Version 1

January 8th, 2021

26 Netherhall Gardens NW3 5TL
Review of planning application 2019/1515/P
With respect to risk of damage to Nos. 24A, 24, &28 Netherhall Gardens

G2009-RP-01-E1

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1 Introduction

1. Annabel Bacal, owner of 24A Netherhall Gardens, together with the owners of Nos. 24 and 28 Netherhall Gardens are concerned that the current application for the redevelopment of 26 Netherhall Gardens does not adequately address and mitigate the risk that the works proposed by this application will cause significant damage to their properties.

2. I am instructed by Ms. Bacal, the client, to consider the application published on the Camden planning portal and report my independent unbiased opinion with respect to these concerns for each of Nos. 24A, 24 and 28 Netherhall Gardens.

3. My findings rely upon information available from the planning portal, photographs provided by the client and other freely accessed public sources. In consideration of current restrictions imposed during the Covid 19 pandemic, I have not visited the properties concerned.

2 Summary of findings

4. The following summary provides the heads of more detailed explanation and discussion within subsequent sections of the report.

5. There is good reason to suppose that the foundation of most of the flank boundary wall of No.24A is not as deep as assumed by the applicant and that the proposed method of temporarily supporting adjacent excavation by trench sheets will not avoid the risk of significant damage to the wall and other parts of that building.

6. That risk has been increased by several assumptions made for the ground movement assessment, which make the results considerably less conservative than is normally required at the planning stage of a project.

7. Whilst a final construction sequence would be determined largely by the contractor, the preliminary version provided by the engineer to demonstrate scheme feasibility and protection of neighbouring property lacks credibility in those respects.

8. It is my opinion that the application does not currently demonstrate that the risk of damage it presents to numbers 24A and 24 Netherhall Gardens complies with Camden Planning Policy in that regard. I consider that the corresponding risk to 28 Netherhall Gardens is negligible.

3 No. 24A flank wall footing

9. By reference to the site investigation record for trial pit TP2 situated at the rear end of the flank wall, the applicant's engineer has noted that the wall foundation at that point

extends for more than 1.5 m below ground level. Without further investigation elsewhere along the wall, it has been assumed that the same footing depth continues for the full length of the wall affected by the development.

10. The TP2 excavation record shows polystyrene cladding on the wall below ground level. Close to the back of the building there is a mature Lime tree and a collection of smaller trees, some of which are in the garden of number 26. Camden planning records show that in 1993 consent was given to a 1990 application for alterations to the rear elevation and what was then a utility room. A condition of the consent was the replacement of a tree which had been removed and maintaining a tree in that location in the future.

11. 1990 was the last of several years of severe drought and the time of much subsidence damage and underpinning. The background to the planning consent makes it highly probable either that deep underpinning was carried out to stabilise the rear of the property following damage associated with the previously existing tree or that a building inspector required such deep foundations to protect the alterations against damage caused by the replacement tree. Whichever was the case, it would have been most unlikely for the deep foundations to continue along the full length of the wall.

12. A former annex of number 24 Netherhall Gardens was reconstructed as number 24A at some time after 1949. The 1947 drought had prompted the requirement for foundations in clay to be 0.9 m below ground level. Considering the ground level from which Nos.24 and 24A were built and which extends into number 26, it is reasonable to suppose that the original footings of the flank wall would have been set at about 73m OD, rising to 74 m OD at the rear of the property. This is higher than both the proposed side access and the level of 71 m OD assumed by the applicant for the ground movement assessment.

13. Consequently, it is currently probable that excavation for the side access next to No.24A would expose ground below the wall foundation. If that ground were not rigidly supported and protected from the weather, it is also probable that the flank wall would suffer significant settlement and damage which would be in addition to any caused by the basement excavation.

14. The engineers' design provides for the insertion of trench sheeting which penetrates ground below the side access for a depth approaching 1.5 m. The practicality of inserting the proposed trench sheets, which are light gauge, flexible and not intended to be heavily driven, to temporarily support ground against the flank wall whilst the permanent construction takes place is doubtful. The site investigation for No. 26 found much brick rubble in the made ground covering most of the area and my experience in

such conditions is that steel trench sheets either buckle or go badly off line, making their support ineffective. In the circumstances described they would also need to be inserted before piling took place and their flexibility would necessitate support by a system of struts extending into the working area. Contrary to the engineers' construction method statement, the sheeting and struts would need to be in place before piling took place, but the presence of struts would probably preclude efficient construction of any form of piled wall.

15. Considering the potential risk of damage described I believe it is essential for further investigation of the depth of flank wall footings to be undertaken and, if necessary, for the engineering design to be reviewed.

4 Ground movement assessment

16. The ground movement assessment has been undertaken with the assistance of an industry standard computer program named Xdisp. Results provided are empirical. In essence, the programme contains a library of information about ground movements derived from completed construction cases for which movement was measured. The program user is required to choose conditions which are as close as possible to those of the problem at hand from a limited range of choices. The program then adjusts library values in proportion to the configuration of the particular situation and provides both estimated ground movement values and corresponding damage risk assessments according to the standard Burland model.

