

Lawson Martin Long Consulting Engineers Ltd



The Freeholders of 116 Highgate Road  
C/o Reanne MacKenzie  
116 Highgate Road  
London  
NW5 1PB

28<sup>th</sup> October 2019

Ref: 19/0098

Dear Ms MacKenzie,

**Structural Inspection of Cracking at 116 Highgate Road, London NW5**

The freeholders of 116 Highgate Road have engaged Lawson Martin Long Consulting Engineers (LMLCE) to visit the above property and carry out a non-intrusive structural inspection of the cracking you have reported at the front of the property (ground and first floor). Martyn Long visited on Tuesday 22<sup>nd</sup> October and we would report as follows

**Observations**


**General:** 116 Highgate Road is a four-storey mid-terraced house with a single storey bay to the front, typical of the area and built around the turn of the 19th century. The external walls are of 9in thick solid brickwork for the upper floors and likely to be thicker at the lower floors. The floors are of traditional timber joist construction and the internal walls are a mixture of masonry and timber stud walls. The geological maps indicate that the building is likely to be founded in London Clay Formation, clay, silt and sand (which is shrinkable ground that can be affected by cyclical seasonal movement).

**External Front Elevation/Garden:**

There is a crack at the bottom right corner of the right hand bay window (where it joins the front elevation) This turns to a diagonal crack just above the sill going downwards towards the ground in the front elevation; this crack starts as hairline (where it has broken through the paintwork and finishes as a slightly displaced subsurface crack (see photo 1).

There is a crack through the front doorstep of No 116 (see photo 2).

The front elevation of No 116 has a significant bow, with belly of bow being between first and second floor levels; there are signs of this having been repaired in the past with the installation of bowties and Helibars to arrest the bowing (see photo 3). We have been given sight of a report from a previous engineer recommending Helibar and Bow tie repair, along with receipts from contractors showing this work has been done. There is every reason, therefore, to anticipate that the bowing is historic, and the remedial work has arrested it. We saw no recent cracking which would suggest there has been no recent movement of the bowing.



There is a crack to the right hand side of the front door at toplight level that rakes diagonally upwards (see photo 4 ).There is a vertical crack from the top right hand corner of the front bay of No. 116 rising up and through the window sill of the righthand first floor window (see photo 5). There is a crack above and to the left of the main entrance door when viewed externally (see photos 3 & 5). This crack tapers so that it is narrower at the bottom and wider at the top and it extends to the first-floor windowsill (as detailed below).

The downpipes to the right of the front door allow the water to discharge over the surface potentially adding to moisture content differentials (see photo 6). Ideally down pipes should discharge into the public sewer (possibly via the manhole in the front garden).

The slabs at the front of 116 Highgate Road adjacent to 114 are cracked, raised and uneven (see photo 6). There is a significant crack in the left-hand junction of the front and the left-hand side of the bay to No 114 (see photo 7) of width approaching 10mm; there is also a vertical stepped crack to the left-hand side of this window (see photo 7).

There are several mature trees in the front gardens of 114 – 118 Highgate Road, such that the buildings are within the zone of influence of these trees' roots (a number of these trees are of similar height to the four-storey building), see photo 8.

(There is also significant damage to the front garden wall between No. 116 and No. 114. This however is not covered by this report.)

#### **Internal First Floor Front Room:**

A windowsill tile has popped up on the left-hand windowsill (looking from within the room) (see photo 9). This is the same windowsill with external crack mention earlier. The bowing of the bay can be clearly seen in the tapering junction between the fitted wardrobes and the front elevation (see photo 10). The bow is also visible at the junction between the ceiling and the front elevation where there is also a hairline crack in the junction (see photo 11).

#### **Ground floor hallway:**

There is a vertical crack in the junction of the brick part of the internal hall flank wall to the front reception room and the studwork part, below the downstand beam. There is also a raking crack through the ceiling adjacent to the junction of this internal wall and ceiling (see photo 12 & 13).

There is also a hairline vertical crack in the party wall with No 114 at the bottom of the stairs (see photo 14 & 15)

#### **Ground floor front room:**

There are two significant cracks at the top of the front elevation between the junction with the hallway wall and the junction with the front bay (see photo 16). The large crack carries on into the bay in the junction with the bay ceiling (see photo 17). There

is also a vertical crack in the junction of the hallway wall and the front elevation and evidence the front elevation has dropped slightly in relation to the hallway wall (see photo 18).

