Subsidence Management Services
3 Smith Way, Grove Park
Enderby
Leicester
LE19 1SX
United Kingdom

T: +44 (0) 330 380 1032
F: +44 (0) 330 380 1051
E: subsidenceclaimsunits@uk.innovation-group.com
www.innovationpropertyuk.com/subsidence

innovation group
subsidence management services
UNITED KINGDOM

Addendum Engineering Recovery Report

(Amended to incorporate further information following a number of queries submitted by the local authority)

IFS-AVI-SUB-14-0052426
Haverstock Hill Limited
Haverstock Hill, London, NW3 2BD

Investigation Appraisal

Introduction

We have advised in our Engineers Report that following the recent appearance of cracking, being concerned that the damage may be due to subsidence a claim for subsidence damage was submitted to insurers.

The policyholder advised that the building damage to the Garden Flat commenced suddenly over July 2014.

The policyholder also advised that the Garden Flat of the property had been extensively renovated at the time of purchase in 2011.

Finally, the policyholder also advised that the property had been the subject of a past subsidence claim for the front right entrance steps and portico in 2003.

The following is a summary of the damage relating to the Insurance claim, including any unrelated damage in the same vicinity.

Amendment:

The previous subsidence claim was progressed by another loss adjuster. We understand from documentation supplied to us in the form of a final Certificate of Structural Adequacy that there was not underpinning carried out to the front right entrance steps and portico, but a scheme of mini piling was utilised known as Shire Stabiliser. We have been provided with the design/construction drawings that show up to 8 piles were installed to the front section of the steps.

It is possible that the Shire scheme whilst providing additional support to the front step foundations has not totally achieved stability of the steps as seen from the level monitoring exercise. However, as outlined above there is no current crack damage associated to subsidence movement to the front steps.

A copy of the final Certificate of Structural Adequacy is to be provided for further information.

INTERNALLY GARDEN FLAT:

FRONT LEFT SIDE BEDROOM:

Diagonal tapering cracks in the region of 10 - 15 mm in width were recorded to the right side and rear walls of the bedroom around the Ensuite bathroom and hallway doors.

A further vertical tapering crack in the region of 1 - 2 mm in width was recorded to the front right of the room underside of the window.

FRONT RIGHT SIDE BEDROOM:

Diagonal tapering cracks in the region of 2 - 3 mm in width were recorded to the right side wall of the bedroom to underside of the window. Diagonal tapering cracks in the region of 20 – 25 mm in width were and to the front wall above the hallway door. A crack was recorded to the ceiling close to the hallway door. An area of dampness was recorded to the front bay and is the subject of further investigation.

The bedroom floor was also recorded to have dropped along the right side kitchen wall in the region of 20 mm.

EN-SUITE:

A crack in the region of 1 – 2 mm in width was recorded to the En-suite tiled flooring.

FRONT RIGHT STUDY:

The study timber flooring was recorded with downwards movement resulting in a gap with the skirting.

HALLWAY:

The hallway timber flooring was recorded with downwards movement of approximately 25 – 75 mm resulting in a gap with the skirting. Diagonal tapering cracks in the region of 1 – 15 mm in width were recorded to the left side wall of the hallway to above both the bedroom and bathroom doors.

BATHROOM:

A horizontal and vertical tapering crack in the region of 1 - 2 mm in width was recorded to above the hallway door. A vertical crack in the region of 1 mm in width was recorded to the rear tiled surface to the rear of the bathroom.

REAR LEFT LOUNGE:

A number of both horizontal and diagonal cracks in the region of 2 - 3 mm in width were recorded to the front right of the lounge to above the hallway and kitchen doors. A further diagonal crack in the region of 2 - 3 mm in width was recorded to the front wall of the lounge.

The lounge floor was also recorded to have dropped along the right side kitchen wall in the region of 20 mm.

REAR RIGHT KITCHEN:

A number of both horizontal and diagonal cracks in the region of 5 - 10 mm in width were recorded to the front right of the lounge to above the hallway and kitchen doors.

The kitchen floor was also recorded to have dropped along the right side kitchen wall in the region of 20 mm.

GROUND FLOOR FLAT

RIGHT SIDE KITCHEN:

A number of both horizontal and diagonal cracks in the region of 1 - 3 mm in width were recorded to the front left of the kitchen to above the hallway and lounge doors.

