independent verification of the BIA and as confirmed in RKD reports dated 27th September 2012, pertaining to the original proposals and 15th August 2013 pertaining to the revised planning application and CGL reports dated December 2012 and 8th August 2013 pertaining to the original proposals and revised application respectively.

4.11 In addition to a review of the BIA, RKD and CGL addressed questions put by Camden Development Management Planning Services and neighbours (Stark Associates). The reports by both RKD and CGL confirm the BIA as adequate.

4.12 LBC accepts the BIA as adequate and satisfactory to discharge the criteria of DP27.3 (please see Core Document B3).

5.00 RULE 6(6) PARTIES' – STATEMENT OF CASE, OVERVIEW

5.01 The Rule 6(6) Parties' Statement of Case relating to the BIA and matters covered by the BIA as set out in Section 6.36 – 6.38 of that document dated 20th August 2014, is in essence an allegation that the BIA documentation is not only not compliant with LBC planning policies but that adjacent structures would be at risk of "substantial harm". This allegation appears to be based on the objectors' own particular interpretation of the LBC planning policies developed by the Council over the years (together with public consultation) and assessed and implemented at each stage with the assistance of the Council's professionals and independent external consultants.

5.02 The Rule 6(6) Parties detailed objections although numerous overlap with one another and have a common theme, in that the BIA is alleged as being insufficiently detailed to show that the development proposed at New End "will not" cause harm (see C.08 Appendix C) and further that this alleged insufficiency of detail cannot be provided post-planning as the corollary of a grant of planning permission is confirmation of the sufficiency of detail because compliance with the requests of DP27 (please see Core Document B3) is a statutory requirement. This allegation does not stand up to scrutiny as the level of detail being asked for by The Rule 6(6) Parties at planning stage is covered by the current legislation. Sec. 1 (1)(a) of The Building Act 1984 states the Secretary of State's power to make regulations for the purposes of "securing the health, safety, welfare and convenience of persons in or about buildings and of others who may be affected by buildings or matters connected with buildings". This clearly covers the scope of detail suggested by The Rule 6(6) Parties as required at planning stage.

5.03 The regulations referred to in 5.02 above are The Building Regulations 2010 and in essence they require building work to be carried out at the requirements of a schedule which is divided into sections, the relevant one to this case being Schedule 1 Section A which concerns structure and clause A1.(1) which requires the building to transmit loadings to the ground "a) safely, and b) without causing such deflection or deformation of any part of the building or such movement of the ground, as will impair the stability of any part of another building".

5.04 In addition to the provisions of the Building Act 1984, where there are adjoining/nearby properties construction work comes under the Party Wall etc Act 1996 which gives adjoining owners the right to appoint a surveyor to resolve any dispute, require reasonably necessary measures to be taken to protect their property from foreseeable damage and for their security, not to be caused any unnecessary inconvenience, be compensated for any loss or damage caused by relevant works and ask for security for expenses prior to the commencement of work under the Act.

5.05 Compliance with the requirements of DP27 (please see Core Document B3) is compliance with matters of planning concerning the identification and assessment of factors that may

affect construction of the development proposal and whether any predicted damage is acceptable or can be satisfactorily ameliorated and with regard to the BIA that statutory requirement has been met. The Rule 6(6) Parties assertion that the BIA must show that a development "will not" cause harm is incorrect and their allegation that there is insufficiency of detail is mistaken as the relevant statutory instruments for this are not planning law but the Building Act and Party Wall Act.

5.06 The alleged insufficiencies in detail in the BIA are listed and addressed in Appendix C to this document. In essence the allegations stem from a difference in opinion between on the one hand The Rule 6(6) Parties/advisers and on the other hand the appellant/advisers together with the independent consultants instructed by LBC and the LBC planning officers. The level of detail required implied by The Rule 6(6) Parties is commensurate with that of a final design where as much uncertainty as possible (e.g. final shape, size and height of the building) has been removed and as much information as possible determined (e.g. more extensive/intrusive ground investigations, detailed numerical modelling of temporary works). Detailed investigations are both costly and time consuming and until construction commences and a monitoring regime installed they remain theoretical. At the post-planning stage it is not unusual to carry out not only additional investigations but also confirmatory works such as a working pile test. In the case of New End the theoretical calculations may be checked by first installing the piles furthest from structures to allow measurement of movement without risk to neighbouring buildings and the results of the measurements used to confirm/adapt the construction methodology as may be relevant, this is a commonplace procedure. At planning stage the sufficiency of detail in basement construction is that to arrive at a type and method of construction which will control ground and water movement in such a way as to ensure that the surroundings are protected. In my opinion the level of detail suggested as appropriate by The Rule 6(6) Parties is unjustifiable because adequate parameters for this stage have already been established.

5.07 There remains The Rule 6(6) Parties concern that the content of an approved BIA may not be followed in the construction phase and that Building Control Officers will be unable to control activity on site short of something resulting in a dangerous structure and that the Party Wall etc. Act too cannot limit damage (Eldred report point 3) and they propose a draft Section 106 Agreement in Sec 7.1 of the Statement of Case which is "predicated on the production of an acceptable BIA compliant with planning policies DP23, DP27 and CPG4" (please see Core Documents B3 and B7). However this offer lacks merit as there is no evidence offered by the Rule 6(6) Parties and no basis for their allegation that the content of the approved BIA may not be followed post-planning and also the measurement of "acceptability" implied is not clear. It is certainly not the same yardstick used by LBC and its instructed independent specialist reviewers. There may be scope for the appellant to enter in a formal undertaking with LBC that the BIA will be complied with, i.e. the quite normal step of developing the planning permission into the final design stage.

6.00 SUMMARY AND CONCLUSIONS

6.01 The Rule 6(6) Parties' detailed objectives are numerous and purport to have been produced by three independent experts. Two of the experts are confirmed to have collaborated in the preparation of their report and the experience and independence of the third is not confirmed. The numerous objections overlap and in essence represent two concerns:

a) that there is insufficient information in the BIA at planning stage,

b) there is no method of controlling the developer's adherence to the BIA post-planning.

The TWS BIA is acceptable and has been accepted by LBC, its technical officers, LBC appointed external independent reviewers RKD (reports of 27.9.12 and 15.8.13) and CGL (reports of Dec 12 and 8.8.13).

6.02 There is adequate information in the BIA for planning purposes and the acceptance of the BIA by LBC, well experienced and used to dealing with applications for basement developments, supports this view as does acceptance by the specialist reviewers of the BIA instructed by LBC to advise them on technical matters.

6.03 Progression of design to construction stage in the post-planning is covered by the Building Act 1984 and The Party Wall etc Act 1996 which are statutory instruments that provide control over construction.

6.04 The BIA, which was determined as acceptable by LBC, is a sound document and an appropriate base for Conditions and/or Sec. 106 obligations to manage construction effectively.

DECLARATION

The evidence which I have prepared and provide for this appeal reference APP/X5210/A/14/2218243 in this proof of evidence is true and I confirm that the opinions expressed are my true and professional opinion.

JACEK R GABRIELCZYK OCTOBER 2014

APPENDIX A

HUGH ST JOHN REPORT

PROOF OF EVIDENCE

of

Hugh David St John
Ph.D, BSc

Appeal against Refusals by Camden Council
of Planning Permission and Conservation Area Consent
for Redevelopment at 29 New End, Hampstead, London NW3 1JD

(Camden Refs: 2012/3089/P and 2012/3092/C)

Planning Inspectorate Ref: APP/X5210/A/14/2218243

on behalf of Karawana Holdings Limited

1. BACKGROUND

1.1 My name is Hugh David St John. I am currently a Senior Consultant for the Geotechnical Consulting Group LLP (GCG). My CV is attached as appendix 1. I have been working with Taylor Whalley Spyra (TWS) assisting Kanawa ltd on this project since around 2010. My colleagues and I have prepared reports on the ground and groundwater issues related to the preliminary designs that have been prepared. I have also discussed the design and construction principles with TWS at various stages . These reports have been prepared in support of the Planning Applications specifically to address the issues raised in the LBC requirements to produce a Basement Impact Assessment.

1.2 I have been involved with the design and construction of basements (including deep basements since around 1971. My Ph.D. was based on measurements of ground movements that were made by myself and others during the construction of deep basements in and around London at that time. My entire career has largely comprised working on the design and construction of deep foundations and basements, firstly in research and subsequently in practice. Although a significant proportion of the basements that I have been involved with have been in the London area, I have participated in similar projects throughout the UK and worldwide. The projects that I have been involved with range in scale from small shallow domestic basements to large deep basements for commercial developments. These have been in a wide range of soil types and groundwater conditions and have varied considerably in terms of complexity. Because of my experience my advice is widely sought. I am involved in projects at conception through to completion and I have acted as an expert witness on issues related to basement and substructure matters on numerous occasions in the UK and overseas. In some instances I have been called in to advise where problems have occurred. During my career I have had the opportunity to observe both good and bad practice and am therefore more aware than most professionals where the principal risks lie. In many instances the role of both myself and my colleagues at the Geotechnical Consulting Group has been to assess the potential impact of construction on the surroundings. We frequently undertake detailed numerical analyses of basement construction during the design phases of projects in order to estimate the movements of, and potential damage to, buildings and infrastructure.

1.3 In recent years I have contributed to a number of projects within the London Borough of Camden (LBC) where basement construction has been an issue and have witnessed the evolution of the current policies and the impact that these have had on the way in which planning applications have been dealt with. Many of these projects have been in the Hampstead area. We referred to two such projects in our report on damage assessment as being particularly relevant; the Witanhurst project on the west side of Highgate Hill and 5 Cannon Lane which is to the east of the New End site. Both these projects have been successfully completed. Both projects involved excavation to similar depths to the deepest excavation at New End. Both are in similar ground and groundwater conditions. Careful observations were made at both sites and the experience from these can be brought to bear during the design development on this project. This applies particularly to the issue of groundwater where WJ Groundwater whose preliminary advice has been sought during the planning stages on

this project, have been involved in the implementation of ground water control measures.

1.4 LBC obtained independent reviews of both the geotechnical and groundwater issues (the RKD and CGL reports). The terms of reference given to the two reviewers are stated in the reports produced. These comprise two parts, firstly, the sufficiency of the proposals with regard to the Basement Impact Assessment, and secondly comment on the reports and critique submitted by neighbours to the proposal. The latter are the Eldred report dated 25th July 2012 and the First Steps report dated 23rd July 2012 together with the letter from The Heath and Hampstead Society dated 26th July 2012.

1.5 Both reviewers concluded that what had been presented:

- identified the principle issues,
- was sufficiently robust and accurate,
- was accompanied by sufficiently detailed amelioration/mitigation measures to ensure that the grant of planning permission would accord with Policy DP27,

They acknowledged that it would be necessary to carry out more work at the detailed design phase but that this was an entirely appropriate and normal approach.

The reviewers, whilst acknowledging the relevance of the comments and critiques in some instances, were of the view that none of the concerns raised changed their views on the adequacy of the proposals at this stage. Officers recommended planning permission be granted and that there was no sustainable reasn to refuse planning permission on the bases related to the basement construction. Planning permission was refused but not on the basis that the construction of the basement would be inappropriate in stability or geotechnical terms.

1.6 Non-compliance with the terms of DP27 was therefore not given by LBC as one of the reasons for refusing to grant planning permission.