### **Opinion**

It is our opinion that the cracking noted at the front of the building to the right of the bay window (as viewed from the street) and extending up to the right and first floor window is very likely to be the result of subsidence (ground shrinkage). The probable cause of the subsidence is the presence of substantial trees in the front gardens of no. 116, 114 and 118 (particularly both sides of the boundary between 116 and 114). The movement can be characterised as the clay ground shrinking beneath the foundations, probably due to the trees removing moisture from the shrinkable clay soil.

We have come to this opinion because:

1. The ground is most likely clay, which is susceptible to volume change due to variations in moisture content.
2. There are a number of substantial trees close by. All these trees are tall enough and close enough that No 116 is within the likely zone of influence of the roots of these trees. Further, the foundations, although probably standard for the time of building are likely to be relatively shallow by modern standards and therefore relatively susceptible to the effects of the presence of the tree roots.
3. Although we consider the trees to be the most likely major contributing factor to the cause of the movement, we can't rule out that damage to the drainage may also be a part cause. It may even be that the tree roots have damaged the drainage, which has caused leaks which have in turn caused the subsidence. Bearing this in mind, we would recommend a thorough CCTV survey of all the below ground drainage on the property.
4. The fact that the downpipes mentioned above discharge on to the ground surface rather than into a sewer is far from ideal and could contribute to increased seasonal moisture content.

The cracking to the bay of no. 114 is much more severe than to no. 116. The owner of no. 114 has reported that at least part of their property has been underpinned. The severe cracking at the junction of the bay of 114 and the front elevation suggests that the bay wasn't underpinned although we can't know this for certain. If no. 114 has been underpinned, then the cracking seen in no. 116 is likely to be differential settlement (bit still subsidence) because no. 114 would not be moving any more but no. 116 is moving slightly relative to it.

**Recommendations:**

1. It is not possible to say for certain whether the movement is ongoing after one visit, there would need to be a period of monitoring in order to be sure. We would therefore recommend that the crack widths are monitored and level monitoring is done bi-monthly over a period of 12 - 18 months to ascertain whether the movement is ongoing.
2. In our opinion, the cracking is most likely to be due to subsidence and is therefore likely to be an insured peril on your building's insurance. You should therefore contact your insurance company and inform them of the situation. At this stage, the subsidence is relatively slight and we would anticipate a certain amount of recovery as the soil re-hydrates over the winter, particularly if the trees are reduced. It may be that you would prefer not to institute a claim with your insurance company (at least initially) and instead you may prefer to have the trees reduced (in conjunction with your neighbours) and monitor as described above and give the ground time to recover before deciding whether you want to institute a claim and have the trees subsequently removed completely. If you did proceed with this course of action, you must inform your insurance company, show them this report and get their express written agreement that the tree reduction and monitoring course of action is acceptable to them and that it does not prohibit you from instituting a claim later if the subsidence proves to be progressive. At this stage, we do not think the subsidence is severe enough to justify underpinning immediately.
3. A CCTV survey is undertaken of all the underground drainage on the property. We recommend Drainsmart (contact Tony Marsh, 02086633699). This will check if there are any significant cracks in the underground drainage which may have the potential to damage the ground or foundations now or in the future.
4. The trees in the immediate vicinity of the front of the house are pollarded to reduce their height by half and canopy volume to approximately 1/2 of the current volume and thus to reduce the zone of influence of their roots. If the trees are reduced, the ground can be expected to recover (heave) back to something approaching its original volume. This could mean that over the coming couple of years, more cracking damage could occur to all three buildings (114, 116 and 118) until the recovery is complete, at which point the cracks could be repaired and redecorated. If the recovery were monitored and not found to be excessively damaging to the existing structures, you may, at that point decide to completely remove the trees, subject to recommendations from a structural engineer and Arboriculturalist at that stage.
5. The downpipes on the front elevation between Nos 116 and 114 are connected to either a soakaway or the surface water sewer.

**Risks:** If the trees are reduced, there is a small risk that the recovery will initially cause more cracking (but most likely relatively slight) as the building structures react to the ground recovery. This further damage will be the result of the buildings' returning to their original levels. In our opinion, this risk is unavoidable and whatever recovery damage is experienced will almost certainly have minor short term consequence compared to the benefit of having the trees reduced and potentially later completely removed

I hope this letter report provides you with the information you need for now. If you wish to discuss further or have any queries, please don't hesitate to call me at this office.

