

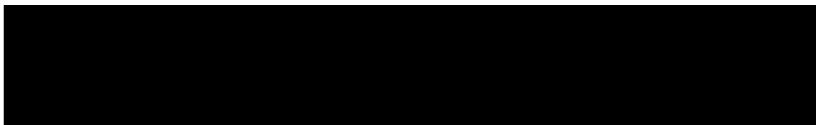


Structural Assessment
Concerning:
**Outbuilding Development
At
Higher Chipping House, Chipping**

Client: **Ms Gillian Hitchen**

Date: **19th March 2021**

Our Ref:



1. Description Of Project

At Higher Chipping House, Cutler Lane, Chipping there is a roadside, 2 storey outbuilding which has historically been used as some form of animal shelter. The Client wishes to convert the outbuilding into a study area. However, the masonry shell of the building is substantially distorted and requires repair works. The present memo provides an outline, qualitative scheme design to return the existing building to a condition of structural integrity.

2. Sources Of Information

2.1 Relevant British Standards cited (Summary title/subject area only given)

BS EN 1991-1-1:2004 EC1 Pt1-1 General Actions

BS EN 1992-1-1:2004 EC2 Pt1-1 General Rules & Rules For Buildings

BS EN 1993-1-1:2005 EC3 Pt1-1 General Rules & Rules For Buildings

BS EN 1996-1-1:2005 EC6 Pt1-1 General Rules For Masonry Structures

2.2 Site Plans

None supplied to the Engineer.

2.3 Site Assessment

The site was attended on 16th March 2021 in the presence of the current property owner Ms Gillian Hitchen and the project builder Mr Glenn Slater. Various observations and specifications of the existing building structure were obtained during this site visit.

3. Notes

It is advised that all structural designs and calculations are submitted to the Local Authority for Building Regulations compliance *before* any works are commenced. Where appropriate, early consideration must also be given to the Party Wall etc Act 1996, more than one month before any work is commenced. Advice may be obtained from your local Planning Department and Building Control.

4. Health And Safety

It is essential that all health and safety aspects of the completed building and the works are addressed before commencement of the works. The Engineer has given consideration to relevant issues in the proposed designs. In many situations the Construction Design and Management (CDM2015) regulations apply which must be considered by the client, builder, designer and all other personnel within the project. Advice can be obtained from the local HSE, contact number in the telephone directory. We will carry out our duties as a Designer under the Regulations, providing structural information and advice. If you have not already done so, it is recommended that you appoint a suitably

competent Principal Contractor as soon as possible who is also suitably competent to be able to carry out your duties as a Client. It is also recommended, if you have not already done so, that you appoint a suitably competent Principal Designer as soon as possible who would be the designer in control of the preconstruction phase of the project. This role could be carried out by the Principal Contractor if suitably competent and appointed at a sufficiently early stage. We would not be able to take on the appointment of Principal Designer. Our role as a Designer in the project formally ends with completion of the design work within.

