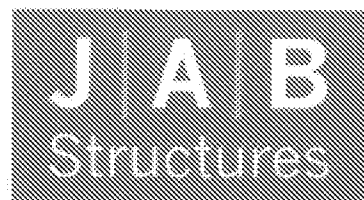


Mr Bill Hardman
Three Pears Cottage
3 Mill Lane
Rustington
West Sussex
BN16 3ED



Structural Design | Survey Reports

19 Cheviot Close, Worthing
West Sussex, BN13 2LL

Ref:- 22-005

Monday 4th April 2022

Dear Mr Hardman,

RE: THREE PEARS COTTAGE, 3 MILL LANE, RUSTINGTON

We confirm visiting the above property on Tuesday 25th January 2022 to carry out a visual inspection, where possible, and to report on the cracking and movement to the Lounge / Kitchen area and Bedroom within the annex to the right hand side of the property. The inspection and report have been carried out in accordance with the Terms of Business which are attached. We comment as follows:-

1. General

- 1.1 In describing the property all references to the front, rear, left and right assume that it was viewed from Mill Lane. For the purposes of this report the front of the property was assumed to face East.
- 1.2 The main property was a two storey detached building with masonry external walls beneath a pitched tiled roof. There was a two storey projection from the North side of the front elevation. The pitched roof over the property spanned front to back and side to side over the front projection. The external elevations to the building were of brickwork. There was a single storey extension which had been added against the North side elevation of the main property. The addition was understood to have been an attached double garage with a store and wash area which was converted to the annex and habitable rooms with a Lounge / Kitchen area and Bedroom, subject to this report. The addition to the right hand side of the property was of masonry external walls beneath a flat roof. The building was thought to have been constructed circa 1930s.
- 1.3 The construction was conventional throughout, and, as far as could be determined from a visual inspection, contained no materials or details which might give rise to structural problems.

1.4 This report is associated with an inspection of the annex to the right hand side of the property and was not an inspection of the whole building.

1.5 The reporter was unaware as to the detailed history of the property.

2. Discussion on site

2.1 You made us aware that you bought the property in 1999. You commissioned a HomeBuyers Survey report which did not identify any structural damage to the property.

2.2 We understood from our discussions during our visit that the double garage had been converted into the annex in 2000. You made us aware that these works had been carried out with the relevant statutory consents, including Planning and Building Regulation approvals. The works were believed to have included infilling the opening into the garage, upgrading the external walls and the introduction of insulation.

2.3 You had noticed cracking and movement to the annex which had progressively worsened with time. You have become concerned with the progress of the damage, particularly in the past couple of years. The cracking within the annex was recent and increasing in width and length with time.

2.4 The drive to the front of the property was understood to have been of a tarmac surface which was replaced with the block paviors in 2011. There were undulations to the block drive which had also progressively worsened with time. This included hogging and dips to the blocks causing undulations and trip hazards.

2.5 There was a mature tree, understood to be a Monterey Cypress, growing adjacent to the front right hand corner of the annex. This tree, which was growing within the land to the rear of No 1 The Limes, was understood to be subject to a Tree Preservation Order. Application for works to reduce the height of the tree had been made in the past, although these were refused by the Planning Department on the basis they were considered excessive and would affect the amenity value of the locality.

2.6 The development of the The Limes estate, which was located to the North side of the property, was believed to have taken place in 2007.

2.7 You advised us that the works to the estate to the North side of the property had included the introduction of a pre-cast concrete soakaway to the land to the side and rear of No 1 The Limes. This was in close proximity to the mature tree. You had concerns that this may have had an impact on the tree.

3. Documents / Internet Search

3.1 We were provided with a HomeBuyers Survey report, dated 31st March 1999, which had been prepared by Rackhams, Members of the Royal Institution of Chartered Surveyors. The HomeBuyers Survey report prepared by Martin Rackham did not indicate any serious cracking or significant movement to the garage structure.

