



Structural Survey (Inspection)

to

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EXECUTIVE SUMMARY

Structural Surveys UK were commissioned to undertake a Full Structural Survey (Inspection) to a residential property at Moose Hall, Castle Street in Neath.

The survey was carried out on a non-intrusive basis, the observations of which form the body of this report, together with the conclusions and recommendations for repair where applicable. Any defects that were hidden which could only be ascertained by intrusive works are not covered, in addition to areas that were in-accessible.

The property is detached grade 2 listed former Wesleyan Methodist Chapel which has previously been converted into a hall and has been derelict for a number of years.

The main items addressed externally included the roof coverings, load-bearing walls, damp courses, building ventilation and foundations.

Our internal inspection included the roof void, ceilings, load-bearing walls, ground and first floors, together with a visual inspection on the presence of damp in the property.

Having completed a structural survey to Moose Hall, Castle Street in Neath and following inspection / assessment of the roof profile and structural timber frameworks, load-bearing wall condition and alignment, first and ground floors, foundation performance and assessment of damp in the property we conclude the following (N.B. based on a non-intrusive inspection) :

N.B. Prior to undertaking any repair works the owners should check the Grade 2 listed status (e.g. from a planning perspective and also conservation) and ensure the repair works align with these requirements.

The Condition Rating **3** defects that will require remedial works are as follows:

- Penetrating damp was noted to the external walls of the rear room, front room 1, staircase and male toilets – see photos 143-144, 147-148, 150, 152, 154, 156-163, 165 and 167-168. These areas of penetrating damp are expected to be caused by cracking of the external render and stonework mortar joints / pointing. Also, the type of render being cementitious based entraps moisture and prevents the solid wall from suitably ‘breathing’.
- Penetrating damp was noted to the ceiling of the rear room – see photo 139. Due to the limited access to the roof void we were unable to confirm the cause of the penetrating damp at this location.
- Penetrating damp was noted to the internal wall between the original building and front extension within the rear room – see photos 140-142. It is suspected that the damp is caused by issues / defects to the roof valley between the original and front roof profile. However, due to the limited access to the roof void and limited visibility of the external roof profile at this section of roof we were unable to confirm the cause of the penetrating damp at this location.
- Penetrating damp was noted to the window of the front room 1 – see photo 164. It is expected that this penetrating damp is caused by rot to the timber window frame
- During the survey, rot was noted to the timber purlins in the fire exit room – see photos 219-223. This rot is expected to be caused by the penetrating damp through the roof

sheeting material. Due to the purlins condition it is recommended that the purlins are removed and replaced.

- During the survey, no lintel was noted to the doorway between side room 1 and side room 2 – see photo 197. The absence of a lintel for the doorway opening means that the brickwork is not held in place and is unsupported. It is recommended that a lintel is installed in this doorway to support the masonry above (N.B the remnants of a timber lintel were visible but is substandard to support the masonry above).
- During the survey it was noted that the staircase from corridor 2 to front room 1 was sloping. It is expected that the timber members of the staircases are rotten due to penetrating damp through the right wall elevation.
- A number of holes and corrosion was noted to the metal roof sheeting of the rear extension.
- Penetrating damp was noted to the external walls under the stairs, corridor 2, side room 1, the kitchen, utility room 1 and the hall – see photos 224, 226-237 and 241-242.
- Penetrating damp was noted to the rear wall of the hall and to corridor 3 and the fire exit room – see photos 238-239 and 243-244. These areas of penetrating damp are expected to be caused by the condition of the roof of the rear extension.
- Rising damp was noted to the wall of corridor 1 – see photo 225.

The Condition Rating **2** defects that will require remedial works to prevent further more problematic degradation occurring are as follows:

- Trickle vents were absent from the window frames so there is an inadequate means of providing passive ventilation to evacuate internal condensation and moisture.
- We noted the absence of a passive ventilation route into the roof profile. Passive ventilation is required to ensure moisture and condensation that builds up within the roof void has an opportunity to escape (otherwise it would attach itself to the structural timber frameworks and create defects in the form of dry rot)
- A number of damaged tiles were noted to the front roof profile.
- Significant vegetation growth was noted to the rear extension roof and the rear roof profile, rear, left side and right side wall elevations and internally in the fire exit room.
- The timber fascia board to the property were noted to be weathered and will require repair or renewal in areas of rot damage.
- Poor guttering to the roof line was evident with multiple missing gutter sections and defective sections to the rear roof profile – see examples in photos 11-14, which can lead to rainwater discharging down the face of the wall (potential damp issues).
- Cracking (damage category 1 and 2) was noted to the render of the left side wall elevation and to the mortar of the front wall elevation. It is expected that these cracks are caused by some minor localised wall panel movements. No obvious loss of structural support is evident.

- Our inspection of the external walls confirmed shrinkage cracking (damage category 1 to 2) to the left and right wall elevation.
- Render cracking (damage category 1 to 2) was noted around an infill of an original opening.
- Render cracking (damage category 1 to 2) was noted between the original property and front extension.
- An exposed edge was noted to the render of the left wall elevation.
- The tap tests confirmed areas of detached render to the left and right wall elevations. Due to the condition of the external render it is recommended that the render to the property is removed in its entirety and replaced.
- Stepped cracking (damage category 2) was noted to the brickwork mortar of the left wall elevation of the rear extension. During the survey it was noted that these cracks are mirrored on the internal face of the wall suggesting that the cracks have penetrated the full depth of the wall construction.
- Rotten timber was noted to the doorway lintel to the left wall elevation of the rear extension.
- Rotten timber was noted to the window frames of the left wall elevation and to the door frame on the front wall elevation. Corrosion as noted to the metal window frames of the right wall elevation.
- Cracking (damage category 1 to 2) and weathering was noted to the mortar of the stonework to the front wall elevation. The cracking noted above the archways are expected to be caused by minor movement within the window arches below caused by weathering of the archway mortar. Cracking (damage category 1) was noted to the wall plaster above the external wall archways in the front room 1.
- Cracking (damage category 1 to 2) and gaps in the stonework mortar were noted around the timber window of the front wall elevation.
- The majority of the timber frameworks have water markings / apparent surface rot across their surface areas. We'd recommend that the roof timber frameworks are suitably treated to negate any further deterioration.
- We noted ceiling cracks to the rear room – see photos 102-112, and also cracks to the hall and side room 1 – see photos 191-192 and 203-205. N.B. we recommend that all internal ceiling finishes are replaced.
- Internal cracking (damage category 1 to 2) to plaster finishes were noted to the rear room, front room 1, staircase and male toilets – see photos 113-121, 124, 126, 128, 130 and 132-138. Further cracking (damage category 1 to 2) was noted to the wall plaster above the external wall archways in the front room 1 – see photos 127, 129 and 131. Also, cracking (damage category 1 to 2) was noted around the archway infill in the rear room and front room 1 – see photos 122 and 125. Further Internal cracking (damage category 1-2) to plaster finishes were noted to corridor 1, 2, female toilets, front room 2, side room 1, utility room 1 and fire exit room – see photos 185-186, 188-190, 193-196, 202 and 214-218. The internal wall finishes should be removed to check the integrity of the load-bearing wall face beneath and to conduct the necessary repairs

