

Structural Report

Relating to:

The roof at the property known as

XXXXXXXXXX

XXXXXXXXXX

XXXXXXXXXX

XXXXXXX



structural engineers & building surveyors

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Project Preface

Client name: Ms. R. Clive

Client address: 37 Hillyfield Road
Marsh Hill
Birmingham
B23 7HB

Senior Partner: David Allcott

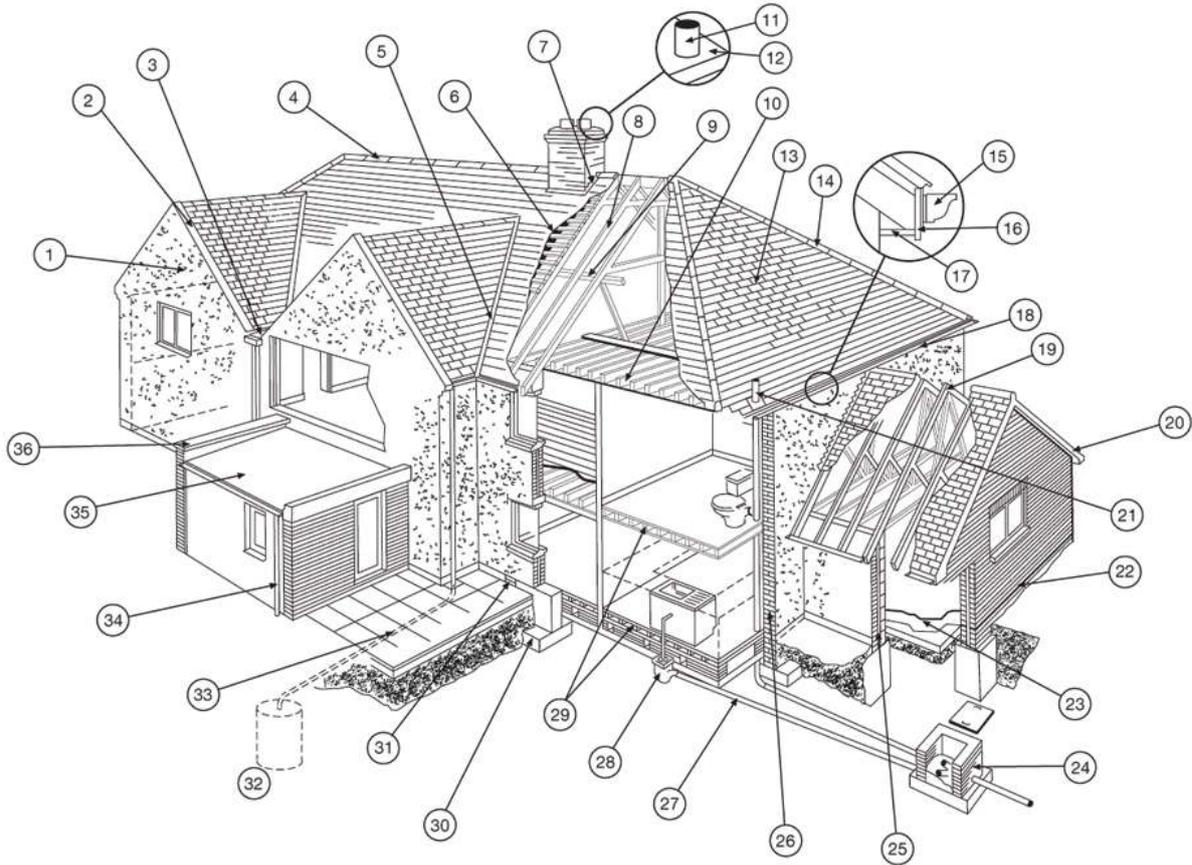
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Date of Inspection: XX/XX/XXXX