- 3.2 We carried out an internet search of the Planning records at Arun District Council which indicated that a Building Notice application for the garage extension (R/195/76/B) was made in 1976 with the garage conversion to an annex (R/162/99/BN) with habitable rooms being made in 1999. However, there were no documents available to inspect.
- 3.3 We were provided with Architects drawings, prepared by Tripe and Wakeham Partnership, which related to the attached garage and store / wash area to the right hand side elevation of the property. The garage extension to the right hand side of the property was understood to have been approved with the relevant statutory approvals in 1976. The Architects drawings indicated that the flat roof to the garage spanned side to side and was supported onto the walls to each side of the garage. The external walls to the extension were indicated to be of cavity masonry wall construction supported onto trench filled foundations, with the exception of the opening to the front elevation which appeared to be located above the floor slab below. The floor within the addition was detailed as being a ground bearing concrete slab. An internal masonry wall which separated the garage from the store and wash area to the rear was indicated to be supported onto a thickened slab. The actual construction of the garage may not reflect that as marked on the Architects drawings.
- 3.4 The Architects drawings indicated that there were inspection chambers adjacent to the front and rear of the garage and that the rainwater downpipe against the rear elevation of the garage discharged to a soakway within the back garden.
- 3.5 The works carried out to convert the garage and the store / wash area into habitable rooms for the annex was unknown. The foundation works undertaken to support the infill masonry external wall to the opening to the front elevation of the garage was unknown.
- 3.6 The Planning records at Arun District Council identified that the mature tree, located directly adjacent to the front right hand corner of the annex, within the neighbouring land to the front of the property was subject to a Tree Preservation Order (TPO/R/3/07). The tree was a Monterey Cypress (*Macrocarpa*).
- 3.7 We also understood from the Planning records that works to reduce the crown of the tree had been refused in both 2007 and 2010. These Planning applications included:
- Planning Reference - R/232/07/T. To reduce crown by 30%, thin crown by 15%, remove dead and diseased wood of 1 *Macrocarpa* tree. 2007 The works proposed to the tree were refused on the basis that they would compromise the significance and amenity value of the locality. The application for works to the tree had been made by Connick Tree Care, Arborists.
 - Planning Reference - R/177/10/T. Amended application to crown lift to 3.5m secondary and tertiary branches. Thin by 10% including to remove dead and diseased wood and to prune branches clear of phone lines. The works proposed to the tree were refused on the basis that they were considered excessive and limited works were put forward. The application for works to the tree was made by Connick Tree Care, Arborists.
 - The Planning applications did not indicate any damage to the garage structure.

- 3.8 We undertook a historical search on Google Earth which indicated that the development of The Limes Estate was taking place in April 2007. The full extent of works to The Limes was unknown.

4. Topography / Geology

- 4.1 The site is relatively level and we could see no falls or drops considered sufficient to cause instability in the foundations. There was a gradual fall in the drive at the front of the property to the public footpath and a small change in ground level to the North side of the extension.
- 4.2 Data from the British Geological Survey Map indicated that the property was underlain by a Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation And Portsdown Chalk Bedrock Formation. The British Geological Survey Map also indicated superficial River Terrace deposits below the property. The River Terrace deposits can be made up of Sand, Silt and Clay. If Clay or Silt are present below the property then these could shrink or expand according to the level of moisture in the ground. Shrinkage of the ground under the foundations in times of drought, or when desiccated by tree roots, can cause foundation movement leading to subsidence. The presence of vegetation adjacent to the property would be a potential threat to its stability.

5. External Inspection – Single Storey Annex

- 5.1 The works to accommodate the annex to the North side of the property had included to infill the garage door opening to the front elevation of the extension. The opening had been infilled with a masonry cavity wall with a window and door. There was a window to the left hand side of the front elevation with an entrance door to the right. The window and door frames were of PVCu construction.
- 5.2 The extension which had been added to the North side of the main property was of masonry external walls with brickwork elevations beneath a flat roof. There was a small pitched roof from the side elevation of the main property which dropped down to the flat roof over the extension. The annex appeared to measure approximately 4.3m wide x 8.5m in length on plan.
- 5.3 There was a dip within the lawned area to the East side of No 1 The Limes with inspection chambers within the neighbouring garden. Within the garden to the East side of No 1 The Limes there was an inspection chamber within 10m of the front right hand corner of the annex.
- 5.4 There was a mature tree, upto 20m in height, less than 1m from the front right hand corner of the annex. The tree had a trunk diameter of 1.2m with a diameter of 2.0m at ground level. The roots from the tree were present above ground level and directly adjacent to the annex.

- 5.5 There was a rainwater downpipe, which served the roof over the annex, against the North side elevation at the rear right hand corner of the annex. The rainwater downpipe was located on the neighbours side of the wall. We were unable to confirm whether the downpipe discharged into a gulley. We were unable to determine the location of any inspection chambers to the North side of the property.

