PRICE&MYERS

REPORT

143 Abbey Road, London, NW6 4SL

Structural Inspection Report

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Job Number:	27944

Date	Version	Notes/Amendments/Issue Purpose
February '19	1	For Information

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Note:

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Contents

Appendices:

1 Introduction

Price & Myers visited the lower ground and ground floor flats of 143 Abbey Road, on behalf of Starlevel Properties Ltd, on 6th February 2019. The purpose of the visit was to undertake a visual inspection of some cracking to a few external walls and report our findings and recommendations. Access was possible to the external perimeter of the property at ground level and internally at lower ground and ground floor only. The inspection was limited to what could be seen without the removal of any finishes.

2 Description of Existing Structure

The existing building is a five storey, end of terrace property comprising five self-contained flats. It is understood that the property has been extended at the rear from lower ground to second floor in the early 1990's. A roof top extension to the fourth floor flat was also constructed in the early 2000's. The building is constructed of load bearing masonry with assumed timber joisted floors and a flat roof. The original building is estimated to be built around the 1850's.

The geological map of the area shows the site to be underlain by the London Clay formation comprising clay, silt and sand. A trial pit investigation of the existing foundations has not been carried out, but it is likely the building is founded on shallow spread footings.

3 Observations

It is understood that the cracking has been observed by a building surveyor, who inspected the property in January 2019. It is not known when the cracking first occurred and there is evidence that the external cracks have been rendered over previously.

The cracking exists in two locations, refer to Appendix A for photographs;

- The junction between the original house and the rear extension on the wall facing the main road. Cracking can be seen both externally and internally. Externally, the crack runs up the entire height of the building from lower ground floor to roof (see Photographs 1&2). Internally, at lower ground floor, the crack is present in the corner of the kitchen and tracks away from the junction of the cross wall at approximately mid-height. The crack then penetrates the coving and tracks along junction with the wall and ceiling (see Photograph 3). Internally, at ground floor, the crack is also present in the corner of the kitchen and tracks across the junction with the wall and ceiling. The crack can only be seen at high level, due to built in kitchen units (see Photograph 4).
- To the side and rear wall of the extension. Cracking can be seen both externally and internally. Externally, the crack runs from lower ground to just above ground floor level on the side wall and then tracks around the corner and continues up the rear wall to roof level (See Photograph 5). An internal crack can be seen in the kitchen at ground floor level at the junction between the rear and side wall (see Photograph 6). The internal crack tracks along the junction with the ceiling and wall.

A large Eucalyptus tree exists on the boundary of the garden to 143 Abbey Road and the adjacent land. The Eucalyptus tree is approximately 5m from the rear wall to the extension and is approximately 12m tall. The tree canopy spreads towards the top of the tree and is touching the building at roof level (see Photograph 5 - on the right hand side).

4 Discussion

London Clay, which is present on the site, is typically classified as highly shrinkable. This means that it has a high potential to change volume due to fluctuations in water content. The water content of the clay can be influenced by trees as well as climatic conditions. The zone of influence of trees (the area in which the tree roots extend and draw water from the soil) is determined by the species and height of tree. When a structure is built within the zone of influence of a tree then their foundations need to be sufficiently deep, so they are not affected by seasonal fluctuations in the volume of the clay which can lead to building movements.

In accordance with the National House Building Council (NHBC) Standards 2018, Section 4.2 Table 12, Eucalyptus trees are classified as having a high water demand. Eucalyptus trees are known to be fast growing and can grow up to 18m. The current tree is approximately 12m tall, and based on this height, the zone of influence extends as a 16.25m radius from the centre of the trunk. The rear of the property, including the extension, is well within this zone of influence.

The minimum depth of the foundations within the zone of influence is determined from Chart 1 in the NHBC Standards 2018. A 12m high Eucalyptus, situated 5m away from the building requires a minimum 2.7m deep foundation. It is unlikely that the existing foundations to the original house and extension were founded to this depth.

Met Office data for the summer of 2018 shows the months of June and July having below average rainfall and above average temperatures. In these conditions, the Eucalyptus tree would have been drawing more water than usual from the ground. The ground water was then not being replenished by rainfall. This will have caused volume changes in the clay that were larger than average and resulted in the settlement of buildings with shallow foundations.

