2 & 3 AKENSIDE ROAD NW3 5BS

A geotechnical and structural assessment of basement planning applications 2015/0851/P and 2015/1207/P and their potential impact on 4 Akenside Road NW3 5BS

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Eldreds

Geotechnical ▪ Geoenvironmental ▪ Civil ▪Structural

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The brief

1. This report concerns planning application Planning applications 2015/0851/P and 2015/1207/P to Camden Council (Camden) which propose constructing basements below and to the rear of each of two semidetached houses at 2 and 3 Akenside Road NW3 5BS. I am instructed to advise Mr & Mrs M Wilson of 4 Akenside Road (the Client) of:

   (a) whether or not the application provides sufficient information to satisfy the engineering aspects of planning policy DP27 and

   (b) the probability that if permitted the proposed development will cause damage to their property.

Report summary

2. A conceptual model describing the current situation has been derived from the application and other documents described in the report. It is summarised as follows.

3. Nos. 2 to 5 Akenside Road are built on ground which slopes down from north to south in an area heavily affected by groundwater springs. Ground water flows south; that is to say from the general direction of 29 and 30 Lyndhurst Road and below the gardens of 2 and 3 Akenside Road to lower ground in 4 and 5 Akenside Road and beyond.

4. There is strong evidence that groundwater draining downhill into No 4 Akenside Road can rise to 0.5m below ground level and that, in the past, variations of groundwater level have had a destabilising ground subsidence effect upon No.4 which had to be remedied by partial underpinning.

5. There is strong evidence also that since the basements of 29 and 30 Lyndhurst Road were recently deepened and extended to the rear as a large sunken courtyard, the flow of groundwater has changed leaving the external amenities of No.4 significantly impaired and causing Mr and Mrs Wilson inconvenience and material expense.

6. Less certain but nonetheless material for the model is the possibility that repairs made in 4 and 5 Akenside Road in the last year, comprising adjustment to floor levels, window and door frame alignments, and internal crack repairs, are symptomatic of further structural movement.

7. There is no reliable information about ground conditions in 2 – 3 Akenside Road that affect engineering design of the proposed redevelopment, assessment of damage risk for neighbouring property and potential effect of the development on the groundwater regime, which is more complex than recognised by the application.

8. No.4 Akenside Road has thus already been materially impacted by recent development. That situation has not been recognised by the applicant for

redevelopment of 2 and 3 Akenside Road. But it is the situation into which it is proposed to introduce yet more potential impact upon No.4.

9. Engineers Halstead Associates propose that the external walls and internal party wall that are intended to remain should be underpinned to form reinforced concrete walls below the existing footings. Differing excavation depths are shown by the various documents but a minimum depth of 4m seems likely.

10. Allowing for construction thickness, the backs of the buildings are intended to extend outward by varying amounts up to approximately 6m beyond the existing façade. The excavation sides are shown to be supported by contiguous bored piles. The engineer requires the piles to be cantilevered vertically so as to avoid need of lateral support whilst the permanent reinforced concrete wall is constructed against them.

11. Open excavations for underpinning the existing walls would have to extend 2.5m below groundwater levels near spring lines in what is likely to be soft to firm ground. Such ground water levels were seen close the Nos. 3 and 4 boundary during excavation within No.4 and were recorded at 23 Wedderburn Road. There is a moderate to high probability that notwithstanding any sheeted support to the sides of the underpinning excavations ground loss capable of destabilising No.4 would occur during excavation and behind the sheeting. There would be no way of preventing that.

12. The cantilevered contiguous piled wall at the rear of the proposed development would need to extend about 12m below ground level. The wall would reduce the ground permeability by at least 75%. The effect of that would be to deflect groundwater that currently flows below Nos 2-3 Akenside Road towards No.4. That would exacerbate the recent unwarranted impact of development upon Nos 4 and 5 and further contravene the requirements of policy DP27. The risk of that happening could not be ameliorated should the proposed redevelopment of 2-3 Akenside Road be permitted.

13. A specialist ground movement and building damage assessment report contained within the BIA report refers to conventional methodology but has had to be based upon imagined ground conditions, and is subject to qualifications that are not consistent with the practical realities of the current conditions and construction features reasonably to be expected for the proposed development.