where necessary

- Areas of detached plaster were noted to the rear room, front room 1, staircase and side room 1.
- Stepped cracking (damage category 1 to 2) to the internal wall of the kitchen and utility room 2. It was noted during the survey that the crack is mirrored on both sides of the wall implying that the crack has penetrated the full depth of the wall construction.
- Stepped cracking (damage category 2) was noted to the brickwork mortar of the in the fire exit room – see photos 212-213. During the survey it was noted that these cracks are mirrored on the external face of the wall suggesting that the cracks have penetrated the full depth of the wall construction. These cracks are expected to have been caused by the significant vegetation growth to the wall
- Condensation damp was noted in the rear room, front room 1 and male toilets and to the ceiling in the hall – see photo 240 – see photos 145-146, 149, 151, 153, 155, 166 and 240.
- Vegetation growth was noted the internal of the fire exit room – see photos 210-211.
- Rot was noted to the base of the doorway frame to corridor 3 and the storage room – see photos 207-208.
- No indication of significant movement (through subsidence, settlement or heave), deflection, cracking or other defects to the concrete ground bearing slab. However, it was noted during the survey that the entrance room floor has a slope towards the front wall elevation and so remedial works will be necessary.
- Also cracking (damage category 1) was noted to the concrete floor of front room 2 and the storage room – see photos 187 and 209. It is expected that minor compaction of the material below the concrete slab has occurred (gaps were noted to the slab periphery) and subsequently minor settlement of the concrete floor slab which has caused the cracking and so remedial works will be necessary
- A defective drainage channel and lack of drainage gully to the right wall elevation were noted during the survey. Additionally, the rainwater down pipes to the front wall elevation discharge to the pavement without a method for removal of water away from the base of the wall. These defects can allow water to pond and build up against the property increasing the risk of rising and penetrating damp to the internal ground floor areas.

Further details on the above are presented in the main body of the report which follows:

SECTION 1 INTRODUCTION

Structural Surveys UK are a group of highly skilled Chartered Civil & Structural Engineers who have acquired over 25 years experience in the design and construction of a wide range of buildings and facilities. We have also gained considerable experience in the structural inspection, appraisal, assessment and investigation of building structures, including commercial and residential properties.

This report details the results of a Full Structural Survey (Inspection) to a residential property at Moose Hall, Castle Street in Neath. The scope of the report covers the main property only and is not inclusive of any further outbuildings or other structures.

In accordance with your instructions we have completed the internal and external survey at the above property, the results of which are contained in Section 5.

Section 6 details the conclusions of the survey, indicating areas where remedial works are required.

Section 7 and 8 discuss the recommendations for these works and a guide to repair costs.

Section 9 provides guidance on what to do now.

Appendix A provides a 3D view of a typical house and the various building components listed to ease reader understanding.

1.1 Scope of the Report

The scope of our Full Structural Survey (Inspection) covers an assessment of 6 key 'structural' areas of a typical property, which if defects were identified would be the most costly to repair. These 6 areas include a structural inspection of the following:

- 1). **Roof Structure** (external profile including chimneys where applicable, roof coverings as well as internal structural timber framework in roof void and roofing felt)
- 2). **External load-bearing walls** (including finishes where applicable, e.g. render)
- 3). **Internal load-bearing walls** (including plaster finishes)
- 4). **Foundations** (presence of settlement / building movement / heave / subsidence)
- 5). **Suspended and ground floors** (including finishes to underside of suspended floors, i.e. ceilings)
- 6). **Damp and Ventilation** (visual inspection only)

1.2 Exclusions

This report provides an assessment on the **Structural Condition** of the property only, concentrating on the 6 structural items noted above. This report does not cover a condition assessment of non-structural items, apart from those that may affect the performance of or provide further supporting evidence to the condition of the 6 structural items noted in 1.1.

Clients generally have an understanding on whether they need to replace non-structural items, hence why we concentrate on the 'structure' only. This is of most importance when assessing the structural condition of the property / building as any defects noted to the six items listed above in 1.1 will provide an indication on how well it's performing.

Non-structural items not specifically covered (unless agreed with the client at point of instruction) include:

- **Services** (e.g. gas, water, electrical)
- **Windows and doors** (Window condition is only checked to support our assessment on whether any movement (settlement / heave) of the property has occurred, i.e. any consequential damage to the frames that prevents them being opened or closed. We do inspect the windows to confirm whether they provide an adequate means of internal ventilation and this is reported herein. Our report does not address the actual condition of the windows in terms of their acoustic and / or thermal performance. Any defects to the windows that have not been caused by structural movement of the property or are not associated with ventilation are out of scope of this report)
- **Internal joinery** (e.g. staircases, coving, skirting, doors)
- **Insulation** (to roof void, walls, floors)
- **Chimney Flues** (N.B. the chimney structure is included in our report if a chimney is present)
- **Fixtures and fittings** (e.g. bathrooms, kitchens)
- **Rainwater pipes and guttering** (unless these are defective and are creating damp in the walls)
- **Below ground drainage inspection** (manholes, pipes, soakaways, septic tanks)
- **Presence of contaminated materials** (e.g. asbestos)

The report is based on the condition of the property on the date of inspection and no liability can be accepted for any deterioration in the condition of the property after this date. The structural condition of the property is based on the expert judgement of a Chartered Civil / Structural Engineer, taking account of the outcome of the inspection and any defects identified during the survey, ascertaining the history of the property from the current owners where such information is available (e.g. any structural modifications, building works, previous defects and repair works undertaken etc.) and also performing any relevant searches if required (e.g. coal mining for subsidence, ascertaining local geology) or desk top studies that may have influenced the buildings performance.

In addition, the report contents are based on a **non-intrusive survey** of the building as presented. No liability can therefore be accepted for defects that were hidden and not accessible, which could only have been noted from intrusive investigation or where physical access was precluded (e.g. working at height due to health and safety reasons).

SECTION 2

SURVEY DETAILS

Property Address	Moose Hall Castle Street Neath SA11 3LU
Property Occupancy	Property was vacant at time of inspection.
Client(s) Name	Chris and Angela Hill
Client(s) Address	Not disclosed
Property Agent	Not disclosed
Buyers Solicitor	Not disclosed
Date of Inspection	8 th of February 2021
Weather	Clear
Our Engineer	Geraint Lamble – M.Eng (Hons) C.Eng MICE

Signed



Review/Approved

Simon Clarke – B.Eng (Hons) C.Eng MICE

Signed



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Simon will be pleased to talk to you about your report and answer any questions you may have.

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SECTION 3

PROPERTY INFORMATION

Description and Age

The property is detached grade 2 listed former Wesleyan Methodist Chapel which has previously been converted into a hall and has been derelict for a number of years.

The property was constructed in 1813, so will be circa 207 years old.

The front of the property faces South East approximately.

We noted a two-storey extension to the front of the property and a single storey extension to the rear of the property. The scope of this report does not include whether the extensions complied with local planning and building regulation requirements at the time and was constructed / built in accordance with any approved plans. Any potential buyer is recommended to make their own enquiries through their solicitor prior to signing any contract.

Structural timber frameworks have been used to construct the roof, which are supported off the external perimeter walls. As well as providing vertical support to the roof coverings, the timber roof frameworks also provide horizontal restraint to the top of the load-bearing walls acting as a horizontal diaphragm tying the walls together to maintain structural robustness and stability.

The original roof structure adopts a hipped roof profile, and the front extension roof structure adopts an open gabled pitched roof profile. The roofs are built at an approximate 35-degree pitch and are covered with slate roof tiles. Non-breathable felt has been installed to the underside of the roof profiles. The rear extension adopts a GRP flat roof and mono-pitched roof profile covered with profiles metal sheeting.

We could not determine the exact form of construction adopted for the structure due to the non-intrusive nature of the survey. However, we would consider that a solid wall construction has been adopted throughout the property and extensions. The above form of construction would be expected to have been used for all load-bearing walls within the main property. Externally, the load-bearing walls adopt an exposed stonework finish to the front elevation and a fully rendered finish to the side and rear elevations. Exposed brickwork and stonework finishes have been adopted for the single storey rear extension.

First floor construction will have used structural timber beam frameworks supported off and bearing directly onto the load-bearing masonry walls. As well as providing vertical support to the first-floor loading, the timber beams also provides horizontal restraint to the load-bearing walls at mid height and are thus integral to their overall stability.