1.7 In their Statement of Case the Rule 6(6) Parties state in their summary (3.3 (8)):

In the absence of an acceptable BIA and robust section 106 Agreement, each required to be compliant with the planning policies(e.g.DP23,DP27 and CPG4); critical demolition, construction, hydrological and engineering issues remain unresolved placing adjacent listed buildings and schools at risk of substantial harm'.

1.8 In elaborating on this statement (para 6.38) the Rule 6(6) Parties refer to the Eldred and First Steps reports and a review and commentary carried out by Stark Associates for the Neighbours dated 27th June 2013. The latter review summarises the comments made by Eldred and First Steps and also the issues raised by RKD. They add their own comments. Comments are also made on the later submissions made by TWS and GCG (dated April 2013) which were produced after the previous RKD and CGL reports in order to address a detailed issue regarding the affect of construction on the buttressed wall adjacent to Lawn House. It should be noted that although these reports post-dated the original reviews they were reviewed by LBC's consultants who

gave their views at the meeting of the Planning Committee when the project was discussed. **Both RKD and CGL advised that the proposals were acceptable.**

1.9 I am not personally familiar with Stark Associates, nor with Stephen Stark who prepared the overall summary of the objector's case. I note that he is a Hampstead Conservative Councillor. He is, or has been, I understand, on the Planning Committee of the Heath and Hampstead Society who object and had commissioned the reports by First Steps and Eldred Geotechnics.

1.10 The Rule 6(6) Parties also refer to a letter from the Diocese of Christ Church, concerns as to foundation stability at 10-14 New End and the presence of an underground passageway between the former New End Hospital and the former Mortuary (now the Village Shul). They finish this section stating that:-

In short, the present BIA and Review(s) represent no more than a feasibility study whose shortcomings will only become apparent once demolition has taken place and excavation has begun'.

1.11 This statement is just not true. LBC considers that the BIA is adequate. It has been made clear in the reports that, as is usual and necessary, more detailed work will be carried out before any excavation is undertaken. No work on the basement construction will be started before the detailed design has been completed. Although, as with most basements, it is the intention to make careful observations during the work once it is started, the purpose of this is to give forewarning of any unexpected behaviour so that, if necessary, the construction procedure can be appropriately modified in detail in order to take account of this. This 'observational' approach is standard practice in geotechnical engineering and recognises that there are always risks of uncertainties in the ground.

1.12 I have been asked to address the issues raised where they relate to geotechnical or groundwater matters. Other issues, relating to construction and the overall structure and detail of the BIA are dealt with by TWS.

1.13 I have divided my responses broadly into two. In the first part I have tried to put the work that has been carried out during this stage into the context of the overall scheme development. In the second part I have attempted to respond to the detailed issues raised. I have used the general headings given in the tabulated summary comments prepared by Stark Associates. Many of the points are repeated and I have tried to answer the main points in the context of the headings used in the table, i.e.,_

A) Existing condition
B) Construction
C) Ground conditions and report
D) Ground Water/Hydrogeology
E) Slope Stability
F) Foundations of Existing Buildings/Basements
G) Ground Support around the site
H) Construction Sequence
I) Damage Assessment
J) Rail

For convenience and completeness I have also added my comments to the appendix in the TWS report based on tabulated critique prepared by Stark Associates. I have also responded to the additional concerns raised in the Rule 6(6) document.

2. GENERAL COMMENTS

2.1 From a geotechnical point of view the main emphasis at this stage in a project such as this is to select a method of construction which will control ground and water movement in such a way as to ensure that the surroundings are protected. This is principally about movement of the ground as it is generally this that has the potential to cause damage. However, in this instance, it is also about ensuring that movement of ground water is controlled so that any changes in flow do not result in adverse effects. The objective at this stage is to demonstrate that there is sufficient certainty about these issues that a clear, safe and sufficient solution can be advanced. The fine detail needs to wait until the detailed design.

2.2 This basement is by no means exceptional. There are many examples of basements built in London and elsewhere which are much larger and deeper, sometimes in much poorer ground conditions, especially near to the surface. The techniques used to construct these are the same as it is proposed to use for the New End basement. Such basements have the same issues with regard to the potential damage to surrounding buildings. There are many experienced contractors who can undertake this work safely. It is important however to recognise that this site is not an 'easy' one. It is a confined sloping site and it is important to understand and deal with the ground water issues.

2.3 In the ground movement report submitted , the emphasis was on trying to explain the general reasoning behind the conclusions regarding the potential damage to the surrounding structures, rather than to go into significant detail. Such detail will be provided in the detailed design which will require a number of steps comprising 1) further site investigations to better define the groundwater and groundwater control issues, 2) detailed numerical modelling to understand the way the temporary works will work and eventually 3) the development of a very detailed monitoring scheme and construction methodology to control the ground movements. As is explained in the report, the initial assessment of the potential ground movements is best done on the basis of experience rather than reliance being placed entirely upon detailed calculation. Calculations have been carried out in order to check the size of the retaining wall and the overall stability the site and the walls but there will be a series of checks as part of the iterative design process. In the case of the movements due to installation of the piles, there is no way precisely to estimate the ground movements other than on the basis of experience and on-site measurement. As suggested, the cautious approach has to be taken where there may be risks to property by first installing piles where the operation does not affect any buildings, to measure movements and if necessary to adapt the construction method so that movements are

acceptable. Having said that, recent experience of installing walls under very similar conditions in the local area (at Witanhurst and 5 Cannon Lane) has given confidence that the work can be done with minimal impact.

2.4 The developer's consultants have identified a suitable way of constructing the proposed scheme. In doing so they have identified ways that they consider appropriate to address risks. Once detailed design starts, more detailed investigation is undertaken and a contractor is appointed. It is at this later stage that it is appropriate to carry out the detailed assessments which are expensive, and time consuming and require full access to all relevant parts of the site. This is what we did recently (together with TWS) on the scheme at 120 Finchley Road which is also a complex sloping site. The appropriateness and merit of this approach is recognised by LBC and their consultants.

2.5 During the main excavation stages the key to limiting the effects on the ground around the new basement will be to identify support systems which ensure that the pressure from the ground on the uphill side is effectively transmitted to the downhill side. This will be done through the temporary support systems and the secant walls acting in shear and by sequencing the work in such a way that the load paths are effective. By using adjustable props the movement at the tops of the walls and in critical locations (such as adjacent to Lawn House) can be controlled sufficiently to keep the horizontal movements down to an acceptable level. Similarly, where it is important at a lower level, the prop positions and stiffnesses can be adjusted to ensure that the wall movements are controlled. The proposals for the construction sequence recognise these matters and the calculations that have been carried out have been aimed at checking that the elements of the scheme are broadly the correct size and capacity and that a detailed scheme can be developed which will provide the necessary protections. The exact sizes of piles, the amount of reinforcement, the sequence and levels of excavation and propping have all yet to be finally selected. It would be premature and potentially counter-productive for this detail to be specified at this stage.

2.6 The overall picture is complex because the ground falls both to the east and the south. This means that in general, because all thrusts are transmitted to the opposing walls, the walls to the east and the south will move less, whilst the walls to the north and the west will move forward more in towards the excavation, being controlled where necessary. At the corners of the new basement wall the secant wall at the top part of the site will provide a significant buttressing effect that will transfer load down into the ground, particularly during the early stages of the excavation when the embedment is high. As the Rule 6(6) Parties advisors have stated the condition is not simple. It is not appropriate to make detailed ground movement predictions at this stage.

2.7 In order to assess potential for damage it is important to understand what can actually cause damage. If the ground under a building simply tilts, that in itself will not cause damage. It may result in movements of the building relative to, say, abutting walls if they are supported differently, or differently affected (e.g. because of having very shallow foundations and there being local excavations or tree growth under them). If a building moves bodily horizontally (by virtue of its inherent strength/stiffness) it will not be damaged. The assessment of damage potential, as

described in CIRIA C580 (see attached extract) is therefore a matter of assessing the potential for distortion created by the differential movement of the ground under the structure (assuming in this case that the building itself does not modify the movement pattern). The stability of a foundation or wall is generally not affected by the ground under it moving. It is only affected if support is removed or it is made to lean over so much that it becomes unstable.

2.8 In my experience the main cause of damage is unexpected localised movement due to poorly controlled/monitored work or the use of inappropriate construction methods. This is why it is so important to carefully monitor what is happening and to sequence work in such a way that potential problems can be identified without putting vulnerable buildings at risk.

2.9 My understanding is that the proposed Section 106 undertaking and the relevant parts of the Building Regulations are aimed at making sure that the work (both in terms of design and construction) is being carried out in such a way that the work is properly controlled.

2.10 I am truly satisfied that for the purposes of the grant of planning permission, an appropriate level of assessment has been undertaken to ensure that, for planning purposes, the basement can be safely and securely constructed.

3. RESPONSES TO DETAILED COMMENTS .

3.1 In responding to the issues raised I have only dealt with issues related to the ground and groundwater. TWS will provide separate comments on all other issues.

3.2 Comments on Stark Associates summary table

A) Existing condition (comments 1-8)

A.1 The comments relate largely to the lack of detailed information. Regarding ground and groundwater the main concerns seem to be that there is not a clear understanding of what the conditions actually are. In the reports provided all available sources of information have been reviewed in order to get a broad picture of the geology and the hydrology. This is, in fact, the desk top study that it is suggested has not been carried out. The information from the site specific boreholes has been used to confirm what the local conditions are. This information is sufficient to be able to characterise the conditions and carry out calculations sufficient for Planning purposes pending further investigation particularly with regard to the control of ground water (see below).

A.2 There is a suggestion that underground rivers or springs exist at the site. There is no evidence that this is the case. There are numerous springs around this area and they are associated with the geological conditions. They occur principally at or just above

where clay horizons sit below sands and gravels. On this side of the hill the spring line is well below the level of the proposed basement and it would be extremely unlikely were there to be any streams near the surface. If there were, because of the number of local buildings it is something that would have been reported in the past. We have been unable to find such reports.

A3. However, even if, contrary to present evidence, further investigation changes the current ground and groundwater models, there will be the opportunity to review the proposals and, if necessary, make adjustments to the proposed method of working. It should be noted that such detailed investigations could, in fact, show conditions that are *less* onerous than have been assumed.

B) Construction (8-14)

B.1 Concern has been expressed about the appropriateness of the propping system to control movement. The support system comprises a number of elements:
- the bored pile walls themselves which transfer loads deeper into the ground by virtue of both their bending stiffness when pushed from behind and the stiffness in the plane of the wall.
- the temporary soil berms left in place in front of the walls.
- the props themselves which bear against capping beams and waling beams designed to transmit the support they provide between the piles.
- the raft slab used largely as a means of transmitting load from one side of the excavation to the other.

The precise suite of measures to be employed will of course be detailed in the emergent design.

B.2 The interaction between these different elements can only be finally determined by setting up a model of the entire system within the ground and simulating the construction process. It will need to be done with the contractor appointed to design and construct the basement and will inevitable result in having to modify the detail of the proposed support system, if only in minor way, to find what is both practical and effective. As explained above this is far too detailed an analysis to undertake at this stage of the design. At this stage the appropriateness of the system to control movements can only be judged on the basis of some simplifications and assumptions which enable straightforward calculations to be done together an understanding of how the support system is likely to work based on experience.

