

Historic Environment Scotland

Àrainneachd Eachdraidheil Alba

NEW ABBEY CORN MILL: MILL BUILDING PROPOSED KILN FUNNEL VAULT REPAIRS

ANNEX A SUPPORTING INFORMATION

1. The nationally important Scheduled Ancient Monument water powered corn mill complex at New Abbey Corn Mill includes a Drying Kiln. This comprises a ground floor brick vaulted funnel structure, incorporating the fire grate, with a perforated iron plate floor structure above forming the Drying Floor. Visitors are taken on guided tours through the Mill on a route which passes through the Kiln, beneath the Funnel vault.
2. The Kiln area is roughly square on plan with brick vaulted partial arches rising from a square base in four directions, bearing against outer stone walls to form the funnel. The hand-made clay bricks which appear to be 18th / early 19th century suggest a construction period in line with the c.1800 date of the Mill building's rebuild. Mortar is largely lime. Slight plank mark indentations in those mortar spots remaining in-situ below the vault give an indication of the construction temporary shuttering used. Brick ribs at corners give structural strength but vault construction is relatively insubstantial; using bricks of variable size and quality, with the upper part only ½ brick thick.

Though much appears to be authentic original fabric, significant past intervention is also evident. There are areas of mismatched, later, more regular brickwork with cement mortar at repairs to the Funnel's west and north sides. The corner ribs are limewashed but also appear to have been repointed in cement.

3. Inspection in conjunction with the HES Structural Engineer has identified serious defects in the brickwork of the Kiln Funnel's vaulted west elevation:
 - Deformation towards the upper part of the arch structure, compromising structural performance of the thin 'arch';
 - Long continuous cracks in some bed joints and cracks in some perpendicular joints;
 - Weakened lime mortar which is turning to powder in many locations.

Our conclusion is that the entire arched area of the west side of the vault is at risk of collapse. Consequently the passageway below this part of the Kiln Funnel has been closed to Visitors for health and safety reasons. However concerns remain that collapse could occur with serious consequences, including loss of historic fabric due to breakage of bricks preventing their reuse in reconstruction, and collateral damage to adjacent areas.

4. Options for corrective action to repair fabric and restore public access to the area have been considered, as set out in the Options Appraisal Sheet Annex B. Repointing and an additive support option, retaining the existing masonry in-situ were included but discounted.

The proposed solution, Option 1, would involve carefully dismantling the ½ brick thick arched section of the west vault between the corner ribs and reconstructing back in place using the salvaged bricks and lime mortar. The nature of the original construction and repair needs, including correcting the arch radii in rebuilding to remove the deformation and ensure structural performance, means that absolute exact reinstatement is infeasible. A number of make-up bricks will likely be required and it is intended 'red rubbers' would be used to allow new bricks to be cut down easily on site to match the irregular sizes of original bricks.

Shuttering board mark construction evidence on the west vault would be lost as a consequence of dewatering but would be fully recorded in advance, with a record

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report presented. An initial photographic record sheet has been prepared and is included with the application.

'Doing nothing' is not considered to be an option due to concerns about potential collapse and the risks to persons, building fabric and reputation that would bring.

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Historic Environment Scotland

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