



Richard Jackson
Building Consultants

VISUAL STRUCTURAL REPORT

The Old Vicarage, Church Hill, Ramsey, Essex, CO12 5EU

Mr & Mrs Crossman

November 2019

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Title: VISUAL STRUCTURAL REPORT
 Project: The Old Vicarage, Church Hill, Ramsey, Essex, CO12 5EU
 Client: Mr & Mrs Crossman
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Record of Site Observations

Copy of Table 1 BRE Digest 251

1. Introduction

- 1.1. We received verbal instructions from Mrs Crossman on 21st October 2019 to make a structural inspection of The Old Vicarage, Ramsey, CO12 5EU. This was made on 5th November 2019.

2. Description and Background

- 2.1. The property is a large detached two storey dwelling. The original section we understand dates back to the Tudor period, with other sections added circa 1840.
- 2.2. There are additional single storey extensions attached to the rear left and right-hand corners which are of more modern construction.
- 2.3. The external elevations show painted rendered walls above low level brickwork plinths. Internally the ground floor is a combination of solid concrete and suspended timber with a suspended timber first floor. The internal partitions are a combination of masonry and timber studwork.
- 2.4. The property is set on a large open site with areas of vegetation around the building, some of which are noted to be within the zone of influence of the property.
- 2.5. The current owners, Mr & Mrs Crossman, have occupied the property since 1994. We have had previous involvement with this property on their behalf between 1998 and 1999. At that time, superstructure cracking was evident to the building centred around the rear right-hand corner. This was attributable to clay shrinkage by tree roots from adjacent vegetation. We have used the information from our previous involvement to assist with the latest visit.
- 2.6. The purpose of the visit was to inspect new cracking noted by the owners during 2018, which has become significantly worse during 2019. The inspection of cracking is the subject of our brief and this report.

3. Scope and Limitations of Structural Inspections

- 3.1. A visual structural inspection is an enquiry into the structural condition of a property. It is a specialist survey, concerned only with structural matters and not with wider issues which are covered by the Chartered Surveyor's "Building Survey".
- 3.2. This report has been prepared for the benefit of Mr & Mrs Crossman and the right to rely upon this report cannot be passed to a third party without the written authority of Richard Jackson Building Consultants.
- 3.3. All information provided by others is taken in good faith as being accurate, but Richard Jackson Building Consultants cannot, and does not, accept any liability for the detailed accuracy, errors or omission in such information.
- 3.4. During a visual structural inspection, we carefully inspect sample surfaces which are exposed and accessible. Where possible, we use a spirit level to detect any unusual distortions. Our opinion on the structural condition of

the building is then based on what we see and on our general impression of the building's robustness, which is a rough measure of its layout and properties of the materials used. Standard guidelines are available on the severity of damage (BRE Digest No. 251) and on stability (CIRIA report No. 111), and we rely on these when forming our opinions.

- 3.5. Most structural problems, by the time they are serious enough to cause concern, are leading to visible damage, and will be spotted during a visual structural survey. However, some faults lie hidden in the early stages; also, low levels of structural movement are not detectable by surface inspection or spirit level checks.
- 3.6. There are a number of things we can do to increase the chances of finding hidden faults and slight movement. We can, for example, expose foundations, test the soil and carry out a precise distortion survey. These tasks add considerably, both to the cost of the report and to the inconvenience of residents, and for those reasons they are reserved for the full structural inspection, where serious damage is evident and it is necessary to find its cause and suggest a remedy. We can, if instructed, convert a visual structural inspection to a full structural inspection by returning to do the extra tasks.
- 3.7. If a visual structural inspection finds slight damage, the question arises: Will the damage get worse and eventually require an expensive remedy? Monitoring would give the most reliable answer to that question. However, we assume, unless told otherwise, that a period of monitoring would not be practical. We therefore give our informed opinion on the risk of future movement and damage, based on what we have seen during our visit, but no-one can entirely eliminate the risk of future movement, and it is important to maintain insurance cover for the building.
- 3.8. We are obliged to state that we have not inspected woodwork or other parts of the structure which are covered, unexposed or inaccessible and we are therefore unable to say that any such part of the property is free from defect.

