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Callendar House Stable Block

Interim repairs to roof, rainwater goods and associated elements

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CONTENTS

Preface

Historic Scotland Refurbishment Case Studies cover building repair and adaptation, largely concerning occupied structures and buildings in use. These generally consider the use of traditional building materials and describe how buildings can be improved, sometimes using novel techniques, without harming the character or technical performance of the building fabric. Improvements to energy efficiency, vapour permeability or reinstatement of internal details and finishes are some examples of work that is covered in this series. However, there are also examples where works to a building or structure that is not in use is necessary to preserve its immediate future. These reactive works can be termed interim or temporary repairs, or even ‘emergency repairs’ depending on how critical the situation is, and are suitable where only modest funds are available; where the building or structure is in a fragile state; or where there is on-going discussion as to the most appropriate long term solution. Early intervention, even if of a temporary nature, is preferable to continued decay while awaiting a more comprehensive repair scheme. This case study describes works of an interim nature on a structure of some historical importance, that provides clear benefits even while the longer term future of the building remains uncertain.

With changes in local authority funding, and the management of sites and facilities being increasingly operated by volunteer and community groups, it is important to establish an easily adapted methodology for the temporary repair of buildings. Such an approach might require swift action, while that action may not be ideal or long lasting. All those who are custodians of traditional and historic buildings should be encouraged to act quickly when damage occurs or is threatened, and address the root cause of the threat to the building, without compromising conventional building conservation principles. This can sometimes involve using a different range of materials than might be desirable for long term repair.

This case study is the second in the Refurbishment Case Study series that addresses interim repairs. The project involved a rapid process of assessment and delivery on site, without compromising the principles of historic building conservation. It demonstrates that the traditional construction of a building should not be perceived as an impediment to practical building conservation, in the broadest sense of physically safeguarding the historic environment for the future.

1. Introduction

This case study considers interim repairs made to an early 19th century stable block of standard detailing and construction. The works described develop themes investigated in the repair works at the Wauchope Mausoleum in Edinburgh in summer 2014 (Refurbishment Case Study 14). It is sought by these examples to demonstrate the value of modest and timely repairs to prevent buildings falling into a state in which repair becomes extensive and costly. The works which are described here include repairs to a decayed section of roof, reinstatement of rainwater goods, and removal of vegetation and securing of openings. A brief introduction to the rationale behind interim repairs is also included as, where budgets are constrained, such repair strategies will likely become an important part of safeguarding vulnerable traditional and historic buildings in the future.

Although there are long term plans to repair the stable block and bring it into use as a centre for the Falkirk Archives, the funding for this work has not yet been secured and it is likely to be some time before this happens. Given the deteriorating condition of the building, Historic Scotland, in partnership with Falkirk Council, felt it would be appropriate to embark upon a program of interim repairs to minimise further decay of the structure, which will in turn help to make a new use viable. While these works would be valuable in themselves, the project would also demonstrate the principle of emergency or interim works to a wider audience. Every pound which has been spent on these interim repairs is likely to be repaid many times over in savings when it comes to implementing the longer term repair and adaptation which will be needed to bring the building back into use.

2. The site

This case study describes interim repairs carried out on the stable block at Callendar Park, Falkirk (Fig. 1). Constructed in 1828, it is rectangular in plan and two storeys in height. The walls are mainly of coursed and squared rubble sandstone masonry with a pitched slate roof. The building is Category B listed and is on the Buildings at Risk Register.

Prior to the implementation of the interim repairs, the building was rapidly falling into a state of serious disrepair. Many gutters and downpipes were blocked, cracked or missing, allowing large amounts of water to saturate the building fabric. Almost all glazing had been lost, with windows either boarded up or unsecured, leaving the building vulnerable to infestation by birds and vandalism. A large area of the internal pitch of the roof had lost its slates, leading to extensive rot in the timber structure beneath, and partial collapse. Finally, a chimney on one elevation had suffered severe stone decay leaving it in an unsafe condition.