FRONT LEFT SIDE LOUNGE:

A diagonal tapering crack in the region of 2 -3 mm in width was recorded to the left side of the rear lounge wall.

Amendment:
As indicated above crack damage does exist to the flat situated directly above the garden flat and generally this damage is consistent with the internal crack damage and movement to the garden flat.

EXTERNALLY

FRONT ELEVATION, ENTRANCE STEPS AND PORTICO:

Crack damage was recorded in the form of render deterioration to both the front entrance steps, portico and boundary walls to the property.

Amendment:
As indicated above, we have noted a number of areas of external crack damage to both the front and rear of the property. We do not generally consider this to be related to the downwards movement to the building foundations i.e. subsidence. We consider the external crack damage to be as a result of gradual deterioration of the rendered surfaces with age. We do not consider this to be unusual in the context of the subsidence damage to the property.

During the recent site meeting with the local authority officers we noted areas of new crack damage to the right side of the front entrance steps. We consider this is in keeping with foundation related movement i.e. subsidence.

We are of the opinion that the previous scheme to stabilise the front entrance steps located on the right side of the building utilising a number of piles (Shire Piling) has in part resolved the subsidence movement but not prevented the internal areas of the property being affected by root induced clay shrinkage subsidence. The scheme of piling to the front entrance steps has not prevented tree roots from affecting the shrinkable clay sub soil beneath the building foundations internally to the property.

RIGHT SIDE ELEVATION:

No crack damage was recorded.

REAR ELEVATION:

No crack damage was recorded.

The indicated mechanism of movement is downwards internally to the right side of the property

An initial site investigation has been carried out to the front of the property.

A copy of the factual site investigation report dated 3rd November 2014 provides some further information.

The building foundations within the area of damage were found to be at a depth of between 500 - 1500 mm below ground level (bgl) comprising of a brickwork

steeped footing bearing onto a subsoil comprising of a stiff brown clay with the presence of
tree roots to a depth of between 1500 - 1900 mm bgl.

Tree roots were identified from Ulmus spp. are elms.

The cause of the building damage was now confirmed a clay shrinkage subsidence as a result of shrinkage of the clay subsoil due to the moisture extracting influence of the nearby trees in both front garden of the property and the adjoining neighbour's gardens.

A further site investigation was carried out to the front right of the building to pro additional evidence concerning the nearby trees.

The site investigation report dated 27 March 2015 provides some further details.

The root identification confirmed tree roots encountered to 3.00m bgl in BH3.

Roots were not encountered from 3.00m bgl to 4.00m bgl in BH3.

Tree roots were identified as Ulmus spp. are elms and Acer spp. are maples, inc sycamore, Norway maple, and Japanese maples.

Amendment:
TP/BH 1 is located to the front left side of the property and next to the bedroom bay window. A copy of the site investigation dated 03 November 2014 is attached for some further information.

A drainage survey was carried out to the right side of the building and with the area of subsidence damage.

The drainage investigation report dated 18 December 2014 provides some further details.

The drainage investigation contractor carried out a CCTV survey of the drainage system. All runs were cleaned by high pressure water jetting prior to the CCTV survey.

All drainage runs surveyed were found to be in a serviceable condition and did not require any repair.

Amendment:
In view of the above a further drainage survey was carried out on 5th April 2016. A copy of the factual report dated 7th April 2016 is attached for information purposes.

The drainage investigation contractor advised that they attended the property to carry out a CCTV survey. All runs were cleaned by high pressure water jetting prior to the CCTV survey. The survey report presents a summary of the findings with recommendations to repair and/ or return the drains to a serviceable state, where necessary. The contractor has recommended repairs to the following drainage runs, Drain Run A: CMH1 Upstream to FMH1, Drain Run D: RUN C Junction Upstream to RWG2, Drain Run F: CMH1 Upstream to the ACO drain, Drain Run J: CMH2 Upstream to Possibly Disused Gully and Drain Run O: CMH3 Upstream to RWG3. It is noted that the drainage runs recommended for repair are all located outside of the area of subsidence movement. The main drainage runs within the area of subsidence movement are all noted to be in a satisfactory condition and not requiring repair.

We note that a number of previous drainage investigations have been carried out. The survey dated 30 June 2015 confirmed the need for localised repair to Run D along the right side of the property given the ingress of tree roots. We are not aware of a roof downpipe that is not connected to the main drainage system allowing surface water discharge.

