

Historic Environment Scotland Àrainneachd Eachdraidheil Alba

BOTHWELL CASTLE, LATRINE TOWER PROPOSED MASONRY REPAIRS ANNEX A SUPPORTING STATEMENT

version 06/05/2016

1.0 BACKGROUND

1.1 The Scheduled Ancient Monument of Bothwell Castle is one of the outstanding buildings of the medieval period in Scotland and came into State care in 1935. The site is a staffed Historic Environment Scotland site open to the public attracting around 10,000 visitors annually. The Castle is situated in public parkland close to where the river Clyde flows along the park's south boundary. The Castle's South Curtain Wall is built off a rock outcrop high above the river with a narrow strip of level ground adjacent, then a steep banking down to the water. This application relates to the Latrine Tower which projects from the external face of the South Curtain.

1.2 The majority of the South Curtain Wall dates from the C15 with later C16 reconfiguration to some of the upper part of the wall. Build is of ashlar, though somewhat roughly squared. Examination of the masonry build and bonding at the interface of the South Curtain and Latrine Tower suggests that the Tower was built at the same time as the wall.

Stone is badly decayed so little in the way of original tooling is evident. Even though faces are eroded back some comparatively narrow joints are visible hinting at the good quality of the masonry work here - though not of the exceptional standard of the earlier Donjon work. Thomas Ross's 1913 conjectural drawing of the castle imagines the Latrine Tower was originally capped by a jettied out timber structure with a steeply pitched roof. Site evidence at wall head suggests some sort of timber structure existed with a few stone corbels surviving on east and west sides of the Latrine Tower immediately adjacent to the curtain. However stone courses terminating the masonry, including those lining through with the corbels, are lost from the Latrine Tower's southern wall head which is broken.

Within the tower a single large shaft extends from external ground level up to Courtyard level. A latrine at this level occupies the western side of the tower and discharges directly into the large shaft. A lintol on a corbel spans the shaft here to support the enclosing masonry forming the side of the east shaft which continues in smaller cross section to the top.

1.3 A major past campaign of repair was undertaken on the Latrine Tower as revealed by comparison of present appearance with an archive photograph dated 1899 – see drawing 90038-150714-002 - which shows extensive areas of facework missing. However our files are silent about this. It may be that this consolidation work was undertaken by the Ministry of Works in the 1930's or work may have been carried out by the Estate in the period immediately prior to the Monument coming into Guardianship. What this means is that a large area of the Latrine Tower masonry is of early C20 date and therefore of limited significance compared with the authentic C15 stonework.

Based on tower south and east elevation masonry seen in the 1899 photo, Drawing 90038-150714-002 has been marked up to distinguish between modern C20 stones from repairs, and those presumed to be original. Consolidation work included re-forming the large vertical opening on the south elevation. Examination of stonework and the archive photos suggests that though evidence of dressings exists, this large opening was not the original configuration. Our drawings record yetts were fitted to this opening c.1984. The modern yett in the opening to the shaft within the Latrine Chamber accessed from the Courtyard is of similar design.

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- 1.3 cont'd The outlet at the Latrine Tower's base was excavated and was subsequently sealed up with set-back masonry or a metal plate, presumably to prevent unauthorised access. Again our files are silent. This area is thought to have been disturbed previously in past campaigns of repair and presentation of the outlet including clearance works by the Ministry of Works in the late 1930s, though detailed archaeological records of the standard we would expect today have not been found.

The wide top of the Latrine tower has been rough racked to consolidate and in an effort to reduce rainwater penetration into the masonry

2.0 THE PROBLEM

- 2.1 Masonry deterioration, in areas severe, represents a major conservation challenge across this site. Within the South Curtain and Latrine Tower masonry build, the majority of the stones in the lower part of walls are badly decayed with surfaces eroded back and powdering, and some facing blocks entirely missing exposing wall core material. This contrasts with masonry in the upper reaches of these parts of the monument which generally displays more superficial weathering. The decay pattern might be attributable to moisture movement from the courtyard side into the masonry and related salts crystallisation, all aggravated by wind erosion. Decay in the Latrine Tower masonry, including stones introduced post 1899, is particularly severe and this is likely to be due to heavy salt contamination from urine and use of cementitious mortar in early consolidation work, concentrating moisture movement and wetting / drying cycle decay with high levels of salt crystallisation damage into the stones themselves.