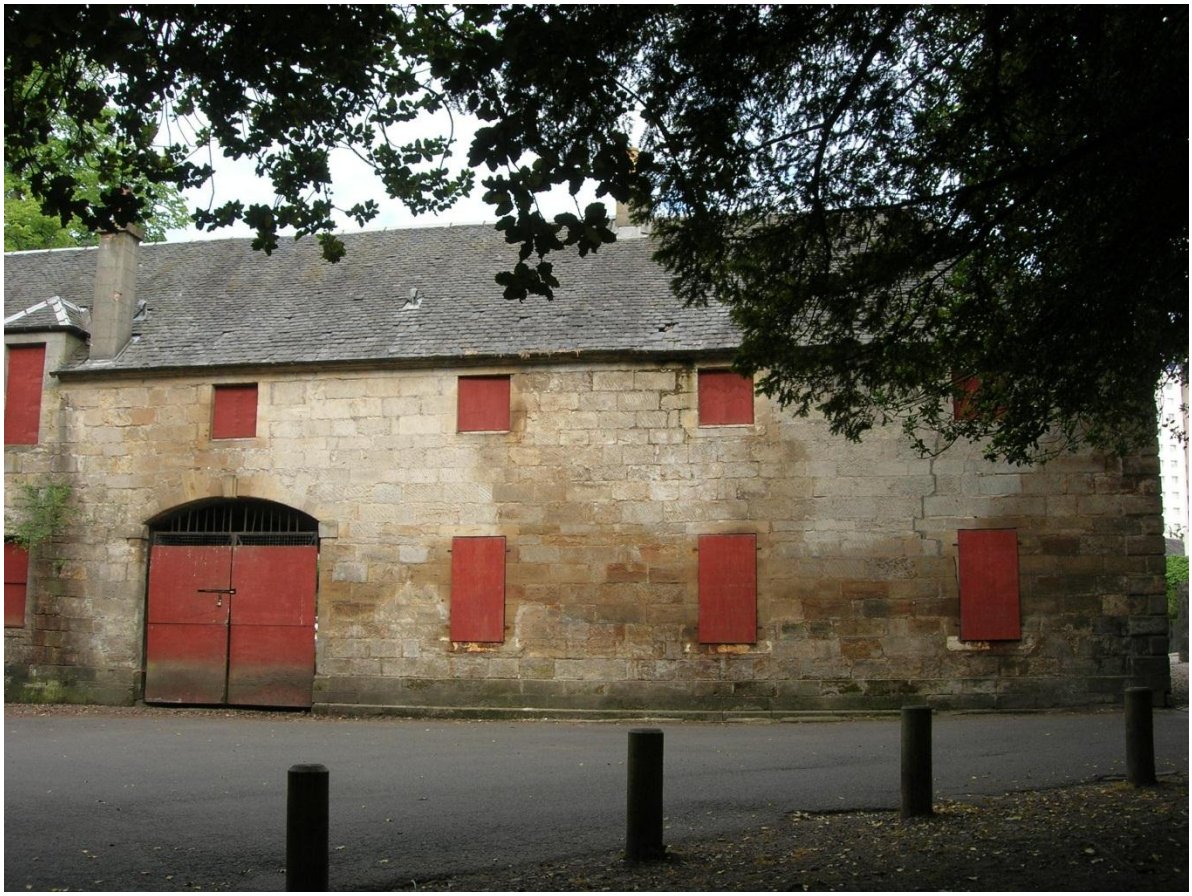

Fig. 1. The west elevation of the stable block at Callendar House, Falkirk

3. Interim repairs

The repairs described in this case study are not long term solutions. They have been implemented with the aim of making the building wind and water tight and are likely to have a lifespan of between five to ten years. Repairs such as installing plastic rainwater goods and providing a felt roof will make a substantial contribution to ensuring that further decay to the building fabric is avoided, but both are temporary solutions and will require the delivery of more permanent repairs in the longer term in materials which are more appropriate to a building of this type. However, had these repairs not been carried out it is likely that within a short space of time, part of the building would have lost its roof, suffered continued masonry decay and become prey to vandalism and even arson. All of this would have made future repairs much more difficult and costly. The principle behind any interim repair strategy should be to execute a repair at modest cost which will avoid further decay and allow time for a more substantial program of works to be drawn up and funded in the future. This may prove the difference between an unoccupied building remaining viable as a future prospect and its abandonment, dereliction and ultimate demolition.