Yours sincerely,

A large black rectangular box redacting the signature of Martyn Long.

Martyn Long MEng CEng MIStructE, Director

## Photo Gallery

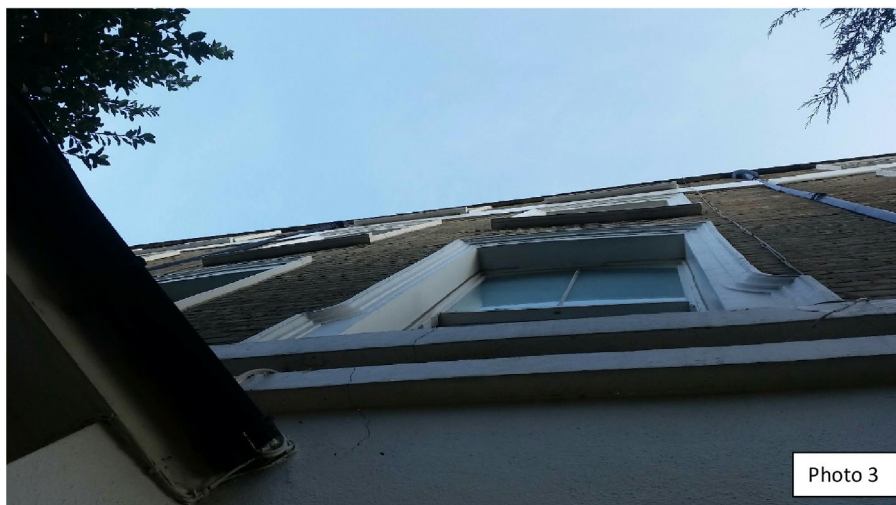




Photo 4



Photo 5



Photo 6





Photo 9



Photo 10

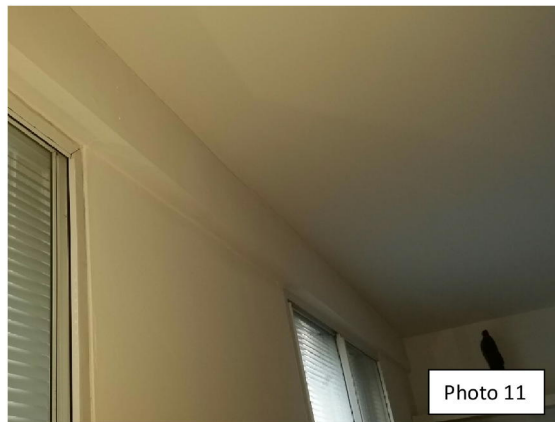


Photo 11



Photo 12



Photo 13

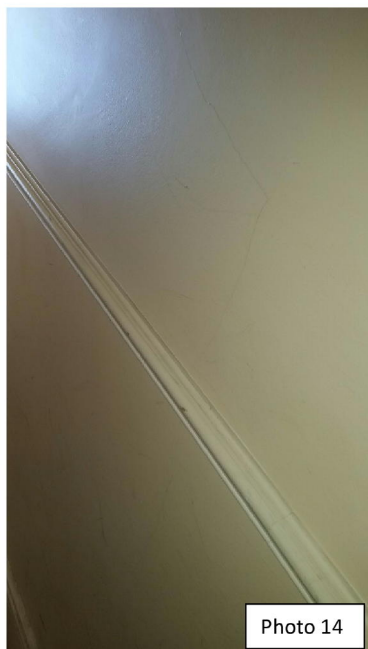


Photo 14



Photo 15



Photo 16

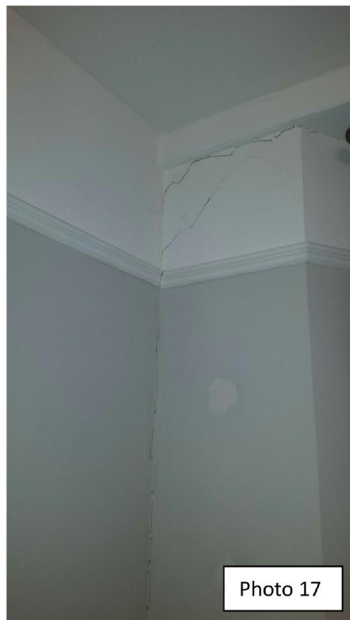


Photo 17



Photo 18