- 2.2 Numerous vertical cracks are also evident in the Latrine Tower masonry, each extending over several metres with some branching and extending the full height of the structure. Whilst some of the cracks have been pointed up in the past and remain tight, others, particularly near the top are open and widened, especially near the top corners of the south elevation, suggesting a lack of tying stones.

Bothwell Castle is surrounded by coal mine workings. Any ground movement or settlement would result in cracks propagating from the top of the wall. However masonry at the junction of the Curtain Wall and the Latrine Tower is generally undistressed, thus indicating that cracking is not due to major foundation problems.

The lower half of the south face seems to have been built on a slight outward splay with several facing stones missing or deteriorated exposing the core of the wall. It is to be noted that the wall build is not homogenous over its thickness. It will comprise facing stones with the occasional through or tying stones over a weaker core.

The cracks evident in the Latrine Tower are likely to be caused by gradual loss of the facing which is resulting in loss of support to the upper section of the wall. This combined with on-going water ingress at wall head and cyclic freeze thaw action would result in opening of these cracks and a potential high risk of localised collapse.

Continued loss of the facing stones is the predominant issue as this exposes the weaker core material which gradually erodes, reducing the support to the masonry above and increasing the stresses within the upper half of the structure.

Historic Environment Scotland Àrainneachd Eachdraidheil Alba

BOTHWELL CASTLE, LATRINE TOWER PROPOSED MASONRY REPAIRS ANNEX A SUPPORTING STATEMENT

version 06/05/2016

- 2.2 cont'd If left in current condition it is expected that there will be further loss of the exposed core material and potential for localised collapse of the upper section of the Latrine Tower. This would have serious H&S implications to visitors and would result in loss of monument fabric.
- 2.3 At present fragments of decaying masonry falling from height, and the risk of structural failure and collapse, pose potential health and safety risk to Visitors and the general public using the adjacent public park area. As a temporary means of addressing, freestanding Herras fencing has been erected along most of the external face of the south curtain to create an exclusion zone. However this is unsightly, vulnerable to vandalism, breaching and requires frequent checks so is not a permanent solution.
- 2.4 The modern rough racking to the top of the Latrine Tower is failing. Loose sections have previously been removed leaving pockets which have filled with wind-blown soil. In any case such a wide, reasonably flat wall head area is challenging to successfully cap with rough racking, depending upon an unrealistically frequent maintenance regime especially given present day safety and resource constraints. Rough racking is allowing water to penetrate into the stonework below, contributing to decay processes.
- 2.5 Decay of stonework to the south elevation opening jambs has compromised yett fixings (bronze 'holdfast' twisted bars set into masonry) which are no longer secure. The yett and fixings themselves remain serviceable. Within the Courtyard accessed Latrine chamber The yett over the shaft and its fixings is corroded and no longer secure.

3.0 PROPOSED SOLUTION

- 3.1 Alternative solutions to address the Latrine Tower's deteriorated condition and ongoing conservation needs have been considered as set out in the attached Options Appraisals Annexes B & C. The appraisals' conclusions have been developed into the following proposals:
- 3.2 A major programme of carefully considered masonry repair through indenting in conjunction with introduction of small diameter steelwork structural reinforcement into bed joints is proposed. See drawing 90038-150714-004.

Indenting of decayed stones which are structurally defective and introduction of stainless steel helical bars into bed joints will provide bearing and support for facing masonry from the base up and also tie the structure back together again, curtailing the tendency to spread and crack. This is particularly important in the upper half of the tower where a lack of tying stones is evident. Indenting will also be carried out where badly decayed stones are adversely affecting the weathering of the structure.

Where damaged stones' retention is feasible, they will be brushed back, pointed up, or in potentially very limited cases here, dowel repaired and retained providing their performance within the build will remain satisfactory after these remedial works.

Historic Environment Scotland

Àrainneachd Eachdraidheil Alba

BOTHWELL CASTLE, LATRINE TOWER PROPOSED MASONRY REPAIRS ANNEX A SUPPORTING STATEMENT

version 06/05/2016

- 3.2 cont'd These methods and philosophy of repair are consistent with works carried out across the Estate and as recently implemented elsewhere at this monument.

It is proposed that once full safe access is feasible, stonework would be brushed down in areas for final identification of the most suitable bed joint locations to accept helical bars, commensurate with structural repair needs, with this layout then agreed with HES HMD. At the same time stones requiring indent replacement or repair provisionally identified on drawing 90038-150714-004 would be reviewed to enable a finalised scheme of masonry repairs in the area to be agreed with HES HMD. Opening up may lead to further revision of detail and scope of repair proposals with any such amendments agreed with HES HMD. Should finalised repair needs determined by findings on site vary from the initial proposals submitted, we would propose to submit further methodology and supporting information as necessary for final agreement with HES HMD.

