

**Allington Farm
Wrexham
Structural Inspection**



By Steve Naylor BEng(Hons) CEng MIStructE

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Introduction

This structural inspection concerns, Allington Farm. The report is provided to form part of the Planning application to convert the dilapidated building in to a habitable dwelling.

The property is a grade 2 listed 2 storey house; with a partial basement constructed of brick work and generally rendered exterior with either stone or concrete cills to the window openings. The property has been added to numerous times over the years with the south west section believed to be the oldest. The roofs consist of slate tiles on timber battens and although access to the roof space was limited and unsafe it appeared to be generally a traditional roof structure consisting of rafters and purlins supported off the load bearing internal walls, several brick chimneys were present, extending above the roof structure. The first-floor structure was timber joists which clear spanned the rooms in the more modern sections of the property, however, some of the rooms within the older section to the rear, the joist spans were split by exposed oak beams. The ground floor was generally believed to be a concrete ground bearing slab apart from locally above the partial cellar/basement area under the front south east corner room which consisted of a suspended timber floor. The foundations were not exposed; however, it is highly likely that the older sections of the property, the masonry walls will be founded directly on to the ground at shallow depth, some of the later additions may have some shallow concrete strip foundations. Entrance to the front garden from the drive is gained through an ornate gatehouse building with a central tower above the opening and two small storage rooms either side, all rendered brickwork with tiled slate and timber roof structure.

Inspection Summary

This structural inspection report concerns Allington Farm; the inspection carried out was a visual inspection and did not involve any intrusive investigation or testing. It is understood that the property has not been in use for some time and is in a dilapidated condition, there are some areas of structural concern and some remedial measures will be required but this would be considered normal practice when converting such a building to a habitable condition.

Structural Design Philosophy

The following assessment is based on the visual inspection only, and no calculations or analysis has been carried out.

The property is constructed with a traditional roof structure, the timber rafters carry the vertical loads due to gravity from the roof finishes via. flexural bending and shear action and transfer the loads to the timber purlins, which in turn transfer the loads via. flexural bending and shear action to the internal dividing load bearing walls, this load is transferred by compression of the wall structure to the foundations and subsequently to the founding ground strata below.

Lateral loads arising from wind action are transferred from the walls via. flexural bending and shear action to the roof structure and lateral load bearing walls, this load is then transferred to the lateral walls that act as shear walls and transfer the loads to the foundations and subsequently the founding ground strata below.

Structure Condition

The roof structure is in a poor condition with partial collapse to some elements internally. Water ingress is wide spread throughout, particularly at valley gutter locations. The roof structure is geometrically quite complicated as the addition of extensions have been added over the years, this has led to numerous roof structures intersecting one another and creating lots of hidden valleys and gutters. Subsequently many of the rafters and timber sections are suffering from rot, although some of the larger sections may be salvageable. Virtually no gutters or down pipes were present to any of the eaves locations causing the rain water to run directly down the walls and numerous roof slates were broken and missing. The roof structure to the north-west corner appeared to be in better condition with no apparent water ingress, however, loose, broken and dislodged tiles were present and gutters were missing. There also appeared to be evidence of mechanical damage to the roof finishes from previous vegetation growth up the walls and roof.

The chimney stacks visible above roof level was in poor condition, particularly the central chimney which has a large crack running vertically up both sides increasing in width at the top, with heavily weathered joints and lead flashing details.

Many of the external masonry walls were rendered and not visible, the render was generally in poor condition and hollow, coming away in places, where the brick work was visible to the front elevation sections to the south and east the brick work appeared to be in reasonable condition under the render. Some of the rear elevation masonry walls to the south west and west elevations were in a poor condition with crumbling bricks vertical cracks and heavily weathered mortar joints.

There was a significant lean and bulge to the south-west elevation wall, which is believed to be one of the later additions, a large masonry buttress has been introduced at some time, probably in an attempt to prevent any further movement, the buttress masonry is heavily weathered with crumbling brick work and weathered mortar joints.

The first-floor structural timber elements appeared to be generally in reasonable condition with no obvious signs of rot or infestation, no visible signs of distress or excessive spring or deflection was noted. The oak floor beams within the older section of the property appeared to be in good condition. There was a minor uneven floor and slope within the first-floor front room to the east corner, a vertical crack was also noted within the internal supporting wall. The majority of the window frames were in very poor condition with rotten and crumbling timber, there was no particular evidence of failed lintels, however, it is highly likely that any internal timber lintels may require replacing and when replacing the windows it is highly likely that some external leaf lintels may be required.