Job reference: XXXXXXXX

Traditional House Construction



KEY

- | | | |
|------------------|------------------------------|------------------------|
| 1 Gable end wall | 13 Hip roof | 25 Cavity wall |
| 2 Verge | 14 Hip tile | 26 Solid Wall |
| 3 Valley gutter | 15 Gutter | 27 Foul drain |
| 4 Ridge tile | 16 Fascia | 28 Gulley |
| 5 Valley | 17 Soffit | 29 Floor joists |
| 6 Roofing felt | 18 Eaves | 30 Foundation |
| 7 Flashing | 19 Roof truss | 31 Airbrick |
| 8 Rafter | 20 Barge board | 32 Soakaway |
| 9 Purlin | 21 Soil-and-vent pipe | 33 Surface water drain |
| 10 Ceiling joist | 22 Damp-proof course (DPC) | 34 Downpipe |
| 11 Pot | 23 Damp-proof membrane (DPM) | 35 Flat roof |
| 12 Cement | 24 Inspection chamber | 36 Parapet |

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1 Introduction

1.1 Instructions

In accordance with instructions received from Ms. R. Clive on 25th January 2011 we have been asked to carry out a Specific Structural Inspection on the cracking above windows and around wall heads at first floor level at the property known as 37 Hillyfield Road, Marsh Hill, Birmingham B23 7HB. The inspection was carried out on Wednesday 26th January 2011. All comments are based on visual inspection only and no opening up of areas was carried out.

1.2 Brief

In October 2010 the current owner had the roof re-covered with a concrete tile as opposed to a slate, which the original roof surface consisted of, and concerns have now become apparent as a result of minor cracking above windows and around wall heads at first floor level. We have therefore been requested to carry out a specific structural inspection in relation to the cracking noted at first floor level only consequently this report is limited to these areas only and no comment is made on any other part of the property, which is not the subject of this report.

1.3 Site inspection

Where the terms “right hand” or “left hand” are used, they assume that the reader is facing the front of the property with the main access door situated within the front elevation.

We can only make general comments on electrical circuits as detailed comments and inspections have to be carried out by an NIC EIC registered electrician. Also we can only make general comments on gas installations, as detailed comments and inspections have to be carried out by a Gas Safe Registered Engineer.

1.4 Terminology

Where the expressions immediate, short term, medium term, long term and very long term are used they generally mean the following:

- Immediate: within 1 year
- Short Term: within the next 1 to 3 years
- Medium Term: within the next 4 to 10 years
- Long Term: within 11 to 20 years
- Very Long term: over 20 years

Where relating to structural damage and crack widths the expressions negligible, very slight, slight, moderate, severe and very severe are used they generally mean the following:

Category 0	"negligible"	< 0.1mm
Category 1	"very slight"	0.1 - 2mm
Category 2	"slight"	>2 but < 5mm
Category 3	"moderate"	>5 but < 15mm
Category 4	"severe"	>15 but < 25mm
Category 5	"very severe"	>25 mm

Table 1. BRE Digest 251

Classification of damage to buildings based on crack widths.

2 General Description of Property

XXXXXXXXXXXXXXXXXX is a detached two-storey property believed to be constructed in 225mm wide solid brickwork with the elevations finished with painted sand / cement stipple finish.

To the right hand side of the front elevation is a two-storey bay window beneath a flat roof.

An attached garage is to the left side beneath a flat felt roof which is integral with a ground floor porch to the left side of the front elevation where a pitched and gabled roof is the front of the garage and porch area.

The drainage system was noted to collect around the rear and front of the property and we assume extends out to the main public sewage system located within the public highway although this cannot be confirmed.

A significant tree having a trunk diameter approaching 1m was noted within the public highway however had been regularly maintained by the local authority to prevent being a nuisance to the property.



3 Observation / Damage

In this section of our report, we summarise the defects noted and principal concerns regarding the property.

3.1 External Condition

The new roof covering that has been installed appears to have been installed to a reasonable quality with the lead flashing around the remaining chimney in the right hand elevation in acceptable condition. Hip tiles appear firmly fixed with a coloured mortar so as not to stand out from the dark roof colouring. The roof surface is generally flat with the hiplines straight.