17. The programme is widely used to screen for unacceptable movement and risk of damage, but results depend upon the choice of input. The pile length selected by the analyst for the basement excavation is 7.6 m. Results of the site investigation suggest that the clay subsoil is no better than firm to a depth of about 8 m and the engineers' provisional temporary works design shows a system of lateral support for the wall which the industry standard CIRIA publication referenced by the assessment classifies as moderately stiff. The analysis is however based upon the piles being embedded in stiff clay and the lateral propping of the wall providing high support stiffness.

18. The process of installing piles in the ground causes part of the total ground movement. Again, the CIRIA publication provides guidance in the form of a conservative upper bound to the amount of movement to be expected. The analysis used values of movement equal to half of the CIRIA recommendation. In making this reduction the analyst relied upon the published record of a project in Kensington. That project was larger, bounded by a considerable number of large properties and the piles were embedded in stiff clay. It was well instrumented and very carefully controlled to keep

movement within limits stipulated by various party wall surveyors. The analyst for the current project used the same 50% reduction by assuming that the standard of workmanship and care for the project will be equal to that of the Kensington case. Experience is that such standards are not routinely achieved on small projects such as that proposed.

19. Factors that cannot be accounted for frequently result in actual movements that are less than those estimated by analysis. But the purpose of analysis at the planning stage is to derive estimates of risk which are conservative and based upon criteria established by peer review of a substantial body of field research. Without such criteria to justify departure from current industry standards, it is necessary to conclude that the analysis provided for this project is likely to have significantly understated the risk of damage that the basement construction would currently present to No. 24A and perhaps to No.24 also.

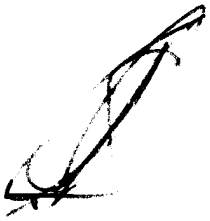
5 Construction method

20. The construction method statement in the BIA report requires substantial revision to describe a sequence that is practicable, relates to information provided by other documents, and demonstrates that potential risk to neighbouring property has been recognised and addressed.

21. The requirement is general, but more notable examples are:

    a) the method by which the type of piling rig and attendant plant required to construct a secant pile wall successfully and accurately might be installed and work on the raised level at the rear of the site.

    b) How and at what stage the temporary and permanent retaining walls next to No.24A are to be constructed and, if before the ground floor slab over the basement is cast, how the permanent wall will be supported over the length between piled walls of the basement and those in the upper part of the site.



Michael Eldred MSc CEng FIStructE MICE
Eldred Geotechnics Ltd

Brief Professional Biography
Michael Eldred MSc CEng FIStructE MICE
August 2016

Date of birth: 26th December 1938

Current Position: Director of Eldred Geotechnics Ltd;

General Education King Edward VI Grammar School Chelmsford.
Higher Education Westminster Technical College:- Qualified for Graduate Membership of the Institutions of Civil and Structural Engineering.
University of Surrey:- MSc in Geotechnical Engineering.

Professional Memberships

Institution of Structural Engineers	Corporate Membership	1965
	Fellowship	1983
Institution of Civil Engineers	Corporate membership	1969
Association of Geotechnical and Geoenvironmental Specialists	Membership	1999

Career Progression

1957-1965	From draughtsman to project engineer: employers; British Rail, a specialist civil engineering research and development contractor and an engineering consultant.
1965-1967	Associate Partner managing a consulting engineers' subsidiary office.
1967-1969	Resident Engineer for the City of Lancaster central redevelopment.
1969-date	Independent practice.
1985-2007	Included ground investigation and laboratory testing facility within practice

Design and Practical Experience

Advice related to basement development	Ground stability assessment & remedy
Alteration & strengthening of subterranean Works.	Laboratory testing of soils
	Load testing of structures and components
Clay subsidence & heave	Mine reinforcement
Cofferdams	Mining subsidence
Contaminated land assessment & remedy.	Party Wall Act administration as surveyor
Flood risk assessment & amelioration.	Piling
Ground investigation.	Temporary support of structures, and
Ground dewatering	Groundworks.
Groundwater erosion subsidence	Underpinning

Particular experience related to residential basements

As adviser to the Heath & Hampstead Society: forensic analysis of two failures and one collapse, and geotechnical and structural engineering advice during the formulation of Camden CPG4.
For 50 basement schemes to date: geotechnical and structural engineering consultant with respect to basement impact assessment, acting mainly for adjoining owners, in Camden, Fulham, Haringey, Lambeth, Kensington & Chelsea and Richmond; expert witness for planning enquiries; appointment in several cases as adjoining owners' party wall surveyor during the construction phase of develoment.

Other related experience

Lecturer in geotechnical engineering to the Royal Engineers MSc course, RMSE Chatham
Informal lectures to Institution of Structural Engineers members on geotechnical/structural engineering interface for basements.
Twelve years as Director, seven as Chairman, of a professional indemnity mutual insurer for engineers.