The ground bearing floor slabs were general level with some uneven sections particularly within the older sections to the rear elevation at a lower level, it was also noted that the lower sections of wall and floor, particularly towards the rear elevation were very damp.

The timber floor above the partial basement was in a very poor state of repair, with rotten timbers throughout and noticeable bowing and deflection. The support timbers for the stairs is within the access down to the partial basement and has also suffered from rot and some members have failed resulting in stairs dropping and becoming unstable and unsafe.

The basement was a very damp environment and partially filled with water at the time of inspection, a drain was present in the floor but appeared to be blocked and the floor appeared to fall away from the drain causing the basement to hold water.

The masonry to the gate house to the garden entrance was generally in fair condition, however, the slate roof and timber elements were in a poor state of repair.

The external levels surrounding the property were generally either level with the internal floor level to the front elevation or above the floor towards the rear elevation.

Conclusions and Recommendations

Overall the property is in a poor condition, however, the remedial measures required which should form part of any re-development are considered quite straight forward, and should as a minimum include the following:

- 1) The roof structures should be completely removed and replaced (apart from may be the north-west corner element, re-using the existing tiles and possibly some of the purlins if suitable, with new membrane and insulation as required, as well as new rainwater gutters/ valley gutters and downpipes connected to a soakaway or existing drainage.
- 2) The chimney stacks above roof level require a complete overhaul and partially taking down and re-building with new flashing details.
- 3) The render should be completely removed from all of the external walls to enable the brick to be exposed, it is envisaged that many of the joints will require raking out and re-pointing. Some of the brick particularly to the rear elevation, the buttress and west/south-west elevations are significantly damaged and will require partially or fully taking down and re-building to replace the damaged bricks.
- 4) The leaning and bulging wall to the south west elevation appears to be historic movement, there are no signs that this is ongoing, however, any redevelopment should include the introduction of galvanised steel straps between the floors and walls to effectively tie the building together. Where walls are not tied or keyed in it would also be prudent to strap these walls together as part of any works.
- 5) The existing first floor timbers appear satisfactory, however, during the development the ends of the joists protruding in to the external walls should be inspected and checked for any rot and replaced accordingly. The uneven timber floor to the upstairs front, east corner room appears to be historic

movement with no signs of anything ongoing. The cracking within the internal wall appears to be likewise historical and is probably due to some minor settlement decades ago.

- 6) The suspended timber floor above the basement should be completely replaced with a new insulated timber floor as should the timber staircase due to rotten timbers.
- 7) The basement drainage should be thoroughly cleaned and unblocked and the floors levels adjusted so that they fall towards the drain. Ventilation should be introduced to the basement via air bricks or similar to enable movement of air.
- 8) The ground bearing floor slabs should be grubbed out to enable a new insulated concrete slab and membrane to be laid. As this will entail significant internal excavation and it is likely that the foundations to the walls will be very shallow, some underpinning of the walls may be required to facilitate this.
- 9) Externally the ground levels are too high around the whole property but particularly to the south, east and west elevations, which is causing the external walls and floor slabs to be damp. The external levels should be reduced throughout to a minimum of 150mm below internal finished floor slab level with a gravel border against the masonry.
- 10) The garden gate house building requires complete new timber structural elements to the roof and internally.

In conclusion there doesn't appear to be any ongoing movement or stability issues with any of the building, the movement that has occurred is historic in nature and the remedial measures listed above will enable the building to be successfully converted to a habitable use.

Photographs



Rear elevation – note, external levels above internal floor and leaning wall with buttress.



Central chimney with large vertical crack and unstable brick work.



Failed and rotten timbers supporting stairs.



Damp environment within basement



Damp walls and floor to rear elevation rooms due to high external levels and lack of membrane.



Some of the walls under the render appeared in fair condition, particularly to the north east and south-east elevations.



Some exposed brick work is in poor condition and will require partial re-building to replace the crumbling and damaged masonry.



The primary structure of the garden gate house was in fair condition.



Some of the internal timber and roof elements require complete replacement.



Elevation showing the older section of the property – note very poor brick work to the far elevation that will require partial re-build.