3.2 Internal Condition

At first floor level on the landing there was a vertical crack, which was hairline extending upwards within the sloping part of the ceiling due to the ceiling joist being higher than the wall plate.

Within the rear left hand bedroom the hip beam was showing and there was a diagonal hairline crack, which had been filled extending across the rear left hand corner of the artex finished ceiling. The front wall of the same room again there was a hairline crack extending vertically downwards from the area where the flat part of the ceiling joined the sloping part of the ceiling. Within the middle of the rear window again hairline cracking was evident within the plaster above the window and through the reveal.



Within the rear right hand bedroom hairline cracking, which extended upwards from the window and through the reveal was evident in three places across the window.



In the bathroom situated on the front left hand corner horizontal crack had formed at the junction of the flat part of the ceiling with the sloping part of the ceiling, which again was hairline.



In the front right hand bedroom the bay window noted externally was evident within the front wall and hairline cracking extended downwards from the ceiling to the opening of the bay window and through the bay window surface again in two locations with further hairline cracking to the right hand wall and on the junction of the ceiling with the sloping area.



The roof area was accessed by an access hatch within the ceiling of the landing area. This revealed that the underside of the tiles had been felted with a breathable felt as per current regulations. One purlin was in each roof surface supported on hip beams and no significant distortions had occurred at the time of our inspection to either the rafters or the hip beams. Tile debris was within the roof area.

