

SURVEY OF ENTRANCE PANELS - BALVAIRD CASTLE



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INTRODUCTION

A condition survey was carried out on request of the District Works Manager, following an incident of stone loss from the panel. The extensive and progressive decay of the panels has been documented over recent decades. According to HS conservation records, the panel was consolidated with the alkoxysilane 'Brethane' in the late 1970's and with acrylic resin injections and mortar pointing in the 1990's. The report describes the current condition of the stone panels and concludes with treatment recommendations.

DESCRIPTION

Balvaird Castle is a 16th century L-planned tower house with a corbelled parapet wall. The entrance panels are located above the arched entrance into the stair tower on the return corner of the south elevation. They feature traces of heraldry which bear the impaled arms of Sir Andrew Murray and Dame Margaret Barclay.

The castle appears to be predominantly built from a dark-grey extrusive volcanic rock (basaltic tuff) whereas fine-medium grained red sandstone is used for dressed and decorative aspects of masonry.

Three rectangular panels of receding dimension are stacked vertically above each other over the tower entrance. All panels are framed by simple red sandstone architrave mouldings. The same stone was used for the smallest uppermost panel whereas the two lower panels are carved from a pale-buff coloured medium-grained sandstone. The moulding between the lower two panels is also carved from this buff stone.



South elevation entrance to stair tower



Heraldic panels above doorway

CONDITION SURVEY

The panel is pointed with soft lime mortar and pinned with shells which often protrude from the joints by several cm, illustrating the extent of erosion. The surrounding masonry appears to be cement pointed.

While the dark igneous rocks of the surrounding rubble wall masonry appear to be generally stable, the red sandstones frequently show signs of delamination.

Top panel: 780mm Height (from top of sill to top of frame) x 890mm Width

The face-bedded panel has lost all carved detail and is delaminating severely. In places, it is eroded by up to a depth of approx. 80mm. The left side (towards the return corner of the south tower, west of the entrance) of the panel is worst affected by this. Subsurface hollowness was noted in almost all areas. Freshly exposed surfaces are disaggregating

All frame components are delaminating and display open bedding planes. While the upper architrave retains traces of moulded detail, the left (western) upright is particularly eroded and fragile.

White lichen covers many surface areas while algae has also colonised the upper architrave surface. Old resin repair mortars remain visible in the centre and on the right (eastern) side of the panel.

The overall condition of the panel is very fragile and severely decayed.



Upper panel



Eroded moulding with protruding shell pinning

Middle panel: 840mm Height (from top of from top of sill to top of panel frame) x 123mm Width.

The face-bedded panel has lost all carved detail and is eroded up to a depth of approx. 100mm in places.



Middle panel with area of recent loss

A section of several cm thickness was recently lost from the lower edge of the panel. The exposed fresh surface is very soft and powdery. The older surface is hard (possibly due to previous alkoxy silane treatment) but sub-surface hollowness could be detected over the whole panel. Edge pointing remains visible along areas of decay on the right (eastern) side of the panel.

Fragile areas at imminent risk of delamination and loss were noted along the central – right top edge, central bottom edge, bottom left corner and central left edge.

Judging by the protrusion of the shell pinnings, the top moulding (sill of top panel) has eroded by at least two cm. The upright frame members like the top and sill moulding are delaminating along open bedding planes. The left upright member is again more eroded than the one on the right. The sill is delaminating and disaggregating. It has lost all detail and moulded shape.

The overall condition of the middle panel is very fragile with several substantial areas at imminent risk of loss.

Bottom panel: 1160mm Height (from top of sill to top of panel frame) x 1590mm Width

The panel consists of two buff sandstones, both of which retain carved heraldic detail on their outer sides. All carved detail has been lost from the central section where the stonework is very fragile.

Sub surface hollowness was detected in the central areas and on outer panel edges. Surface blistering occurs on the lower outer edge of the right panel. Previous resin pointing is visible here and the outside edge of the left panel



Lower panel with recent loss

The central top edge is delaminating and at risk of loss, previous repairs are visible but failing. A large surface area has been lost recently in the central lower area. The exposed aggregate is soft and powdery.



Failing resin repairs and surface delamination at centre of top edge



Area of recent loss from surface delamination with exposed disaggregated substrate

The frame components are delaminating along open bedding planes. The horizontal and right upright are particularly eroded.

The lower panel is very fragile with further areas at risk of loss.

SUMMARY

Conservation records show extensive decay for decades leading to the panels being treated with surface consolidants and injected with resins in an attempt to fill voids and adhere detaching surfaces back to the substrate.

In the case of the buff sandstone, the alkoxy silane may have penetrated to the thickness of the current (substantial) delaminations. However, its hydrophobic nature and the impermeability of resins may have resulted in moisture entrapment behind treated areas leading to accelerated decay of the substrate and subsequent surface delaminations.

In any case, the stone used to carve the panels and decorative masonry is soft and likely of poor durability. All but the outer parts of the lowest panel have lost their detail. Sub-surface hollowness was detected in most areas indicating that further substantial surface delaminations will be likely in the foreseeable future.

CONCLUSION

Past consolidation attempts have proven unsuccessful in the long term, as envisioned at the time of treatment.

The stones are in such poor condition that no currently available treatment has the hope of being effective. The only way to achieve this would be to remove the stones from their external location and keep them preserved in a museum environment.

Since almost all carved detail is lost, the recommendation would be to record them through laser scanning which may also show up traces of carved detail not visible to the naked eye.

The upper two panels and sill stones should be removed and replaced with blank stones of the same petrology and similar or higher porosity than the original stones so as not to shed excessive amount of water onto the stones below. Stone matching analysis needs to be carried out for this purpose.

The delamination edges of the lower panel should be consolidated with lime mortar pointing so as not to cause any further moisture barriers.

The open bedding planes and delamination edges of the upright frame parts should be injected with solutions of acrylic resin and pointed with a colour-matched acrylic mortar.

Since these treatments are also not likely to be great longevity, the panel should be inspected yearly for the early identification of areas at risk of loss. It is inevitable that this panel will also need to be replaced in the long term.

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