Higher Standen, Clitheroe

STRUCTURAL & CONDITION SURVEY REPORT

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APPENDICES

DOCUMENT HISTORY:

REV	DATE	DESCRIPTION	PREPARED BY	CHECKED BY	APPROVED BY
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1.0 Introduction

1.1 Clients Brief

Shape Consulting Engineers have been instructed by our client Henry Charlton on behalf of Taylor Wimpey to carry out a structural appraisal of the structure located at Higher Standen, Clitheroe, Lancashire.

The principal objective of this inspection was to assess the structural integrity of the historic building with plans in place for the development of the surrounding site.

The structural appraisal as outlined above was undertaken via visual assessment from ground floor level only to identify any areas which were considered in a poor structural condition and/or are requiring further investigation/remedial action.

The structural appraisal was undertaken on 23rd February 2022 at which time there were high winds and rain.

1.2 Scope of Survey

The contents of this report are strictly confined to comments concerning the terms outlined in the clients brief above. We have not inspected any parts of the structure which were covered, not exposed or inaccessible and we are therefore unable to comment that any such parts are free from structural defects or issues.

The views expressed in this report are based entirely upon a visual inspection of the building from ground floor level where accessible internally and externally. No intrusive investigations, exposure works, or destructive investigations were carried out as part of this appraisal, although some areas had deteriorated to the extent that it was possible to view in detail the construction type and confirm assumptions.

This report is not intended to be an exhaustive list of minor defects. It is a report commenting upon significant structural defects, which were apparent from a visual inspection of the building.

1.3 Potential Hazards – Prior to Entering

The building was assessed prior to entrance via an external observation of all elevations and a review of elevation photos provided by the client. From this assessment it was evident that parts of the building were suffering from severe structural decay, however it was deemed that there was no immediate risk if care was taken to approach these areas with the necessary sensitivity.

2.0 Building Description

2.1 Referencing

For ease of referencing within the report the structure has been split into two sections, described as the western section and the eastern section. Elevations of the western and eastern sections are referenced via there cardinal orientations also as per image 1 below.

Image 1. Aerial Photo, western section highlighted in red

2.2 Building History & Description

The site and surrounding area have been historically used as arable land. The building appears on historical maps from 1844 and is likely to have been constructed at approximately this time. Subsequent historical maps from 1844 indicate that the building has experienced no further structural extensions/additions from that date.

2.3 Building Construction

Foundations - footings were not exposed however a stone base is believed to have been utilised as a level surface to construct the walls. As the foundations were not exposed it was not possible to discuss their condition, however there is no evidence of structural issues relating to the foundations.

Elevations - Wall construction was undertaken in composite rubble fill stone walls, comprising two skins of stone with a central core of lime mortared rubble. Lime mortar was originally used for pointing walls internally and externally. Since the original construction several elevations appear to have been sporadically coated with a cement based render. Repointing of stone has been undertaken with a cement based mortar and the pediment to the eastern section (north elevation wall) was reconstructed in blockwork and a cement based mortar. Window and door openings are supported via timber lintels or framed out in sandstone, historic openings were infilled in many locations throughout, infills were constructed largely in masonry or block and a cement based mortar. Historic metal fixtures can be observed on many of the internal and external walls and were noted to be of no consequence structurally. An arch opening in the western section (north elevation wall) was supported via stone voussoirs that were in good condition. Ivy was obsevered on the souther elevation and western elevation.

Roofs - The original roof construction comprised of kingpost timber trusses and timber purlins, the eastern section roof was replaced in the recent past and is constructed with loose rafters and a make shift ridge beam has been extended to

the underside of the rafter at apex in what appears to have been an attempt to prevent roof spread. Roofs are slate tile finished.

2.4 Conservation

The structure is not noted as a designated heritage asset (listed building, scheduled monument, conservation area) on the Historic England database, however, the local planning authority may request a Heritage Impact Assessment (HIA) or Heritage Assessment (HA) to accompany the proposed development.

Even though the building is not a designated heritage site this report, and its findings follow the three basic tenets of conservation philosophy which are minimum intervention, reversibility and an honesty of intervention or repair.

3.0 Observations

3.1 General

A full photo log of individual defects and an associated descriptions is presented within Appendix A. Minor structural defects are noted within these logs such as delamination, crumbling/flaking stonework, repointing, staining, vegetative (ivy) growth, however the observations that follow relate to the key items of structural significance only.

3.2 Blockwork/Masonry Infills & Repointing in Cement Based Mortars

Blockwork/Masonry infills and repointing in cement-based mortars has been undertaken in the recent past and is evident throughout the structure (images 2-4), these are most prevalent at windows and doors, however the western section of the structure has its pediment entirely rebuilt on the north side in blockwork. The reasoning behind the decision to in-fill historic structural openings is unclear with only a couple of examples that seem to have been undertaken to attempt to stymie structural issues. From both a conservation and structural perspective the in-fills have been poorly specified with no consideration made to retaining the historic fabric in the choice of materials with block/brick and cement mortar used in place of a natural lime mortar and stone that were appropriate and compatible building and bedding materials.

Not only are these repairs/infills unsympathetic to the historic aesthetic, they have also generated structural issues, specifically the rigid cement based mortar and brick/block has created localised areas of structural rigidity that were not present in the existing structure and have impacted the performance of the building, significant vertical cracking and distortion of stone panels surrounding the infills is common throughout and severe in many places, the use of compatible materials as outlined above would have ensured the structure worked in a traditional manner and maintained its ability to accommodate normal building movement and aid breathability. Furthermore, repointing in a cementitious mortar in place of a pre-existing lime-based mortar is a common error in such structures and as well as preventing natural movement it impairs the ability of the rubble core to remove moisture and creates potentially progressive future issues.