4. Consents for the work

The building is Category B Listed, and while repair and maintenance does not generally require Listed Building Consent (LBC) the nature of the repairs, the materials used and the scale of the work meant that such consent was appropriate. As a condition for the granting of LBC it was stated that the UPVC rainwater goods which were installed would be replaced by cast iron alternatives within three years.

5. Delivery of the work

The works were undertaken by Falkirk Council direct labour organisation, with the oversight of a council architect and structural engineer. There was regular input from Historic Scotland and discussions on the programme. The works were funded with assistance from Historic Scotland and council maintenance budgets; the modest cost of the works allowed prompt financial allocation and approvals. Keeping interim works within a maintenance budget, as opposed to a capital allocation, in medium or large organisations can make the funding of the works much more manageable with decision making kept at a local level. However, it should also be noted that in many cases it is maintenance budgets that are reduced when savings are required.

6. Access

When planning any scheme of construction work, safe access is an important consideration. At Callendar House Stables a range of access measures were required. For the repairs to the roof this was achieved through the use of scaffolding both externally and internally. To construct the internal scaffolding, a section of decayed floor had to be removed to allow the scaffold to rest on firm ground (Fig. 2). Although this may seem an extreme way of achieving access, the floor had decayed to such an extent that its removal would always have been necessary. Other repairs to gutters and downpipes were carried out using a cherry picker or smaller sections of scaffolding.

Fig. 2. Access to the damaged section of roof was via both an internal and external scaffold

7. Rainwater goods

At several points around the building, rainwater goods had been lost or were becoming detached. Their reinstatement was a priority to prevent the continued saturation of the masonry. Existing cast iron sections were re-used where intact, and made up by a small number of new pieces (Fig. 3). Due to financial constraints plastic rainwater goods were fitted as a temporary measure around the interior of the courtyard (Fig. 4), however their future reinstatement in cast iron was specified as part of the Listed Building Consent. A program of maintenance ensuring that rainwater goods remain free of blockages has been put in place to ensure problems do not recur. By re-instating a fully functioning rainwater disposal system, several areas of masonry which were becoming saturated and suffering decay will be much less vulnerable to further deterioration.

Fig. 3. Existing rhones were repaired and downpipes made good

Fig. 4. Where the existing castwork was missing, new temporary plastic gutters were fitted to the courtyard elevations

8. Repairs to the roof

Significant failure had occurred to the roof covering and structural timbers below, on the internal pitch of the south elevation of the stable block. This was caused by an escalating series of slate slippages on the pitch, saturation and decay of the sarking boards and rotting of the rafter feet at wall head level. Following assessment it was found that twelve of the roof trusses had either cracked or suffered significant enough section loss to require replacement (Fig. 5). Given the extent of water penetration through the damaged roof covering, repair of the trusses by scarfing or other methods which would have retained some of the existing timber were not viable options. The sarking board had also suffered significant decay where a loss of roof covering had led to saturation. The wall plate was likewise entirely decayed in several places.

Fig. 5. The decayed section of roof being removed, in total twelve trusses required to be replaced during the interim repair measures

In carrying out the interim repair to the roof, the section of sarking which had rotted or been damaged was removed along with the slates and decayed trusses. Slates in good condition, or damaged larger sizes that could be re-dressed, were retained for reuse in a subsequent phase of more formal repair. The decayed sections of the wall

plate were replaced like for like. New roof trusses of similar dimension to the originals were assembled, joining at the ridge with the sound timbers of the other pitch. Sarking board was reinstated to act both as a base for a roof covering and to provide lateral bracing to the new roof trusses (Fig. 6). These new structural elements, and the sarking, being essentially the same as the originals, would form a durable base onto which the slates could be fastened should a full repair scheme go ahead. It should be noted that while the works are described as interim, some elements could be done to the same standard as the original; the equivalent works using more temporary structural components would not have cost significantly less, and would not have suited a subsequent phase of work.