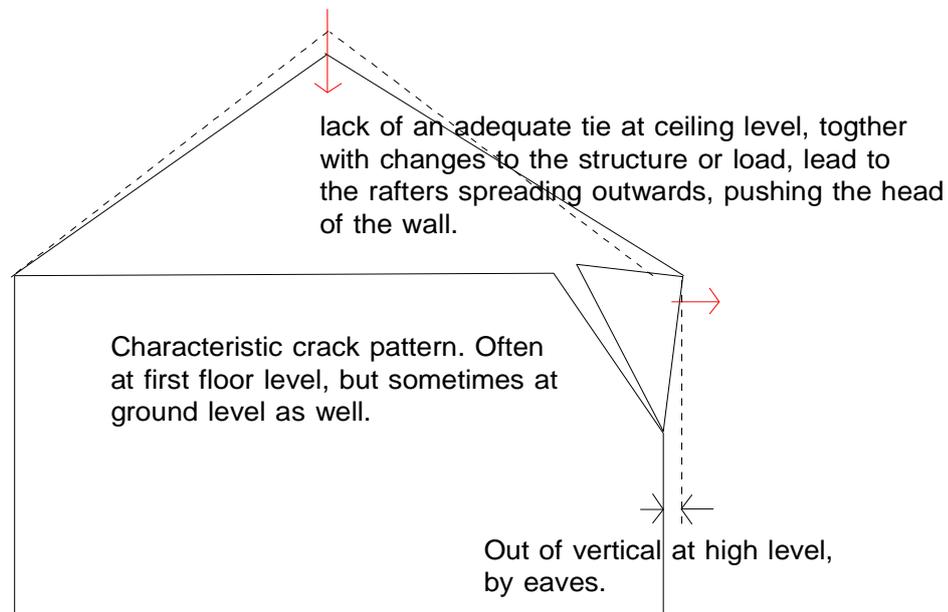


4 Discussion of Observations

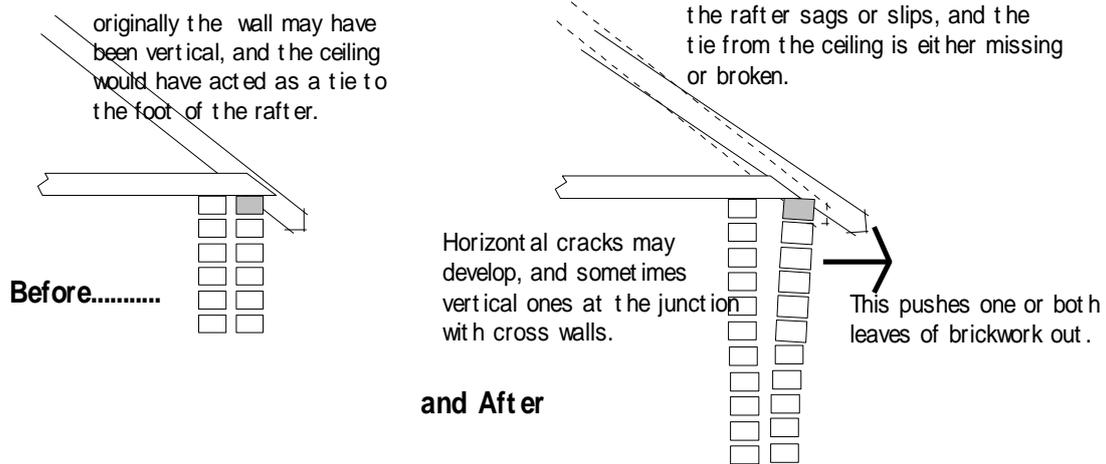
All the cracking that has occurred is classed as 'Category 0 negligible' in accordance with building research establishment digest 251 for specification of damage to buildings in relation to crack widths.

The pattern of distress is indicative of roof spread. This is a commonly encountered problem in older properties where there (a) is no restraint, or tie, at the head of the wall and (b) may have been some change in loading. For example, recovering a roof with heavier tiles or perhaps some seasonal load due to wind pressure or snow.

original roof line shown dotted



Matters are exacerbated if any of the timbers are rotten or suffering from excessive deflection due to deterioration. Often the bottom of the rafters are not tied, allowing the roof frame to spread outwards as shown above.



We consider the slight cracking has been brought about by installing the new tile covering to the roof as opposed to installing a slate covering. Concrete mono tiles are approximately 2 ½ times heavier than normal slates consequently impose a greater load to the roof surface.

In some cases this can cause serious distortions to a roof however in this particular case the roof structure appeared relatively substantial internally. We consider due to the age of the building there is more than likely a timber lintel over the windows internally and due to the weight of the roof being supported on the inner leaf of the brickwork the additional weight is imposing additional stresses, which is causing a deflection of the timber lintels. This in turn is manifesting itself as minor cracks.

Due to the property being a hipped property again loadings to the roof surface are transferred from the purlins to the hip members on all corners. Consequently the additional loading will also be causing a slight further deflection of the hip members. To compound the situation the ceiling joists are not at the bottom of the rafters but approximately 400mm above the wall plate. Consequently any increase in loading on the roof structure will be transposed into a horizontal and vertical load causing a slight lateral movement at the head of the wall, which would cause the cracking noted at the junction of the flat part of the ceiling with the sloping part of the ceiling.

As the cracking is negligible at current times we consider it is the existing structural timbers taking up the additional loading. The timbers appears to be of sufficient size to withstand the additional loadings consequently we would advise that the cracking should cease after a period of time and we would advise a period of 12 months is given for the stresses in the roof to equalize and the cracking to cease.

We therefore consider that the cracking may increase or continue until approximately October 2011 at which time it will be a case of reassessing the movement and if no further movement has occurred than the additional loadings to the roof surface have had no significant structural affect to the building however if increased cracking occurs over that period of time and cracks become worse it will then be a case of strengthening the roof to prevent further deflection of both purlins and hip members.

We would therefore advise that you contact the roofing contractor and advise him that you have had a professional opinion and that you put him on notice that should further damage occur to your property you be holding him liable for any costs of repairs. The building contractor should have been aware that a concrete mono tile weighs approximately 2 ½ times heavier than traditional slate and advised you that an artificial slate should be used as opposed to a concrete tile for the re-covering of the roof.

7 Conclusion

We consider the slight cracking around the first floor area of the property is as a result of additional loadings being applied to the roof timbers due to an additional weight from the new roof covering.

