

QG Ref:



BROKER Ref:

NAME & ADDRESS OF CUSTOMER:



Garlands
Billingshurst
West Sussex
RH14 9BH

SITUATION OF LOSS:

As above

ENGINEERS SITE REPORT

Observations and Recommendations:

BACKGROUND

Initial Diagnosis

The claim for subsidence was submitted in September 2023 and Questgates arranged for Structural Surveys to investigate. Their Report of 26th September 2023 concludes that subsidence had occurred to the rear left of the single storey rear addition with the most likely cause being clay shrinkage through moisture extraction by roots from nearby vegetation. However, they also indicate that leaking drainage may be a factor. Site investigations were recommended.

Site Investigation

The site investigation was carried out by Auger and their report is dated 30th October 2023.

The trial pit/borehole revealed the Addition is founded on a 1.2m deep concrete trench footing underlain by an intermediate to high plasticity clay (medium volume change potential in accordance with NHBC Standards 4.2). Soil suction tests were used to determine if the clay was desiccated and gave values of 1930kPa at 1.2m, 3600kPa at 2.2m and 3280kPa at 2.7m. These levels of suction are not possible in clay soils so the results should be treated with caution. However, it would be reasonable to conclude that the clay was desiccated.

One root was recovered immediately beneath the footing and identified as Pomoideae which the Arboriculturist later suggested stemmed from either T1 Rowan or T2 Pear.

The drains close to the area of subsidence were also investigated and joint displacements were noted in the run from the rainwater gully run to the manhole at the rear left of the addition. These were subsequently patch lined. The run from the rainwater gully at the rear left of the original house was found to be free from defects.

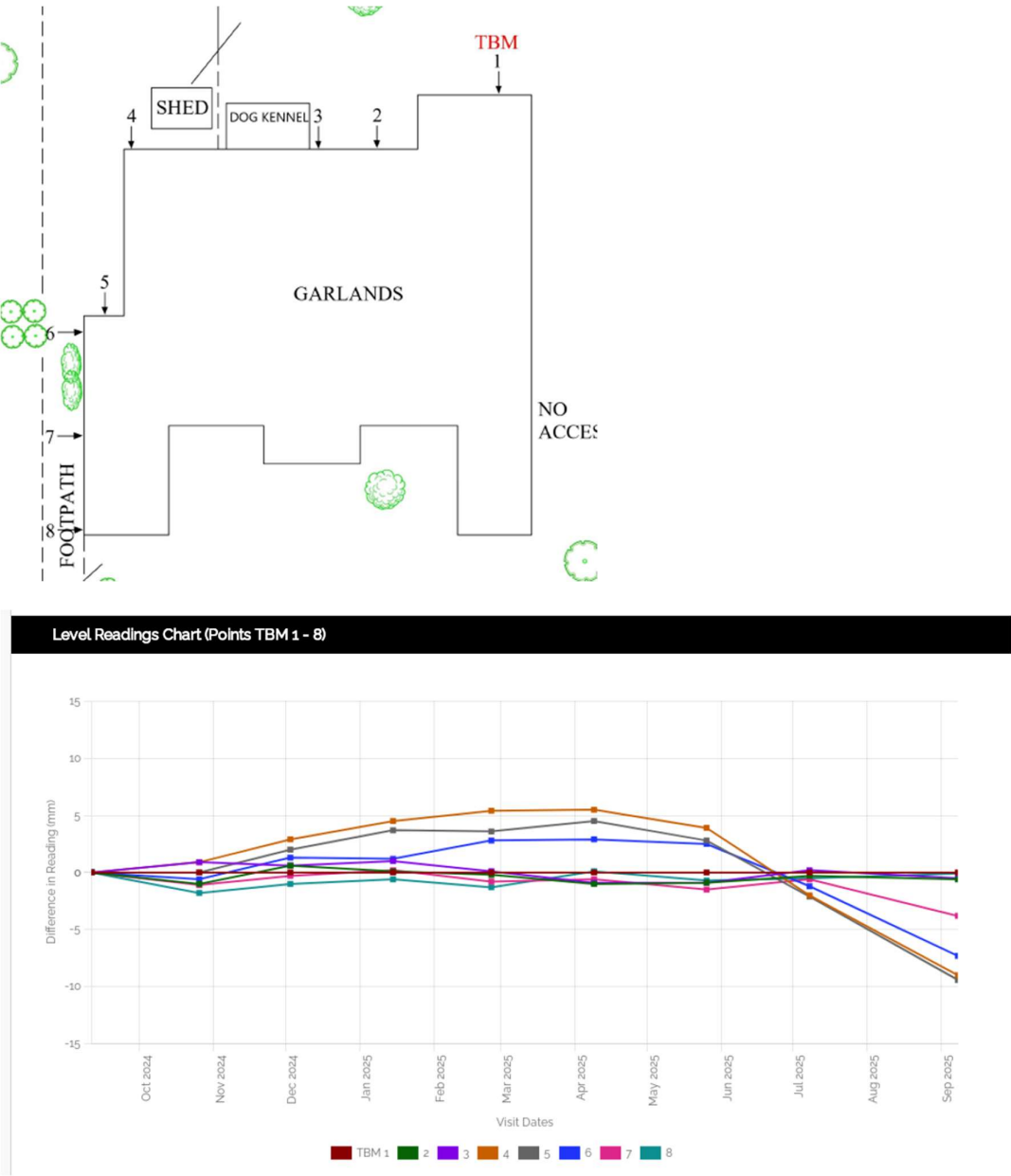
Arboricultural Works

As a result of the site investigations, it was concluded that the cause of subsidence was root-induced clay shrinkage. This is the most common cause of subsidence and the structure can normally be stabilised by removing the vegetation that is causing the clay shrinkage. An arboricultural report was obtained from MWA Arboriculture and their