Front Elevation - Annex

- 5.6 There was a tapered stepped crack present below the North side of the annex window. The crack was upto 2mm wide at the sill and closed at 4 brick courses below where it dropped down to the reveal to the side of the door. The window sill fell to the South when checked with a spirit level.
- 5.7 There was a tapered vertical gap present between the window frame and the reveal to the South side of the opening. The gap was upto 5mm wide at the sill and closed at 4 brick courses above. There was distortion to the window frame.
- 5.8 There was a vertical crack below the South side of the window. The crack, which continued through bricks, was upto 3mm wide at ground level and closed at 6 brick courses above.
- 5.9 There was a tapered vertical gap present between the door frame and the reveal to the North side of the opening. The gap was upto 10mm wide at the head of the opening and closed at 10 brick courses below.
- 5.10 There was an isolated horizontal crack, upto 5mm wide, at high level from the right hand side elevation of the annex to the North side of the entrance door.
- 5.11 The brickwork beds to the North side of the entrance door fell to the North by upto 1:60 when checked with a spirit level.
- 5.12 The original brickwork directly adjacent to the North side elevation of the annex was weathered and had deteriorated with eroded pointing to the wall.
- 5.13 The right hand side elevation of the property adjacent to the front return wall to the door was leaning outwards at high level to the North by upto 1:40 when checked with a spirit level.

Rear Elevation - Annex

- 5.14 There was a mature climbing plant adjacent to the addition against the rear elevation of the main property.
- 5.15 There were stepped cracks at high level to the North side of the window. The cracks, which were upto 5mm wide, rose to the North. There was loose and missing pointing to the fractures with cracked bricks to the side of the opening. The cracking appeared to indicate that the wall below had dropped.

- 5.16 There was a gap, upto 10mm wide, between the end of the concrete lintel over the window and the brickwork to the North side of the opening. The lintel support over the opening fell to the North by upto 1:60 when checked with a spirit level.
- 5.17 The brickwork beds to the North side of the window fell to the North by upto 1:60 when checked with a spirit level.
- 5.18 There was an isolated tapered horizontal crack towards mid height to the wall to the North side of the back door. The crack was upto 5mm wide at the reveal to the opening and closed towards the window sill. There was loose and missing pointing to the brickwork.
- 5.19 There was a tapered vertical crack below the middle of the window. The crack, which continued through bricks, was upto 3mm wide at the sill and reduced in width at the damp proof course. There was loose and missing pointing to the brickwork below the opening.
- 5.20 There was a foul water pipe below the annex window. There was raised timber decking in place against the rear elevation of the annex and the property.

Side elevation

- 5.21 We were unable to gain access to carry out an inspection of the North side elevation of the annex. This was located on the boundary line with the gardens to the rear of the properties to The Limes backing onto the addition.

Internal Inspection – Annex

- 5.22 There was a Lounge with a Kitchen area to the front of the annex with a Bedroom to the rear. The rooms to the annex were separated by an internal wall of masonry construction. The floor of the annex was thought to be of ground bearing concrete slab construction.
- 5.23 The inner leaf of the external side wall of the addition was thought to be of either timber studwork or dry lined masonry.
- 5.24 The external walls to the front and rear of the annex were of masonry cavity wall construction. The front external wall had been added to infill the garage door opening during conversion to the annex. The internal wall which separated the Lounge and Kitchen area from the Bedroom was thought to be of masonry construction with the ground floor thought to be of ground bearing concrete slab construction.

Lounge / Kitchen area - Annex

- 5.25 There was a gap, upto 10mm wide, between the soffit to the entrance door and the reveal to the North side of the opening. There was a tapered vertical gap present at high level to the reveal to the North side of the entrance door. The vertical gap was upto 10mm wide at the head of the opening and closed at approximately 300mm below. The cracking extended along the junction between the ceiling and the wall to the front

external corner of the Lounge. There was a gap, upto 5mm wide, at the junction between the skirting and the reveal to the North side of the opening.

- 5.26 There was a stepped vertical crack below the North side of the window. The crack was upto 3mm wide at the sill and closed towards the skirting board. There was also a vertical crack, less than 1mm wide, below the South side of the opening. The window sill fell to the South by upto 1:60 when checked with a spirit level. These cracks were reflected externally.
- 5.27 There was a gap, upto 10mm wide, at the junction between the coving and the wall to the front external wall of the Lounge.
- 5.28 There was a 10mm wide gap present between the soffit and reveal to the South side of the window. There was a tapered vertical gap present at high level to the reveal to the South side of the window. The vertical gap was upto 10mm wide at the head of the opening and closed towards the sill.
- 5.29 There was a significant ridge within the floor to the Lounge. The ridge extended from the entrance door to the annex towards the Kitchen area. The floor to each side of the ridge fell away by upto 1:10 when checked with a spirit level. We believe that the floor had raised by over 100mm at the location of the ridge. We were provided with photographs which indicated significant cracking and movement to the concrete slab which was hidden by the carpets.