We anticipate that the stresses will be taken up in the timbers within the roof due to their size however a further opinion will need to be taken after the covering has been in place for approximately 12 months all as detailed above.

You should advise your roofing contractor that you hold him responsible should the damage worsen for costs involved in strengthening roof if need.

5 Terms of Future Engagement

Design & Calculations

Within the conclusions / recommendations of our report under 'recommendations' we may advise that certain items of repair will require the preparation of design and calculations which after receiving instruction we will proceed to prepare the design / calculations as required. These will be forwarded to you directly upon completion.

Note: If design / calculations are required, you will need to have these available before obtaining estimates as the contractor will need to view them in order to price for the works.

Specialist Reports

If we have recommended you obtain additional specific specialist reports, these should be sought from specialist contractors who are qualified and experienced in this type of work and who can offer suitable certification upon completion. We will require sight of both the report and certificate from this specialist prior to issuing our own Engineer's Completion of Works Certificate.

Completion of Works Certificate

We would strongly advise that all **essential works** recommended should be inspected and certified to protect the long term insurance and saleability aspects of the property. The report and completion certificate should then be stored with your deeds to provide an accurate record for the future.

If our report is for mortgage purposes, your mortgage/insurance company are likely to **insist** that an Engineers Completion of Works Certificate is issued to cover the essential works recommended and will require sight of the documentation to release any monies / retentions due. If you are unsure as to whether you require a Certificate for mortgage/insurance purposes, please contact your mortgage company / insurer direct.

6 Rights of Originator

This report was for the sole use of the client, and insurance company. It must not be reproduced or transferred to any other third party without the express written consent of Allcott Associates LLP.

Allcott Associates LLP will consider the re-issue of the report in its original form to a third party within 6 months of the original report date. Upon the lapse of a 6 month period the report can only be re-issued following a full re-inspection, which will attract a full inspection fee.

We reserve the right to refuse copies of the report to any third party (other than those named above). We also reserve the right to amend our opinions in the event of additional information being made available at some future date. The Contracts (Rights of Third Parties) Act 1999 shall not apply to this agreement.

