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STRUCTURAL ENGINEERS REPORT No.3

12 AKENSIDE ROAD
LONDON NW3 5BT

(JOB NO. 16108)

[redacted]

23rd September 2017

Also at:
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STRUCTURAL ENGINEERS REPORT

1.00 Introduction

This report follows our previous reports dated 24 October 2016 and 10th June 2017.

2.00 Soil Investigation

Trial pits and boreholes have been undertaken on two occasions, in April 2017 and August 2017.

Trial Pit 1 April 2017

Trial pit 1, to the front right-hand corner of the main house, revealed a concrete strip foundation resting 1200 mm deep below foundation level on firm, silty clay. A borehole within the trial pit revealed similar silty clays to termination at 4 m deep, becoming siltier at depth. Slight moisture was noted at 3.3 m deep.

Roots of live appearance up to 4 mm in diameter were noted at underside of foundation with fine live roots to 2.3m deep within the borehole. Roots taken from the trial pit and sent for analysis were identified as Plane roots and Shrub.

Laboratory testing indicates clays of very high plasticity, reducing to high at depth. Desiccation is difficult to assess in Clay Gate Beds such as this with variable silt content. However, we consider that at the time of testing there was little, or no, desiccation below foundation level. This assessment is consistent with the root evidence and insitu testing; strength increases steadily with depth and is firm becoming stiff.

Trial Pit 2 April 2017

Trial pit 2, to the rear right-hand corner of the main house, revealed a concrete strip foundation resting 960 mm deep below foundation level on firm, silty clay.

No roots of live appearance were noted at underside of foundation.

We consider that at the time of testing there was little, or no, desiccation below foundation level. This assessment is consistent with the root evidence and insitu testing.

Trial Pit 3 April 2017

Trial pit 3, to the middle left of the rear elevation, revealed a concrete strip foundation resting 1530 mm deep below foundation level on firm, silty clay. The projection is so great from the wall that this is potentially a previous attempt at underpinning. A borehole within the trial pit revealed similar silty clays to

termination at 4 m deep, becoming siltier at depth. Slight water seepage was noted at 2.6 m deep.

Roots of dead appearance up to 1 mm in diameter were noted at underside of foundation with fine dead roots to 2m deep within the borehole. Roots taken from the trial pit and sent for analysis were identified as Plane.

Laboratory testing indicates clays of very high plasticity, reducing to intermediate plasticity at depth. Desiccation is difficult to assess in Clay Gate Beds such as this with variable silt content. However, we consider that at the time of testing there was little, or no, desiccation below foundation level. This assessment is consistent with the root evidence and insitu testing; strength increases steadily with depth and is firm becoming stiff.

Trial Pit 4 August 2017

Trial pit 4, to the rear right-hand projecting bay, close to Trial Pit 3, revealed a concrete strip foundation resting 900 mm deep below foundation level on soft to firm, moist, silty clay. A borehole within the trial pit revealed similar silty clays to termination at 4 m deep, becoming siltier at depth.

Roots of live appearance up to 2 mm in diameter were noted at underside of foundation with fine live roots to 1.5m deep within the borehole. Roots taken from the trial pit and sent for analysis were identified as similar in some ways to Plane roots and Shrub.

Laboratory testing indicates clays of very high plasticity, reducing to intermediate plasticity at depth. Desiccation is difficult to assess in Clay Gate Beds such as this with variable silt content. However, we consider that at the time of testing there was little, or no, desiccation below foundation level. This assessment is consistent with the root evidence and insitu testing; strength increases steadily with depth and is firm becoming stiff.

Trial Pit 5 August 2017

Trial pit 5, to the rear right-hand corner, revealed a concrete strip foundation resting 1500 mm deep below foundation level on firm, silty clay. the projection is such that we suspect that this foundation has been previously underpinned. A borehole within the trial pit revealed similar silty clays to termination at 4 m deep, becoming siltier at depth. Slight moisture seepage was noted at 2.7 m deep.

Roots of live appearance up to 2 mm in diameter were noted at underside of foundation with fine live roots to 2m deep within the borehole. Roots taken from the trial pit and borehole and sent for analysis were identified as live Lime roots.

Laboratory testing indicates clays of very high plasticity, reducing to intermediate plasticity at depth. Desiccation is difficult to assess in Clay Gate Beds such as this with variable silt content. However, we consider that at the time of testing there was

little, or no, desiccation below foundation level. This assessment is consistent with the root evidence and insitu testing; strength increases steadily with depth and is firm.

3.00 Level monitoring

Monitor installed in November 2016 indicates clear seasonal movements to the front right-hand corner, right flank wall and rear elevation confirming beyond any reasonable doubt the causal influence of the trees. Magnitudes of movement are slight to moderate, total annual amplitudes of 7 mm to the front right-hand corner, 4-5 mm to the right flank wall and rear elevation and up to 9 mm to the garage have been recorded over a relatively wet summer. Greater magnitudes of movement would be anticipated in periods of drought unless the cause is addressed.

4.00 Conclusions

The property has suffered slight crack damage, Category 2 when assessed in accordance with BRE Digest 251. The cause of the damage is subsidence due to the action of tree roots on the shrinkable clay sub-soils. The recovery over the winter period confirms beyond all reasonable doubt the causal influence of the trees.

Whilst the damage is slight, as are the movements recorded, it is none the less detrimental to the saleability, insurability and mortgageability of the house in addition to being unsightly and needs to be addressed. Tree management is a clear option that should result in a relatively rapid return to stability, probably over one or two winter periods. Whilst tree management may be detrimental to the garage structure, potentially causing further damage due to the close proximity of the Plane tree, the only alternative to tree management is underpinning of all of those parts of the property currently suffering seasonal movement, with transitional bases potentially including the entire perimeter of the main house and garage.

Tree management will not be straight forward. All offending trees are within third party properties, at least one, the Plane tree, is covered by a Tree Preservation Order. However, with the evidence available permission to fell should be forthcoming, if it is refused compensation for the additional cost of underpinning can be claimed from the local authority.

5.00 Recommendations

Continue level monitoring.

Appoint arboricultural consultants to identify the offending vegetation and make recommendations for tree management to eliminated the seasonal movements.

6.00 **Limitations**

We have not inspected woodwork, damp proof courses, services, foundations except where exposed, or any other part of the structure which was covered, unexposed or inaccessible, and we are therefore unable to report any such part free from defect.

This report has been prepared for the sole use and benefit of [redacted], and the liability of R. F. Gill and Associates shall not be extended to any third party.

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For Richard F. Gill and Associates LLP

23rd September 2017