B.3 Concerns have been expressed about the lack of data on ground water and the understanding of where water is flowing. Experience at Witanhurst and 5 Cannon Lane where the geological conditions also comprise Bagshot Beds over the Claygate member and London Clay has taught us that ground water flow is complex, although not difficult in principle. It is affected by local changes in lithology within each of the strata which make it difficult to predict very detailed flow patterns. At 5 Cannon Lane pumping tests were carried out and measurements of water levels made both before and during the basement construction. Wells were used to control ground water pressures during construction and it was planned to have a permanent system to reduce water pressures in the long term should it prove necessary. However, the latter proved to be unnecessary because the flow rates were very low and there was no

significant effect of the construction on the water levels. It will be necessary to undertake similar pumping tests at the New End site so that the groundwater control systems can be properly designed. These will enable a model of the groundwater flow to be set up and the effects of the proposed changes to be evaluated.

B.4 The opinions expressed by WJ Groundwater are based on the above local knowledge, and as with the issues about ground movements, until further very detailed investigations are carried out, the final detail of the groundwater control system cannot be provided.

B5. In summary, the issues raised all relate to details that will be dealt with during the final design which will include further investigation and detailed analysis. Recent experience on nearby site in similar ground conditions can be used to great effect.

C) Ground Conditions and Report (15-18)

C.1 There is a suggestion that the site investigation results obtained to date are suspect and lacking in detail and, as a result, the possible effect of construction on the neighbouring properties may not be accurate. It is suggested by Dr de Freitas that the methods of investigation were inappropriate and the information insufficient. Neither suggestion has any foundation. The three borings undertaken were carried out in accordance with normal practice and showed consistent results. The principal tests carried out to assess the ground properties were Standard Penetration Tests (SPTs) supplemented by limited laboratory tests to determine some of the mechanical properties. This is standard practice in what are predominantly granular soils. The SPT results can be used, as described in the RKD report, to derive soil strength parameters based on empirical correlations, as can the soil stiffness. Again, this is standard practice and perfectly adequate for use at this early stage of a project. As RKD say, the soil parameters actually used in the analyses that have been done, are conservative, i.e. they are, appropriately, a cautious estimate.

C.2 The scope of the investigation work that has been done to date has been limited necessarily because of the difficulty of gaining access to the site while the existing building is still in place. Access can only be gained from New End and there is limited width around the sides of the building. Equipment cannot be lifted over the exiting building to obtain access to the rear of the site. It is the top end of the site which it is most important to carry out the investigation as this is where the retained height of the basement is greatest. Once the existing building has been demolished and the site cleared these constraints will be removed. Further investigations can then be done. The investigations to date have been sufficient to determine broadly the geological and groundwater conditions and the likely ground properties so that the initial calculations can be carried out.

C.3 The Rule 6(6) parties state that the developer has not clearly set out what further investigation work will be required and ask why such investigation could not be carried out now. The reports refer to the need for additional investigation, particularly with respect to the acquisition of further information on ground water flow. Such investigations will require the installation of a number of additional boreholes at least

one of which will be used as a well and others to observe changes in ground water level whilst pumping is being carried out. In-situ testing and sampling will be carried out while these are being done in order to provide further details of the variation of ground conditions across the site. This all forms part of the final design and the details will be decided once the project proceeds. It would be impractical to try to do all this investigation now, as explained above.

C4. In summary, the investigation work that has been done to date is adequate for the determination of the ground conditions and choice of parameters for analysis for the purposes of planning. Further investigations will be put in place once Planning Consent is granted. This is normal practice.

D). Ground water/Hydrogeology (19-21)

D.1 The Rule 6(6) parties raise issues concerning the current scarcity of information on groundwater flow. Information has been collected which has shown that there is little variation of ground water levels seasonally. The reasons for this is likely to be that there is limited infiltration above the site and that, as at 5 Cannon Lane the flow of water down the slope is a function of the relatively low permeabilities and the presence of intermittent layers of more clayey layers within the predominantly sandy soils. This will become more apparent when the detailed studies have been carried out.

D.2 Reference is made to the seasonal path of water causing loss of ground ' thus raising the risk of damage to adjacent buildings'. This is pure conjecture and raises the question of why this would not be happening anyway. The whole idea of the proposed method of dealing with the groundwater flow across the site is to avoid significant increases in flow velocities that would be likely to cause increased internal erosion. The detail of the groundwater control measures cannot be determined until further investigation has been carried out.

E. Slope Stability (22-23)

E.1 We have carried out a stability check for the global slope failure, i.e., were excavation to reduce the load on the slope, the entire slope could move. In such an analysis it is assumed that the individual walls are propped internally against each other. The calculations for individual retaining walls (using WALLAP) also carry out stability checks for the walls at different stage. In all cases the factors of safety were adequate. In all cases the calculations assume that the excavation is a infinitely long trench, which is far from reality as additional resistance is gained from sides of the basement excavation.
Comments made about the lack of slope stability checks are unjustified.

E.2 The Rule 6(6) parties state that no assessment has been made of the out of balance forces on the basement design and the ground level differences. It is correct to say that no assessment has been carried out of the out of balance forces. However, it is misleading to express it in this way. As explained under the general comments above, the forces are not out of balance. They have to be balanced. The stresses against the

backs of the walls change as the walls move relative to their initial position, dropping as they move inwards towards the excavation and increasing if they are pushed into the ground. This process can, and will, be modelled, but it is complex. The important thing at this stage is to define a scheme which ensures that suitable support is provided at all stages of the construction process to control ground movements.

F). Foundations of Existing Buildings/Basements (24-25).

F.1 It is stated in the comments that there has been insufficient investigation of the foundations of the existing buildings and that no assessment has been done of the potential damage to adjacent garden walls and paths.

F.2 This is not true. While it is true to say that exhaustive investigations have not been carried out, such investigations as have been done have been largely confined to the site for obvious reasons. Further investigations will be carried out pursuant to Party Wall legislation during Party Wall negotiations (if it is deemed necessary). Having said that, it is only in very limited cases where the foundations of nearby structures are relevant to their performance during the process of the works. Where open excavations are to take place near to a foundation such checks need to be done. If a robust retaining wall is to be installed before any excavation takes place, then once it is in, movements of the ground are controlled by controlling the movement of the wall. The adjacent foundations may move with the ground, but not because of any reduction in the ability of the ground or the structure to support them. The important issue remains ensuring that the new retaining wall is installed carefully.

F.3 In the case of the garden wall to the west and the retaining wall on the west side of Christchurch Passage these will only move with the ground. In the latter case it is possible that the top of the new retaining wall will be pushed back (to the east) by a few millimetres and that the old wall will be pushed with it. This is not likely to affect its stability regardless of what it is founded on. However, this will be checked during the final design.

G). Ground support around the site (26-28).

G.1 Concern about the details of relating to the garden walls is expressed again under this heading. I repeat my comments above.

G.2 Most of these concerns are actually about the walls to the east of Lawn House. This matter was addressed in the supplementary reports. This was mainly a concern when the bored pile wall was shown to be closer to the boundary. It was subsequently moved away from the boundary (after the Eldred and First Steps had been issued) and the new proposals were accepted as reasonable by RKD.

H). Construction Sequence (29-31).

H.1 There are concerns that the proposals do not take into account the nature of the surroundings (both in terms of the different structures and the changes in ground leve)l. I have explained above that it is not the intention that the developer will just build what is described and hope that everything will be OK provided that the work is monitored. There is much work to be done to complete a detailed design which will

take into account the above factors. It will still be necessary to monitor the ground (and the water) carefully at all stages and have proposals in place for changes in the construction procedure should movements be larger than expected.

I).Damage Assessment (32-40).

I.1 There are a number of comments that have been made about the assessments of damage that have been made. These can be divided up into two categories, firstly how the assessments were made, and secondly the basis on which the movements have been estimated.

I.2 The process of damage assessment has been described in the GCG report. The main sources of movement that might affect the adjacent structures are the installation of the bored pile walls and the process of excavation. The issue of long term heave and settlement have been raised in the comments. Although vertical movements under the site will occur as the ground is unloaded and reloaded with the new structure and these will be accompanied by movements outside the basement these are unlikely to be significant in terms of potential damage as they are not likely to result in any distortional settlement or to any lateral movement outside the confines of the site. The effect of this has therefore not been considered. RKD found no reason to comment on this. It should be noted, however, that, when the detailed analyses are carried out these effects will form part of the analysis.

I.3 The assessments have been carried out using the methodology generally described as the 'Burland' method. For structures where estimated movements are small (less than 5 mm) it is judged that there is no need to undertake such an assessment as it is clear that damage is likely to be very limited. Although under these circumstances it is very possible that there will be no damage at all, even small movements can have an effect on a structure which may be almost at the point of cracking in its current condition. It is therefore appropriate to categorise such buildings as possibly experiencing 'negligible' damage.

I.4 The only structure which is more vulnerable is Lawn House. This has been carefully considered using conservative estimates of the possible differential settlement across the building and the axial strain resulting from lateral movement. The objective was to demonstrate that the predicted damage lay within the 'slight' category which proved to be the case.

I.5 It is stated that there are limited examples of basements constructed in sand. It is certainly true to say that there are fewer case histories for sand than for predominantly clay soils. Much of the data reported in the CIRIA C580 report relates to basements which extend into the London Clay. It is often the case, however, that even these involve installing piles through the upper layers of made ground, alluvium and granular Terrace Deposits before the clay is reached. In the case of installing the piles for the walls it is normally the penetration of these that causes the largest movements local to the walls. Such local movements are the ones that have the potential to cause damage, not the movements that are seen at some distance from the wall. The recent experience locally at Witanhurst and 5 Cannon Lane is very important, particularly when assessing the likely effect of pile installation. These give confidence that the predicted movements are unlikely to be exceeded.

I.6 No matter what the predictions of movement are it will still be essential to take a cautious approach to controlling the effects of construction by using extensive monitoring. In the case of the effects of installation of the piles there is the opportunity to check what these might be, and if necessary to modify the construction process before the work is carried out near to existing buildings.

I7. In summary, the comments show little understanding of the realities of making assessments of potential damage and the normal approach to control of the construction process. They do not have the advantage of first- hand experience of working in these ground conditions.

J.Rail (41).

J.1 We are well aware of all the rail tunnels in this area there are none that are relevant to this project.

3.3 The Stark Associates commentary also comment on the Addenda of April 2013 produced by TWS and GCG which review the possible effects of the construction of the basement in its modified position on the buttresses supporting the boundary wall adjacent to Lawn House. The GCG report discusses how the ground movements that may occur could affect the buttresses, the listed wall and Lawn House. It does not attempt to assess damage to the listed wall which seems to be the main concern because the only likely detrimental effect of differential settlement that could occur is a slight rotation of the wall. The wall is not perfectly vertical as it stands and such a small rotation would be completely undetected visually. It is suggested that separation of the buttress from the wall would have a detrimental effect because it would reduce the support. This is illogical. If such separation occurred it would be because the wall does not need the support of the buttress.

3.4 No doubt it will be possible to look into the details of the construction in this particular area once the constraints currently imposed have been removed and some of the fears expressed by Stark Associates can be laid to rest.

3.5 Concerns have been raised by Christ Church (para 6.38(5) to the north and 10-14 New End (para 6.38(6)) at the bottom of the site. The predicted movements at both locations are small. In the case of the Church the building is 24 metres from the basement. Even were there to be problems with the existing foundations (which is a fact that I have not been made aware of) any ground movements that might occur would not change the condition of the ground. Therefore the condition of these foundations will not be worsened by the proposed construction. Any differential movements across the Church would be so small that the structure would not be affected. The basement at the New End side of the site is of very modest proportions and likely ground movements are small. The main concern, which will be addressed in the detailed design, will be how loads from the top of the site will be transferred in the ground at the bottom of the site, i.e. there is likely to be a thrust to the south that will decrease the amount of lateral movement of the ground towards the excavation. This reduces the risk of the development of tensile strain in the adjacent buildings.