Report of January 2024 recommended removal of T3 Goat Willow and to maintain regular pruning of T2 Pear. T3 Goat Willow was removed in March 2024 and the property was monitored to assess the effect. Due to downward movement starting again in late May 2025, MWA were asked to review their recommendations and this resulted in their revised report recommending that T2 Pear should also be removed.

Level Monitoring

Level monitoring has been ongoing at approximately 2 month intervals since September 2024. A plan showing the stations and a graph showing the movement is reproduced below.



The readings show a typical cyclical pattern of movement associated with clay shrinkage subsidence with about 15mm downward movement occurring during Summer 2025 so

far at Stations 4 & 5, around 9mm at Station 6 and about 3mm at Station 7. The remaining stations are stable.

Station 4 is at the rear left corner of the Addition. Stations 5 & 6 are on the rear left corner of the original house and Station 7 is on the left wall of the original house, closer to the front than illustrated on the Plan.

DAMAGE OBSERVATIONS – OCTOBER 2025

The original damage was recorded and photographed in the Structural Surveys Report and was classified as Category II 'Slight' in accordance with BRE Digest 251 'Assessment of cracking in low-rise buildings'. Recent observations show that the damage has worsened significantly, particularly inside, and would now be classified as Category 4 'Severe'.

Hall

- Diagonal crack above left side of door, tapering open with height and extending along sloping ceiling/wall junction on left wall of Addition. Open c.20mm.
- Cracks above beam opening to lobby area (original house) extending above and below bedroom window and across sloping ceiling to window light.
- Crack across limestone quarry floor tiles from WC door and tapering to closure by lobby junction



WC

- Vertical crack above and below rear wall window, translating to horizontal cracking at sloping ceiling/rear wall junction
- Above crack extends along left wall/sloping ceiling junction, tapering open and translating to diagonal crack on internal wall to side of door. Open c.20mm.



Bedroom (1st floor above lobby)

- Minor cracking above and below left flank window
- Diagonal crack below right side of rear window



There is also minor cracking in the laundry room and 1st floor bathroom at internal wall corner joints, similar to previous cracking recorded.

External

- Stepped crack below left corner of lobby window extending around corner as stepped crack
- Stepped crack above left side of door to Addition
- Stepped crack to left side of rear WC window and vertical crack below right side
- Tilt to left corner measured at 1 in 75.



The main change in damage is the cracking deriving from the rotation of the left flank wall. This has increased the main cracking on the internal partition wall between hall and wc from 2.5mm to c.20mm. Other cracks are broadly similar in magnitude, including the limestone floor.

CAUSE

The cause was established as root-induced clay shrinkage and this has been further confirmed by the monitoring. However, Summer 2025 has shown that it is not only the Addition that is affected but also the left flank wall of the original house, with movement worsening towards the rear left corner.

The monitoring shows about 15mm downward movement this summer but this has translated into cracking around 20mm between the left flank wall (which has rotated outwards) and the internal partition wall. This is due to simple geometry, with the fulcrum of movement being the crack in the floor tiles which is a shorter distance from the flank wall than the height of the cracking.

The external cracking on the rear wc wall was previously measured at 3mm and is now about 6mm open, again indicating further rotation due to subsidence.

It is therefore evident that previous tree mitigation (ie removal of the Goat Willow) has not been successful in stabilising the property. Root evidence had indicated that the Pear tree was also of influence and MWA have already revised their recommendations that the Pear should be removed. Given the movement now extends further back up the left flank wall of the original house, there is a strong likelihood that the ornamental Beech's (H2) are also of influence. I would also question whether the Rowan is a factor given the previous root identification.

Notwithstanding, the amount of movement does seem high for the water demand of these relatively small trees, even if previous drain issues may have attracted roots to the

area in the first instance. One of the issues is the footings to the Addition. Whilst they are relatively deep, 1.2m being below the depth of normal seasonal movement, they have minimal spread (ie only 100mm out from the brickwork) so the whole wall is more prone to rotation outwards, even with small movements. Now the bond is lost from the left flank wall to the internal partition wall, any rotational movement of the footing is translating to similar movement (subject to geometry) of the flank wall outwards.

NEXT STEPS RECOMMENDATION

There are a number of potential solutions including further tree mitigation and/or underpinning and/or a masonry reinforcement solution and/or root barrier. However, before these can be looked at in details, further site investigations are required:

- a) To establish the depth of desiccation and
- b) To find out the foundation details for the original house and soil conditions below.

Care needs to be taken with any solution since we essentially have a flexible original house and a rigid rear Addition. I would not recommend any further tree works at this stage until these further investigations have been completed. Monitoring should continue.

[REDACTED]

[REDACTED]

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