Fig. 6. Fixing the sarking boards onto the new trusses

It was considered to be too expensive to reinstate the slated pitch, so it was decided to cover the new roof structure with bituminous felt. This material lends itself to temporary works as it is light, easily worked and can be quickly secured to the sarking boards or other substrate. While nailed at regular intervals along the horizontal joints, additional securing by means of timber battens is necessary to prevent wind lift (Fig. 7). The battens are fixed vertically down the line of the roof pitch to allow free drainage of water; when mounted horizontally they cause ponding

and consequent leakage. The product life of a single felt covering of this type is not long, probably five to ten years maximum. A further option would have been to apply several layers of felt, finished with a mineralised coating on the final layer, as employed at the Wauchope Mausoleum (Refurbishment Case Study 14). However, such an approach would have involved more work, and since the material would be melted together in layers onto the sarking, its removal may have presented a challenge when re-slating works commenced. The single layered covering as implemented has successfully made the building wind and water tight until a more long term and appropriate repair in slate can be carried out.

Fig. 7. The finished roof repair, showing the temporary felt covering and the battens

9. Taking down the chimney

On the east elevation of the building, the stonework of a chimney had suffered severe decay; the sandstone blocks forming the chimney had been subject to significant erosion, exacerbated by inappropriate cement mortar repairs and pointing. It was judged by a conservation engineer to be structurally unstable, and therefore unsafe. This chimney was taken down and the stone retained where possible for use in re-erection under a separate scheme. It should be noted that the chimney was

only removed because it was deemed to be unsafe and the taking down of chimneys should not occur unless safety is a concern.

10. Removal of vegetation

At several points around the building, a lack of maintenance and consequent water ingress had allowed vegetation to establish and spread. The roots were well established in the damp masonry, and the growth was starting to force apart the joints. The vegetation was therefore cut back and the roots removed where possible. Where roots were deeper and removal was not straightforward, the cut ends were poisoned with a proprietary brushwood killer. In a more formal repair programme the masonry would have been lifted to remove larger root sections. More substantial repairs will be made in the future when budgets allow. Around the external perimeter of the building, shrubs and trees had been allowed to freely encroach on the masonry; this was causing physical damage and restricting air movement around the walls, preventing the dispersal of water from the fabric. The shrubs were cut back to a distance of four metres from the walls (Fig. 8).

Fig. 8. Shrubs and trees were cut back to prevent physical damage and allow free air movement

11. Securing openings

Although a number of windows had been secured with steel plates in the past, at several points these were missing, most notably in the upper floor windows and skylights. These openings were re-secured with composite timber boards to prevent access by pigeons and other birds (Fig. 9). The securing of window and other openings is also an important part of prevention of unauthorised access, reducing the risk of vandalism, arson or other activities to which empty buildings can be prone. Small gaps were left at the margins to allow a degree of ventilation. The boards were then painted to harmonise the presentation of the elevations and improve the overall appearance.

Fig. 9. Windows were boarded up to prevent re-infestation by birds and other unauthorised access

12. Costs

Table 1 below displays the provisional costs of the works; the final contract sum for the project has yet to be confirmed.

	Costs (£)
Prelims (includes all contractors' overheads, plant/equipment/scaffolding/storage/welfare etc.)	4,000
Demolition and Down-takings (includes removal of chimney and vegetation/tree branches)	1,600
Woodwork (includes all works to roof, removal/boarding of roof lights and boarding of windows)	9,310
Roofing (includes removal of existing slates, new felt and new slates)	726
Plumber work (includes all works to rainwater installations	5,000
Total	20,636

Table 1. Provisional costs of works, awaiting final total

13. Conclusion

This case study has outlined interim repairs carried out at Callendar House Stables, Falkirk. The most significant of these repairs was to a decayed section of roof where 12 new trusses were inserted and a new covering of sarking boards and bituminous felt put in place. Other repairs included the re-instatement of gutters and downpipes, removal of vegetation and the securing of openings. These measures are designed to prevent further decay to the fabric of the building which would certainly have occurred had nothing been done. When a new use is found for the building in the future, these works will have reduced the scope and cost of the repairs which will be necessary, making such a project more viable. Interim repairs can therefore be seen as an important part in securing a vacant traditional building for future re-use.

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