14. The application is technically fragmented, uncoordinated and fails by a significant margin to demonstrate that it satisfies the requirement of DP27. There is currently a significant risk that its construction would cause unacceptable damage to No.4 and possibly No.5 Akenside Road.

1 Introduction and purpose of report

15. Planning applications 2015/0851/P and 2015/1207/P to Camden Council (Camden) propose constructing basements below and to the rear of each of two semidetached houses at 2 and 3 Akenside Road NW3 5BS. I am instructed to advise Mr & Mrs M Wilson of 4 Akenside Road (the Client) of:

(a) whether or not the application provides sufficient information to satisfy the engineering aspects of planning policy DP27 and

(b) the probability that if permitted the proposed development will cause damage to their property.

16. I am Michael Eldred MSc. CEng. FIStructE MICE, Director of Eldred Geotechnics Ltd and a Consultant in the disciplines of Geotechnical, Geoenvironmental, Civil and Structural engineering. The assessment which follows is exclusively of matters falling within these disciplines. Dr Michael de Freitas has reported separately on geological and hydrogeological aspects of the proposals [1]. Some of the information acquired during research for this report serves to corroborate Dr de Freitas' findings, which in turn highlight matters that are material to engineering assessment.

2 Planning policy requirements

17. Camden Planning Policy DP27 states that the Council will only permit basement and other underground developments that do not cause harm to the built and natural environment and local amenity and do not result in flooding or ground instability. The Council will require developers to demonstrate by methods appropriate to the site that basement schemes:-

(a) Maintain the structural stability of the building and neighbouring properties.

(b) Avoid adversely affecting drainage and runoff or causing other damage to the water environment.

(c) Avoid cumulative impacts upon structural stability or the water environment in the local area.

18. The requirement to *demonstrate* compliance with these things is or should be of the utmost significance.

19. Camden policy guidance CPG4 [2] describes how applicants must undertake three stages of investigation, assess the results and use them in a 4th stage to show that the scheme satisfies DP27. In principle these four stages demand no more than the rational approach adopted by a reasonable human being who is desirous of undertaking any sort of project no matter how simple or complex. That is to say:-

1. Decide upon the project and consider what is known of the circumstances capable of affecting its success. (Screening)

2 Decide what other information is needed. (Scoping)

3. Enquire, investigate and consult with others having particular knowledge to fill gaps in the immediately available information; this sufficiently to engender a measure of confidence that the circumstances have been properly defined. (Site investigation and study)

4. Look carefully at what the results of 1 -3 mean for the plan, think about what might go wrong and do whatever is needed to offset the risk. (Impact assessment).

20. CPG4 and its charts constitute *guidance*, not a set of absolute rules; not a system of pass/fail charts that define the limits of investigation etc. needed. Those assisting applicants are expected to be competent in their fields and to extend and validate investigations as required by the circumstances.

3 Conceptual model

3.1 Requirement and process

21. The outcome of stage 3 of the CPG4 process should be a graphic or written statement that knits all of the information gained into a composite picture or model of the existing conditions. This should contain enough information to provide the base line from which to assess the potential impact of changes proposed. There is no model as such in the application; only four separate reports, one of which refers to two others by the same organisation, (which seem relevant but have not been provided), and all of which to some degree conflict with the provisions of the others.

22. Information extracted from these reports, visits to 4 Akenside Road and discussion with Mrs Wilson, postings on the Camden planning website for both these and other applications in the area, commercially available historical maps and Lidar DTS ground height data measured between 2005 and 2012 is given below and used both to construct a model and identify absence of material information.

3.2 Topography

23. Appended Figure 1 will assist the following description.

24. Akenside Road slopes down to the south east and both Lyndhurst and Wedderburn Roads rise from it in a north east direction. Ground surface levels in the area fall in an approximately southerly direction at a general gradient of 1 in 9.5 (6 degrees). From Lyndhurst Road, for about half the distance towards Wedderburn Road, the land was filled and ground levels were adjusted to create individual plots as the area was redeveloped for housing at the end of the 19th Century. There is now an approximately 1m drop between each of the four plots of Nos 2 to 5 Akenside Road.

The change at the boundary between Nos 3 and 4 occurs as a sharp step down to a surface level of 85mOD in No.4.