4. Documents

- 4.1. As noted above, we have had previous involvement with this property during 1998 and 1999.
- 4.2. We have limited documentation contained in our files given the length of time now elapsed, but we have reviewed the available documentation and used this to assist with our assessment of the latest damage.

5. Cracking

- 5.1. An external and internal inspection was made. The following significant external and internal damage was recorded. Reference to the right and left hand sides for rooms and walls are made looking at the front of the house with one's back to the entrance drive. Reference to the right and left for the location of cracks is made from the direction facing the wall.
- 5.2. Apart from the damage described below, the internal walls appeared to be in a reasonable condition. The visible extent of internal cracking is

dependent upon the standard of decoration. Where there is wallpaper, it is usually impossible to tell whether old cracks exist and if so whether they have been repaired or simply covered up. Our inspection was also limited by items of fixed or heavy furniture and of stored materials.

- 5.3. The principal area of cracking is centred around the rear right-hand corner of the two-storey property. This has been noted in more detail in our site observations, but the principal cracking is external render cracking on the rear wall and internal cracking at corresponding locations within the hall, stairs and landing and also the rear right-hand bedroom.
- 5.4. Summarising, the principal crack damage was to the rear right-hand corner. The severity of damage was in Category 2 to 3 as defined by BRE Digest No. 251. A summary of Table One from this document is included in the Appendix.

6. Deformations

- 6.1. Where considered appropriate or necessary a spirit level was used to make random checks on the verticality of walls and the level of floors, window cills and other normally horizontal surfaces. Naturally the amount of out-of-plumb or level will vary accordingly to the exact position measured. Variations in plumb and level given below are therefore only to indicate the severity of the apparent distortion.
- 6.2. Whilst level measurements record any distortion of a building, variations in level of brick courses or other nominally horizontal features do not necessarily represent movement. Likewise, variations in plumb may not necessarily represent movement. They may simply reflect inaccuracies in the original construction. Such measurements are only of value where they show a consistent pattern.

7. Geology

- 7.1. The geological map of the area, based on the 1883 geological survey of England, indicates that the site is on Thames Group containing clay, silt and sand with superficial deposits listed as Kesgrave Sand and Gravel. Geological mapping is not precise however and should only be used as a guide.
- 7.2. Clays are generally termed as being shrinkable. This means that the clay shrinks when moisture is removed and swells by a similar amount when the moisture content increases. Shrinking causes subsidence and swelling causes heave. The properties of clays (and all soils in general) vary greatly from site to site and it is difficult to predict with accuracy what soil movements may occur in the field. The results of laboratory tests help in making such estimates.
- 7.3. Subsidence and heave occur seasonally in the top metre or so of shrinkable clay. Unusual weather conditions and changes to land drainage can extend this zone. Trees can extend it considerably.
- 7.4. Modern building practice for determining the depth of conventional foundations on clay soils usually follows the recommendations of the NHBC

Standards Chapter 4.2 "Building Near Trees". This document makes recommendations for foundation depths on clay soils in three categories of shrinkability in the vicinity of various tree species relating to their water demand, their projected mature height and distance from the building.

- 7.5. Sand and gravel is a soil which is entirely granular. It can vary considerably in its strength. Most sand and gravel is stable, but the more loose it is and the less gravel it contains, the more susceptible it is to erosion by water. Leaking drains and water mains can cause such soil to wear away and if this happens beneath foundation level the resulting collapse can cause subsidence.

8. Discussion and Conclusions

- 8.1. In establishing the cause or causes of defects we look for compatibility between the extent and pattern of damage, distortions, information on the subsoil and any other evidence it has been possible to gather. The greater the volume of evidence gathered, the more certain we can be of our conclusions.
- 8.2. In this instance, because of budget restrictions, we have not tested the subsoil or drains but can draw some conclusions about the defects present based on experience, geological data and a study of any distortions and cracking.
- 8.3. We first visited the property in 1998 to inspect superstructure cracking reported by Mr & Mrs Crossman at that time. The cracking was noted to be around the rear right-hand corner of the building which is in reasonably close proximity to trees and bushes. At that time, we excavated a trial hole to establish foundation depths and recorded this to be approximately 1.04m deep below local ground level with a corbeled brickwork footing founded onto firm brown clay. There was also evidence of tree roots in our excavation.
- 8.4. Our assessment at that time concluded the cracking to be due to foundation movement caused by the volumetric reduction of clay subsoil due to moisture abstraction by the roots of the adjacent trees.
- 8.5. We recommended tree control in the form of removal and crown reduction. Following the completion of this, we then monitored the property from a deep datum to study the behaviour of the building and to establish if it returned to a stable condition.
- 8.6. The monitoring results confirmed stability had returned and our involvement finished during 1999.
- 8.7. During our recent visit on the 5th November 2019, we recorded superstructure cracking centred around the rear right-hand corner of the building. This is approximately the same location as the previous cracking had occurred during 1998.
- 8.8. We understand from Mr & Mrs Crossman that cracking was first noted during 2018 and then this has increased significantly during 2019. Therefore, they have been concerned and commissioned us to carry out a reinspection.