Ground floors adopt a concrete solid slab construction throughout the property. The hall has adopted a raised timber floor though this is suspected to be positioned above the original concrete solid slab. The concrete slabs may have incorporated a layer of reinforcement to the top and bottom surfaces (e.g. A393 reinforcement mesh consisting of 10mm diameter bars on a 200mm grid spacing) to enhance structural robustness and strength as well as negate surface cracking (although this could not be corroborated).

Timber boarding has been used for the external fascia to the front, side and rear elevations of the property. Windows and doors were a mixture of timber and metal frames throughout.

It would be expected that the foundations would consist of a solid stone trench for the original and front extension of the property and a conventional concrete strip footing to the rear

extensions, typically 600mm to 900mm wide, depending on the ground conditions and the quality (strength and stiffness) of the supporting geology. The foundation details could not be presented here due to the non-intrusive nature of the survey.

Wall and Ceiling finishes – anticipated to be typically solid plaster to the original property and the extensions. Studwork boarding was noted to the walls of the hall, entrance and front room 1 on the ground floor which prevented inspection of the wall finishes in these rooms. N.B our engineer was unable to confirm the exact form of internal wall finish due to the non-intrusive nature of the survey. Wall and ceiling finishes are non-structural items but do offer some indication on the condition of the load-bearing walls if defects were noted, e.g. cracking.

Insulation – No insulation was noted in the loft spaces. However, we were unable to confirm insulation in wall constructions (if present) or the concrete ground bearing slabs due to the non-intrusive nature of the survey.

SECTION 4 STRUCTURAL SURVEY (INSPECTION) - GUIDE FOR CLIENTS

Types of Survey

The Construction Industry Council (CIC) has produced a highly informative leaflet entitled 'Definitions of Inspections and Surveys of Buildings' clarifying the terminology used in conjunction with the various kinds of survey. The term 'Structural Survey' has come into common use to describe a survey which covers all visible and accessible parts of a building.

Eleven different types of 'survey' are described by the CIC and the one which is discussed with here is a 'building survey' which is defined as*an investigation and assessment of the construction and condition of a building and will not normally include advice on value. The survey will generally include the structure, fabric, finishes and grounds; the exposure and testing of services are not usually covered.*

The extent of the survey will be subject to specific agreement between the professional and the client. The report will include reference to visible defects and guidance as appropriate on maintenance and remedial measures.

The current differences in survey nomenclature are further set out in 'Guide to Surveys and Inspections of Buildings & Similar Structures' published by the Institution of Structural Engineers. In consequence, the term 'Structural Survey Report' has been adopted as a preference when preparing reports of this nature.

Purpose of Survey

The primary purpose of a survey is to give an independent professional opinion on the structural condition of a property.

The word 'independent' requires further explanation. In the strict sense of the term the engineer carrying out the survey is acting on behalf of his client, the purchaser, and therefore cannot be wholly independent as he serves the purchaser's interests. However, the main object of such a survey is to ensure that an opinion is given by someone who has no connection with the vendor or their agents.

Those who are best qualified to carry out such work will have considerable experience in the performance of buildings and their components as well as their design and construction. This would suggest that a Chartered Civil / Structural Engineer would be best suited to this type of work.

Clients Instructions

In the first instance the client should provide the engineer with the address and a general description of the property concerned. In particular, the type of property, its age, use, size and the means of access thereto should be noted.

In addition, the client should stipulate any specific requirements for the survey, e.g. if a known defect exists that requires further investigation.

The client should be advised of the method by which the engineer's fees will be calculated. Sometimes it is possible to give an approximate cost if the engineer has knowledge of the property concerned, or if the description by the client is sufficient for the engineer to assess the extent of the work which will be required.

For many years the Royal Institute of Chartered Surveyors attempted to complete a scale rate of charges for building surveys, but this in practice proved very difficult. The reasons are manifold but the principal difficulty is that more time and trouble can easily be spent on a small two up and two down cottage in a bad state of repair, than on a large four or five bedroom dwelling which is of modern construction and in good order.

Generally, fees are charged on an hourly rate.

The client must be advised that the engineer is a 'General Practitioner' and will not provide specialist reports on drainage, heating systems or electrical installations. A broad opinion usually based on visual observation is given in the report but if the client requires more detailed information then the engineer must advise specialist tests and reports which will involve additional costs.

Condition Rating

To help describe the condition of the property, the engineer gives 'Condition Ratings' to the main parts (or elements) of the building. Some elements can be made up of different parts. For example, a home can have a pitched (sloped) roof to the main buildings and a flat roof to an extension. In this case, the engineer will give each a condition rating.

The condition ratings are described as follows :

Condition Rating	Definition
3	Defects which are considered to be more urgent and requiring remedial works in a more timely manner.
2	Defects that need repairing or replacing but are not considered to be serious or urgent. The property must be maintained in the normal way.
1	No repair is currently needed. The property must be maintained in the normal way.
NI	Not inspected (See 'Important Note' below)

Important Note

The engineer will only carry out a visual inspection. This means that they do not take up carpets, floor coverings or floorboards, move furniture or remove the contents of cupboards. Also, they do not remove secured panels or undo electrical fittings.

The engineer will inspect roofs, chimneys, and other surfaces on the outside of the building from ground level and, if necessary, from neighbouring public property and with the help of binoculars.

They will inspect the roof structure from inside the roof space if there is access (although they will not move or lift insulation material, stored goods or other contents).

They will examine floor surfaces and under-floor spaces so far as there is access to these (although the engineer will not move or lift furniture, floor coverings or other contents). The engineer is not able to access the condition of the inside of any chimney, boiler or other flues.

The engineer will note in their report if they were not able to check any parts of the property that the inspection would normally cover. If the engineer is concerned about these parts, the report tells you about any further investigations that are needed.

Classification of Visible Damage to Walls (Guide for Clients)

Most buildings develop cracks in their fabric. This often happens soon after construction when many materials are drying out; however sometimes it occurs later during the life of the structure.

Most early cracking is not structurally significant but it may be aesthetically offensive and rain penetration maybe increased. It is easily repaired and unlikely to recur to any great extent. Only rarely does cracking indicate a reduction in structural capacity.

Diagnosis of specific causes of cracking is often difficult; every building is unique and several factors may combine to produce the observed defect. These range from physical changes (i.e. temperature, freeze / thaw action), chemical changes (i.e. sulphate attack, carbonation), imposed load effects (changes to the building load, i.e. extensions / conversions), differential soil movements (i.e. settlement, heave) and vibration (i.e. traffic, mining).

The following information is presented to inform the client about the different crack categories and the influence they have on the performance of the structure.

Damage Category	Description of Typical Damage	Typical Size of Crack	Ease of Repair
0	Hairline cracks classed as negligible	Less than about 0.1mm	No action
1	Fine cracks with damage generally restricted to internal wall finishes. Cracks rarely visible in external brickwork	Up to 1mm	Treated easily during normal decoration
2	Cracks not necessarily visible externally; doors and windows may stick slightly	Up to 5mm	Cracks easily filled. Recurrent cracks can be masked by suitable lining. Some external pointing may be required to ensure water-tightness

Damage Category	Description of Typical Damage	Typical Size of Crack	Ease of Repair
3	Doors and windows sticking. Service pipes may fracture & weather tightness often impaired	5-15mm	Cracks require some opening up and can be patched by a mason. Repoint external brickwork and maybe a small amount of brickwork to be replaced.
4	Extensive damage, especially over doors and windows. Framework distorted, floor sloping noticeably, walls leaning or bulging noticeably. Some loss of bearings in beams & service pipes disrupted	15-25mm	Requires breaking out and replacing sections of walls
5	Structural damage; beams lose bearing, walls lean badly and require shoring; windows broken with distortion; danger of instability	>25mm (but depends on number of cracks)	Requires a major repair job, i.e. partial / complete rebuilding

SECTION 5 – STRUCTURAL SURVEY (INSPECTION) DETAILS

The following section details the condition of the main structural components of the property. A description is provided of defects that were found and the probable cause of their development.