There are also sharp drops in level from the gardens of 29-30 Lyndhurst Road to those of both 4 Akenside Road and 22 and 24 Wedderburn Road. Before its recent redevelopment, ground in Nos 29 and 30 Lyndhurst Road stood slightly more than 1m above the gardens of No.4 Akenside Road and 22 and 24 Wedderburn Road. From there it rose towards Lyndhurst Road at the general 6 degree gradient. I understand from Mrs Wilson that ground levels in No.30 were slightly raised with excavated soil during its redevelopment. The current Google Earth image still shows construction there in progress. Vegetation near No.4 has been cleared and the ground surface appears to be covered by subsoil.

3.3 Ground conditions and engineering properties

25. Dr de Freitas' account of the nature and complex origin of the shallow strata in this part of the Hampstead area [1] belies the apparent simplicity of the more generalised geological maps. The more recent re-profiling of the ground surface described above adds another degree of complexity which has left the naturally disturbed and variable ground more disturbed, more porous and affected by service trenches and the like.

26. Figure 2 is an extract from the 1870-1871 Ordnance Survey map. Akenside Road had not been constructed, Lyndhurst Road extended only as far as Windsor Terrace and the area now contained between Lyndhurst Road and Wedderburn Road was occupied by Rosslyn House and Belsize House. Ground next to Lyndhurst Road sloped down steeply into the grounds of Rosslyn House, suggesting that the road was built on an embankment so as to make its cross fall less than the general ground slope. Ground at the front of 29 and 30 Lyndhurst Road is now at the same level as the carriageway, which accounts for the depth of fill encountered by a borehole excavated there for the recent development.

27. At the front of Nos 28 and 30 Lyndhurst Road, the filled ground is about 3.5m deep reducing to about 1m at Nos. 2 and 3 Akenside Road. Below that is the sandy clay of the uppermost Claygate member of the London Clay Formation. The depth at which this gives way to the London Clay itself is uncertain, as is both the ground strength and its variation with depth.

28. Borehole records for 2 and 3 Akenside Road show considerably higher than expected ground strengths and soil descriptions that are at variance with both test results and the written account. To assess their reliability the records were considered in relation to records for some other local sites which exhibit the same mapped geology as Akenside Road, and which are available via the Camden website. Brief details are as follows.

Address	Code	Investigator	Excavation method
2-3 Akenside Road	BH1 AR	SAS Ltd	Window sampler
29- 30 Lyndhurst Road	BH1 LR	GEA Ltd	Cable percussion
26 Wedderburn Road	BH1 WR	GEA Ltd	Open drive sampler
6 Wedderburn Road			Flight auger
59 Maresfield Gardens	BH1 MG	Ian Farmer Associates	Geotool window sampler

Application documents posted for 6 Wedderburn Road did not include original investigation records; only the BIA account. Ground strength profiles derived from the records for the other four locations have been plotted in Figure 3.

Strengths at Maresfield Gardens and 26 Wedderburn Road fit well with those found by other investigators of the Claygate Member elsewhere in Hampstead but are much lower than those recorded at 2-3 Akenside Road. At the base of the filled ground, the ground strength at Lyndhurst Road was approximately the same as at 2-3 Akenside Road. But strength then decreased quite rapidly with depth, joining the Maresfield Gardens profile at 7m below ground level. No explanation of the upper part of the Lyndhurst Road profile or of a note on the record sheet stating that the borehole was terminated due to groundwater inflows.

The inescapable conclusion is that the results of the ground investigation at 2-3 Akenside Road are unreliable, that the soil descriptions provided are at variance with both test results and the written account and that the information provided is of little or no use for the engineering design of the proposed development or for assessing damage risk for other property.

Three of the four Atterberg Limit tests of soil plasticity made in 2-3 Akenside Road and all of the eight tests made in similar ground at Maresfield Gardens showed the ground to have intermediate shrinkage potential during reduction of moisture content.

3.4 Groundwater and surface water

29. Figure 2 shows conduit wells on the north side of what is now the junction of Akenside and Lyndhurst Roads and another well in land east of what is now the return of Lyndhurst Road linking it to Wedderburn Road. By the end of the 19th Century the first of these was labelled a drinking fountain and a fountain was shown in the grounds of Rosslyn House, approximately in the current location of 29 and 30 Lyndhurst Road. These are all likely to have been supplied by shallow groundwater flow and springs as described by reference [1].