3.6 In our view the concerns raised by Christ Church and 10-14 New End are unfounded.

4. SUMMARY

4.1 The Rule 6(6) Parties have raised a large number of issues, many of which overlap. The main comments raised come from one source and it is doubtful that, although referred to as coming from three independent engineers, these reports can be regarded as truly independent in the same way that the TWS, Arup and RKD and CGL reports can. The overriding conclusion from LBC's own advisors is that the scheme as proposed satisfies the requirements of LBC's BIA, a fact which is disputed by the Rule 6(6) objectors.

4.2 It is recognised that further investigation is required and detailed analysis has to be carried out. It is normal practice to defer detailed design and investigation until it is known that the scheme is to proceed. The provisions of other legislation such as the Building Acts and the Party Wall legislation control the more detailed elements of such analysis. The main objections are matters of detail, not matters of lnd use principle.

4.3 There is no reason why this basement, as described in the submission, cannot be carried out without causing damage more than the 'slight' category to any of the surrounding buildings, provided that the work is carried out with sufficient care. This has been done on other projects nearby in similar environments and the experience gained from these projects can be used to good effect.

4.3 What is important, if the project is to proceed, it to ensure that the detailed design is carefully carried out, that it is coordinated with the construction process and that the construction is carefully controlled and monitored.

DECLARATION

The evidence which I have prepared and provide for this appeal reference APP/X5210/A/14/2218243 in this proof of evidence is true and I confirm that the opinions expressed are my true and professional opinion.

Hugh David St John October 2014

Dr H D St John
BSc PhD
Director

Areas of expertise
Soil properties, field studies, foundations, deep basements, slopes.

Recent experience
Since joining GCG in 1985 Hugh St John has worked with a wide range of clients, advising them on a variety of geotechnical issues at tender stage through to project completion. Much of this work has been concerned with the design and construction of deep foundations, excavations and basements.

He has acted as geotechnical advisor to structural consultants, contractors and client bodies on a large number of projects involving complex foundations in soil and rock, acting as designer and checker. In recent years this has included advising on deep excavations in Italy and Greece and the installation of large diameter caissons for offshore wind farms and deep shafts for tunnelling projects. He has also works on projects where deep foundations are required in shallow water (for example, bridges and the Thames Cable Car currently under construction). He has been involved in a variety of both small and large basements and foundation schemes in London and other UK cities. On many of these schemes the issues have been the prediction of sub-structure performance. He has led work in the UK on the reuse of substructures in urban environments. He has much experience of working within multi-disciplinary teams to deliver projects.

In recent years Dr St John has had much involvement in aspects of litigation, particularly with foundation problems and also with issues arising from construction of retaining walls, fills, slopes and harbour works. He is an experienced expert witness.

Dr St John has published technical papers on in-situ testing, field studies and design of foundations and basements and foundation reuse. He has served on the Géotechnique Advisory Panel, various national and international committees and was recently Chairman of the British Geotechnical Society. He is currently Chairman of the "Ground Engineering" Editorial Advisory Panel.

He is a visiting Professor in the Geotechnical Engineering Research Centre at City University, who awarded him an honorary DSc in 2009. He was awarded the Skempton Medal by the BGA in 2009 for his sustained contribution to the practice of geotechnical engineering in 2009.

Areas worked
UK, North Sea, Norway, Poland, Spain, Italy, Greece, Ukraine, Middle East, Malaysia, Hong Kong, China, Pakistan, India. Iraq, Nigeria.

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Previous experience
On graduation Dr St John worked for 12 years for the Building Research Establishment's Geotechnics Division. During this period he was engaged in applied research, principally concerning excavations in soft ground, foundations for offshore structures, and ocean disposal of hazardous waste. His PhD, based on field observations of ground movements around deep excavations, was undertaken whilst on secondment to Cambridge University.

He was also seconded to the Norwegian Geotechnical Institute in 1976 and British Petroleum in 1977, where he undertook a variety of research and project-oriented tasks related to offshore structures. In 1980 he became Section Head responsible for a number of projects on offshore geotechnics. These included the development of an offshore pressuremeter, research into the design of tension piles, and the initiation of a UK research programme into the deep sea disposal of nuclear waste.

In 1982 Dr St John joined Ove Arup & Partners and worked in their Hong Kong office as a senior geotechnical engineer. During this period he was responsible for a variety of geotechnical projects, including slope protection works, excavations in soil and rock, and foundation design for high-rise buildings and building on reclaimed land. He was also involved in advising departments of the Hong Kong Government on technical aspects in litigation and he carried out design of foundations and temporary works for a high-rise hotel in Shanghai.

Education/Research
PhD, Cambridge University, 1975
BSc (1st Class), University College, London, 1970

Service on Technical/Professional Bodies
Chairman of the British Geotechnical Society, 1995 - 1997
Chairman of the *"Ground Engineering"* Editorial Advisory Panel

Year of Birth
1949

APPENDIX B

RESPONSE TO STARK ASSOCIATES COMMENTS ON REPORTS (REV A)

29 NEW END HAMPSTEAD LONDON NW3 1JD

Comments on Reports (Rev A)

	NEIGHBOURS' CONSULTANTS' COMMENTS ON DEVELOPERS BASEMENT PROPOSALS AS INTERPRETED BY STARK ASSOCIATES MICHAEL ELDRED/MICHAEL DE FREITAS REPORTS 31ST JAN 2012/24 AND NOVEMBER 2011 – KEY POINTS (to be read in conjunction with actual reports by Michael Eldred/Michael de Freitas) (Also includes comments by Stark Associates)	CAMDEN COUNCIL'S CONSULTANTS COMMENTS ON DEVELOPER'S BASEMENT PROPOSALS AS INTERPRETED BY STARK ASSOCIATES RKD CONSULTANTS /CGL CONSULTANTS REPORTS 27 SEPTEMBER 2012/DECEMBER 12 (to be read in conjunction with actual reports of RKD Consultants/CGL Consultants)	NEIGHBOURS' CONSULTANT'S REVIEW OF COMMENTS STARK ASSOCIATES COMMENTARY	IMPACT/ IMPORTANCE
Existing Condition				
1	No information about the age and construction of Christchurch passage, the retaining wall and the existing retaining walls to the east has been provided.	RKD fails to take account of the absence of such information and/or inadequate information provided when considering movement, damage and monitoring at item 4.7.3 and 4.7.4	The absent information is very important to have in order to cater for the short and long term stability of these areas.	A
2	No information on the construction and the purpose of the brick buttressing to the wall with Christ Church and Lawn House. No design check on these walls.	RKD fails to take account of the absence of such information and/or inadequate information provided when considering movement, damage and monitoring at item 4.7.3 and 4.7.4.	The provision of this information and carrying out of the design check are very important for the short and long term stability of these buildings and structures.	A
TWS response: The construction of the Christchurch passage boundary wall has been investigated by trial pits TH1, TH1-a, TH2 and TH3 locations as shown on TWS drawing 8082/SI-01 rev B and results shown in MRH report of July 2010, appendix H in the BIA of May 2012. This drawing was subsequently revised recording borehole water levels and an additional trial hole to the original Lawn House buttress trial holes current rev. E. The relationship between the levels on the east and west sides of the boundary wall varies as shown in the sections on original TWS drawing 8082/PW2A (May 2012) updated rev. B in April 2013 to show a realignment of the pile cap away from the boundary wall. The level and principle extent of the piling mat is shown on TWS construction drawing series 80782/CSW01-12 and the sensitivity of Christchurch Passage, as well as the other boundary walls, is known and as is usual the performance methodology for probing of obstructions, allowance for their removal, temporary propping in the event of a longer than expected excavation due to archaeological log and effect of the specific characteristics of the contractor's chosen plant set out in the relevant specification and subject to scrutiny and approval via the Party Wall Award process which covers boundary and party walls and in this proposal also structures within 6m of the excavation. The buttresses to the wall of Lawn House were investigated and are shown, together with the realigned piling line, on TWS drawing 8082/PW01F in the BIA addendum of 29.4.13. The northernmost pair of buttresses are clear of the piling line and excavation for associated pile cap. There is adequate room for a better working space, the need for, type and extent of temporary works to form the pile cap will be subject to incorporation in the Party Wall Award. The southernmost buttress to Lawn House will need to be cut back and its temporary stability during the construction works will be directly affected by the chosen methodology and will be addressed under the Party Wall Award in the same manner as Christchurch Passage. The long term stability of the Christchurch Passage and Lawn House buttresses is achieved through the reduction of loadings due to the development for Christchurch passage, no change for the northern pair of Lawn House buttresses and the construction of the stair walls adjacent to the southernmost Lawn House buttress although it is not excluded that a separate construction could be used by mutual agreement.			

3	No foundation or superstructure details of the adjacent buildings, Christ Church, Lawn House, Carnegie House and Christ Church Cottage nor of existing retaining walls, garden walls, buttresses and paths.	RKD fails to take account of the absence of such information and/or inadequate information provided when considering movement, damage and monitoring at item 4.7.3 and 4.7.4	Provision of such information is very important to safeguard the short and long term stability of these buildings and structures. Arup in their adjudication of another site at 16A Lyndhurst Gardens NW3 state that "the details of existing buildings are important". It is even more important here given that there are Grade II listed properties in close proximity and all around.	A
TWS response: The principle of the proposed basement design is to constrain the ground underlying the foundations of the existing buildings by not undermining them with the pile cap as shown on TWS sectional drawings 8082/PW01C and 02A in the BIA of May 2012 and updated revisions PW01F and 02B in the BIA addendum of April 2013 and by the construction methodology described therein. Conservative movement assessments have been made at ground level by geotechnical specialist GCG based on shallow foundations that may be expected resulting in "very slight" to "slight cracking". Stark Associates and Arup's comment on another site is superseded by Arup's comments on this specific site and in particular that the BIA is acceptable.				
4	According to British Geological Maps the highest natural deposit is Bagshot sand but the depth of the contouring of the material has not been provided. No desk top study information provided.	RKD agree that this has not been provided.	There is no reason why this information cannot be furnished prior to the planning application being considered. Once this information is available, it may have an impact on the design, dewatering of the area and the proposed construction.	B
GCG response The comments relate largely to the lack of detailed information. Regarding ground and groundwater the main concerns seem to be that there is not a clear understanding of what the conditions actually are. In the reports provided all available sources of information have been reviewed in order to get a broad picture of the geology and the hydrology. This is, in fact, the desk top study that it is suggested has not been carried out. The information from the site specific boreholes has been used to confirm what the local conditions are. This information is sufficient to be able to characterise the conditions and carry out calculations sufficient for Planning purposes pending further investigation particularly with regard to the control of ground water.				