Report conclusions are set out in Section 6. Recommendations for remedial works are discussed in Section 7. A guide to repair costs are detailed in Section 8. Section 9 discusses what to do now.

Roofs

We noted no major undulation, deflection or other distortion to the roof structure of the property, i.e. sagging or leaning of the timber frames to the front or rear elevations – See Photo 1 to 10. Minor sagging was noted to the front roof profile – see photo 20 below. The alignment of the roof profile was satisfactory and did not raise concerns regards the integrity of the structural timber frameworks beneath (when inspected externally).

N.B. further commentary on the condition of the structural timber frameworks follows later in the report, see ‘Internal Condition – Roof Void.’



Photo 1 – Front Roof Profile (Left)



Photo 2 – Front Roof Profile (Right)



Photo 3 – Front Roof Profile



Photo 4 – Front Roof Profile



Photo 5 – Right Side Roof Profile



Photo 6 – Left Side Roof Profile



Photo 7 – Rear Roof Profile



Photo 8 – Rear Roof Profile



Photo 9 – Rear Roof Profile



Photo 10 – Flat Roof Profile

There is no obvious indication of the roof structure ‘spreading’ or pushing out, which would otherwise have a noticeable effect on the stability and alignment of the load-bearing walls, which in turn would develop cracking and possibly spalling / detachment of external render finishes from the substrate below (i.e. the load-bearing masonry).

The tile covering (including ridge tiles) is presently complete throughout. However, a number of damaged tiles were noted to the front roof profile and will require renewal in order to prevent rain penetration the roof covering – see photo 20 below. Condition Rating **2** See Section 7.0 Recommendations for guidance on repair works required.

Significant vegetation growth was noted to the rear extension roof and the rear roof profile – see photos 17-18 and 21 below. This vegetation growth has caused significant damage to the rear extension metal roof and displaced the edge tiles of the rear roof profile. It is recommended that all vegetation is removed from the property, the tiles to the rear roof profile are removed and replaced and that the metal roof covering to the rear extension is removed and replaced. Condition Rating **2** See Section 7.0 Recommendations for guidance on repair works required.

A number of holes and corrosion was noted to the metal roof sheeting of the rear extension – see photos 18-19 below. These holes and corrosion are suspected to be due to vegetation growth and lack of maintenance to the roof covering. The condition of the roof covering is expected to be the cause of the damp to corridor 3 and the fire exit room. Due to the condition of the roof covering and the supporting purlins it is recommended that the roof covering is removed in its entirety and replaced after repair works have been undertaken to the support purlins below. Condition Rating **3** See Section 7.0 Recommendations for guidance on repair works required.

The lifespan of slate roof coverings can vary depending on the quality of the materials used, although 80-100 years (90 average) would be a reasonable assumption for good quality Welsh slates and 40-60 years (50 average) for slates of a lower grade / quality (as per the table below). We could not determine the exact age of the roof tile coverings, as laboratory material testing would be necessary which is outside the scope of this report. Notwithstanding this, clearly the roof tiles would have been replaced at some point in the past due to the presence and type of a heavy duty roofing felt and the fact that the condition of the external roof coverings are not representative of tiles that are 207 years old (age of the property). Heavy duty roofing felt was introduced into the UK housing market in the 1960/70's and therefore the roofing tiles have been replaced after this date. We'd estimate the extant roof tiles to be circa 50+ years old based on their condition.

We'd estimate the roof tiles will require replacement in the next 10 years (approximation only and based on the current estimated age and condition of the roof tiles), although degradation / delamination of roof tile materials can differ depending on the quality of tiles used and the environment and weather conditions (which vary across the UK).

Any decision to replace the roof tile coverings shall be based on their ability to act as the primary barrier to resist rainwater penetration into the property. If rainwater penetration develops through the roof coverings then roof tile coverings will need to be replaced either locally or as a whole. Further commentary on the weather-tightness of the roof structure is discussed further in this report, see 'Internal Condition – Roof Void.'

	Years
Hot-bonded, built-up mineral felt flat roofs to BS 747, well constructed	10-15
Hot-bonded, built-up felt roofs constructed to lesser standards	3-10
Good quality flat lead roofs, well detailed and laid with rolls	80-100
Good quality flat copper roofs, well detailed	30-75
Zinc roofs, well laid with rolls, in areas not subject to chemical pollution	20-40
Zinc roofs in situations of chemical pollution	15-20
Asphalt, well laid and detailed, in two coats to BS CP 144, Part 4: 1970	20-40
Hand-made clay tiles with battens and sarking felt	60-70
Machine-cut clay tiles with battens and sarking felt	40-60
Plain concrete tiles, double lap with battens and sarking felt	50-90
Interlocking concrete tiles with battens and sarking felt	50-80
Interlocking Dutch or Belgian clay tiles	40-60
Asbestos-cement tiles or roofing sheets	20-25
Good quality Norfolk reed thatch	50-60
Straw thatch	20-25
Local stone slabs (depending upon porosity)	10-100
Good quality Welsh slates with battens and sarking felt	80-100
Poorer slates, subject to lamination with age	40-60
Shingles (depending upon quality and frequency of treatment)	5-30
Perspex, clear or obscure unplasticised polyvinyl chloride (PVCu) sheets, etc. (depending upon brittleness, etc.)	5-25

Typical Life Span of Roof Covering Materials

The periphery of the roof profile, i.e. the top 'ridge' level, the lower 'eaves' level and 'verge' lines in between appear in a serviceable condition overall (i.e. no missing tiles).

The roof periphery and the adequate ‘closure’ between the roof line and the top of the load-bearing walls is important as the aim is to ensure the roof profile remains weather-tight and does not allow rainwater to penetrate the internal roof void area or to the top of the load-bearing cavity walls. The timber fascia board to the property were noted to be weathered and will require repair or renewal / replacement in areas of rot damage – see example in photos 15-16 below. Condition Rating **2** See Section 7.0 Recommendations for guidance on repair works required. Further commentary on the weather-tightness of the roof coverings are discussed further in the report, see ‘Internal Inspection – Roof Void.’

Further inspection externally also highlighted poor guttering to the roof line with multiple missing gutter sections and defective sections to the rear roof profile – see examples in photos 11-14 below, which can lead to rainwater discharging down the face of the wall (potential damp issues). New gutter sections will require installation to improve the roof drainage around the periphery of the roof profile.



