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STRUCTURAL SURVEY

RELATING TO

Sheds and Outbuildings

AT

Box Cottage
Whistley Lane
Potterne
Devizes
Wiltshire
SN10 5QY

FOR

Mrs J Webb
Box Cottage
Whistley Lane
Potterne
Devizes
Wiltshire
SN10 5QY

DATE

9th August 2023

BY

David Lambard
MIStructE CEng

INTRODUCTION

This Structural Survey was carried out on 5th August 2023 in response to a request from Wiltshire District Council for a Structural Report following submission of a Planning Application for the minor alterations and modifications to the existing sheds and outbuildings.

Previous visits to the site have been made and so some comments may relate to observations made prior to the date of inspection.

The weather at the time of the inspections was heavy showers and moderate winds.

The Planning Application has been prepared by Anna Hammond Architect and consists of insertion of windows and minor alterations to some walls and rooflines. There are several documents and drawings but of particular relevance to this report is Drawing 34-L-04 which is a plan of the existing layout identifying the individual buildings.

BACKGROUND

It is understood that the majority of the sheds/outbuildings (apart from Building E) date from around 1960 and were used to house livestock (pigs and chickens) and store animal feed, etc.. This use ceased many years ago and the sheds have been used for more domestic uses and storage more recently. They are currently used for storage of personal items whilst the owners prepare for major repairs and renovations to the main house. This storage prevents inspection of some areas of the buildings but an overall view of construction/condition can be made.

The basic construction is as follows:
Building A - timber framed, walls timber clad, roof corrugated metal sheet
Building B - timber framed, walls and roof corrugated metal sheet
Building C - timber framed, walls corrugated metal sheet, roof corrugated asbestos cement
Building D - brick walls, timber roof structure, roof corrugated metal sheet
Building E - domestic timber garden shed
Building F - timber framed, walls and roof corrugated metal sheet

The alterations relate to three buildings:

Building A - repair and re-clad walls to match existing, insert timber windows
Building C - repair structure, replace asbestos cement roof sheeting with corrugated steel, create new window and door openings
Building D - renew entire roof structure and covering, modify roofline to increase headroom, repair/ rebuild/modify walls

INSPECTION

Building A

This is a low level shed approximately 3m by 7m, 1.5m to eaves and 2.5m to ridge.

It is of timber framed construction built off a low brick plinth. The roof is boarded internally supported on board purlins which are in turn supported by the end walls and two equally spaced 'trusses' with central posts down to floor level. There are signs of deflections, both vertical and horizontal, to both the plinth and timber walls, the roof structure and the floor, but this does not appear to have caused significant distress to the building due to its relatively flexible construction.

Several areas of the brick plinth have been rebuilt or infilled and the upper walls have been repaired with most of the existing posts being replaced or supplemented with 100x50 members and new sections of 100x50 sole and head plate. The timber walls have been lined internally with 18mm OSB to provide a flush finish and this will also have significantly enhanced the stability. Where new openings have been formed these have been framed all round with 100x50 members.

Externally the building has been re-clad with feather edge softwood boarding matching the original and new windows have been installed.

Building C

This is a timber framed building of approximately 3.6m by 11.5m, 2.5m to higher eaves and 2.1m to lower eaves. The walls are constructed of 100x50 timbers at 2.15m crs with a 100x50 rail at high level to support the roof timbers and 50x50 framing within the walls as cladding supports (Photo 1). It is though that there was originally a 100x50 sole plate but this has been obscured by a concrete floor slab cast up to the wall cladding. There are additional timbers trimming openings where there are access doors and windows to the east elevation. The roof is constructed of 100x50 timbers at approximately 1.1m crs again with 50x50 timbers as cladding supports (Photo 2). There is no diagonal bracing and it is assumed that the diaphragm effect of the cladding provides stability.

The walls of the building appear to be relatively vertical but are in moderate to poor condition and there are significant areas where water ingress has resulted in severe decay of the timber, particularly to the west elevation. There is also a metal garage door standing against this elevation at around the mid- point which is considered to now be providing some support to the roof (Photos 3 and 4).

The roof itself shows significant deflection due to the undersized timbers and some rot at the west end of some members. The asbestos cement sheeting (which is not considered to be original) will be exacerbating the situation due to its greater weight compared to the original metal sheeting.

Repairs to the walls will be relatively straightforward with new 100x50 timbers inserted to replace or supplement the existing members. Similarly, where new openings are to be formed additional members can be introduced full height either side and trimmed top and bottom, to frame the openings and allow re-fixing of the cladding. Some temporary support may be required in the form of Acrow props whilst the repairs are carried out. It is essential that the cladding be repaired at the same time to prevent the water ingress and deterioration of the new structural members.

As the roof covering is to be replaced on this building the existing structure can easily be repaired at the same time. Consideration could be given to upgrading the roof supports to remove the deflections but this is not considered essential as the weight or the proposed new corrugated metal cladding will be significantly less than the current asbestos cement.

Building D

This is a brick walled building of approximately 2m square, 1.5m to lower eaves and 2.0m to higher eaves. The roof extends significantly beyond the north and west walls to provide covered areas over open areas and animal pens enclosed by low brick walls. Within the building the roof is boarded internally and supported on a timber

purlin across the building running along the roof. Outside the walls the roof is supported on various sized timber members and posts.

The brickwork is generally one brick thick and to higher levels shows signs of decay due to damp and some structural movement. The brickwork over the single window is built off a timber lintel which has now substantially rotted away leaving the brickwork unsupported allowing it to drop (Photos 5 and 6).

Repairs to the walls of this building will require deconstruction of several courses to the top of the walls to remove decayed bricks, rebuild cracked sections and allow realignment, together with repointing works to other areas. The walls should be rebuilt using the existing salvaged bricks where possible, supplemented by matching secondhand bricks, set in a lime base mortar to match the existing and also allow for similar movement characteristics. Where new sections of wall are required these should be built off a new shallow foundation (depth determined on site) and toothed into the existing walls to provide continuity and enhance the stability.

The roof structure is to be raised to provide adequate headroom at the lower eaves and it is considered that the opportunity should be taken to replace the existing timber structure and support posts. A basic structural scheme can be developed but generally 100x50 members will be adequate for the roof supports and 100x100 for the posts, which should be properly detailed at the base to prevent deterioration.

CONCLUSIONS AND RECOMMENDATIONS

All the buildings (with the exception of Building E) have deteriorated with age and it appears that obviously been poorly maintained and have suffered to varying degrees from structural movement and water ingress.

Although they are in poor condition it is considered that they can be brought up to a better standard suitable for their intended use as storage, craft/hobby and/or vehicle garage use and their lifespan further extended. This is obviously beneficial from an environmental point of view compared to demolition and rebuilding.

The repairs can be summarized as follows:

- Timber members to be supplemented/replaced with members of a similar size (generally 100x50).
- Temporary support by Acrow props to be provided where existing members replaced
- All new openings to be framed with 100x50 members.
- Roof structure to building D likely to be formed from 100x50 members, spacing/spans to be advised
- Brick walls to be dismantled as required and rebuilt in matching/salvaged bricks toothed into existing and set in lime based mortar on new shallow footings where required
- Where wall or roof sheeting is to be replaced this should be done bay by bay to maintain stability (or a simple scheme of temporary diagonal bracing installed).

PHOTOGRAPHS



Photo 1 – Building C wall



Photo 2 – Building C roof



Photo 3 – Building C damp penetration



Photo 4 – Building C garage door ‘support’



Photo 5 – Building D damaged brickwork, view of roof



Photo 6 – Building D general defects