5	Concern with the method of construction of the piles and capping beam along Christ Church passage.	RKD have not commented on this adequately.	The absence of information on the method of construction will affect the buildability of the scheme and stability of this and the adjacent areas.	A
TWS response: In the presumed absence of any archaeological features to be preserved and retained and by agreement through the vehicle of the Party Wall Award, the precise location of the pile line will be determined by the width of wall foundation that may be retained with associated temporary works (a sound attenuation hoarding will also be required) and the distance away from the wall achievable by the specific piling rig used on site. The final line of the piles will provide permanent support to the boundary wall.				
6	Concerns expressed about the top of the piled wall besides Lawn House. Its height means that the methods of propping will not support the wall adequately and will allow excessive movement.	Nothing provided - RKD have not commented save that they consider that further investigation works are desirable.	This issue will affect the buildability of the scheme and stability of the adjacent Grade II listed house, Grade II garden wall and buttressing. The further investigation works should be carried out prior to consideration of the planning application. The developer has submitted an addendum report dated April 2013 and is proposing to relocate the secant piled wall in this location. Precise details of the secant piled wall is not known. There is no evaluation of the effect on risk to the Grade II listed property and garden wall. Further investigations and analysis are required.	B
TWS response: The pile line was amended as shown in BIA addendum April 2013, increasing the distance between the piles and Lawn House. This reduces the potential impact on Lawn House slightly but not so much as to require a re-analysis of the assessments and calculations carried out in Appendices E-G in the BIA May 2012 at planning stage.				
7	The ground water level has been agreed to be at about 6m below ground level. Concerns have been raised as to whether this is the true ground water level or whether this is perched water.	RKD have not commented.	Further site investigations are required to evaluate this. Why has this not been done by now? The outcome of such investigations may affect the soil results. Such investigation results will also have a bearing on the build, design and likely damage to the adjoining properties.	A
GCG response. . As with 4 above, this information is sufficient to be able to characterise the conditions and carry out calculations sufficient for Planning purposes pending further investigation particularly with regard to the control of ground water				

8	No allowance has been made for the underground rivers/spring lines which are known to exist. No investigations have been carried out.	RKD have not commented.	The developer acknowledges that underground water courses exist but makes no attempt to try to find out where they might be or whether they run through the site. At the very least precautions should be adopted in case rivers/springs are discovered to be running through the site. This issue must not simply be ignored as it has been.	A
GCG response. There is no evidence that this is the case. There are numerous springs around this area and they are associated with the geological conditions. They occur principally at or just above where clay horizons sit below sands and gravels. On this side of the hill the spring line is well below the level of the proposed basement and it would be extremely unlikely were there to be any streams near the surface. If there were, because of the number of local buildings it is something that would have been reported in the past. We have been unable to find such reports.				
B. construction				
9	Concern has been raised with the proposed propping system that is likely to cause lateral movement, twist and/or settlement.	RKD agree. They believe that additional work is required.	If such additional work is not carried out correctly, the risk of damage to the neighbouring properties will increase. This must be looked at again and addressed now.	B
TWS response: The propping scheme proposed at planning is one based on the planning submission. The final propping scheme must be specifically tailored not just on what is below it but also what is above and take into account all aspects of the detailed proposal including the results of additional site investigation/exploration works in order to arrive at a 3D model that is as representative as reasonably possible of the final conditions and to provide a higher precision in orders of loads that will ensure, in conjunction with the use of hydraulic props and very careful monitoring, the adequate balance of forces across the excavation in its temporary phases and also in the final, permanent condition. GCG response. Concern has been expressed about the appropriateness of the propping system to control movement. The support system is complex and comprises a number of elements: - the bored pile walls themselves which transfer loads deeper into the ground by virtue of both their bending stiffness when pushed from behind and the stiffness in the plane of the wall. - the temporary soil berms left in place in front of the walls. - the props themselves which bear against capping beams and waling beams designed to transmit the support they provide between the piles. - the raft slab used largely as a means of transmitting load from one side of the excavation to the other. The precise suit of measures to be employed will of course be detailed in t emergent design. The interaction between these different elements can only be finally determined by setting up a model of the entire system within the ground and simulating the construction process. It will need to be done with the contractor appointed to design and construct the basement and will inevitable result in having to modify the detail of the proposed support system, if only in minor way, to find what is both practical and effective. As explained above this is far too detailed an analysis to undertake at this stage of the design. At this stage the appropriateness of the system to control movements can only be judged on the basis of some simplifications and assumptions which enable straightforward calculations to be done together an understanding of how the support system is likely to work based on experience.				

10	Only 6 trial holes have been excavated and 3 boreholes.	RKD do not recognise that the investigations carried out do not provide adequate information on the existing foundations and ground immediately below.	Trial holes do not prove foundations adequately. The foundations have not been proved to any of the neighbouring buildings nor structures, walls nor buttresses (work apparently stopped because listed building consent was required). This is critical. If this is not carried out adequately, the risk of damage to the neighbouring properties will increase. You cannot predict accurately settlement or risk of damage without proving foundations. A design check on the existing conditions is required as a good starting point but this has not been done.	B

GCG response. See 4 above – repeated here.

The comments relate largely to the lack of detailed information. Regarding ground and groundwater the main concerns seem to be that there is not a clear understanding of what the conditions actually are. In the reports provided all available sources of information have been reviewed in order to get a broad picture of the geology and the hydrology. This is, in fact, the desk top study that it is suggested has not been carried out. The information from the site specific boreholes has been used to confirm what the local conditions are. This information is sufficient to be able to characterise the conditions and carry out calculations sufficient for Planning purposes pending further investigation particularly with regard to the control of ground water

11	Updated water monitoring results are required. Concern expressed about the method of monitoring, water levels and movement. Concerns also raised about the direction of flow. It has not been possible for the developer to reach any conclusions due to the deficiency of information gathering.	RKD agree that water may be flowing north east to south east. RKD express concern with water flow through the contiguous piled walls, harvesting of water, SUDS and the final drainage system.	Water monitoring results are only available up to October 2012. Why is this? Why is there a gap between readings and missing results? The latest results are required. Clearly monitoring of the results has not been taken seriously. See attached photo of the overgrown site. Clearly nobody has been on site to monitor the water for some considerable time. This is likely to have a serious effect on the accuracy of the results available, increase the risk of damage to neighbouring properties and affect buildability. There is a difference of opinion on the flow of water. It has been agreed that it could be north-east to south-west. This alters the calculations produced by the developer who should always take the worst case scenario into account. No account for any underground rivers/springs that may be encountered has been allowed for.	B

GCG response. . Concerns have been expressed about the lack of data on ground water and the understanding of where water is flowing. Experience at Witanhurst and 5 Cannon Lane where the geological conditions also comprise Bagshot Beds over the Claygate member and London Clay has taught us that ground water flow is complex, although not difficult in principle. It is affected by local changes in lithology within each of the strata which make it difficult to predict detailed flow patterns. At 5 Cannon Lane pumping tests were carried out and measurements of water levels made both before and during the basement construction. Wells were used to control ground water pressures during construction and it was planned to have a permanent system to reduce water pressures in the long term should it prove necessary. However, the latter proved to be unnecessary because the flow rates were very low and there was no significant effect of the construction on the water levels. It will be necessary to undertake similar pumping tests at the New End site so that the groundwater control systems can be properly designed. These will enable a model of the groundwater flow to be set up and the effects of the proposed changes to be evaluated.

The opinions expressed by WJ Groundwater are based on the above local knowledge, and as with the issues about ground movements, until further investigations are carried out, the final detail of the groundwater control system cannot be worked out.

12	Concerns expressed about site investigations and how the SPT tests were carried out on site. Works may not be in accordance with British Standard. Contaminated samples taken from site will lead to misinterpretation of the soil material on site. Very limited laboratory testing.	RKD report at item 4.4 agree "available evidence is far from perfect". A better specified SI would have given a more robust conclusion" . RKD recommended that a cautious estimate of design soil strengths is used. RKD have expressed strong doubts about the use of a contiguous piled wall and gaps between. RKD have also expressed concern with the proposed sheet piling and the method of piling. There is no measurement of soil permeability.	Testing and accurate information on the soil are fundamental to the whole design stage and if not correctly assessed or inaccurate the whole design proposal may be wrong. This could cause greater damage to the neighbouring properties. The developer has largely ignored the concerns raised. The developer has failed to deal with the other issues raised.	A
GCG response. There is a suggestion that the site investigation results obtained to date are suspect and lacking in detail and, as a result, the possible effect of construction on the neighbouring properties may not be accurate. It is suggested by Dr de Freitas that the methods of investigation were inappropriate and the information insufficient. Neither suggestion has any foundation. The three borings undertaken were carried out in accordance with normal practice and showed consistent results. The principal tests carried out to assess the ground properties were Standard Penetration Tests (SPTs) supplemented by limited laboratory tests to determine some of the mechanical properties. This is standard practice in what are predominantly granular soils. The SPT results can be used, as described in the RKD report, to derive soil strength parameters based on empirical correlations, as can the soil stiffness. Again, this is standard practice and perfectly adequate for use at this early stage of a project. As RKD say, the soil parameters actually used in the analyses that have been done, are conservative, i.e. they are, appropriately, a cautious estimate. The RKD and CGL reports needs to be read in their entirety. CGL agree that that the proposals for dealing with groundwater are acceptable. As stated above, there will be further investigation which will include the determination of permeability.				

13	De-watering of the site will be required to enable construction. Concerns have been expressed about pumping of water which might cause loss of fines and settlement of foundations. Water loss unlikely to be uniform which would cause a greater risk of settlement and damage to neighbouring buildings and structures. Discharge of water into the drainage system has not been agreed nor is it permitted but no alternatives have been provided.	RKD have not dealt with this fully. They have expressed concern with the SUDS and harvesting which have not been thought through.	The developer does not have approval from the Environmental Agency/Thames Water to discharge water into the drainage system. If approval is not forthcoming the whole proposal will be compromised. It is important that this is dealt with prior to planning permission being considered. The developer has not dealt with SUDS nor harvesting the water. Dewatering will result in a loss of ground water and fines from soil below the neighbouring properties and structures. This is unlikely to be uniform which may cause differential settlement. This is made worse because the developer does not know what the foundations are to the adjacent buildings/structures, the recording of ground water levels is suspect and the soil has not been adequately analysed. No contamination testing has been carried out which could effect the site and also the surrounding area. This is also a H&S .matter.	A

			All of this must be dealt with prior to considering the application for planning permission.	
TWS response: SUDS: In Sec. 5.0 of BIA addendum September 2012 the basic statement in Sec. 7.0 of the BIA May 2012 is clarified to explain the absence of a detailed SUDS design. In addition in Appendix B of BIA addendum September 2012 a diagrammatic representation of the proposed horizontal and vertical wall connection detail is given which will allow infiltration of the rainwater otherwise precluded from natural infiltration by the basement construction. Post-planning the partial demolition of the external areas will enable appropriate plant to gain access and permeability tests may be carried out to enable a design to take place.				
14	Water will collect behind the basement wall. Concerns have been expressed with the permanent solution i.e. controlling the flow of water, flooding down stream, where will the water be taken, blockages (pressure) and maintenance of the system. What about rivers/springs running in the ground, rerouting of below ground water courses?	RKD report at item 4.1 (3) agrees that this information has not been provided. Water will rise behind the wall up to 1m. RKD confirm that permeability is not known and they recommend that this is calculated. This is required for the detailed design of the drainage system.	This is key to the whole water management system. This could have a significant effect not only on the development but also the area and other properties close in the vicinity. A rise of water level of up to 1m to building close by is significant. No information about the run-off into the drainage system nor harvesting has been provided. No allowance for underground rivers/springs has been mentioned. Should the developer wish to discharge into Thames Water system their authorization will be required. This has not been dealt with. None of these issues have been dealt with adequately.	B
TWS response: The permanent solution to ground water and surface water management is part of the final design and specialist consultant WJ Groundwater Ltd's report in Appendix E of the BIA of May 2012 under point 6 Conclusions assesses the rise in groundwater behind the secant wall as "…modest (almost certainly less than 1m) because groundwater can flow around the basement". TWS drawing 8082/TM02 rev C included as Fig. 10 in geotechnical specialist consultant GCG's report in Appendix E of BIA May 2012 shows the proposed permanent drainage system behind and under the structure to allow re-establishment of natural groundwater flow downslope and prevent the potential effects of water pressure on adjacent structures. This is the principle and will be subject to a final design. The application for connection to utility company services is part of the final design.				
C. Ground Conditions and Report				
15	No survey of services to/from nor on the site has been carried out. No desk top studies nor documentation of any sort has been provided No reference to a tunnel from New End Theatre to the hospital.	No comment. RKD agree that this has not been provided.	It is unclear why this has not been done. Information required.	B

This is for TWS				
16	Ground related risks have not been highlighted for design, damage to neighbours etc.	No comment	This is important but with suspect SI results this analysis may not be accurate and the risks to the neighbouring properties may not have been postulated realistically. Ground movement/settlement and crack contouring has not been provided. This is an important reason for the BIA.	B
TWS response: Ground related risks have been highlighted and assessed in the BIA May 2012 and Appendix F "Assessment of the effects of the proposed basement construction on the adjoining properties May 2012" and ground movement contours are given in BIA addendum September 2012 Appendix A "Supplementary Note on Ground Movement and Damage". It is not possible (or normal) to undertake crack contouring.				