- 3.3 Comprehensive repointing in lime mortar is proposed to encourage drying out through joints which should in turn contribute to reducing the rate of stone decay. The usual provisions apply - any sound existing lime pointing is to be retained and cementitious mortar pointing removal may be constrained by the need to avoid damaging original stonework during raking and cutting out operations. Structural helical bar insertion works do require localised use of cementitious bedding mortar but this would be kept back from the wall face and over-pointed with lime mortar.
- 3.4 Soft Topping the broken head of the Latrine Tower is also proposed to reduce moisture penetration into the masonry by providing a protective capping to wall heads rather than perpetuating the failing and labour intensive rough racking detail. Although this represents a change in presentation, soft topping remains consistent with the picturesque ruin aesthetic. Supporting work will also entail fitting a reversible capping detail over the top of the latrine shaft since leaving an open shaft concealed by encroaching grass would present a high risk to future high level inspection rope access work at a point on the wallhead where physical access is necessary. See drawing 90038-150714-005. Prior to undertaking soft capping, existing rough racking will require overhaul and in some areas reprofiling. Should finalised repair needs determined by findings on site vary from the initial proposals submitted, and go beyond Estate Wide Clearance provision, we would propose to submit further methodology and supporting information as necessary for final agreement with HES HMD.
- 3.5 Yetts to openings are all modern and in varying states of repair. Works include their removal if necessary for repair works to masonry or where the yetts or fixings themselves require more extensive remedial work. Repairs would be like for like with any new fixings required made into masonry joints. Finalised repair needs determined by findings on site which go beyond Estate Wide Clearance provision would be agreed with HES HMD.

Historic Environment Scotland Àrainneachd Eachdraidheil Alba

BOTHWELL CASTLE, LATRINE TOWER PROPOSED MASONRY REPAIRS ANNEX A SUPPORTING STATEMENT

version 06/05/2016

- 3.6 Access to the latrine shafts interiors is difficult. Inspection of these confined spaces to identify any masonry repair needs within is being investigated and will require opening up of the latrine yett at Courtyard level and may also require removal of the presumed modern infill to the outlet at the base (see also 3.7 below). This SMC application includes provisional allowance for these works to facilitate access. We propose to consult further with HES HMD on the detail of this aspect of the project and submit further methodology and supporting information as necessary for agreement to enable detail resolution of any issues arising for inspection access and for any repair work needs identified within the shafts.
- 3.7 Provision is made within the application for opening up the modern infill to the latrine shaft outlet at the base of the tower should access needs and repair works require this. Finalised proposals would be agreed with HES HMD. In association with this there may be a need to remove turf in the depression at the outlet to give sufficient work area and access. Should turf removal prove necessary, further discussion with HES HMD is proposed and provisionally submission of a Written Statement of Investigation, including for watching brief archaeological oversight if deemed appropriate, prior to this element being progressed.
- 3.8 In advance of any works, photographic recording will be undertaken by HES Estates using corrected photos of the entire elevation gridded for ease of reference. Photography of any parts of the latrine shaft interior where repairs are identified as necessary will also be undertaken within the constraints imposed by the confined space.
- Archaeological monitoring by HES call off contractor will also be carried out, with extent of involvement determined by HES Cultural & Natural Resource Team as work progresses, but expected to involve an initial assessment thorough inspection making use of the access scaffold affords, monitoring of opening up of key areas which can inform understanding of build periods and construction, and inputting into and viewing results of latrine shaft inspections.
- 3.9 Our Natural Environment Advisor has visited the site and has confirmed that works to the exterior of the Latrine Tower will not affect European Protected Species (EPS). He has also clarified that works to the exterior of the Tower would not affect any EPS should they be present within the shaft. In accordance with his recommendation about the Latrine Shafts' interior, once access to shafts is feasible a further inspection would be undertaken within to find out whether any EPS are present there. That would then inform proposals for any work required to shaft internal masonry, determining any measures requiring implementation and formal consents to be obtained for compliance with natural environment legislation.

Paul Beaton
District Architect
SW District, South Region
HES Estates

Dr Kashif Ashraf
Chartered Structural Engineer
Conservation Specialist Services
HES Estates