The water demand and zone of influence of the Eucalyptus would have increased as it has grown over the years. This coupled with the dry and hot summer of 2018 could be why cracking has occurred to the property. The brittle nature of bricks and plaster means they have little ability to adapt to differential movements and as such cracks can form.

5 Conclusions

The cracking observed is consistent with signs of subsidence and shows that the foundations to the rear extension have settled. As discussed above, this is likely to be caused by the presence of a near by Eucalyptus tree and the highly shrinkable nature of the underlying soils. In addition, the recent dry, hot summer of 2018 will have meant the tree was drawing more water from the soils, thus causing a higher volume change in the clay.

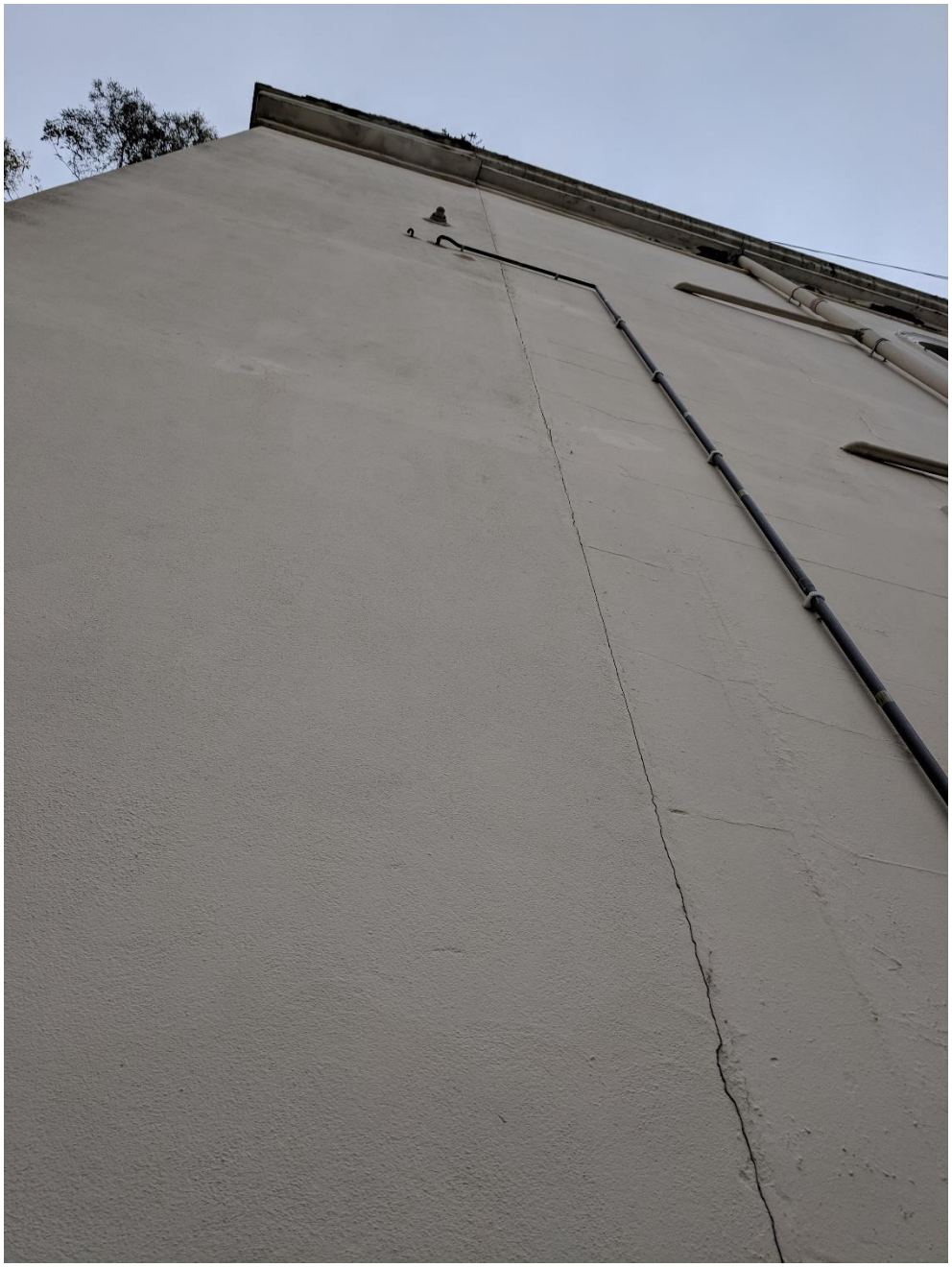
Local repairs can be carried out on the cracks, however, if the foundations are not deep enough to overcome the effects of the volume changes in the clay, then movement may continue to occur seasonally. It is noted that whilst the cracks are unsightly, the cracking is not currently considered structurally significant.