17	Not significant mention of further works being required.	No comment	The developer alludes to additional works being required but this is not clearly set out. Such setting out must be done and agreed prior to the planning application being considered. If this work can it should be carried out now before the planning application is heard so why hasn't it been? To do it later when it could affect neighbouring properties only rewards failure.	B

TWS response: Further works post-planning are always required in order to arrive at a final design. For the purposes of planning the BIA is adequate. Post-planning works will include further site investigations such as soil permeability tests, final design, monitoring regimes, etc. Such works are involved, extensive, costly and potentially abortive should the proposed scheme be amended at planning stage. They also represent the final design.

GCG response: The scope of the investigation work that has been done to date has been limited necessarily because of the difficulty of gaining access to the site while the existing building is still in place. Access can only be gained from New End and there is limited width around the sides of the building. Equipment cannot be lifted over the exiting building to obtain access to the rear of the site. It is the top end of the site which it is most important to carry out the investigation as this is where the retained height of the basement is greatest. Once the existing building has been demolished and the site cleared these constraints will be removed. Further investigations can then be done. The investigations to date have been sufficient to determine broadly the geological and groundwater conditions and the likely ground properties so that the initial calculations can be carried out.

The Rule 6(6) parties state that the developer has not clearly set out what further investigation work will be required and ask why such investigation could not be carried out now. The reports refer to the need for additional investigation, particularly with respect to the acquisition of further information on ground water flow. Such investigations will require the installation of a number of additional boreholes at least one of which will be used as a well and others to observe changes in ground water level whilst pumping is being carried out. In-situ testing and sampling will be carried out while these are being done in order to provide further details of the variation of ground conditions across the site. This all forms part of the final design and the details will be decided once the project proceeds. It would be impractical to try and do all this investigation now, as explained above.

18	No contamination testing carried out. Minimum desk top study.	No comment.	A detailed site investigation and testing are required, not just a desk top study. This at the very least is a health and safety risk. This may affect any proposed works on site. Re-routing of ground water which may be contaminated will affect the neighbours including schools.	B

TWS response: Contamination is not a particular requirement of a BIA and contamination testing is taken with relevance to the contaminants likely to be present and their pathway to receptors. There is no evident reason to pre-suppose contamination of the site and a desk top study with control tests for the purposes of disposal of excavated material is likely to be the sole requirement as part of post-planning works.

D Ground Water /Hydrogeology

19	Seasonal path of water not dealt although the seasonal path of water can cause loss of ground and through this raise the risk of damage to adjacent buildings	No comment.	The developer has not dealt with this at all.	B
GCG/ response: The Rule 6(6) parties raise a number of issues concerning the current scarcity of information on groundwater flow. Information has been collected which has shown that there is little variation of ground water levels seasonally. The reasons for this is likely to be that there is limited infiltration above the site and that, as at 5 Cannon Lane the flow of water down the slope is a function of the relatively low permeabilities and the presence of intermittent layers of more clayey layers within the predominantly sandy soils. This will become more apparent when the detailed studies have been carried out. Reference is made to the seasonal path of water causing loss of ground ' thus raising the risk of damage to adjacent buildings'. This is pure conjecture and raises the question of why this would not be happening anyway. The whole idea of the proposed method of dealing with the groundwater flow across the site is to avoid significant increases in flow velocities that would be likely to cause increased internal erosion. The detail of the groundwater control measures cannot be determined until further investigation has been carried out.				
20	No assessment of water pressure and heave on the design.	No comment.	The developer has not dealt with this at all.	B
TWS response: The geology and groundwater conditions of the site confirms that potential heave is not a major factor in either the design of the basement or the effect on the surroundings. See also comments on 38.				
21	Updated results and further monitoring required for logging of water levels.	No comment.	See item 11 above. Cross reference to weather conditions/seasons and ground water flow.	B
GCG See previous responses.				
E. Slope Stability				
22	Slope stability check is required in temporary condition. What is the embedment length of the piles?	No comment.	Pile embedment depth should be designed and clearly shown. A slope stability check has not been carried out yet. Clay content noted to soil.	B

GCG response: We have carried out a stability check for the global slope failure, i.e., were excavation to reduce the load on the slope, the entire slope could move. In such an analysis it is assumed that the individual walls are propped internally against each other. The calculations for individual retaining walls (using WALLAP) also carry out stability checks for the walls at different stage. In all cases the factors of safety were adequate. In all cases the calculations assume that the excavation is a infinitely long trench, which is far from reality as additional resistance is gained from sides of the basement excavation.

Comments made about the lack of slope stability checks are unjustifie

TWS response: A slope stability check in the temporary condition was carried out in BIA May 2012 Appendix G "Structural calculations including …. summary of slope stability analysis …" The embedment length of the piles is subject to full design, an assumed length of 4.5m is shown in the calculations.

23	No assessment of the out of balance forces on the basement design and the ground level differences, surcharges etc.	No comment.	This has not been carried out yet. It can and should be though.	B

TWS response: Out of balance forces are addressed in the BIA May 2012 Appendix G "Structural calculations including … summary of preliminary retaining wall analysis …" and the incremental propping procedure shown diagrammatically as well. The out of balance forces will be taken to lowermost basement slab section cast early for that purpose. The interaction of the forces, both active and passive, in the temporary phases is complex and the calculations and propping shown reflect the principle. The slab and props will be designed to transfer the forces arising out of confirmation of the proposed development post-planning, together with any pertinent results from further site investigation This is correct. However, it is misleading to express it in this way. As explained under the general comments above, the forces are not out of balance. They have to be balanced. The stresses against the backs of the walls change as the walls move relative to their initial position, dropping as they move inwards towards the excavation and increasing if they are pushed into the ground. This process can, and will, be modelled, but it is complex. The important thing at this stage is to define a scheme which ensures that suitable support is provided at all stages of the construction process to control ground movements.

F. Foundations of Existing Buildings/ Basements				
24	The foundations to the adjacent buildings and structures have not been fully investigated	See items 1-3 above.	See items 1-3 above. Further works are required.	A
25	No damage assessment to the adjacent properties and garden walls/paths which may be founded in the hardcore/over-site material has been undertaken.	No comment.	Not done but should be. See items 1-3 above to firstly obtain information on their construction and foundations.	A

GCG response: It is stated in the comments that there has been insufficient investigation of the foundations of the existing buildings and that no assessment has been done of the potential damage to adjacent garden walls and paths.

It is true to say that exhaustive investigations have not been carried out. Such investigations as have been done have been confined to the site for obvious reasons. Further investigations will be carried out during Party Wall negotiations if it is deemed appropriate. Having said that, it is only in very limited cases where the foundations of nearby structures are relavent to their performance during the process of the works. Where open excavations are to take place near to a foundation such checks need to be done. If a robust retaining wall is to be installed before any excavation takes place, then once it is in, movements of the ground are controlled by controlling the movement of the wall. The adjacent foundations may move with the ground, but not because of any reduction in the ability of the ground or the structure to support them. The important issue remains ensuring that the new retaining wall is installed carefully.

In the case of the garden wall to the west and the retaining wall on the west side of Christchurch Passage these will only move with the ground. In the latter case it is possible that the top of the new retaining wall will be pushed back (to the east) by a few millimetres and that the old wall will be pushed with it. This is not likely to affect its stability regardless of what it is founded on. However, this will be checked during the final design.

Ground Support around the site				
26	Concerns expressed with the method of support and its adequacy.	RKD report indicate that further work is required.	We agree that the developer still needs to consider this. It will impact upon the risk of damage to the neighbouring properties. This should be dealt with now.	A

27	No remedial works/strengthening of the existing adjacent buildings have been considered nor are proposed.	No comment.	Not dealt with and still outstanding.	B
TWS response: These items are addressed in point 1-3 and 16 above. GCG response: Concern about the details of relating to the garden walls is expressed again under this heading. I repeat my comments above.				
28	Not adequate details nor design of the existing garden walls/retaining walls are given.	RKD agree.	This is outstanding but is a factor which has an impact on stability and damage. The properties and their walls are Grade II listed. The developer should deal with this prior to consideration for grant of planning permission.	A
TWS response: The proposed development's external works and landscaping are subject to planning approval and final design. It is difficult to see how such can be addressed as part of the BIA. GCG response: Most of these concerns are actually about the walls to the east of Lawn House. This matter was addressed in the supplementary reports. This was mainly a concern when the bored pile wall was shown to be closer to the boundary. It was subsequently moved away from the boundary (after the Eldred and First Steps had been issued) and the new proposals were accepted as reasonable by RKD.				
H. Construction Sequence				
29	Surface drainage, SUDs and harvesting details have not been adequately dealt with	RKD report agrees that this has not been dealt with	This should be fully dealt with prior to the planning application being considered. Thames Water approval is required.	
TWS response: This item is addressed in point 13 above.				
30	General concerns with the construction proposal	RKD only touch on this issue.	The neighbours consultants raised numerous concerns which have not been answered. This is a specialist area and Camden should instruct as part of the independent assessment team a specialist with specific knowledge and experience of construction to review and report on this. This should also include the disposal of material from the site which will create major problems for the area. This is a buildability issue and raises the potential of damage to the neighbouring properties.	B
TWS response: The general concerns with the construction proposed are presumably other to those raised under other points, in which case they are presumed to refer to the Construction Traffic Management Plan in Appendix J of the BIA May 2012. Specialist consultant TTP Consulting is addressing points raised by LBC in this regard.				