END OF REPORT

Eur.Ing. **David J Allcott** BSc (Hons) CEng MICE MBEEng MIWEM

For and on behalf of **Allcott Associates LLP**

7 Conditions

Structural Engineers Conditions

- 1.0 Inspections**
- A **Specific Structural Inspection** is restricted to visual observations of the matters, concerns, or problems stated in the report. The inspection will be undertaken externally and internally as necessary and you must provide us with access to all necessary parts including any basements and roof spaces if possible. We do not normally move heavy furniture, lift floor coverings or make exploratory holes during and inspection. If our Engineer considers that access to any area would be unsafe, or potentially unsafe, we will be unable to access such areas unless safety measures are arranged, this may incur an additional cost.
- 1.1 A **General Structural Inspection** of the structural load bearing elements does not include those aspects normally dealt within a Surveyors report, such as services, decorations, roof coverings and the like, the position of the property with respect to local amenities and the condition of the property with regards to dry rot, timber infestation, dampness, vermin and the like.
- 1.2 The structural load bearing elements normally comprise items such as the roof trusses, rafters, purlins, floor slabs, joists, beams, columns, external walls, internal walls which support other elements, foundations and the like. The inspection is limited to the main building and excludes any detached garages, outbuildings, walls, fences etc unless specifically included in the request. The report is a considered opinion of the structure at the time of the survey only.
- 1.3 Unless noted in the report we have not considered matters such as contaminated land, asbestos or other potentially hazardous materials, nor high alumina cement or other potentially deleterious materials.
- 1.4 Our report will include details of the inspection, being the condition of the property at the time of our inspection, our conclusions on the findings and our recommendations for any investigations, monitoring, repair or remedial works, or other action required.
- 1.5 A General Structural Inspection **is not** 'A Full Building Survey' in accordance with conditions of engagement of the Royal Institute of Chartered Surveyors (see note 1.2)
- 1.6 Our inspections will be carried in safe manner as advised by the HSE and no undue risks will be taken. Roof areas will only be have a head and shoulder inspection.
- 1.7 We do not check electrical installations or appliances as this has to be done by members of the IEE institute we will however advise if this is necessary.
- 1.8 We do not test gas installations or appliances as this has to be a CORGI registered gas engineer we will however advise if this is necessary.
- 1.9 We will advise if we note timber infestation however we will not check for timber infestation as this has to be carried out by a member of the British Wood Preserving and Damp proofing association (BWPDA). Similarly with damp this also has to be checked and reported on by a member of (BWPDA).
- 1.10 No opening up of areas or lifting of carpets, or moving of furniture is carried out.
- 1.11 Roof inspections will normally be head and shoulders inspections unless specifically having been requested for a roof survey, where we require the roof to be boarded or safe access arrangements made for the inspection. In any case old roofs will not be entered as potentially unsafe.
- 1.12 Where we arrange for other Contractors to carry out specialist reports we are not responsible for their content.
- 1.13 Where costs are quoted for remedial works these are budget costs and not fixed costs and may vary depending on a contractor's availability and location of works.
- 2.0 Investigations**
- 2.1 Our services will be limited to an investigation of the problem(s) specified. Investigations means, and may include, 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.
- 2.2 Investigation work may cause damage – particularly to finishes and decorations. If you request us to carry out any investigations work this will indicate to us that you have all the necessary permissions from the owners and tenants of the property for us to carryout out the work. Reinstatement will be included only if specifically agreed.
- 2.3 Our report will include details of the investigations, our conclusions on the findings and our recommendations for any monitoring, repair or remedial works, or other action required.
- 3.0 Monitoring**
- 3.1 Our services will be limited to monitoring the problem areas specified and will involve measurements and visual observations at regular intervals for a predefined period.
- 3.2 Our report will include details of the monitoring, our conclusions on the results and our recommendations for further investigations, repair or remedial works, or other action required.
- 4.0 Repair / Remedial Works – Design Stage**
- 4.1 Our services may include the detailing, Scheduling and specification of repairs and remedial works as agreed, the preparation of tender documents, obtaining of competitive tenders, reporting on the tenders and applying for Building Regulations and / or other necessary approvals. Building Regulations fess and the like will be extra.
- 5.0 Repair / Remedial Works – Construction Stage**
- 5.1 Our service may include inspecting the contractor's work on an occasional site visit basis and administering the contract.
- 5.2 We normally undertake site inspections at weekly intervals although the frequency may vary according to the needs and the progress of the works.
- 5.3 We will issue instructions to the contractor and variations to the contract as necessary. Please note that you must not instruct the contractor yourself.
- 5.4 We will certify progress payments and upon satisfactory completion will certify the work and the final valuation. Completion certificates will only be issued when all our invoices are fully paid.
- 6.0 Calculations**
- 6.1 Calculations will include for a site visit where ever possible although it is possible to work from your architectural drawings however the onus for dimensions will remain with person providing the plans. All steel beams are calculated on clear openings. Bearing length generally 150mm each side should be added to the length used.
- 6.2 According to your requirements, we will give structural advice on the feasibility of your proposals and will prepared structural calculations and sketch details for incorporation into your architectural drawing, for building regulations submission, and for your builders use and information.
- 6.3 Architectural, general arrangement or structural drawings are not normally prepared and will only be prepared if agreed in writing. Please be aware that architectural drawings are normally required for building alterations and extensions, in all but the simplest of cases.
- 7.0 Miscellaneous Services**
- 7.1 The scope and any limitations to miscellaneous services will be agreed with you before commencing.
- 8.0 Limitations**
- 8.1 This report is for the sole use of the person instructing the survey and cannot be passed to a third party without the consent of Central Surveys as the content will not be guaranteed to be correct as to when the report was transferred.
- 8.2 This survey is only valid for 6 months from the date of the survey as stated within the report

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