An alternative, longer term solution would be to mass concrete underpin all the existing foundation to an appropriate depth (approximately 2.7m, subject to a more detailed review) within the trees zone of influence. However, this is likely to prove less feasible in terms of cost and disruption.

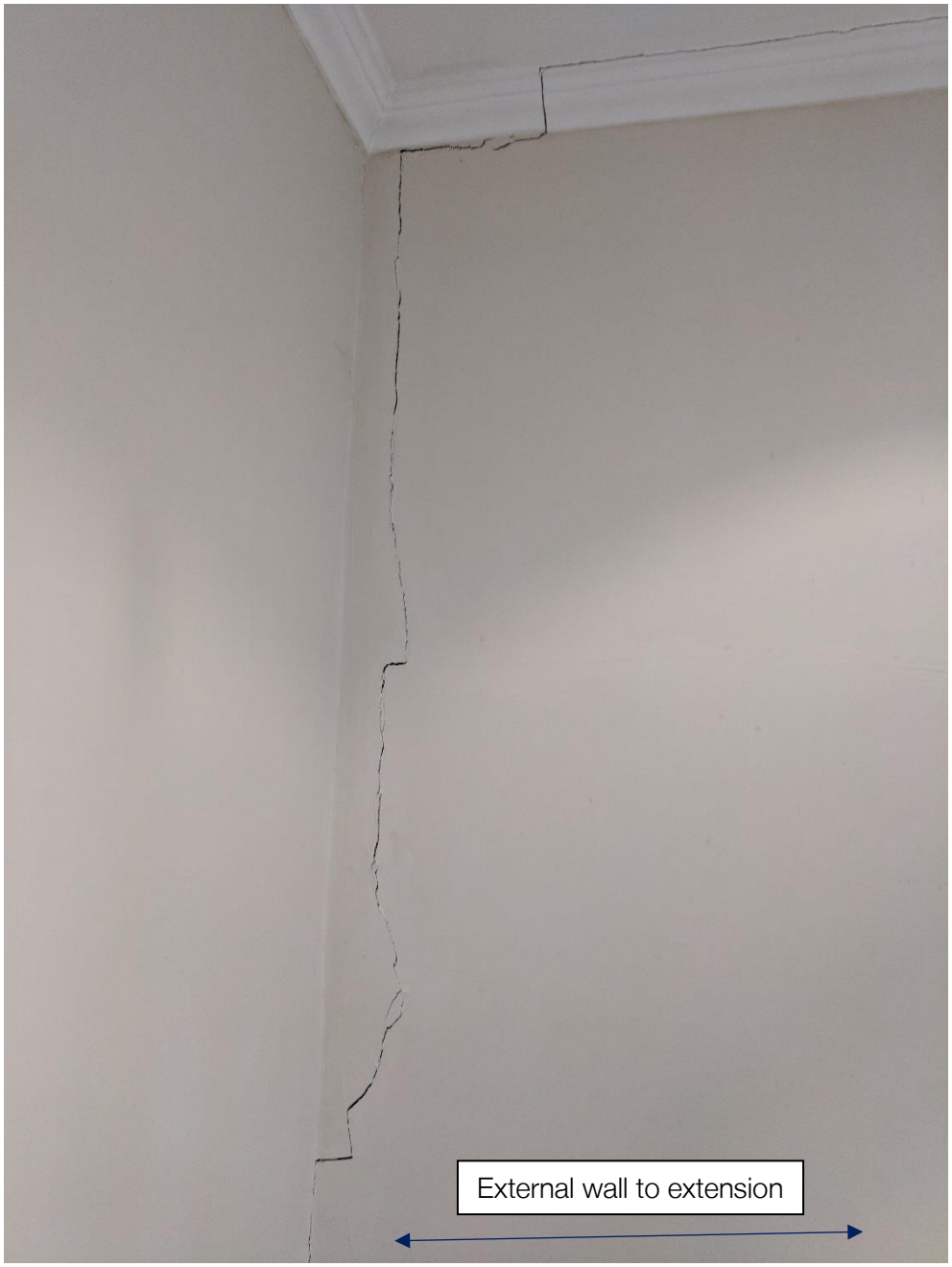
Appendix A

Photographs