31	The developer's intention to prop and monitor movement is questionable. It does not take into account the likely different constructions of the adjacent buildings, differences with their foundations or different forces that will be set up.	No comment.	This will affect the buildability of the scheme and importantly the stability of the adjacent buildings. The developer indicates that he will adjust the temporary propping as necessary but if he does not know what the construction of the various buildings is how can he do this effectively? This is another reason that further detailed investigations are required.	B
GCG response: There are concerns that the proposals do not take into account the nature of the surroundings (both in terms of the different structures and the changes in ground leve)l. I have explained above that it is not the intention that the developer will just build what is described and hope that everything will be OK provided that the work is monitored. There is much work to be done to complete a detailed design which will take into account the above factors. It will still be necessary to monitor the ground (and the water) carefully at all stages and have proposals in place for changes in the construction procedure should movements be larger than expected.				
I. Damage Assessment				
32	There will be a significant difference between the proposed development foundation depth/basement level and the adjacent buildings and structures.	Not commented on. In fact RKD at item 4.7.2 think that the submission is appropriate but they fail to consider the different buildings and structures surrounding the site.	This remains outstanding.	B
TWS response: This is addressed in point 3 above.				
33	Pile design required and deflection design required. What is the embedment length? What is the drainage proposal from behind the piled walls?	RKD agree that the pile design is outstanding and as well as the drainage detail through the piled walls.	This could affect the scheme and increase risk of damage to the neighbouring properties. As such, it should be dealt with prior to the planning application being considered for grant. How useful were the site investigation testing results?	B
TWS response: This is addressed in point 22 above. GCG response: The WALLAP analyses included in the documentation give the pile structural loads and the estimated deflections. The pile sizes are based on this output and the estimated ground movements are based partly on the wall deflections.				

34	Clarification of the construction along the boundaries.		Further work is required.	B
TWS response: This is addressed in points 1-3 above.				
35	Show profiles of ground movement for worst case conditions with all adjacent buildings and structures Show the profiles and how these have been used to carry out the damage assessment.	RKD agree at item 4.1 (4) that this has not been provided.	Further work is required.	B

TWS response: This is addressed in point 16 above.

GCG response: : There are a number of comments that have been made about the assessments of damage that have been made. These can be divided up into two categories, firstly how the assessments were made, and secondly the basis on which the movements have been estimated.

The process of damage assessment has been described in the GCG report. The main sources of movement that might affect the adjacent structures are the installation of the bored pile walls and the process of excavation. See comments below on long term conditions. The assessments have been carried out using the methodology generally described as the 'Burland' method. For structures where estimated movements are small (less than 5 mm) it is judged that there is no need to undertake such an assessment as it is clear that damage is likely to be very limited. Although under these circumstances it is very possible that there will be no damage at all, even small movements can have an effect on a structure which may be almost at the point of cracking in its current condition. It is therefore appropriate to categorise such buildings as possibly experiencing 'negligible' damage.

The only structure which is more vulnerable is Lawn House. This has been carefully considered using conservative estimates of the possible differential settlement across the building and the axial strain resulting from lateral movement. The objective was to demonstrate that the predicted damage lay within the 'slight' category which proved to be the case.

It is stated that there are limited examples of basements constructed in sand. It is certainly true to say that there are fewer case histories for sand than for predominantly clay soils. Much of the data reported in the CIRIA C580 report relates to basements which extend into the London Clay. It is often the case, however, that even these involve installing piles through the upper layers of made ground, alluvium and granular Terrace Deposits before the clay is reached. In the case of installing the piles for the walls it is normally the penetration of these that causes the largest movements local to the walls. Such local movements are the ones that have the potential to cause damage, not the movements that are seen at some distance from the wall. The recent experience locally at Witanhurst and 5 Cannon Lane is very important, particularly when assessing the likely effect of pile installation. These give confidence that the predicted movements are unlikely to be exceeded.

No matter what the predictions of movement are it will still be essential to take a cautious approach to controlling the effects of construction by using extensive monitoring. In the case of the effects of installation of the piles there is the opportunity to check what these might be, and if necessary to modify the construction process before the work is carried out near to existing buildings.

36	Provide full details of loading and the surcharge pressures used.	No comment.	Has a surcharge been used? Breakdown of the design loading is required.	B
GCG response: Surcharges were applied to the ground surface in the analyses as detailed in the calculations.				
37	Method of piling and use of rig near adjacent buildings requires clarification.	RKD have expressed concerns with the developer's proposals at 4.7.3 of their report	Very important and outstanding. A factor which may cause damage to the neighbouring properties.	A
TWS response: The method of piling used is most likely to be cased continuous flight auger and is a construction detail adequately considered within the scope of a BIA.				

38	No assessment of long term heave and settlement behind the wall and below ground slabs.	No comment.	Have the effects of heave/subsidence on the adjacent buildings and structures been fully considered when their construction and foundation are not fully understood?	A
GCG response: The issue of long term heave and settlement have been raised in the comments. Although vertical movements under the site will occur as the ground is unloaded and reloaded with the new structure and these will be accompanied by movements outside the basement these are unlikely to be significant in terms of potential damage as they are not likely to result in any distortional settlement or to any lateral movement outside the confines of the site. The effect of this has therefore not been considered. RKD found no reason to comment on this. It should be noted, however, that, when the detailed analyses are carried out these effects will form part of the analysis.				
39	An assessment of the long term movement on the existing/adjacent buildings must also be undertaken	No comment.	The investigation to determine the surrounding properties/structure construction and foundation is limited. The SI, soil test results and assessment of ground water may not reflect accurately the site conditions. This will lead to inaccuracies in any assessment of long term or short term movement.	A
GCG response: See above.				
40	Category of damage is based on a CIRIA report but examples are of works in sand rare. For the reasons set out the damage may be greater than currently assessed	No comment.	SI which is considered to be flawed. Calculations based on numerous variables including the method of construction, soil parameters characteristics. Damage likely to be greater. A further more realistic assessment is required.	A
GCG response. It is stated that there are limited examples of basements constructed in sand. It is certainly true to say that there are fewer case histories for sand than for predominantly clay soils. Much of the data reported in the CIRIA C580 report relates to basements which extend into the London Clay. It is often the case, however, that even these involve installing piles through the upper layers of made ground, alluvium and granular Terrace Deposits before the clay is reached. In the case of installing the piles for the walls it is normally the penetration of these that causes the largest movements local to the walls. Such local movements are the ones that have the potential to cause damage, not the movements that are seen at some distance from the wall. The recent experience locally at Witanhurst and 5 Cannon Lane is very important, particularly when assessing the likely effect of pile installation. These give confidence that the predicted movements are unlikely to be exceeded.				
J. Rail				
41	Assumption is that there are no rail tunnels or the like close by otherwise movement of the tunnel would have to be considered.	No comment.	This should be double-checked. Camden Council have a responsibility to ensure that this is not overlooked nor disregarded.	B
TWS response: This has not been overlooked by the Developer's Team or by inference, LBC. GCG response: We are well aware of all the rail tunnels in this area there are none that are relevant to this project.				
K. Inconsistencies in Drawings				

42	Drawings to be fully dimensioned	Outstanding.	This is important. This must be done prior to the planning application being considered for grant. This is a planning requirement and the application can be rejected as not being adequate. The absence of dimensioned drawings leads to confusion and ambiguity.	A
TWS response: BIA documentation needs to be adequately clear with sufficient detail for the assessment to be checked and not necessarily to be built, as the final design procedure to undergo will address this.				

The developer has submitted an addendum to the Basement Impact Assessment as follows:-

1.0 Addendum to the Basement Impact Assessment dated April 2013 from Taylor Whalley Spyra (TWS)

Item 2.04 of TWS report advises that the proposal is to realign the basement piles away from the foundation of the wall buttress adjacent to Lawn House. However the precise details of this revised setting out have not been provided. This information is required to provide any meaningful comment.

TWS response: See point ……. above.

Item 4.02 of TWS report refers to the excavation of trial pits and details of the buttress foundations. This information has not been provided. I am unable to verify the extent of the existing foundations and their level or their construction. I understand from the owner of Lawn House at 12 New End that the developer's builder tried to excavate the trial pits but that the local authority stopped them because this work requires listed building consent. I am unaware that the requisite consent was subsequently obtained or that the work was carried out. This information is required. I await the developer's further advice on this.

Item 4.03 of TWS report refers to a second trial pit. See item 4.02 above. No information is available.

TWS response: See point 4.00 above.

Item 4.05 of TWS report states that they do not have sufficient information and that further investigation may be required. The purpose of the BIA is to carry out the investigations now prior to the consideration of the planning application for grant. There is no reason why it should not be fully investigated now. This is likely to have a serious effect on possible damage to the Grade II listed building and the Grade II listed garden wall which are both very close by. It should not be ignored and/or left to a later date.

TWS response: See point ……. above.

Item 4.06 of TWS report refers to temporary support. It also refers to calculations. This information was not available in the addendum report.

TWS response: This refers to RKD review 24.10.12 which as detailed in point 4.01 of the TWS BIA addendum April 2013 became superseded by the realignment of the piled wall away from the buttresses. The retained relevance of the calculations is that the buttresses may exert a lateral loading close to the piled wall which will be taken into account in the final design.

Item 5.1 of TWS report states "realignment of the basement wall will <u>substantially</u> reduce the potential harm to the garden (boundary wall and buttress)". The writer fails to prove or quantify this.

TWS response: Realignment of the piled wall to a position where it is no longer directly underneath the northern part of buttresses to Lawn House "will substantially reduce the potential harm to the garden (boundary) wall and buttresses". In the writer's opinion this does not require proof. For clarity the qualification of the potential harm is confirmed in 5.1 as "very slight to slight".

Item 5.2 of TWS report confirms that the damage will be anything from 1mm-5mm. This is a wide variation. The foundations details to the wall and buttressing are not known (see items 2.04 and 4.02 above) and there is concern that the soil characteristics are not correct and that ground water levels are inaccurate. With this in mind, damage could well exceed 5mm which would not be acceptable. This is a Grade II listed house and wall and further detailed investigations calculations and details are required prior to consideration of the planning application.

TWS response: Confirms the BIA's assessment of potential for damage to be "very slight to slight". It is highly likely that any cracks that may develop will vary in width and the range describes this variation. Trial pitting for further information about the foundation details to the wall was prevented by LBC from being carried out and is now proposed to be carried out post-planning. This does not affect the adequacy of the BIA.

2.0 Geotechnical Consulting Group (GCG) addendum report dated April 2013

GCG confirms that the buttresses are not independent of the structure of the house. They refer to drawing NEN-PL-210. No dimensions nor setting out is provided. Further and better details are required.

GCG are of the opinion that there will be the same degree of movement as before so they have not recalculated the movement/settlement. However they advise that they do not know what the foundations to the garden wall, the buttresses or the house are or the loading area. They simply say that they suspect that they are close to the surface. How are they able to calculate movement/rotation or settlement of the buttress, the garden wall or the house so accurately without this information? Lawn House and the garden wall are Grade II listed. There is far too much risk here!

GCG statement in Para 6 is incorrect. The purpose of the buttress is to support the grade II listed garden wall if damage or settlement occurs to the buttress it will affect its ability to the support the wall. It is unclear what precisely the relationship is between the garden wall and the Lawn House is. This requires further investigation.

GCG suggest that there could be separation between the buttresses away from the wall due to the works. This would remove support away from the garden wall thereby defeating the whole purpose of the buttress i.e. to support the wall. This will increase the likelihood of damage to the Grade II listed wall.

GCG state that compression is less easy to predict. Where the Lawn House does not act as a support this will result in an increased risk of damage to the Grade II listed wall. In our opinion this has not been dealt with adequately.

GCG confirm that ground movements must be well controlled. It is unclear how this will be done especially when they do not know what the construction of the house and wall area is. Details should be provided.

GCG confirms there is potential for larger localised movement during the installation of the secant piled wall. Neither the writer nor TWS deals with this. On page 2 paragraph 9, GCG advise that "if the chosen methodology is not effective practical details of doing this would need to be sorted out on site". It is clear that this has not been adequately thought through and they simply want to shift it to the builder on site. This is not the objective of the BIA.