30. Measured standing heights of water in boreholes at Maresfield Gardens and Lyndhurst and Wedderburn Roads suggest a fairly steep hydraulic gradient to the south and the available records show that flow rate of water draining from the Claygate Member into boreholes has varied significantly. Irregular flows of water through more permeable zones of shallow ground above standing water level are of great importance for basement construction but standpipe installations often fail to capture them.

31. With respect to reference [2] Mrs Wilson has informed me that she remembers groundwater being a constant problem during underpinning excavations for the rear extension of No.4. Excavations needed frequent pumping. She thought that in some cases the water rose to approximately 0.5m below ground level in No. 4 next to the boundary with No.3. Records for 6 Wedderburn Road state that groundwater rose to 0.5m below ground level there, when the borehole was complete and before the standpipe was installed.

32. Inconsistency of groundwater flow rates is evidenced by widely differing inflow rates to standpipes placed in the same properties. At 26 Wedderburn Road, the water level in one standpipe recovered slowly after being baled out, whilst another had such a rapid inflow that its water level could not be lowered. A similar situation occurred at Maresfield Gardens. Rising head permeability tests at these two sites gave permeability values of 10^{-6} to 10^{-7} m/second for the slower recoveries; the rapid inflow described for other cases prevented permeability measurement.

33. Surface water and shallow groundwater drainage characteristics have changed since the recent work at 29 and 30 Lyndhurst Road deepened their basements and significantly increasing the amount of impervious external surfacing. Water now drains from No.30 through the boundary retaining wall into No.4. Mr & Mrs Wilson have had to take down a garden store which was set against the boundary and badly affected by the water, and rebuild it with tanked wall and floor. Also, the rear lawn of No.4 has become so saturated as to cause grass to die off leaving bare earth and soft boggy conditions during the winter months. A statue in No 4, which had been in place for many years quite near the 30 Lyndhurst Road boundary tilted severely in the softened ground and eventually had to be removed to prevent it from being damaged.

34. A resident at 31 Lyndhurst Road has reported that the garden of that property too has become waterlogged since 29 and 30 Lyndhurst Road were redeveloped.

35. Ground in No. 4 Akenside Road has a history of subsidence movement. The rear extension of the property was underpinned some 20 years ago. Engineering reports made at the time are no longer available but Mr & Mrs Wilson [2] believe the cause was associated with high groundwater levels. More recently, non-structural work has been carried out in No. 4 to remedy distortion which indicated settlement towards

No.3. An email conversation between Mrs Wilson and the builder who undertook the work is attached.

36. It appears from planning records for 29 and 30 Lyndhurst Road that disposal of surface water from the enlarged external impervious area was to be the subject of a planning condition 7, which stated:. *No development shall take place until details of a drainage plan have been submitted to and approved in writing by the local planning authority to mitigate any potential build-up of water. The development shall be carried out in accordance with the approved details.*

37. Two submissions intended to secure release of the condition showed a 15 cubic metre attenuation tank in No 30. Water was to drain to the submerged tank from the courtyard and other lowered areas and be pumped out for disposal at high level to the public sewer. The first submission placed the tank close to the boundary with No.4, the second closer to the courtyard. Both applications were rejected and no other was recorded. The method of surface water disposal from Nos 29 and 30 Lyndhurst Road is unknown.

3.5 Summarised conceptual model

38. Nos. 2 to 5 Akenside Road are built on ground which slopes down from north to south in an area heavily affected by groundwater springs. Ground water flows south; that is to say from the general direction of 29 and 30 Lyndhurst Road and below the gardens of 2 and 3 Akenside Road to lower ground in 4 and 5 Akenside Road and beyond.

39. There is strong evidence that groundwater draining downhill into No 4 Akenside Road can rise to 0.5m below ground level and that, in the past, variations of groundwater level have had a destabilising ground subsidence effect upon No.4 which had to be remedied by partial underpinning.

40. There is strong evidence also that since the basements of 29 and 30 Lyndhurst Road were recently deepened and extended to the rear as a large sunken courtyard, the flow of groundwater has changed leaving the external amenities of No.4 significantly impaired and causing Mr and Mrs Wilson inconvenience and material expense.