Mitigation

An arboricultural assessment report has been obtained concerning the vegetation to the front of the property.

The arboricultural consultants report dated 20th October 2014 provides some further information.

The arboricultural consultant has advised that they have implicated T2 (Acer), T3 (Elm) and T5 (Pear), however based on their assessment that the footings of the subject property fall within the anticipated rooting zone of this vegetation.

Vegetation is therefore deemed to retain the capacity to be causal to the current movement and building damage. In assessing the potential drying influence of the vegetation on site, T2 (Acer) and T3 (Elm) are considered the dominant features and accordingly have identified them as the principal cause of subsidence.

T5 (Pear) cannot be discounted as contributing to the overall level of soil drying proximate to the area of damage and is therefore also considered to retain a contributory influence, albeit in a limited or secondary capacity .

The arboricultural consultant has recommended removal of T2 (Acer) , T3 (Elm) and T5 (Pear).

Summary and interpretation of Monitoring

Level monitoring involved fixing pins around the perimeter of the building from which levels were taken to determine where the external walls and hence by implication the foundations are moving and by how much.

Level monitoring was set up in October 2014 and readings have been taken at approximately 8 week intervals.

The monitoring locations which are as shown in the most recent monitoring report dated 23rd October 2015.

The level monitoring has shown that the property is affected by seasonal downward movement to the front elevation/steps with the maximum degree of seasonal downward movement occurring to point 4 in the region of 10 mm overall.

The monitoring shows the affected parts of the property moving down during the summer months when the trees are in leaf, demanding larger amounts of water and rainfall is lower and the net moisture content within the clay soil below the property decreases.

Recovery or upward movement is then witnessed during the winter months when the tree loses leaf, demands less moisture and the rainfall events increase, allowing the soil to rehydrate to some degree and swell, causing upward movement and consequential closing of cracks within the property.

While it was not possible to identify a suitable remote datum the readings have been made relative to Level Station 10 with an assumed value of 10.000m at the time of each reading.

The level monitoring program to date clearly indicates downward movement through Summer 2014 with recovery becoming evident with the onset of the wetter winter months.

This demonstrates that the identified offending trees are the cause.

While climate alone can cause some small changes in the surface soil (to a depth of 500 mm or so), the foundations of the house, being some 3000mm below ground level are beyond this zone and seasonal movements of the scale shown are indicative of root-induced shrinkage associated with a large tree.

In this instance, the only significant vegetation within influencing distance of the front and right side of the property are the Acer, Elm and Pear.

Amendment

The most recent level monitoring readings to 16th February 2016 are attached. This continues to show that the building foundations are being affected by seasonal downward and upwards movement.

Remedial Works

The building damage is generally considered to be Category 3 (Moderate) in structural terms, it will be expensive to rectify because of the size of the rooms and the extensive decorations that will be required.

Even if there were any doubt as to the extent of the damage that can be reasonably attributed to the influence of the nearby trees the current recorded seasonal foundation movements are unacceptable.

If the influence of the implicated trees are not eliminated, an engineering solution will most likely be needed to stabilise the property.

A range of underpinning solutions is available depending on the area that requires stabilisation and the depth required. Traditional, mass concrete, underpinning is generally the most economical solution where the required depth is relatively shallow. It has the added advantage that the underpinning also acts as a root barrier. However, it tends to become uneconomical, and the Health & Safety considerations become increasingly onerous, where the required depth exceeds 2.5 m.

Most underpinning is extended to a metre below the last discovered root and this is 3.0 m making this an unacceptable risk from a health and safety perspective and should be discounted.

A pile-based underpinning solutions tend to be more economical where (i) the required depth exceeds 2.5 m and (ii) it is necessary to stabilise internal walls as well as external walls.

A common variant is the piled-raft which consists of a reinforced concrete slab under the entire footprint of the property supported on driven or bored piles.

It is very difficult to partially underpin a property with a piled raft as the transition between stabilised and un-stabilised parts of the property is very vulnerable to cracking as a consequence of the minor seasonal fluctuations which might be expected in the traditionally founded part relative to the very stable piled section.

Amendment:

We estimate that the cost to provide an engineering solution to the front and right side of the property is £125,000.

The scheme will comprise of a partial underpinning scheme located internally to the garden flat. This will require a period of alternative accommodation for the garden flat owners.

Signed Ray Borrow
Name Ray Borrow
Dated 8th December 2015
Amended 15th June 2016.