- 8.9. The pattern and location of cracking noted during our recent visit is indicative of also being due to foundation movement centred around the rear right corner of the building. The pattern suggests downward movement of the foundation, although some areas of cracking are more consistent with an upward movement of the property (heave). We understand that in recent time pollarding has been carried out to the oak tree opposite to the rear right-hand corner and also the removal of a 4m high tree approximately 9m away from the rear of the property.
- 8.10. It is also of note that the rear single-storey lean-to extension attached to the rear right-hand corner has been rebuilt in recent years on its original foundations. We do not believe that this action has caused the superstructure cracking to the property.
- 8.11. We have compared the record from 21 years ago to the current height and location of trees and noted that the 12m oak has been maintained at 12m, although recently reduced in height by pollarding. The various oak trees and sycamore trees in the adjacent churchyard were recorded as approximately 9m in height in January 1997 and today we estimate they are approximately 16m height. These trees are now also likely to be within the zone of influence of the property.
- 8.12. The deep datum and monitoring points still exist, and therefore an up to date set of readings could be taken. Obviously, the datum and monitoring points are over 20 years old but we believe they should still be in sufficient condition to be used again. A further set of monitoring readings would enable us to confirm the extent of movement and to also assess if any upward movement has occurred at any location.

9. Summary and Recommendations

- 9.1. The present superstructure cracking is consistent with foundation movement most likely caused by the abstraction of moisture from the clay subsoil.
- 9.2. Unless steps are taken, the movement and cracking is likely to continue and eventually affect the serviceability of the building more seriously.
- 9.3. On this occasion, we believe it would be good practice to carry out a further set of monitoring readings to enable us to interpret the situation in more detail.
- 9.4. Given the data collected and the experiences from our previous involvement, it is likely that vegetation control could be carried out again and the property monitored from the datum to study its behaviour and to confirm if stability returns, although we note some vegetation is in 3rd Party Control.
- 9.5. If the above is unsuccessful and movement does continue, we would recommend that formal investigation works are carried out in the form of additional trial holes and soil testing.
- 9.6. We have not carried out sufficient work to assess the risk of subsidence, heave or landslip.

- 9.7. Please refer to section 3 where we set out the limitations and exclusions to which this report has been subject.

Appendix

Site Observations dated 5th November 2019

Extract from BRE Digest No.251 Table 1

RECORD OF SITE OBSERVATIONS

Job No. 53120

The Old Vicarage, Church Hill, Ramsey, CO12 5EU

5 November 2019

EXTERNAL

Left Hand Side Elevation

This shows painted render above a black painted plinth.

Starting at the front corner around the bay window, there is no significant cracking, but at approximately mid-point, there is significant rucking of finishes at the junction of the first floor window and adjacent render panel to the rear. This has caused rucking of the paint which is also evident at the same location at ground floor level.

It is of note that there is no cracking to the bay window at the junction with the main property, although there is some rucking of finishes at the front junction.

Moving to the rear of this elevation, there is evidence of historic distortions above window and door heads. However, there is now recent cracking extending away from the top right hand corner of the first floor door and also disturbances at low level to the black painted plinth. We noted cracking around the side walls of the steps adjacent to each ground floor door opening.

The rear lean-to single storey building has been rebuilt on the existing foundations. This has horizontal timber cladding and at the junction of the side elevation and rear right corner of the Old Vicarage, there was no significant evidence of movement taking place. Elsewhere on this single storey lean-to there was no other cracking of note.

Rear Elevation

This shows painted render above a black painted render plinth.