41. Less certain but nonetheless material for the model is the possibility that repairs made in 4 and 5 Akenside Road in the last year, comprising adjustment to floor levels, window and door frame alignments, and internal crack repairs, are symptomatic of further structural movement.

42. There is no reliable information about ground conditions in 2 – 3 Akenside Road that affect engineering design of the proposed redevelopment, assessment of damage risk for neighbouring property and potential effect of the development on the groundwater regime, which is more complex than recognised by the application.

43. No.4 Akenside Road has thus already been materially impacted by recent development. That situation has not been recognised by the applicant for redevelopment of 2 and 3 Akenside Road. But it is the situation into which it is proposed to introduce yet more potential impact upon No.4.

4 Engineered design proposals

4.1 Overview

44. Engineers Halstead Associates propose that the external walls and internal party wall that are intended to remain should be underpinned to form reinforced concrete walls below the existing footings. Differing excavation depths are shown by the various documents but a minimum depth of 4m seems likely.

45. Allowing for construction thickness, the back of the buildings are intended to extend outward by varying amounts up to approximately 6m beyond the existing façade. The excavation sides are shown to be supported by contiguous bored piles. The engineer requires the piles to be cantilevered vertically so as to avoid need of lateral support whilst the permanent reinforced concrete wall is constructed against them.

4.2 Underpinning

46. Reference [1] suggests a high probability that underpinning excavators will face a wall of wet silty clay with water running from its more permeable parts and have no option but to keep pumping this water and draw fine material from the ground until the excavation is complete and concrete cast. The difficult situation depicted potentially understates the problem.

47. Halstead Associates drawing 15773/FS04 gives sections depicting three stages of construction for a single underpin. They show that the sides of the pit should be supported by a combination of boards and struts, and in the drafting accept that the rough sides of the excavation will be supported only where the boards contact the earth. Soil not initially in contact with boards would be free to move and squeeze in until it is.

48. Such excavations are made in stages. For the 4m pit envisaged, a little more than 1m might be excavated and the first section of boards and struts inserted. The pit would be extended a further metre and the next section of supports inserted, and so on. Using this method, earth faces on 4 sides would be exposed at any one time and seepage ground loss from faces already excavated could continue behind the boarding unobserved.

49. Figure 4 is a photograph which illustrates an excavation of this type. At least three observations are relevant. The first is that one section of boarding has been removed to expose substantial ground loss behind. The second is that all four sides of the pit require horizontal walings, not just the two sides shown by the Halstead drawings.

The third is that the hole appears dry, whereas the excavations proposed in the current case would be carried out to a depth 2.5m below a previously experienced ground water level in excavations close to those proposed.

50. The import of these observations is:

(i). Hidden ground loss can result in ground movement capable of affecting the stability of neighbouring land and buildings;

(ii). Construction of a reinforced concrete wall against one side of the excavation would require walings supporting that side to be removed whilst the excavation is supported by other competent forms of support which would permit construction of the wall stem against (as designed) timber boarding, which would eventually degrade allowing ground movement;

(iii). Ignoring waterproofing but including installation, adjustment and removal of temporary supports, there would actually be 16 construction stages for each underpin. Excavating 2.5m below groundwater level in what seems most likely to be soft to firm ground can cause basal uplift (not just heave) and collapse of excavations.

(iv). Creating the basement wall proposed would require 22 separate underpin legs to be constructed in a predetermined sequence. That would involve 16 x 22 = 352 construction stages, each introducing an element of risk.

51. There is a moderate to high probability that (i) would occur and there would be no way of preventing it. Item (ii) is a matter of fact and a time consuming operation which would increase the .probability of (i). The risks associated with creating basement walls by underpinning at 2.5m below groundwater level near spring lines in soft to firm ground are considerable and have not been considered in the application.

52. The application fails to demonstrate that it satisfies the requirement of DP27(a) in this respect.

53. It might be argued that the basement at 29-30 Lyndhurst road was formed by underpinning and that part of No.4 itself was successfully underpinned. But the underpin depth required for Lyndhurst road was much less than the 4m required for the present case and apart from its hit and miss sequencing underpinning to stabilise foundations bears no comparison with underpinning to create reinforced concrete basement walls.