DP 27 clearly states that "The council will only permit basement or other underground development that does not cause harm to the built or natural environment". The developer has confirmed that they will cause damage but do not know the scale of that damage and should there be adverse impact once works start then the intention is for the builder to resolve this on site. Obviously this is not satisfactory as the harm must not be caused in the first place especially with no plan to redress ill-effects.

GCG response . The GCG report discusses how the ground movements that may occur could affect the buttresses, the listed wall and Lawn House. It does not attempt to assess damage to the listed wall which seems to be the main concern because the only likely detrimental effect of differential settlement that could occur is a slight rotation of the wall. The wall is not perfectly vertical as it stands and such a small rotation would be completely undetected visually. It is suggested that separation of the buttress from the wall would have a detrimental effect because it would reduce the support. This is illogical. If such separation occurred it would be because the wall does not need the support of the buttress.

No doubt it will be possible to look into the details of the construction in this particular area once the constraints currently imposed have been removed and some of the fears expressed by Stark Associates can be laid to rest.

Stephen Stark
From Afar Ltd T/as Stark Associates

Date: 27 June 2013

APPENDIX C

RULE 6(6) PARTIES' – STATEMENT OF CASE – DETAILED RESPONSE

C.01 The Rule 6(6) Parties' Statement of Case is set out in a document dated 20th August 2014 that summarises under Sec. 3.3(8) an objection to the proposed development for: *"In the absence of an acceptable BIA and robust Sec. 106 Agreement each required to be complaint with planning policies (e.g. DP23, DP27 and CPG4); critical demolition, construction, hydrological and engineering issues remain unresolved placing adjacent listed buildings and schools at risk of substantial harm."*

This is incorrect. The hazard of potential harm to adjacent structures has been assessed in the BIA in compliance with LBC requirements and found acceptable by LBC. The Rule 6(6) Parties are asking for final design details to be provided at the planning stage and some details are not at all applicable, e.g. investigations and allowances for underground rivers/springs. The BIA has been reviewed by independent specialists and found acceptable. Appropriate Conditions on the planning permission and/or S.106 obligations to carry forward the BIA to final design stage will merely be stating normal industry practice.

C.02 Sec. 4.6 of the Statement of Case states *"In May 2013, a further revision was necessarily undertaken in order to ensure retention of the buttresses supporting the Grade 2 listed wall ancillary to Lawn House (a Grade 2 listed building adjoining the site). Such revision followed the highly publicised threat of prosecution by Camden as a result of illegal groundworks by the Appellant (see Ham and High newspaper report dated 8th November 2012 at Attachment 2). On* (sic) *one respectable view, the above tends to suggest a developer, cavalier in attitude, who adopts a "salami slicing" approach to planning issues regarding this particular site."*

As stated in point 4.08 above, the "illegal groundworks" were nothing more than attempts by the appellant at shallow trial holes in specific locations in order to gain the further information mentioned in point 4.05 of the TWS BIA addendum of April 2013. This is not an unusual activity on a site and the appellation used in the Rule 6(6) Statement of Case is tendentious.

C.03 Section 6.20(4) of the Statement of Case states: *"The basement excavation will be the full width of the site, 13 metres into the steep hill, up to 3 levels and some 4-5 metres below ground water levels."*

The basement excavation is proposed across the majority of the width of the site and is set back from the boundary of Lawn House (over 2m at the closest point). The levels shown on TWS drawing 8082/CSW-11 rev. F show the ground level at the basement end at 119.500 and the top of the 600mm deep slab at 109.950 on 50mm blinding with drainage trenches below. The depth of the excavation proposed is therefore 10.200m (119.500-109.950+0.600+0.050) with local 500mm trenches, i.e. somewhat less than the 13m stated. The presence of groundwater above a basement slab is not in itself a bar to construction. The site is on a slope and the level of the groundwater relative to the level of the excavation

various from some 4.5 metres at the highest point to an expected less than zero at the front pavement area due to the absence of any evidence of groundwater found in trial holes within the New End basement and given the continuing slope of the local topography.

C.04 Section 6.35(2) of the Statement of Case states *"The BIA fails to include soil profiles necessary to evaluate risk to trees from demolition and construction. The RPZ (root protection zones) are significantly larger than the Appellant's original tree report significantly reducing the available space for demolition and construction."*

The soil profiles of trees to be retained are not included within the BIA as it was understood that trees within the site affected by the basement were known to be unfit for retention and the root profile of the beech on the other side of the boundary wall would be unknown until such time as exploratory shallow trenches were dug to confirm the effect of the wall foundations on the radial root spread. The appellant's arboriculturist confirms the actual rooting of the beech tree within the site as "de minimus" (Adam Hollis Proof of Evidence Section 5.11(3)).

C.05 Sec. 6.35(8) of the Statement of Case expands in Section 6.36-6.43 on the overview heading stated in Sec. 3.3(8) as to why the objectors do not find the BIA acceptable despite LBC, the competent body to determine acceptability of the BIA for planning purposes, confirming the BIA as acceptable.

C.06 Sec. 6.36 of the Statement of Case confirms that *"Developers are required to demonstrate by methodologies appropriate to the site that schemes will not harm the appearance or setting of the property or the established character of the surrounding area (DP27)."*

The methodologies set out in the BIA are acceptable to LBC and the appearance and setting out are dealt with by the Architectural submission.

C.07 Secs. 6.36 and 6.37 of the Statement of Case extract the LBC's general requirements for proposals containing basement and other underground development as taken from published documents DP27, DP27.3 and CPG4, 2.51 and 2.6 (please see Core Documents B3 and B7).

C.08 Sec. 6.38 of the Statement of Case suggests that the LBC has erred in assessing the BIA in the light of its own criteria and states *"The objectors remain of the view that the application has failed to meet the Council's own tests for basement construction, the purpose of which is to require that the proposed basement <u>will not</u> (not might not) cause harm to the built environment and local amenity."*

DP27.3 (please see Core Document B3) clarifies the concept of "harm" in the statement "The Council will assess whether any predicted damage to neighbouring properties from the development is acceptable or can be ameliorated by the developer." In conjunction with statement in CPG4 2.29 (please see Core Document B7), "The sides of excavation always

move to some extent no matter how they are supported. The movement will typically be both horizontal and vertical and will be influenced by the engineering properties of the ground, groundwater level and flow, the efficiency of the various support system (sic) employed during the underpinning and the efficiency or stiffness of any support frames used" and in CPG 2.30 "If the identified consequences are not acceptable, mitigation should be incorporated into the proposed scheme and the new net consequences determined. For example, where the predicted structural damage to the neighbouring property is identified as being greater than the Burland category of "slight" or where water ingress to neighbouring gardens or properties is predicted to be damaging to any residential amenity", it is clear that in terms of structural cracking "harm" is defined by those cracks being 5mm wide or greater. The Statement of Case appears to imply that "harm" is defined by zero risk of any movement, which is not the case.

C.09 Sec. 6.38(1) and (2) give figures for the area and number of basement levels. In itself the size of a proposed basement is not a deciding factor in the planning process.

C.10 Sec. 6.38(3) states *"The BIA is based on theoretical and incomplete calculations which run the risk of under-representing the nature and extent of structural damage that might be caused to the adjoining properties by the proposal."*

Calculations for proposed works are theoretical as is quite normal. The completeness of calculations depends on their purpose. There is no overlap between planning and building control jurisdiction. The purpose of the BIA is not to provide a level of completeness as relevant for Building Regulations submission, i.e. a final design, which while also theoretical until proven through a process of monitoring, will be complete – as is appropriate and necessary for construction details. The purpose of the BIA is to address the planning requirements by considering the principal impacts that a basement development may have and in accordance with DP27 (please see Core Document B3) include methodologies and supporting calculations as evidence that the development proposed will maintain the structural stability of the building and neighbouring properties. As shown in point C.08 above not only is structural stability to be maintained but any cracking is to be limited to "slight". Calculations provided by TWS are complete for the purposes of demonstrating this and therefore for planning and will be developed for the purpose of maintaining stability and limiting the potential for cracking to no more than 5mm during the detailed design phase as described in the BIA and as accepted by LBC.

C.11 Sec. 6.38(4) of the Statement of Case mentions *"three independent experts"* having *"identified in excess of 43 technical shortcomings."* That the experts are each independent is doubtful in particular as in Sec. 13 of his report ref. G1118-RP-01-02 one of the experts, Mr Eldred, confirms his close collaboration with another expert Dr. Michael de Freitas and there is an absence of information on Stark Associates, although this company may be run by Mr Stark who is a LBC Conservative Councillor and a Party Wall Surveyor.

Whether independent or not, the three reports are summed up in a document by Stark Associates with 42 numbered points and further comments which include/cover the four sub-points of this section. I respond to these comments in Appendix B to this document.

C.12 Sec. 6.38(5) and (6) report concerns as to the foundation stability of adjoining and nearby properties which are sensitive to movement. The BIA has identified the need for controlling movement and groundwater in this respect.

C.13 Sec.6.38(7) states *"The present BIA and Review(s) represent no more than a feasibility study whose shortcomings will only become apparent once demolition has taken place and excavation has begun."*

This is not the case, the BIA and the independent LBC Reviews are part of the core strategy and planning process as set out in detail – see Section 4.00 above and have been found satisfactory by LBC which is well experienced and well used to dealing with applications of this nature. The BIA May 2012 in Sec. 1.0 confirms "the information within this BIA in not the final design but is intended to demonstrate that each of the aspects of the design and construction have been carefully considered. All aspects will be subject to detailed design once planning is approved" and in Sec. 7.0 "Further detailed design will be undertaken to confirm the extent of all the building design stages to mitigate any possible movement and the effects on adjoining properties" and "Further detailed temporary design work will be undertaken to finalise the temporary works and agreed with all relevant parties." The use of hydraulic props to adjust to changing forces as excavation proceeds and multiple levels of waling are installed is not unusual but must be subject to a final design. The BIA does not ignore the presence of adjacent structures, the principle of the basement design is based on restricting movement during construction by maintaining support and lateral restraint to the nearby footings which is quite usual.

C.14 Sec. 6.39 of the Statement of Case states *"The Construction Management Plan fails to address the particular needs of the sensitive neighbourhood."*

The Construction Management Plan that was submitted in the BIA was a starting point to identify the scale and time requirements for the construction of the development proposed. It formed the basis for discussions between the appellant and LBC and parties concerned. The conclusion of the discussions, as noted in the Officer Committee Report Part 1 dated 13th June 2012 under points 6.70 – 6.76 was that a final CMP was recommended to be negotiated and agreed and secured via appropriate Conditions on the planning permission and/or S.106 obligations. It is not viable to produce a final CMP at planning stage since it cannot take into account the actual contractor's preferred method of working.

C.15 Sec. 7.0 of the Statement of Case proposes planning conditions set out in a draft Section 106 but then adds "This is predicated on the production of an acceptable BIA compliant with planning policies DP23, DP27 and CPG4." (please see Core Document B3 and B7).

LBC have confirmed the BIA is complicit with planning policies DP23 and DP27 and with planning guidance document CPG4 therefore it is presumed that the BIA's "acceptability" quoted above rests upon it being satisfactory in the eyes of The Rule 6(6) Parties. The criteria for assessing a BIA as satisfactory is not stated by The Rule 6(6) Parties but are presumably beyond those covered in DP23, DP27 and CPG4 and may refer to a final design. A final design is beyond the scope of the documents mentioned but would be adequately addressed by Planning Conditions and/or Sec 106 obligations.