As noted above, the single storey lean-to is attached to the rear wall, which shows a horizontal timber clad elevation above a low level brickwork plinth. We are informed that this has been constructed on the original foundations. There is no significant cracking or movement evident to the timber cladding.

However, it is of note that there is evidence of movement at the junction of the timber cladding and the rear wall. This is the abutment adjacent to the left hand side of the rear door entrance to the main property. The painted finishes have been disturbed with fresh unpainted boarding now visible. It is possible that some of this could be due to shrinkage although it is of note that this movement has occurred directly adjacent to cracking to the main wall of the rear elevation.

Focusing on the rear elevation, there is a vertical/diagonal crack extending up from the lean-to roof which (as viewed from ground level) is wider at low level, measuring up to between 5-8mm plus and reducing to hairline at low level.

There is a vertical crack extending down from eaves level at the left hand side of the rear door entrance and first floor landing window. As viewed from ground level, this is estimated at 20mm at high level and reducing in width to hairline at approximately first floor level. This movement has also caused cracking along the edge of the soffit board and displacement of the soffit board, creating a gap of up to 20mm.

Extending up from the back door entrance, up to bottom corners of the first floor landing window above, there is vertical cracking in the render with the left hand crack measuring approximately 5mm at low level and reducing to hairline at high level. The other crack measures approximately 5mm at high level reducing to hairline at low level.

Elsewhere on this elevation there is no significant cracking evident. There is a vertical hairline crack extending up from above the kitchen window which appears to be due to normal thermal movements.

The abutment between the main property and single storey flat roof extension is good with no evidence of cracking or movement.

At the rear wall of the single storey projection, attached to the left hand corner of the property, there is no significant cracking except for hairline cracking due to thermal variations.

Left Hand Side Elevation including Single Storey Projections

These show painted render elevations above a black plinth. There was no significant cracking evident at the time of our visit with the corner abutments in good order and no cracking visible.

To the right hand side of the rainwater downpipe located on the left hand side elevation, there is a near vertical hairline crack of approximately hairline width for the full height. This also has horizontal cracking and diagonal cracking extending away towards the ground and first floor windows. The pattern and location of this cracking is of uniform width and most likely to be due to normal thermal variations within the structure.

Front Elevation

This shows painted render above a black painted plinth.

There is hairline vertical cracking extending up from the top left hand corner of the left hand ground floor door entrance. This is slightly wider at low level but the location and pattern appears to be most consistent with thermal variations.

There is a modern vertical joint to the left hand side of the main door entrance. This appears to have stop beads and mastic infill with disturbance of the mastic evident for virtually the full height of this elevation. The mastic disturbance is most pronounced at the high level with minimum disturbance at low level. The pattern of movement appears to be due to possibly thermal variations but early signs of foundation movement cannot be ruled out.

To the right hand side of the door entrance there is horizontal and vertical cracking in the render which is relatively uniform in width. There is evidence of previous

repairs having been carried out with hairline cracking now returning. However, the location and pattern of the cracking appears to be due to normal thermal variations within the structure.

INTERNAL

A general walk-round of the inside of the property was undertaken within both rooms showing isolated hairline cracking, which is considered quite normal and due to normal thermal variations and shrinkage. However, in the rear right section of the property, more significant cracking was noted and is described in more detail below.

Study – Ground Floor Rear Right Hand Room

Plastered ceiling with wallpapered walls and picture rail with emulsion above.

This room has shelving around the perimeter which slightly restricted our inspection.

There is evidence of historic distortions, particularly above the external door opening where the door head slopes down towards the rear corner of the building.

There is recent cracking now evident extending up from the top left hand corner of the sitting room door entrance and then extending along wall/ceiling junction down the external wall. The lounge door entrance is located adjacent to the right hand side elevation of the main property. The door sticks slightly in the frame and appears to have been eased and adjusted over the years. There is also disturbance of the paper and cracking extending up from the top right hand corner of the same window.

Ground Floor Entrance Hall, Stairs and Landing

This shows painted ceiling with painted walls above picture rail and wallpaper below.

The front section of this area, at ground floor level, is in good order with no significant cracking. As you enter down the hall towards the rear staircase, there is disturbance at ceiling level, at the junction of the ceiling board and timber boxed beam. This extends away from the study door entrance with the cracking being hairline to 1mm in width.