4.3 Piling

54. A contiguous cantilevered pile wall supporting the sides of a 4m deep excavation would normally be expected to penetrate to a depth of about 8m below excavated level (12m below ground level). Spacing between adjacent piles would be such as to reduce the permeability of the piled “curtain” below basement level to about one

quarter of the natural ground value before piling, always supposing the process of piling did not change the ground characteristics.

55. Since the redevelopment of 29-30 Lyndhurst Road, groundwater flow into No.4 Akenside Road has increased, impacting upon the amenity and quite possibly the stability of that property and contravening planning policy DP27(c) and possibly (a). The precise cause, whether groundwater flow redirection, surface water disposal, or both, is uncertain. It is however certain that a 12m deep piled curtain across the approximately 24 m width of Nos 2 – 3 Akenside Road would block the great majority of groundwater that now flows north to south diagonally below the rear elevation of those properties. That flow would be diverted directly into and below No 4 and to a lesser degree No.5 Akenside Road.

56. The effect of that would be to exacerbate the recent unwarranted impact of development upon Nos 4 and 5 and further contravene the requirements of policy DP27. The risk of that happening could not be ameliorated should the proposed redevelopment of 2-3 Akenside Road be permitted.

57. The application fails to demonstrate that it satisfies the requirements of DP27(a) and (c) in this respect.

5 Ground movement and building damage

5.1 Ground movement

58. The BIA report contains a separate report by Applied Geotechnical Engineering (AGE) on ground movement expected to occur as a result of the proposed development. This cites instructions received and information provided.

59. Acknowledging the absence of reliable ground information for the proposed development, and needing such information for a computer assisted assessment of vertical ground movement AGE have imagined a ground strength profile based upon London Clay rather than the geology that exists at the site. This assumes the ground is stronger than the local investigations discussed above would suggest.

60. The computer programme required an input value relating changes of pressure in the ground to ground movement (an E value). AGE have used a correlation which they state to have been derived for London Clay at Bond Street station. Again the choice belies the Akenside Road geology and additionally ignores the fact that London Clay at Hampstead differs from that at Bond Street.

61. AGE have sought to apply case history information for embedded retaining walls provided in CIRIA C580 [3] to walls constructed by the underpinning process described above. In doing so they have stated a number of times that the underpinning is assumed to be stiffly supported against movement and that if that is not so, further ground movement would occur.

62. Embedded retaining walls are constructed and in place within the ground before excavation starts. By definition they extend below and are supported by ground lower than the full excavation depth. Excavation exposes the wall face gradually and can be managed so that the wall is strutted at intervals before the ground below is removed. The ground that the wall is to support is never exposed.

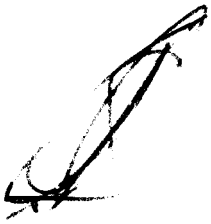
63. When this method is compared to that described for the construction of one underpin leg, let alone the "hit and miss" sequence required to construct a complete underpinned wall, it becomes obvious that there can be no equivalence between the two; this least of all with respect to potential ground movement. The folly of claiming otherwise is heightened by the fact that there are as yet no published case histories of the ground and structural movement that are caused by construction of underpinned retaining walls.

5.2 Building damage

64. AGE have applied what is generally termed the Burland method [4] to the results of the ground movement assessment in order to calculate an estimated level of building damage likely to occur in No.4 due to the proposed development.

65. The method has been applied without regard for the history and without assessing the sensitivity of No.4, and the assessment has relied upon estimates of ground movement which have no basis in reality.

66. The building damage assessment is meaningless and fails to demonstrate that the proposal satisfies the requirements of DP27 in this respect.



MICHAEL ELDRED MSc.CEng.FIStructE.MICE
ELDRED GEOTECHNICS LTD
Date 17th April 2015

References:

[1] de Freitas M.H. Technical objections to Planning Applications 2015/0851/P for No. 2 Akenside Road and 2015/1207/P for No.3 Akenside Road NW3 5BS. March 2015

[2] Emailed objection by Mr & Mrs Wilson to planning application 2015/0851/P dated 14th March 2015 and posted on Camden website.

[3] CIRIA Report C580 (2003) Embedded retaining walls – guidance for economic design.