Photo 11 – Missing Guttering and Displaced Edge Tiles (Rear Roof Profile)



Photo 12 – Missing Guttering (Rear Roof Profile)



Photo 13 – Missing Guttering (Rear Roof Profile)



Photo 14 – Defective Guttering (Rear Roof Profile)



Photo 15 – Weathered Fascia Board (Left Roof Profile)



Photo 16 – Weathered Fascia Board (Right Roof Profile)



Photo 17 – Vegetation Growth Under Roof Tiles (Rear Roof Profile)



Photo 18 – Vegetation Growth and Corrosion to Sheeting Material (Rear Roof Profile)



Photo 19 – Holes and Corrosion to Sheeting Material (Rear Roof Profile)



Photo 20 – Damaged Slate Tiles and Sagging to Roof (Front Roof Profile)

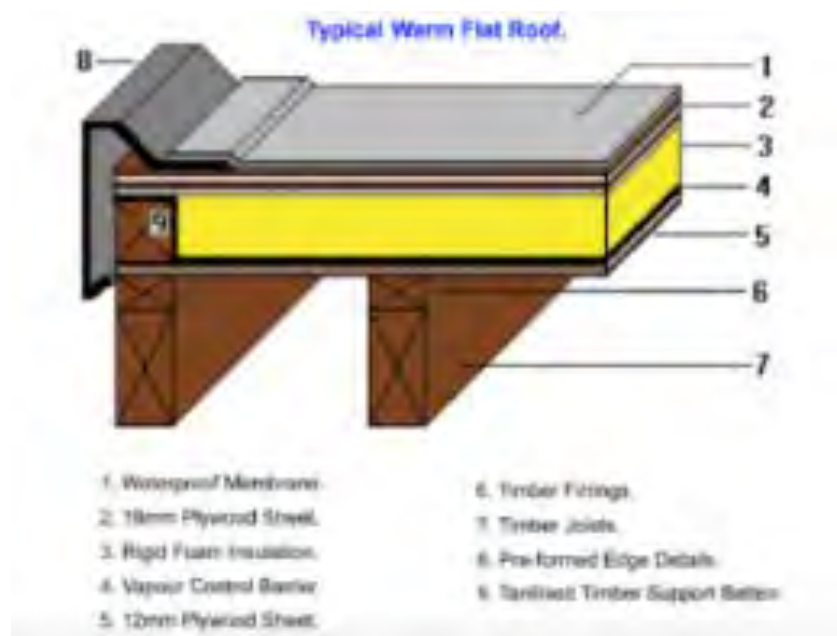


Photo 21 – Vegetation Growth (Right Roof Profile)

We noted the absence of a passive ventilation route into the main roof profile of the property. This is discussed in more detail below in ‘Ventilation’.

The flat roof shown in Photo 10 should have been constructed with structural grade timber roof beams, timber panel boarding and roofing grp/fibreglass external coverings. Insulation should have been installed within the depth of the flat roof, along with a vapour barrier (effectively a layer of polythene sheeting to the opposite side of the plaster board ceiling) to negate condensation / moisture build up within the roof constructions that could otherwise affect the integrity of the structural roof timbers – see detail below.

Externally, the fibreglass roof appeared in an adequate condition with no obvious sign of defects. When it comes to a flat roof's lifespan, the majority of guarantees will only last for **ten to twenty years** (depending on installer and materials used). If well installed and maintained, roof finishes could last longer but it will require time and monetary investment to keep it in a serviceable condition. The internal ceiling finishes have been inspected and confirmed that water penetration was noted below. This is discussed later in the report – see ‘Internal Condition.’



Typical Flat Roof Construction Detail

Walls

The rear and right side walls of the property did not indicate any sign of external wall movement, bulging or misalignment of elevations to the property. Cracking (damage category 1 and 2) was noted to the render of the left side wall elevation and to the mortar of the front wall elevation – see photos 56-57 and 61-62 below. These cracks are caused by some minor localised wall panel movements. No obvious loss of structural support is evident. Notwithstanding this, the cracks shall be repaired accordingly - Condition Rating **2** See Section 7.0 Recommendations for guidance on repair works required.

The vertical and horizontal alignment of the external walls is satisfactory, which suggests the load-bearing wall constructions continue to maintain support to the superstructure loading (i.e. roof loading, first floor loading and the load-bearing walls self-weight) – See Photos 7-11.



Photo 22 – Front Wall Elevation



Photo 23 – Right Side Wall Elevation



Photo 24 – Rear and Right Side Wall Elevation



Photo 25 – Left Side Wall Elevation (Upper)



Photo 26 – Left Side Wall Elevation (Lower)



Photo 27 – Left Side Wall Elevation



Photo 28 – Rear Wall Elevation (Lower)



Photo 29 – Rear Wall Elevation (Upper)

Our inspection of the external walls confirmed shrinkage cracking (damage category 1 to 2) to the left and right wall elevations – see Photos 42-51, 54, 74-83, 85 and 87 below. This cracking is considered ‘non-structural’ and has most likely developed initially during construction, i.e. due to poor preparation and mix design of the render, poor application and inadequate curing (which will have led to the render drying out prematurely and cracking over time). Moisture effects will have also exacerbated the development of these cracks through repeated wetting and drying. This cracking is low grade in nature and expected to be confined to the external render only. There is no loss of structural support or failure of the wall panel at this location. Minor local crack repair works are required. The condition of the external render is expected to be part of the cause of the majority of the penetrating damp throughout the property (discussed later in the report) - Condition Rating **2** See Section 7.0 Recommendations for guidance on repair works required.

Render cracking (damage category 1 to 2) was noted around an infill of an original opening – see photos 37-41 below. This cracking is low grade in nature and expected to be confined to the external render only. There is no loss of structural support or failure of the wall panel at this location. Minor local crack repair works are required - Condition Rating **2** See Section 7.0 Recommendations for guidance on repair works required.

Render cracking (damage category 1 to 2) was noted between the original property and front extension – see photos 52-53 below. These cracks are expected to be caused by minor differential panel movement between the original property and front extension. This cracking is low grade in nature and expected to be confined to the external render only. There is no loss of structural support or failure of the wall panel at this location. Minor local crack repair works are required - Condition Rating **2** See Section 7.0 Recommendations for guidance on repair works required.

An exposed edge was noted to the render of the left wall elevation – see photo 60 below. This unprotected edge can allow water to penetrate behind the render which can lead to the render detaching from the masonry below. Condition Rating **2** See Section 7.0 Recommendations for guidance on repair works required.

The condition of the render was confirmed by carrying out sporadic tap tests (where accessible) which provides feedback on whether render has detached from the substrate (masonry). At the time of the investigation no high level tap tests were carried out. Therefore, the render above 2m was not assessed (N.B. our company health and safety policy prohibits ladder access greater than a single storey). The tap tests confirmed areas of detached render to the left and right wall elevations. Based on the result at low level there is no obvious reason why the render at high level would differ. Due to the condition of the external render it is recommended that the render to the property is removed in its entirety and replaced. Condition Rating **2** See Section 7.0 Recommendations for guidance on repair works required.

Vegetation growth was noted to the rear, left side and right side wall elevations – See photos 30-34 and 88 below. Vegetation growth can cause damage to the wall finishes and the masonry mortar joints. It is recommended that all vegetation on the property walls is removed - Condition Rating **2** See Section 7.0 Recommendations for guidance on repair works required.

Stepped cracking (damage category 2) was noted to the brickwork mortar of the left wall elevation of the rear extension – see photos 35-36 below. During the survey it was noted that these cracks are mirrored on the internal face of the wall suggesting that the cracks have penetrated the full depth of the wall construction. These cracks are expected to have been part caused by the significant vegetation growth to the wall. Condition Rating **2** See Section 7.0 Recommendations for guidance on repair works required.

Rotten timber was noted to the doorway lintel to the left wall elevation of the rear extension – see photo 35 below. It is recommended that the lintel is removed and replaced. Condition Rating **2** See Section 7.0 Recommendations for guidance on repair works required.

Rotten timber was noted to the window frames of the left wall elevation and to the door frame on the front wall elevation – see photos 52, 55 and 71-73 below. Corrosion was noted to the metal window frames of the right wall elevation – see photos 84 and 86 below. Due to the window and door condition it is recommended that the window frames and door frames are replaced to maintain weather tightness of the property. Condition Rating **2** See Section 7.0 Recommendations for guidance on repair works required.

Cracking (damage category 1 to 2) and weathering was noted to the mortar of the stonework to the front wall elevation – see photos 58-60 and 65-70 below. The cracking noted above the archways are expected to be caused by minor movement within the window arches below caused by weathering of the archway mortar. Condition Rating **2** See Section 7.0 Recommendations for guidance on repair works required.

