## 13 December 2022

Caroline Harte 125 Albert Street London NW1 7NB

Dear Mrs. Harte,

## Underpinning to 125 Albert Street and the party wall with 123 Albert Street

Further to our correspondence from July 14<sup>th</sup> to Hayley Simpson and yourself on the 29<sup>th</sup> November, we write to confirm that site investigations have now been undertaken at the property, with the findings described below and the investigations report attached as Appendix A.

A trial pit and borehole has been excavated along the party wall between 125 and 127 Albert Street internally and showed that the house at this position to be founded at 1400mm below ground level, with an assumed corbelling of two bricks providing a 100mm projection. The footing was founded on stiff brown mottled grey clay. Root samples were taken from adjacent and below footing level, at a depth of 1.9m for analysis. The root analysis came back inconclusive on the tree type.

However, soil analysis was undertaken on the clay soil samples, at 0.5m intervals from 1.4m deep to 3.4m deep. The results of the laboratory tests show the clay in generally of a high plasticity and of high swell potential when classified in accordance with NHBC Chapter 4.2. This clay would therefore be subject to significant changes in volume due to any changes in its natural moisture content.

One method of assessing the depth of desiccation is by comparing the natural moisture content with the value of 0.4 x the liquid limit obtained from the Atterberg Limit Tests, a method which was suggested by Driscoll in 'Geotechnique', Volume 33/2, June 1983. However, the value of 0.4 of the liquid limit is the level at which structural movement due to desiccation occurs and it should be remembered that desiccation actually starts in the clay at the value of 0.5 of the liquid limit. These are guidelines recommended by Driscoll and not definitive values.

By comparing the natural moisture contents of the soil samples with the value of 0.4 x the liquid limit on the graphs provided by SubsNetUK, it can be seen that in trial pit No.1 and borehole No.1 the clay is desiccated from 1.4m to 1.9m deep, where tree roots are present to the underside of the foundation.

This concludes that subsidence has likely taken place to the front of the property at 125 Albert Street and along the party walls to the property.

It is therefore recommended that the front elevation and the front returns to the party wall be underpinned below the depth of the tree, we would recommend to a depth of 2.5m deep, to prevent this seasonal movement / subsidence occurring at the property, as the tree root analysis was unable to identify the tree causing the subsidence, and any tree removal has the potential to cause heave, which would further damage the existing property.

Mass concrete underpinning is a low-tech solution to addressing the movement seen at 125 Albert Street, it is less invasive than other methods of dealing with soil desiccation such as grout injection and has a long lifecycle in preventing further movement to the property. The cracking which has already occurred at the property is to a greater extent, than the scope of the cracking likely to occur from underpinning the front elevation and sections of

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the party wall. The underpinning will be sequenced and stepped as we move away from the affected areas of the property, to minimise any differential movement in the property, and thus minimising any potential additional cracking. It is important to note that without the use of any remedial measures, such as the mass concrete underpinning, it is likely the existing condition of the property will worsen and more substantial structural repair works will be required to rectify the situation at 125 Albert Street, which may compromise the heritage of the property.

I trust this letter report is sufficient for your present requirements, but if I can be of any further assistance then please do not hesitate to contact me further.

Yours Sincerely,

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Michael Carr MEng Senior Engineer

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