[4] **CIRIA Special Publication 200 (2001)** Building response to tunnelling: Case studies from the Jubilee Line Extension London: Vol 1. Projects and methods.

Project Ref.	Project Title.	Indicative North
G1504	**2-3 AKENSIDE ROAD NW3 5BS**	
Sheet Ref. **Figure 1**	**O.D. Surface Contours at 1m Intervals of Height**	

Eldred Geotechnics Ltd Telephone: 01689 869406 Email: mail@eldreds-geo.co.uk
2013 EGL MAP G1504 AKENSIDE ROAD NW3.GPJ ELDRED-2013.GDT 19/4/15

Project Ref.	Project Title.	Indicative North
G1504	**2-3 AKENSIDE ROAD NW3 5BS**	N
Sheet Ref. **Figure 2**	**1871 O.S. Map Extract**	

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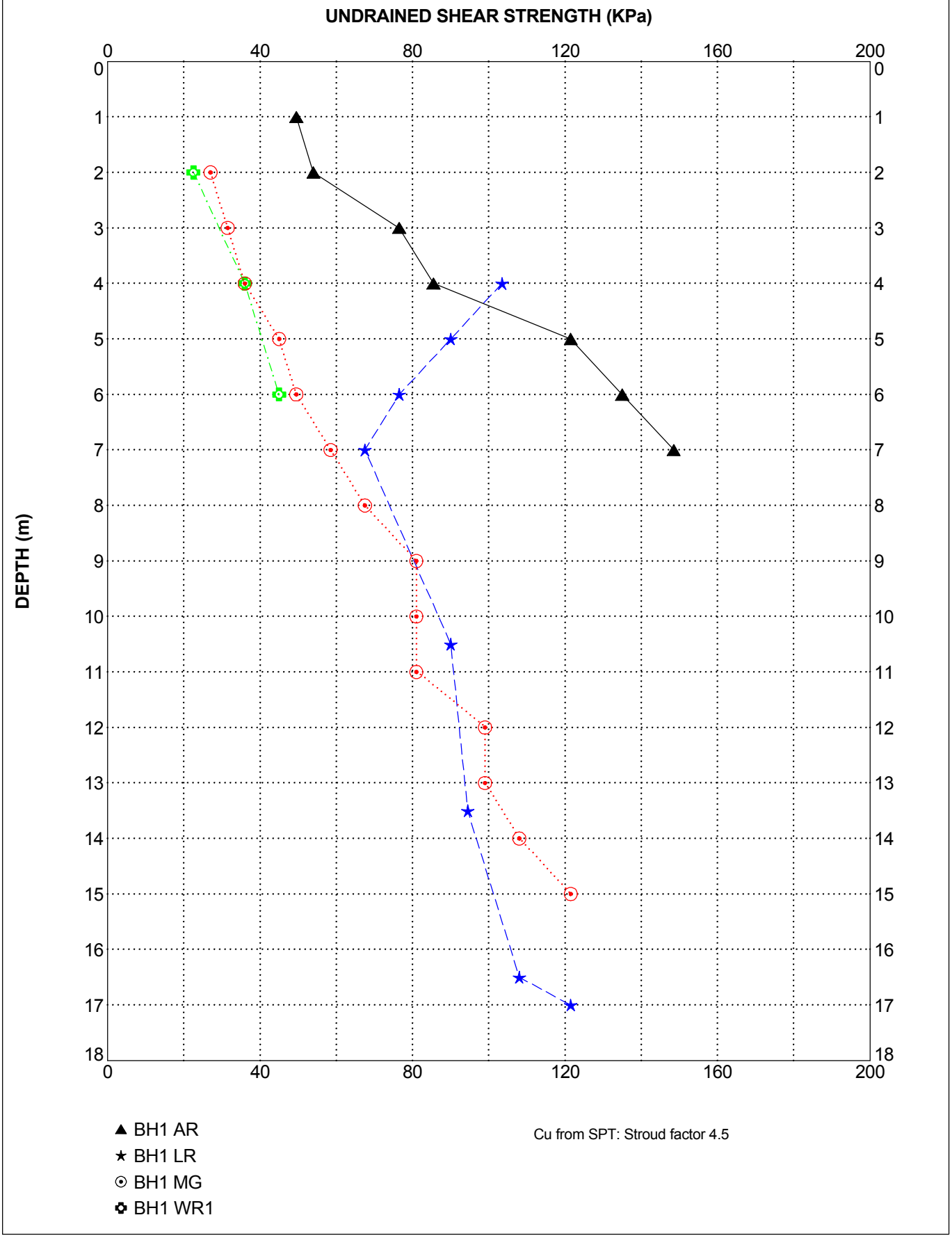
2013 EGL MAP G1504 AKENSIDE ROAD NW3.GPJ ELDRED-2013.GDT 19/4/15