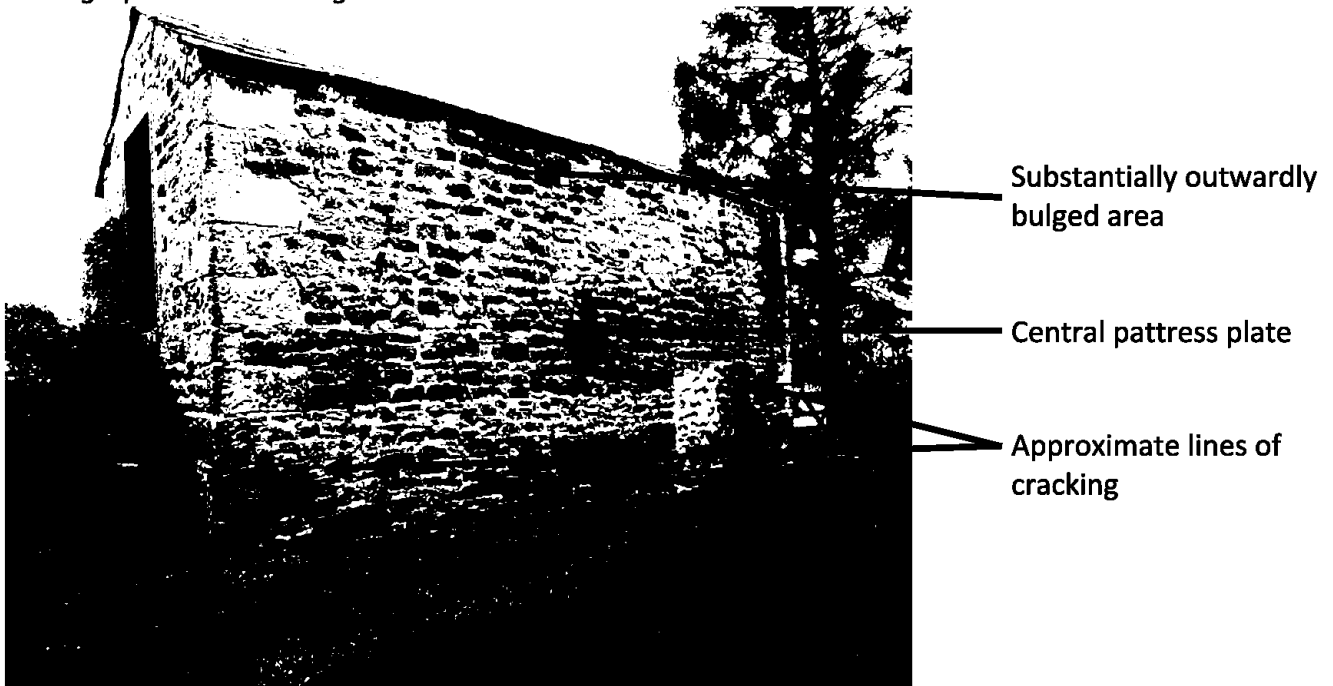
5. Philosophy Of Design

Calculations are provided to verify to the satisfaction of the current Eurocodes, the structural aspects of the design, and the details required by the builder for construction. Reference is made to relevant Building Standards and consideration is given to safety, buildability and economics of the construction.

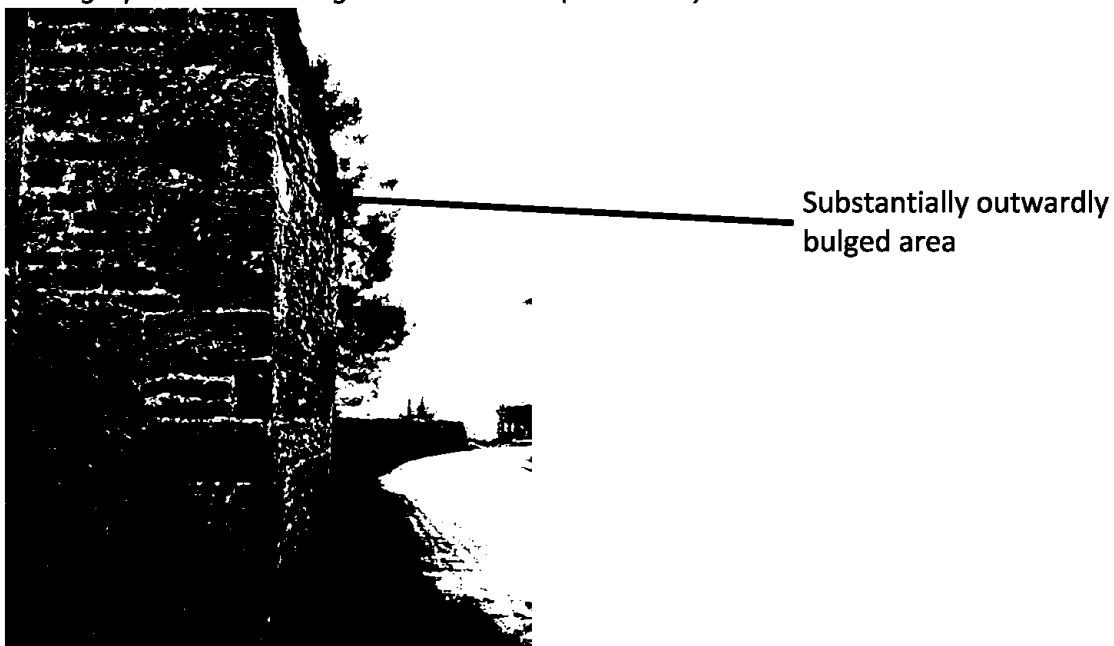
6. Roadside Outbuilding Observations

Photograph 1 shows the roadside outbuilding front elevation. This is a ~400mm thick rubble filled stone masonry construction. The panel is serviceably vertical at ground floor level but is significantly bulged outwards at first floor level. There are various cracks through the masonry, in particular at the left and right ends. There is a central parrass plate which connects the front and rear elevations together via a substantial steel rod. The condition of the pointing is poor over the entire elevation area.