Bedroom – Annex

- 5.30 There was an isolated horizontal crack, upto 5mm wide, below the bearing to the North side of the lintel over the Bedroom window.
- 5.31 The window sill fell to the North side of the opening by upto 1:60 when checked with a spirit level.
- 5.32 The floor was noted to fall towards the middle of the room by upto 1:40 when checked with a spirit level.

6. Conclusions

- 6.1 We understood from the information provided that the garage with the store and wash room extension had been added to the property in 1976 with conversion into an annex with habitable rooms, which included Lounge and Bedroom, having taken place in 1999 / 2000. It was unknown as to whether the extension and conversion of the garage had been carried out with the relevant statutory approvals.
- 6.2 There was tapered cracking and movement to the front elevation of the annex and there was a significant ridge within the floor from the entrance door to the Kitchen area. The pattern of damage to the front elevation of the annex and the Lounge floor indicated that the structure to each side of the entrance door had risen and fell away to each side.

- 6.3 In our opinion the pattern of cracking and movement to the front elevation of the annex and to the Lounge floor was thought to be associated with physical damage caused by the presence of large roots from the nearby mature tree. The tree, which had a trunk diameter at its base of approximately 2.0m at ground level, was less than 1m from the front right hand corner of the annex. We believe that roots from the mature tree have caused the front external wall and the floor to the front of the annex to rise. We believe that the foundations to the front of the annex may have been compromised by the roots from the tree.
- 6.4 The British Geological Survey Map indicates a Bedrock Chalk present below the property with superficial River Terrace deposits. If Bedrock Chalk is present at a shallow depth then the roots from the nearby mature tree may not be able to penetrate the stratum and, as such, will spread laterally. Based on the extent of damage we believe that large roots will be present directly below the garage and through the slab. Any works to provide support to the foundations to the annex extension may compromise the root and anchoring system to the tree. However, this will need to be determined by an Arborist. Due to the size and location of the mature tree we believe that its roots will spread below the footprint of the annex and possibly the main property.
- 6.5 We understood that the works to the land to the side of No 1 The Limes had included to introduce a large pre-cast concrete soakaway. We believe that it maybe possible that the physical presence of the precast units may have changed the path for the roots. We believe that there had been no issues with tree roots prior to the development of the adjacent site. The HomeBuyers Survey Report did not identify any serious cracking or significant movement to the extension.
- 6.6 There was tapered stepped and horizontal cracking to the rear external wall of the extension and particularly to the rear external corner. The brickwork and window sill fell to the North side of the annex.
- 6.7 In our opinion the pattern of cracking and movement to the rear right hand corner of the annex maybe associated with foundation movement due to either drainage or tree related subsidence. This was at the location of a rainwater downpipe which served the roof over the extension. We also believe that the foul water drainage which served the property may pass below the extension. The tree to the front was within influencing distance.
- 6.8 There was a rainwater downpipe at the rear external corner of the extension and the foul water drainage was thought to pass below the addition. If the pipework below ground is allowing escape of water then this maybe causing washout of any granular material or softening of any cohesive stratum below the foundations. This washout or softening could have resulted in a loss of load bearing capacity causing the foundations and walls above, at the rear external corner, to drop leading to the cracking and movement which was present.
- 6.9 The British Geological Survey Map indicated that there could be River Terrace deposits below the property. If the footings to the extension are located over a shrinkable ground then during periods of prolonged dry weather the water demand from the vegetation

would cause the ground to shrink in volume causing the foundations which are supported onto the stratum to drop resulting in cracking to the walls above. The shrinkable ground will rehydrate during the wetter winter months causing an increase in the volume of the ground lifting the foundations and closing the cracks to the walls above. If the River Terrace deposits are to a shallow depth below ground due to the Chalk Bedrock Formation then the extent of movement will be exacerbated.

- 6.10 The works carried out to convert the garage and the store / wash area into habitable rooms was unknown. The extent of any works undertaken to the foundations to support the masonry infill to the opening to the front elevation of the garage was unknown.
- 6.11 Applications for works to reduce the crown of the mature tree within the neighbouring garden to the front of the property were made in 2007 and 2010. These works included to reduce the crown size of the tree. However, the tree works were refused on both occasions by the Local Authority on the basis that the works would compromise the significance and amenity value of the locality. The tree was believed to have increased in size and height since the last application was made.
- 6.12 There was no mention within the applications made in 2007 and 2010 of any structural cracking and movement to the annex. We therefore believe that the damage has taken place since the last application was made in 2010.
- 6.13 It maybe possible that if the works which had been recommended by Connick Tree Care in 2007 and 2010 had been carried out then the tree may not have caused as much significant damage. However, these works were refused and this would be subject to comment by an Arborist.