Project Ref.	Project Title.	Sheet Ref.
G1504	2-3 AKENSIDE ROAD NW3 5BS UNDRAINED SHEAR STRENGTH vs DEPTH	Figure 3



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2013 EGL CU VS DEPTH G1504 AKENSIDE ROAD NW3.GPJ ELDRED-2013.GDT 19/4/15

Figure 4 – Typical Underpin Excavation with Supported Sides
(Source ASUC Library)

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Michael Eldred

From: coila j Wilson <coilajane@mac.com>
Sent: 24 March 2015 17:44
To: Emma Reynolds; Michael Eldred
Subject: Fwd: Subsidence evidence in 4&5

Some of this below in Ralph's email may be a bit confusing. I would need to make a diagram to clarify these locations of subsidence tilt in no. 4&5 Akenside Road.

Ralph and his brother,Darek, have been involved in subsidence repairs levelling floors, etc. in recent years but were not around for earlier repairs. We have had continuing problems with subsidence since 1982 when we purchased no. 4.

Sincerely, CJW
Sent from my iPad

Begin forwarded message:

> **From:** rafal <zawislanski6@aol.com>
> **Date:** 24 March 2015 06:40:15 GMT-6
> **To:** coila j Wilson <coilajane@mac.com>, Emma Reynolds <Emma.Reynolds@eon.co.uk>
> **Subject: Re: Subsidence evidence in 4&5**
>
> The floor of North side of No4 in the Master Bedroom was leaning about 3"/5cm to the very left corner,same as East side mainly by the window.
> We didn't do any levelling in the office above the Master Bedroom,however the office floor was reinforced with extra cross timber,soundproof and new floorboards were put in,
>
> Guest bedroom on the 2nd floor,the floor was leaning to the West/North side corner about 2"/5cm and it was levelled.
>
> Guest bedroom on the 1st floor was leaning to West/ North side corner about 1"
> Two windows in the 1st floor bedroom West side were leaning about 2"/ 5cm,I'll send some evidence photo for the windows in that bedroom.
>
> Grand floor Kitchen and Dining room, we never done anything with the floors to levels them.
> Front launch West corner is out of levels by 2"/5cm also is leaning to North side where the TV set is,
> They are some cracks on the North wall above the TV set indicating the movements.
> No 5 top floor flat kitchen floor was levelled at 3"from the West side by the window to the North
> doors were out of level 3" on the kitchen door,Music room,and the bedroom
>
> Middle flat West side wall have big crack above the two windows in the front living room.
>
> Hope this help
>
> Best Ralph

m

On 21 Mar 2015, at 13:14, coila j Wilson <coilajane@mac.com> wrote:

Dear Ralph, I am trying to write up about the evidence of subsidence in our two houses. Could you and Darek discuss this and get back to me and correct me if I am not accurate? There are some measurements I will need too.

Didn't the floors in no. 4 prior to the recent levelling lean in two different directions: northeast corner of 4 in Master Bedroom, dining room, kitchen, and my office downward in no.east corner? (By how much?); in front of house midway sinking under front lounge and upper floor bedroom windows plus downward tilt so.west corner of house adjacent to number5 (evidence in problems with windows...take photo of windows and rad.s below in two guest bedrooms to show tilt of window sills ... by how many inches were floors corrected to level them? How far out of level is front lounge floor in so.west corner.

How much out of level (give me in centimetres and inches) were Gregg's floors? How out of level his door surrounds?

I think that Michael de Freitas, Michael Eldred, and Jack Norton will need to come back to look at our house before we return. Show them where windows, doors, and floors have had to be corrected due to past subsidence. Thanks, Mrs. W

Sent from my iPad