Photograph 1: Outbuilding Front Elevation



Photograph 2: Outbuilding Front Elevation (Side View)



Photograph 3 shows the left gable elevation of the outbuilding at first floor level. At ground floor level is a stone stairway as seen more clearly in Photograph 1. This 400mm thick rubble filled stone built panel is only minimally distorted but has various cracks above the door opening. The condition of the pointing is poor over much of the elevation area.

Photograph 3: Outbuilding Left Gable Elevation At First Floor Level



Photograph 4: Outbuilding Right Gable Elevation At First Floor Level



Photographs 4 and 5 show the roadside outbuilding right gable elevation. This is a ~400mm thick rubble filled stone masonry construction. The panel is serviceably vertical at ground floor level but is significantly bulged inwards at first floor level. There are various cracks through the masonry, in particular around the door opening lintel area. The condition of the pointing is poor over the entire elevation area.

Photograph 4: Outbuilding Right Gable Elevation At Front Corner



Substantially inwardly
bulged area

Photographs 5 to 8 show the roadside outbuilding rear elevation. This is a ~400mm thick rubble filled stone masonry construction. The panel is serviceably vertical at ground floor level but is significantly bulged inwards at first floor level. There are various cracks through the masonry, in particular around the door opening lintel area. There is a central pattress plate which connects the front and rear elevations together via a substantial steel rod. The condition of the pointing is poor over the entire elevation area.

Photograph 5: Outbuilding Rear Elevation



- Substantially inwardly bulged area
- Approximate lines of cracking
- Central pattress plate

Photograph 6: Outbuilding Rear Elevation At Left Side



- Approximate line of cracking
- Central pattress plate

Photograph 7: Outbuilding Rear Elevation At Right Side



Approximate line of cracking

Central transom plate

Photograph 8: Outbuilding Rear Elevation At Front Corner



Substantially inwardly bulged area

7. Conclusions For Outbuilding Condition

It is concluded from the single non-invasive, visual inspection carried out that the outbuilding elevations have all experienced differential settlement resulting in rotation of the elevations. It is also believed that the fill within the rubble filled masonry construction has moved and settled/compacted resulting in further bulging and distortion of the elevations.

Being the longest and tallest elevation, the front elevation has moved the most, resulting in it pulling on the rear elevation via the parrass plate arrangement at first floor level. The outward distortion of the front elevation will also have contributed to further distorting the left and right gable elevations.

It is considered that the majority of this movement is longstanding but recent and ongoing movement cannot be ruled out. There are also potential (minor) effects from the nearby coniferous tree to the right of the building (Photograph 1). However, the main contributory factor is believed to be the inadequacy of the existing footings, which are likely to be very shallow and insufficiently wide enough for the significant weight of the stone elevations.

Any alterations to the building such as introducing a new, modern first floor will add further loading to the building. There will also be an expectation in any new development works for flawless, plastered finish walls. This will be difficult to maintain in the building in its current condition.

The out-of-verticality of the elevations is not *currently* considered a significant risk. However, recommended repairs should be carried out in this round of development works i.e. within months, rather than years, to ensure the long term serviceability and structural integrity of the building.

It is to be noted that the roof canopy was not inspected as this is to be fully replaced during this round of development works.

8. Recommendations

The following recommendations are considered necessary to stabilise the outbuilding and make it suitable for conversion into a home office:

- Underpin Front Elevation
Pocket fill in C16/20 concrete every 3rd metre over at least a 3 day period.
Depth of new foundation to be at least 0.90m deep and in the region of 0.60m wide, subject to assessment of ground conditions.
- Partially Rebuild All Elevations
All elevations to be rebuilt in keeping with the current appearance from ~2.0m height upwards.
Deeply scrape out and repoint all remaining, original elevations.
- Replace The Roof Canopy
Give consideration to installing a new, felted and insulated roof canopy.
- Note On Proposed Development
For a conversion of this type, it would normally be expected to utilise a new internal RFC raft foundation with a concrete block inner leaf. This approach will lose around 400mm from the internal length and depth but will achieve modern thermal and dampness performance standards.