Cracking (damage category 1) and gaps in the stonework mortar were noted around the timber window of the front wall elevation – see photos 63-64 below. It is recommended that the mortar in these areas is repaired and repointed to maintain weather tightness of the property. Condition Rating **2** See Section 7.0 Recommendations for guidance on repair works required.



Photo 30 – Vegetation Growth (Rear Wall Elevation)



Photo 31 – Vegetation Growth (Rear Wall Elevation)



Photo 32 – Vegetation Growth (Rear Wall Elevation)



Photo 33 – Vegetation Growth (Rear Wall Elevation)



Photo 34 – Vegetation Growth (Left Wall Elevation)



Photo 35 – Steped Cracking to Mortar and Rotten Doorway Lintel (Left Wall Elevation)



Photo 36 – Cracking to Mortar (Left Wall Elevation)



Photo 37 – Render Cracking Around Old Opening (Left Wall Elevation)



Photo 38 – Render Cracking Around Old Opening (Left Wall Elevation)



Photo 39 – Render Cracking Around Old Opening (Left Wall Elevation)



Photo 40 – Render Cracking Around Old Opening (Left Wall Elevation)



Photo 41 – Render Cracking Around Old Opening (Left Wall Elevation)



Photo 42 – Render Shrinkage Cracking (Left Wall Elevation)

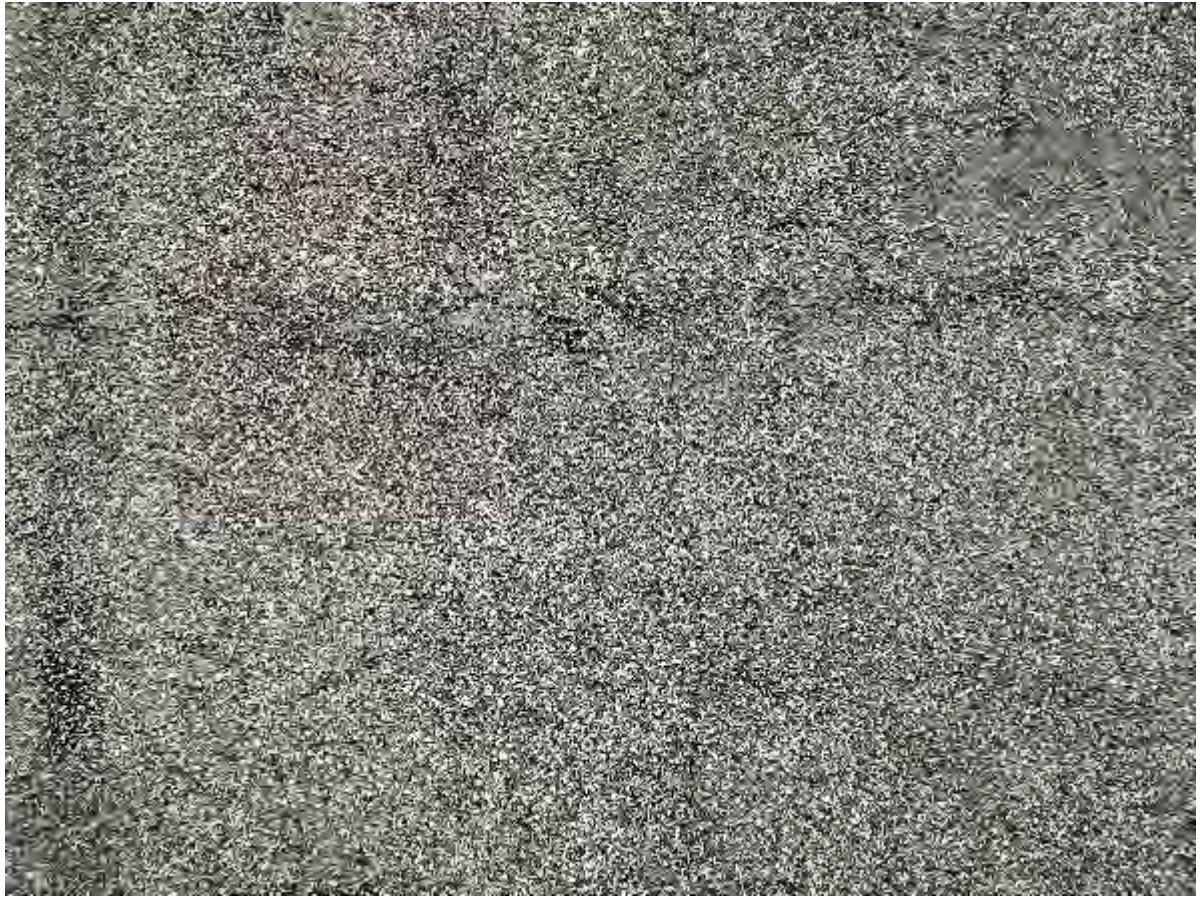


Photo 43 – Render Shrinkage Cracking (Left Wall Elevation)



Photo 44 – Render Shrinkage Cracking (Left Wall Elevation)



Photo 45 – Render Shrinkage Cracking (Left Wall Elevation)



Photo 46 – Render Shrinkage Cracking (Left Wall Elevation)



Photo 47 – Render Shrinkage Cracking (Left Wall Elevation)



Photo 48 – Render Shrinkage Cracking (Left Wall Elevation)



Photo 49 – Render Shrinkage Cracking (Left Wall Elevation)



Photo 50 – Render Shrinkage Cracking (Left Wall Elevation)



Photo 51 – Render Shrinkage Cracking (Left Wall Elevation)



Photo 52 – Cracking Between Original Property and Front Extension and Rot to Timber Window Frame (Left Wall Elevation)



Photo 53 – Cracking Between Original Property and Front Extension (Left Wall Elevation)



Photo 54 – Render Shrinkage Cracking (Left Wall Elevation)



Photo 55 – Rot to Timber Window Frame (Left Wall Elevation)



Photo 56 – Wall Crack (Left Wall Elevation)



Photo 57 – Wall Crack (Left Wall Elevation)



Photo 58 – Cracking to Mortar Above Archway (Front Wall Elevation)



Photo 59 – Cracking to Mortar Above Archway (Front Wall Elevation)



Photo 60 – Weathered Mortar and Exposed Render Edge (Front Wall Elevation)



Photo 61 – Cracking to Mortar (Front Wall Elevation)



Photo 62 – Cracking to Mortar (Front Wall Elevation)



Photo 63 – Cracking and Gaps Around Timber Window Frames (Front Wall Elevation)



Photo 64 – Cracking and Gaps Around Timber Window Frames (Front Wall Elevation)



Photo 65 – Cracking to Stonework (Front Wall Elevation)



Photo 66 – Cracking to Mortar (Front Wall Elevation)



Photo 67 – Cracking to Mortar (Front Wall Elevation)



Photo 68 – Cracking to Stonework (Front Wall Elevation)



Photo 69 – Cracking to Mortar Above Archway (Front Wall Elevation)



Photo 70 – Cracking to Mortar Above Archway (Front Wall Elevation)



Photo 71 – Weathering and Rot to Timber Door Frame (Front Wall Elevation)



Photo 72 – Weathering and Rot to Timber Door Frame (Front Wall Elevation)



Photo 73 – Weathering and Rot to Timber Door Frame (Front Wall Elevation)



Photo 74 – Render Shrinkage Cracking (Right Wall Elevation)



Photo 75 – Render Shrinkage Cracking (Right Wall Elevation)



Photo 76 – Render Shrinkage Cracking (Right Wall Elevation)



Photo 77 – Render Shrinkage Cracking (Right Wall Elevation)



Photo 78 – Render Shrinkage Cracking (Right Wall Elevation)



Photo 79 – Render Shrinkage Cracking (Right Wall Elevation)



Photo 80 – Render Shrinkage Cracking (Right Wall Elevation)



Photo 81 – Render Shrinkage Cracking (Right Wall Elevation)



Photo 82 – Render Shrinkage Cracking (Right Wall Elevation)



Photo 83 – Render Shrinkage Cracking (Right Wall Elevation)



Photo 84 – Corrosion to Metal Window Frame (Right Wall Elevation)



Photo 85 – Render Shrinkage Cracking (Right Wall Elevation)



Photo 86 – Corrosion to Metal Window Frame (Right Wall Elevation)



Photo 87 – Render Shrinkage Cracking (Right Wall Elevation)



Photo 88 – Vegetation Growth (Right Wall Elevation)

All door and window openings through the load-bearing walls remained ‘square’ and there was no obvious sign of structural cracking or other defects adjacent to the openings that could otherwise suggest issues with the load bearing walls. During the survey it was noted that the entrance door on the left wall elevation and the fire escape door to the hall jammed on the

door frame when being closed. This is suspected to be due to warping of the door timber and minor movements of the timber frames rather than due to significant building movements.