7. Recommendations

- 7.1 We recommend that a check should be made to confirm that the garage extension and its conversion to an annex with habitable rooms were carried out with the relevant statutory consents, including Planning and Building Regulation approvals.
- 7.2 We recommend that a claim for subsidence should be made with the insurers of the building who should undertake the necessary site investigations. The investigations will include excavation of trial holes to determine the adequacy of the foundations and auger of boreholes to ascertain the condition of the ground below. It maybe necessary to take soil and root samples for analysis.
- 7.3 An Arborist should be appointed to inspect and report on any tree works deemed necessary based on the findings of the site investigations. We believe that an engineered solution could be required to provide stability to the extension in the form of piled foundations. These works will involve cutting through a number of the tree roots in order to provide introduce support to the structure which forms the extension. The Arborist should pay particular attention on the stability of the tree which could be compromised by the foundation works which are likely to be required. Any recommendations made by the Arborist should be carried out. It will be necessary to liaise with the Local Authority with a Tree Preservation Order being in place.

7.4 We also recommend that the insurers should appoint a Specialist Drainage Contractor to undertake a survey of the foul and surface water drainage to determine the condition of the pipework below ground. This includes the surface water drainage which serves the rainwater downpipe to the rear external corner of the annex and the foul water drainage which passes below the extension. This should include a CCTV survey and water drop test. It will be necessary for the Drainage Contractor to gain access into the neighbouring property to the North in order to access the drainage below ground. Any recommendations made by the Drainage Contractor to prevent escape of water into the ground should be undertaken.

We trust that this report has addressed the concerns raised and is satisfactory for your purposes; however should you have any queries or require any further assistance then please do not hesitate to contact us.

Yours sincerely,



Jason Burstow
BEng. (Hons), C.Eng., M.I.Struct.E.
For and on behalf of JAB Structures Ltd



Our Services

1. Our structural engineers report will be based on visual observations of the property taken externally and internally. You must provide us with access to all necessary areas. We do not normally move furniture, lift floor coverings or make exploratory holes during an inspection. If our engineer considers that access to any area would be unsafe, or potentially unsafe, we will be unable to access the area until safety measures are arranged, which may incur an additional cost.
2. Our work will be carried out by a chartered structural engineer. These are the required qualifications in situations where our report is requested in connection with a lending / mortgage application or a buildings insurance claim.
3. Unless you instruct us to the contrary our report will cover the main load-bearing elements of the property. The inspection will however be limited to the main building and exclude any detached garages, outbuildings, walls, fences etc. unless you specifically instruct us otherwise.
4. Our report will include details of the inspection, our conclusions on the findings and our recommendations for any further investigations, monitoring, repair or remedial works, or other action required.
5. In the event that our report recommends that further investigations are carried out these may include but are not limited to archive research, interviewing persons or organisations, making exploratory holes or excavations, opening up or taking apart, taking samples, undertaking tests and any other activities necessary to determine the extent and cause of the problem(s).
6. In the course of carrying out our work for you we may advise that independent contractors are appointed to perform specialist services such as drains testing, soil testing or excavating trial holes. If so, we will advise you of the costs of the additional services and obtain your approval before proceeding. On completion of their work, we will settle the contractor's account directly and include their costs (along with a 10% administration charge) in our invoice to you.
7. Certain investigation work may cause damage - particularly to finishes and decorations. If you are not the owner of the property and you request us to carry out any investigation work this will indicate to us that you have all necessary permissions from the owner of the property for us to carry out the work. Reinstatement of damaged areas will be included only if specifically agreed.
8. Where estimated costs, budgets or allowances for building/remedial works are provided by us, these are only to indicate the likely order of costs. They should not be considered as an accurate assessment of costs and must not be relied upon as such. Due to the varying complexity of such works you are advised to obtain written estimates, quotations or tenders from suitable contractors with relevant experience before making any financial commitment.
9. We will not inspect the woodwork or other areas of the property which are covered, unexposed or inaccessible and our report will not therefore indicate that any such part of the structure is free from defect.

10. Our report will not include those aspects normally dealt with in a Building Surveyor's report, including but not limited to:
- utilities / services
 - valuation
 - decorations
 - roof coverings and the like
 - the position of the property with respect to local amenities
 - the condition of the property with regard to dry rot, timber infestation, dampness and the like.
11. Furthermore, unless noted in the report to the contrary we will not consider matters such as contaminated land, asbestos or other potentially hazardous or deleterious materials which may have been used in the construction of the property.