Photograph 1 - Cracking between original house and extension

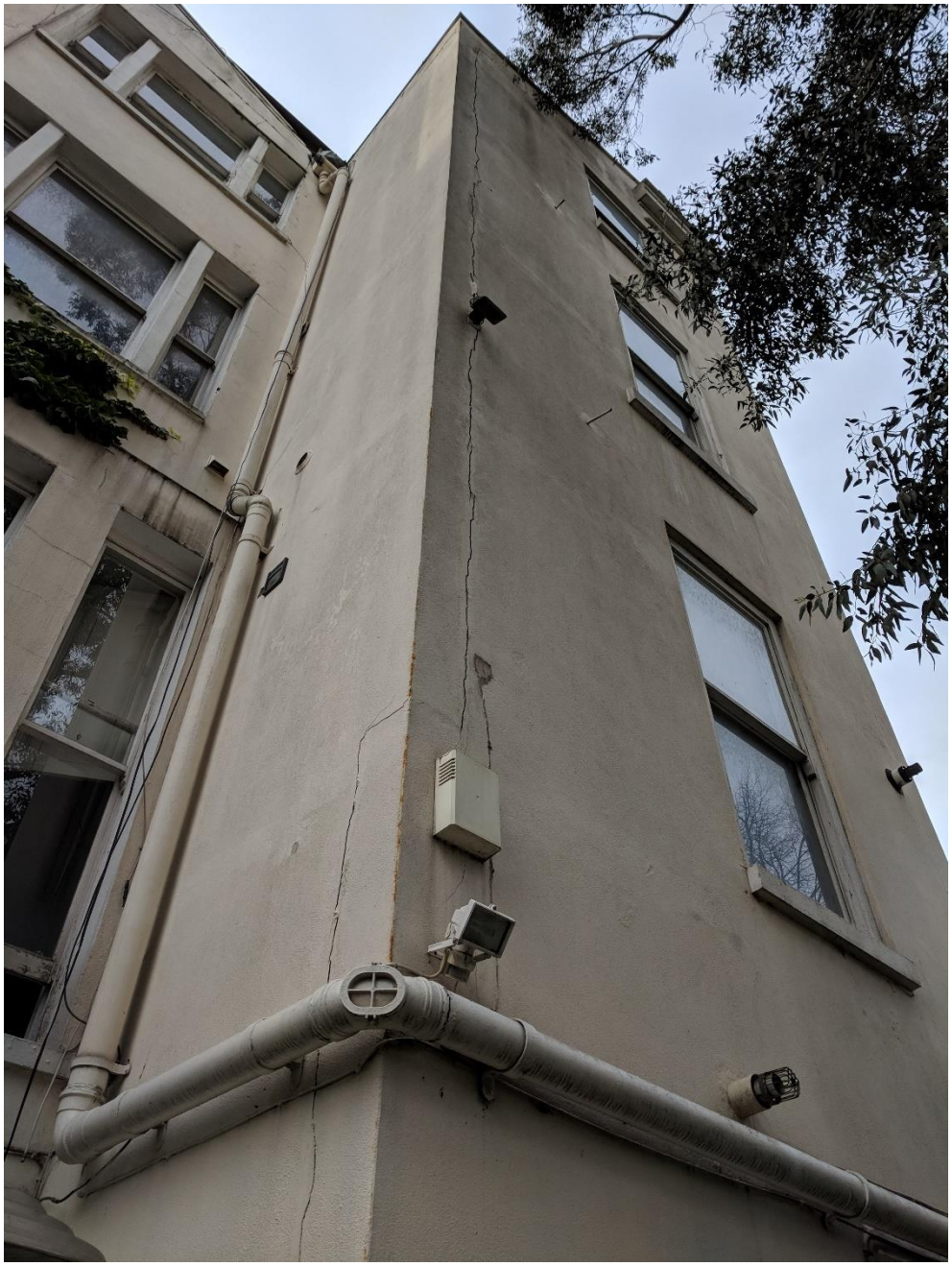


Photograph 2 - Cracking between original house and extension



Photograph 3 - Internal crack at lower ground floor level

Photograph 4 - Internal crack at ground floor level



Photograph 5 - External crack to rear extension

Photograph 6 - Internal crack at ground floor level on junction of rear and side wall

