Stirling Castle – James IV Arch Masonry Works Application for Scheduled Monument Consent

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1. Introduction

Built between1501-6 for James IV the forework is a curtained cross-wall extending across the full width of the Castle rock. It provided a new line of defence across the vulnerable southern front of the castle, but also an impressive façade demonstrative of the prestige of the monarch. It originally consisted of three main elements: an impressive four tower gatehouse, perhaps originally four storeys high, with two rectangular towers either side – the smaller, Princes Tower, to the west and the Elphinstone Tower to the east.

The central gatehouse has drum-towers flanking a three-opening pended entry. Little now remains of the pair of semi-circular towers placed symmetrically either side of the gate; in the 19th century they were known as Wallace's Tower (east) and College Tower (west). The present form of the forework is largely a result of 18th and 19th century remodelling to develop and strengthen the castles defences.

The approach to the forework is through the successive lines of outer defences, from the outer moat, through the main gate, across guardroom-square, and through the overport batteries via a gate bearing the arms of Queen Anne. The outer defences were constructed in the later 16th century and subsequently developed and strengthened, by this time advances in artillery meant that the gatehouse and forework no longer provided effective defence. The ramp that leads to the gatehouse is solid at present, but early 18th-century plans show that it was once separated from the gatehouse by a narrow ditch, spanned by a wooden bridge.

Military architecture dominates the approach to the entrance of Stirling Castle. In their own way the successive military engineers from the 16th century onwards demonstrated flair and finesse in providing the defences and outworks that formed efficient artillery defences to replace medieval walls. The response to the Jacobite Risings of the late 17th and 18th century ensured that the defences were kept repaired and renewed.

Proposed conservation works under this application are associated with a section of military build to the James IV Arch, when the original medieval tower remains were heightened and capped to form an artillery defence. Stabilisation works are required to ensure the upper facing-courses of masonry capping the archway are suitably tied into the core of the parapet wall. Works therefore involve pinning and repointing the ashlar and introducing mechanical ties through joints in the ashlar facing-courses and secured into the rubble inner core.

2. High Level Masonry - Condition and Conservation Works

Open joints had been identified to the later upper masonry courses of the monument during audits of Stirling Castle (fig1). A phase of repointing works to the parapet was added to the planned works programmes, subject to securing the funding for a scaffold to access this area of high level masonry.


(Fig 1)


(Fig 2)

Funding was achieved in 2015/16 financial year, for a limited scaffold to urgently address a blocked rainwater pipe associated with the drainage of the tower's artillery battlement. Upon access, the adjacent open joints in the masonry were inspected in more detail and displacement of the masonry was quickly discovered. Isolated stones were found to be loose on their bed and easily dislodged (fig 2).

From this, it was suspected that there may be wider problem of the later military ashlar facing-courses being insufficiently tied through to the rubble inner wall of the parapet, in isolated areas. Moisture and frost cycles in the wall core via the open joints seemed to have compounded the problem resulting in the weakening of areas of masonry.

Emergency funding for a full access scaffold was provided in April 2016 to confirm the extents of any detached and poorly bonded masonry, as per the scope highlighted in this application.


(Fig 3)


(Fig 4)

Conservation works required under this application:

- All open joints in the military build need repointing, adopting small slate pinnings between the wider joints to give rigidity to the ashlar coursing. This adopts the existing approach (fig 3) but all slate pinnings will now be set back within the joints and concealed by the mortar pointing to help protect them from exposure to the elements, subsequent opening-up and potential loss, as has occurred to some existing pinnings.

- In the absence of sufficient through-stones being incorporated into the original masonry coursing, through-ties are needed in the masonry to tie the ashlar facing-skin back to the rubble inner core. This would need to be achieved mechanically by introducing a small stainless steel tie rod through the wider joints and into the inner rubble core (fig 4). This would involve drilling through only wide ashlar joints to reach the rubble core and inserting a non-ferrous tie to secure the masonry skin back to the core. None of these would be visible on completion and would impact on mortar joints only, not into the fabric of the ashlar masonry itself.

- The combination of pinned ashlar joints, pointing and tie fixings should combine to give the masonry courses back their stability and protection against the elements. Pockets within the core of the wall are likely to remain a risk unless in-filled. On completion of the above, the design team will consider infilling of the core pockets by means of isolated grout-infilling. A final decision on the extents and methodology will be made on site once the scope can be fully ascertained.