At the foot of the staircase there is significant rucking and cracking at the corner junction between the rear wall and the building and internal study partition. This has torn the paper and the cracking extends up until the cornice and then onto the ceiling above. The cracking extends over and above the back door entrance. It is of note that there is cracking at this location externally. The cracking is approximately 2-3mm in width at its widest but possibly wider behind the paper. There is evidence of a slight upward movement ? of the wall.

At first floor level there is cracking to the ceiling extending from left to right above the stairs. This cracking also extends along wall/ceiling junction and becomes more pronounced where the ceiling changes height adjacent to the top of the staircase.

The cracking to wall/ceiling junction is most pronounced around the edges of the airing cupboard situated above the staircase and also adjacent to the rear wall of the property.

Inside the airing cupboard there is significant cracking between the rear wall of the property and rear right hand bedroom partition wall. This measures up to 10mm plus in width and continues along the top of the wall. The pattern of cracking is also suggesting some upward movement of the external wall ?

Rear Right Hand Bedroom

Plastered ceiling and painted above picture rail level and then wallpapered beneath.

Vertical cracking is evident on the other side of the airing cupboard partition wall as noted in that area. There is also rucking of the paper and cracking continuing to ceiling level and then travelling along wall/ceiling junction along the rear wall and then the full length of the external side wall. The cracking adjacent to the airing cupboard is approximately 10mm and reduces in width within the centre of the room where an overhead beam sits on the rear wall and then opens up again at the far right hand corner and then reduces again at the junction of the internal dressing room door entrance. The cracking/movement has caused rucking of the paper and displacement of the plaster finish, particularly around the edges of the overhead beam.

There is historic distortions evident in this room, particularly the floor which slopes down towards the rear and also over the external window, with sloping distortions also down to the rear corner.

Front Right Hand Bedroom

Emulsioned ceiling and emulsioned walls down to picture rail level with wallpaper beneath.

There is historic undulations to the floor and distortions above window head.

At the time of our visit there was cracking at the junction of the ceiling/wall on the external elevation and also cracking on the front wall adjacent to the internal bedroom partition, where wallpaper rucking was also evident.

Glenn Cattermole
on behalf of Richard Jackson Building Consultants

TABLE 1 (BRE Digest 251)

**Classification of visible damage to walls
with particular reference to ease of repair of plaster and brickwork or
masonry**

Category of Damage	Description of Typical Damage <i>10. Ease of repair in italic type</i>	Approximate crack width mm
0	Hairline cracks of less than about 0.1mm width are classed as negligible.	Up to 0.1 ⁽¹⁾
1	<i>Fine cracks which can easily be treated during normal decoration.</i> Perhaps isolated slight fracturing in building. Cracks rarely visible in external brickwork.	Up to 1 ⁽¹⁾
2	<i>Cracks easily filled. Re-decoration probably required. Recurrent cracks can be masked by suitable linings.</i> Cracks not necessarily visible externally; <i>some external repointing may be required to ensure weathertightness.</i> Doors and windows may stick slightly.	Up to 5 ⁽¹⁾
3	<i>The cracks require some opening up and can be patched by a mason</i> <i>Repointing of external brickwork and possibly a small amount of brickwork to be replaced.</i> Doors and windows sticking. Service pipes may fracture. Weathertightness often impaired.	5 to 15 ⁽¹⁾ (or a number of cracks, each up to 3)
4	<i>Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows.</i> Windows and door frames distorted, floor sloping noticeably ⁽²⁾ . Walls leaning ⁽²⁾ or bulging noticeably, some loss of bearing in beams. <i>service pipes disrupted.</i>	15 to 25 ⁽¹⁾ but also depends on number of cracks.
5	<i>This requires a major repair job involving partial or complete re-building.</i> Beams lose bearing, walls lean badly and require shoring. Windows broken with distortion. <i>danger of instability.</i>	Usually greater than 25 ⁽¹⁾ but depends on number of cracks.

- NOTES:**
1. Crack width is one factor in assessing category of damage and should not be used on its own as direct measure of it.
 2. Local deviation of slope, from the horizontal or vertical, of more than 1/100 will normally be clearly visible. Overall deviations in excess of 1/150 are undesirable.



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