Ventilation

No air bricks were noted to the external wall elevations. Moose Hall has a solid concrete floor slab which does not require ventilation, as it would if a suspended timber floor was present.

Current Building Regulation requirements specify that a permanent free flow of air be provided to the internal living areas to prevent the build-up of moisture, damp and condensation. This natural ventilation is usually provided by 'trickle vents' installed in windows and doors – See Figure 1 below, or by having windows with a secondary lock that allows the windows to ventilate (while maintaining security) – See Figure 2.



Figure 1 : Trickle Vents to Window Frames



Figure 2 : Double Security Locks to Window Frames
(to aid ventilation while maintaining security)

It was noted that trickle vents were absent from the window frames so there is an adequate means of providing passive ventilation to evacuate internal condensation and moisture - Condition Rating **2** See Section 7.0 Recommendations for guidance on repair works required.

Having natural ventilation in the roof void is also required by current Building Regulations as it prevents the onset of defects developing to the structural roof timbers, e.g. dry rot. The

solution is to install either 'ventilation roof tiles' to the front and rear roof profiles OR to install 'ventilation slots' to the soffit boards at eaves level (See Figures 3 and 4 below).



Figure 3 : Ventilation Roof Tiles



Figure 4 : Ventilation Soffit Boards

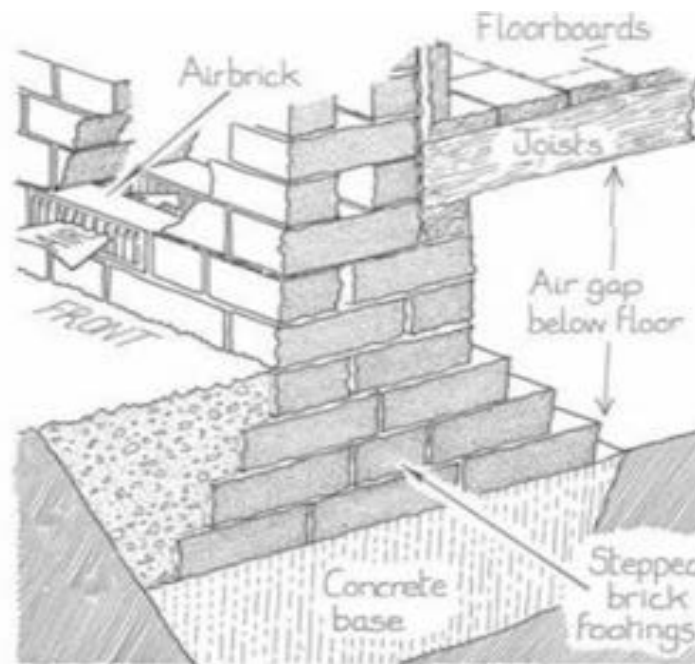
Both the ventilation tiles and ventilation slots serve the same purpose which is to ensure a free air path into the roof void to negate the build up of moisture and the potential for defects to occur (e.g. dry rot in the structural timber sections).

We noted the absence of a passive ventilation route into the roof profile. Passive ventilation is required to ensure moisture and condensation that builds up within the roof void has an opportunity to escape (otherwise it would attach itself to the structural timber frameworks and create defects in the form of dry rot) - Condition Rating **2** See Section 7.0 Recommendations for guidance on repair works required.

Foundations

The Public Health Act of 1875 introduced bylaws for new properties to ensure structural stability of houses and prevent fires, which included the need to construct properties on a suitable concrete footing. As the original property dates back circa 207 years a solid concrete footing as required post 1875 is not expected, although may well still be present.

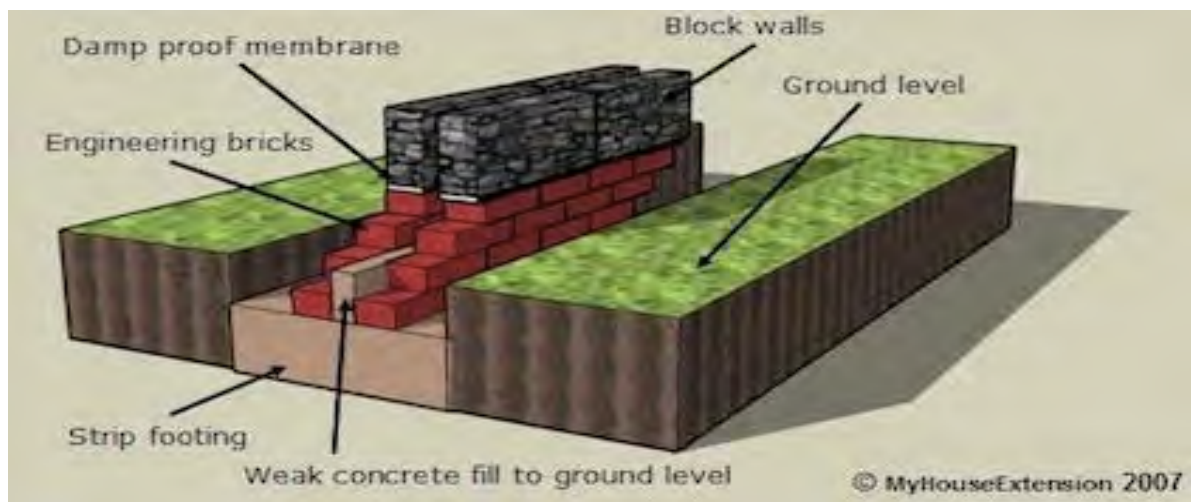
A typical solid wall and foundation system would be expected to have adopted a solution similar to that in the detail below. This would have vertical wall loading being transferred through the solid perimeter load-bearing walls, which would then 'step-out' below ground level and then be supported by a concrete base or solid stoneworks as shown below.



Typical Victorian Foundation System (example only)

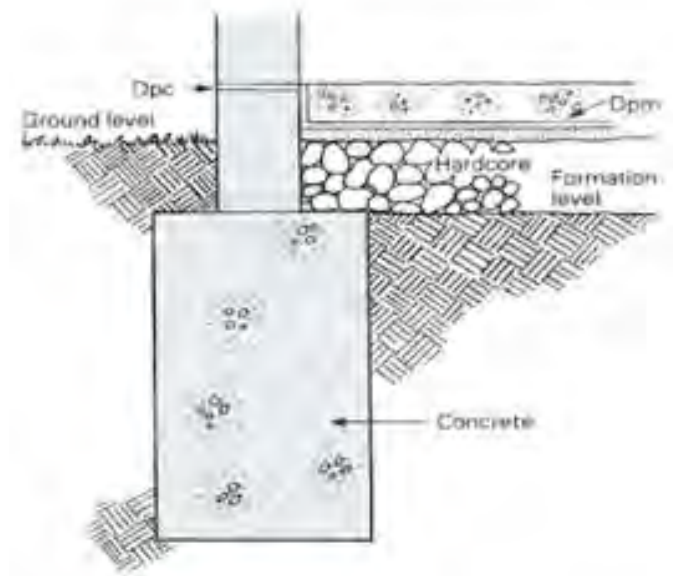
Foundation details for the extensions could not be fully ascertained due to the non-intrusive nature of the works, although would have adopted one of a number of potential solutions :

1). **‘Concrete Strip Foundation’** typically 600mm to 900mm wide, depending on the ground conditions present, to safely distribute the foundation loads to the supporting ground / sub-strata, as per the detail below.