Appendix B

Site Plan

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Job No 27944 Page SK-01 Ver 1

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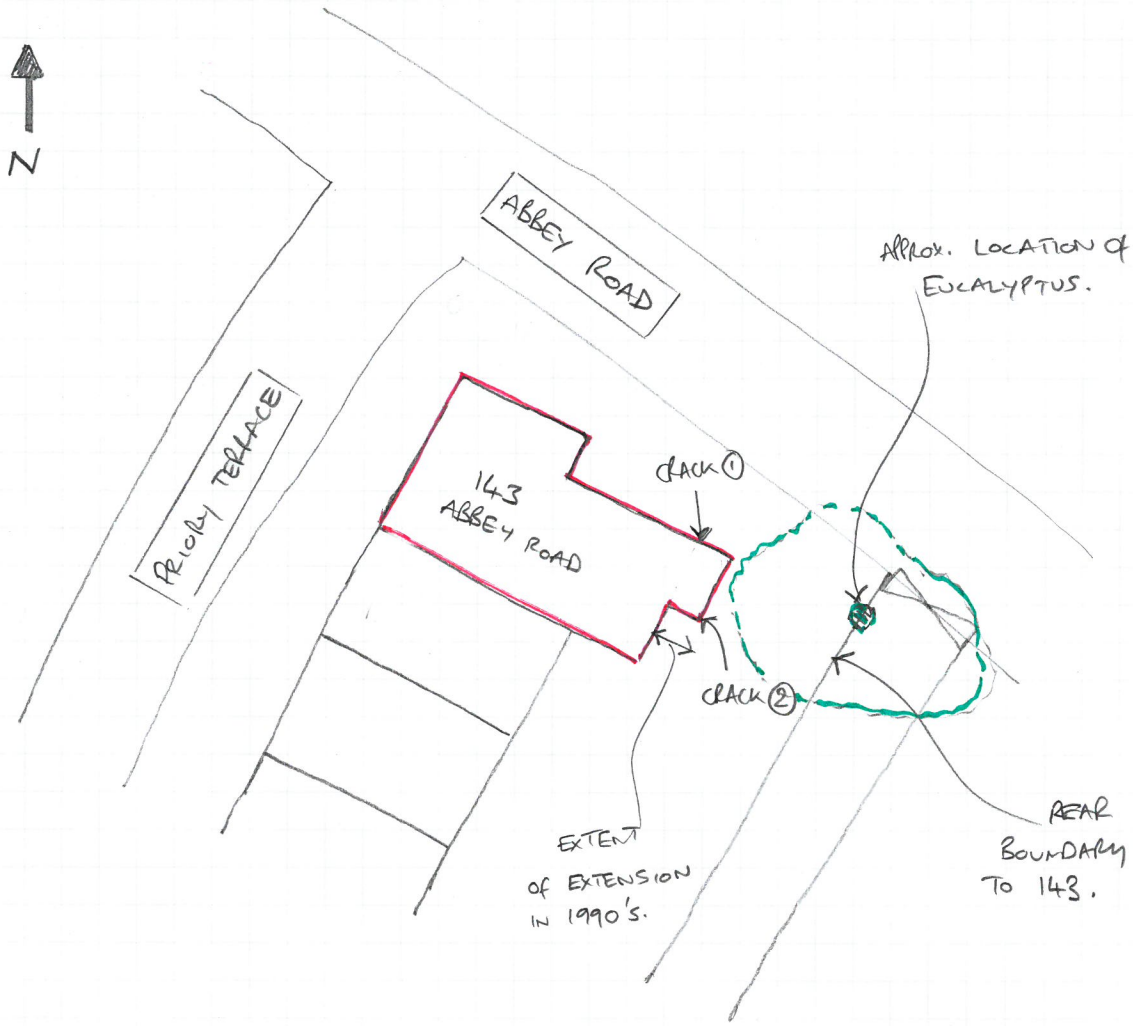
Job 143 ABBEY ROAD – SITE PLAN.



SITE PLAN (N.T.S)