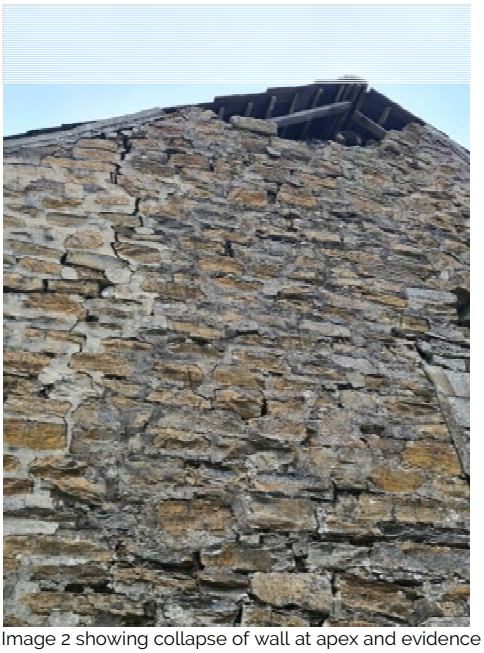


Image 2 showing collapse of wall at apex and evidence of cement based mortar repair in stonework and associated vertical cracking at the interface of the two different mortar types. Image 3 indicating non symapthetic masonry infill and rigid panel

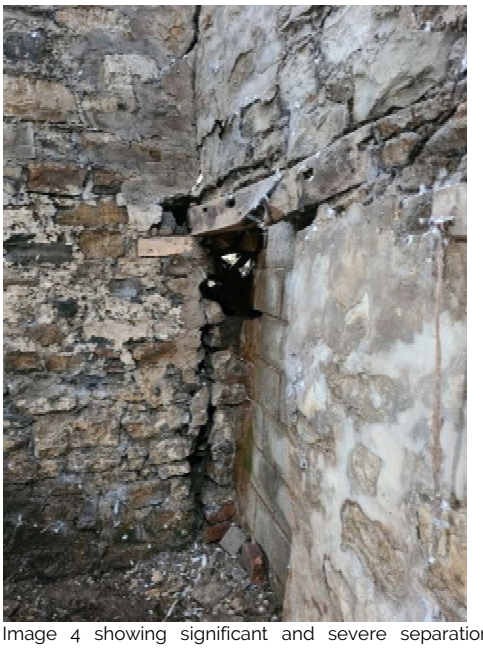
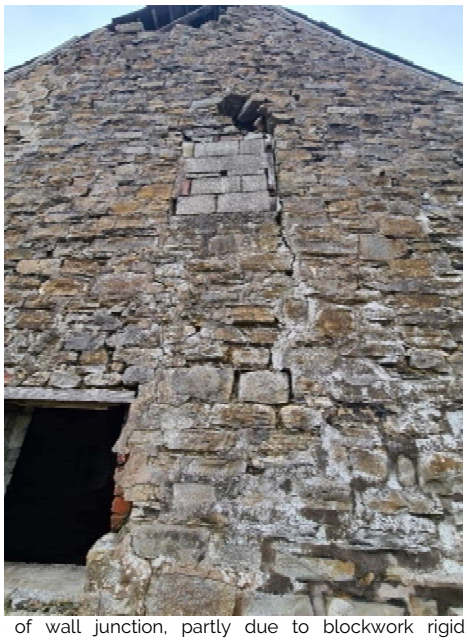

Image 4 showing significant and severe separation of wall junction, partly due to blockwork rigid infill
Image 5 showing blockwork infill and resultant severe vertical cracking

3.3 Progressive Movement

There is clear evidence that recent movements have occurred (since in-fills) and that a progressive movement is occurring in the structure (image 6), the issues are particularly prevalent to the western portion of the building but noted generally throughout. Fallen slate tiles from the roof were observed on the ground surrounding elevations; there is also a clear and significant distortion of recently infilled masonry sections that points to this movement being progressive in the western section of the building. The western section is particularly severely affected with the southern gable wall extremely distorted (image 9) and a part collapse of a stone and block infill at the junction of one of the walls (image 8). The walls are that severely distorted that it is unlikely that remedial measures would be possible without a significant commercial outlay, the separation between wall junction was circa 600mm (image 70 and in our opinion collapse of this wall is inevitable in its current state and if left untreated.


Image 6 showing circa 140mm bow of a remedial masonry support that highlights recent movement. Image 7 indicates a significant and severe seperation of the wall at blockwork infill and junction of elevations.


Image 8 showing collapse of previous masonry infill at the junction of the western and eastern sections. Image 9 side elevation shows the extent of distortion in the stone panel with it believed that the movement is largely recent because of poor remedial works and new roof.

3.4 Western Section Roof

The roof on the western section of the building is severely deflecting at its ridge, this is not due to an historic creep of sufficiently sized timber ridge elements as one might anticipate in historic construction but is solely due to poor workmanship, and incorrect structural specification of repair methods in the recent past. Two steel beams were observed spanning the entire length of the section from which a 'makeshift' trestle style timber support has been constructed to attempt to support the roof ridge (image 11 RHS). A severely undersized ridge board that is inadequately fixed a both its support points was observed to be deflecting very considerably to the point that we are of the opinion that it is simply a matter of time before this element fails and results in failure and collapse of the roof locally at its eastern end as a minimum (image 10). This current condition is unsafe and will collapse if untreated. The poor remedial work implemented is entirely opposed to recommended conservation practices in construction and has not been considered