Concrete Strip Footing / Foundation

2). **‘A Deep Concrete Trench’** solution may also have been used if the ground conditions were poor, to distribute building loads through weaker upper layers of soil down to stronger, more competent ground bearing material.



Deep Concrete Trench Foundation

The adequacy of the foundations to support the super-structure loading from the property is assessed by the condition of the above ground portion of the property that is visible to us for inspection. Of prime interest would be the alignment of roof and wall profiles (e.g. sagging, bowing, leaning), in addition to the presence of cracks to the load-bearing cavity walls (both internally and external).

Where cracking is evident, it's important to understand how this has occurred and its probable cause, either from **physical changes** (i.e. temperature, freeze / thaw action), **chemical changes** (i.e. sulphate attack, carbonation), **imposed load effects** (changes to the building load, i.e. extensions / conversions), **differential soil movements** (i.e. subsidence, settlement, heave) and **vibration** (i.e. traffic, mining). It is important to establish whether a risk remains for any further crack development that could affect the structural integrity of the property.

As noted previously, there was evidence of some structural cracking to external walls. Further cracking is evident following our internal inspection (discussed later in this report).

Building movements can occur for a variety of reasons, which include the characteristics of the supporting ground conditions and nature of the ground water level (which can influence the stiffness / strength of the geology) to name a few. While cracking to the building wall panels is not severe (Damage category 1-2 cracks only) we do recommend that, apart from carrying out intrusive investigations and conducting repair works to the cracks in the walls (masonry units and / or mortar joints where applicable) that periodic visual monitoring is undertaken to ensure no further propagation / extension or changes to the characteristics of the cracks occur. Local repairs to masonry are needed only and we don't envisage the requirement to underpin (assuming a state of 'at-rest' has been reached as noted below). Further advice can be sought from Structural Surveys UK as required (out of scope of this report) - Condition Rating **2** See Section 7.0 Recommendations for guidance on repair works required.

N.B. It is not possible to determine, from a non-intrusive inspection and by a single site visit, whether this is an on-going issue or if any movements that have occurred have reached a state of 'at-rest' (i.e. the supporting ground has 'compressed / consolidated' enough, coupled with an increase in ground stiffness, to support the building loads). On-going monitoring would be

needed over a 3-6 month period (minimum) and crack widths recorded to assess if any further extension or widening of the cracks occurs, as well as development of new cracks. Crack monitoring is out of scope of this report. Notwithstanding the above, there was no clear evidence that cracks were 'fresh', suggesting no ongoing movements.

Structural Dampness

'Structural dampness' is the presence of unwanted moisture in the structure of a building, either the result of intrusion from outside or condensation from within the structure.

A high proportion of damp problems in buildings are caused by condensation, rain penetration or rising damp – see Figure 5 below.

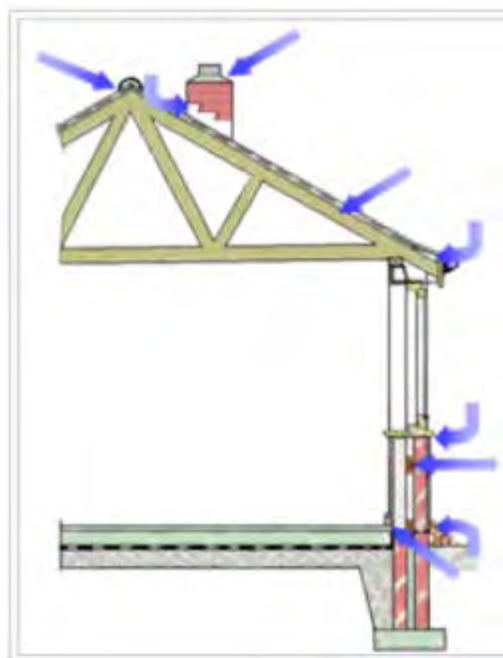


Figure 5 – Detail showing some of the causes of damp penetration

Rain Penetration (also known as "penetrating damp" is a common form of dampness in buildings. It can occur through walls, roofs, or through openings (e.g. window reveals).

Water will often penetrate the outer envelope of a building and appear inside. Common defects include:

- Roof defects such as faulty flashing, cracked or missing slates or tiles.
- Faults in the brickwork or masonry such as missing or cracked pointing. Porous bricks or stones.
- Missing or defective mastic around windows and doors.
- Blocked weep holes.
- Missing or defective trays in cavity walls.

An inspection of potential damp in roofs and external walls is discussed in 'Internal Condition' below. For the case of potential rising damp, this would be prevented by the presence of an adequate damp proof course (DPC) to load-bearing walls and the presence of a Damp Proof Membrane (DPM) to concrete ground bearing slabs.

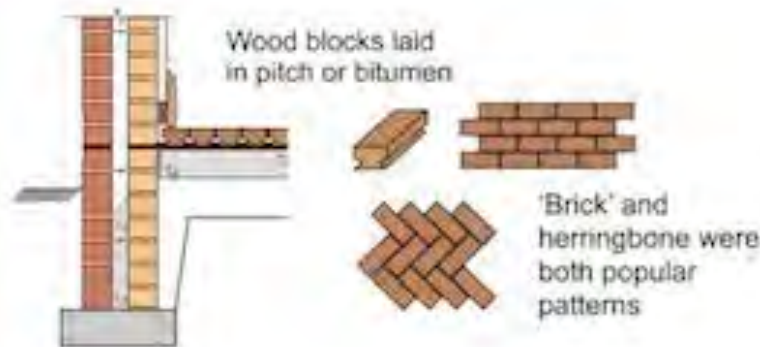
The damp proof course (DPC) provided to the property could not be ascertained due to the non-intrusive nature of the survey. However, for the type and age of the original property we consider this DPC may have taken the form of a layer of slates applied 150mm above finished

ground level. Although it's also conceivable that no dpc exists due to the irregular shape / arrangement of the solid stone works (unless one has been retrospectively installed by the current or past owners). For the extensions we'd expect that a flexible bitumen material will have been used.

For the concrete ground bearing slabs modern day standards require a DPM consisting of a layer of heavy duty polythene sheeting (or 'Visqueen') applied to the underside of the concrete slabs before placement / construction was undertaken to prevent the concrete slab gaining moisture through capillary action – see example in image below. Due to the age of the property, the DPM is most likely to have consisted of a coating of bitumen applied over the concrete slab surface, but beneath the floor finishes – as per detail 1. We could not corroborate the presence, type or condition of the DPM due to the non-intrusive nature of the survey.



Example of a Damp Proof Membrane being installed before placement of concrete slab



DPM Membrane Detail 1
(bitumen laid beneath floor finishes)

The presence of a suitable DPC and DPM would be required to prevent the ingress of moisture via rising damp migrating through the load-bearing wall constructions and ground floor slabs and entering the internal living space.

Condition Rating **NI** as the DPC and DPM (if present) could not be inspected. However, further discussion on the presence of damp is discussed below for each of the habitable rooms inspected.

*N.B. Structural Surveys UK **do not use** 'Damp Meters' to initially assess the presence of moisture in a property. To be clear, damp meters are unreliable in measuring damp and are not appropriate for use in measuring moisture content in masonry, plaster. British Standard*