# Altbreck Broch, Dalchork

## Archaeological Survey Report

**On Behalf of:** Forestry Commission Scotland  
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**National Grid Reference (NGR):** NC 5911 1035

**AOC Project No:** 22483

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This document has been prepared in accordance with AOC standard operating procedures.

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Abstract

An archaeological survey was undertaken at the broch of Altbreck, Dalchork forest, for the purposes of conservation management on behalf of Forestry Commission Scotland. A laser scan survey was carried out in conjunction with an interpreted total station survey and a detailed photographic record.
Introduction

1. In August 2013 a detailed archaeological survey was carried out at Altbreck Broch in Dalchork Forest, near Lairg, Sutherland (Figure 1) on behalf of Forestry Commission Scotland and for the purposes of conservation management planning. The broch is a typical example of a north Highland Atlantic roundhouse, and one of several in the Loch Shin area. The site is ruinous, but many of the features of an Atlantic roundhouse can be discerned amongst the rubble, and post-abandonment modifications have not significantly obscured the form of the structure. The site is located at NC 5911 1035 and has the NMRS number NC51SE 2.

2. The site was surveyed in 2012 by Ross-shire and Cromarty Archaeological Services (RoCAS), at which time a basic plan was produced. That survey did not record any of the structural features of the Atlantic roundhouse, however, and does not depict the form of the original broch structure. The present survey aimed to understand the structural history of the building and relate it to a wider understanding of broch architecture in northern Scotland.

3. In addition to the baseline survey the site was recorded by John Barber (AOC) using a detailed database pro-forma for the purposes of recording engineering and architectural details. This study contributes to fieldwork being carried out by Mr Barber towards a PhD on the engineering and architecture of Atlantic roundhouses; his detailed report is included here.

Survey

4. The site was surveyed on 30th and 31st July 2013. A detailed topographic survey of all visible features was undertaken using an S6 robotic total station, while topographic detail of the local topography was recorded using differential GPS, a Trimble R6 rover using real-time corrections via the VRS Now Service. The site was recorded using laser scanning with a Trimble Focus 3D laser scanner; 28 scanning stations were required to provide total coverage of the monument.

Archaeological Context

5. Altbreck Broch was noted by the RCAHMS in the 1911 inventory, and the features of the monument recorded at that time (RCAHMS, 1911). The RCAHMS recorded the monument as having an entrance on the SE, guard cells on either side of the entrance passage and four other intra-mural galleries. The RCAHMS recorded the site as standing to 1.2m in height, a similar level to which the site can be seen surviving today, although as discussed by Barber (see Appendix) there are grounds for suggesting that further depletion has occurred within the last century, obscuring some previously-visible features.

6. Mackie records the broch in his 2007 corpus as a probable example of a ground galleried broch, 'or something very close to it' (Mackie, 2007:625), while also noting that the dimensions of the site suggested that it was markedly oval in plan, a view shared by Mercer (Mercer, 1980). This observation does not accord with the results of the present survey, and may simply be due to the choice of measurement points selected during a manual survey (see below). Altbreck was tentatively reconstructed by Romankiewicz (without observation in the field) as a ground-galleried broch tower, with the north and western galleries depicted as continuous (Romankiewicz, 2011:206-7), based on comparison with similar arrangements at Dun Carloway.
7. Altbreck broch is one of several such monuments found around the Loch Shin area. Sallachy broch, on the W shore of Loch Shin, was laser scanned by AOC Archaeology Group in 2007. This latter broch differs in form in being solid-based, though the dimensions of the wall and general character of the setting are similar to Altbreck (see Figure 2). In the immediate vicinity of the broch is Altbreck 'homestead' (Figure 1), a small enclosure located to the SE of the broch and of unknown date. The site has been considered to be of potential prehistoric date, but on the basis of the observable upstanding remains an historic date seems equally plausible. Both Altbreck broch and the homestead are Scheduled Ancient Monuments (broch: SAM 1829; homestead: SAM 5563).

Figure 2a: Sallachy broch, Loch Shin (scan by AOC Archaeology Group)
Altbreck Broch: Site Description

The broch

8. Altbreck broch is a heavily robbed Atlantic roundhouse, sited on a naturally terraced knoll (Figures 3 and 4) running E-W, overlooking rolling topography and Loch Shin to the W. The structure comprises a roundhouse with walls averaging c.3.5m thick, circular in plan and measuring 18.57m in external diameter and 10.97m internally. The entrance, at point A on the survey plan (Figure 5) is aligned just north of E, and forms a passage 3.5m in length and c.0.8m wide. The passage is choked with rubble, but a large slab, now fallen into the passage 1.0m from the outer wall face indicates the presence of a door check (Plates 1 and 2). The entrance passage is otherwise choked with rubble and no other features are visible.

9. Two intra-mural cells were accessed from the entrance passage. Cell 1, to the N of the entrance, forms a guard cell and was accessed via a passage 0.7m in width, set back 1.8m from the outer wall face of the broch. Two lintels of the passage to Cell 1 survive in situ; beyond these the cell widens to a maximum of 1.9m in width, although the E side is very ruinous. The W side of the cell is partially corbelled and survives to a height of 1.2m above the rubble surface. Cell 2 was also accessed from the broch entrance passage, with the entrance to that cell directly opposite Cell 1, but the entrance to Cell 2 is ruinous and choked with rubble. The cell itself is 2.5m in length and 0.7m in width, and terminates in a somewhat square return (Plate 3).

10. Cell 3 probably accommodates the stairs and is accessed via an entrance passage from the broch interior 1.3m long, leading into a reverse chamber at the foot of the stair, though this is rubble filled and little can be discerned of its form other than that it is c.1.4m in diameter, partially corbelled and stands to 1.3m in height above the rubble level. Cell 3 narrows to 0.9m in width to the W of the entrance and although no steps are visible beneath the rubble, it is probable that these were carried over the top of Cell 4 to the W, providing access to the first floor.

11. Cell 4 is visible as a round-ended, partially corbelled return within the thickness of the wall; the cell is ruinous and rubble filled, but may be continuous to the W. The western portion of the broch is ruinous and much disturbed, although the rubble between the inner and outer walls (at Point B) is
cavitous and may suggest the continuation of Cell 4. Some of this disturbance may be attributable to the construction of later structures abutting the roundhouse to the W (see below).

12. Cell 5 is visible beginning in the NW quadrant of the wall, running through much of the N side of the broch wall. A block of rubble around halfway along its length may suggest that Cell 5 should be considered two cells, but the evidence is equivocal and this masonry may simply be a fortuitous arrangement of collapse debris. Cell 5 is choked with large rubble blocks, and the E end is ruinous so that it is difficult to determine how close the terminus was to the rear of Cell 1; it seems likely that it was in the region of 1.5m.

13. The outer wall face of the broch makes use of some very large boulders, up to 1.5m across and 0.6m deep (see Plates 8 and 9); the pinning stones between many of these have been lost, implying expansion of the wall following collapse of the structure.

**Later construction**

14. At Point C, a small circular structure of recent origin has been constructed, probably as a shooting butt or for another similar function (Plate 11). Two further structures have been built up against the outer wall of the broch on the W side of the monument: at Point D a D-shaped bank encloses an area 7.25m by 7m internally (Plate 12) and at Point E a sub-rectangular enclosure measuring 4m by 2m internally may be a shieling hut (Plate 13).

15. A wall, probably a field boundary constructed from rubble derived from the broch, runs downslope to the NE. It is likely that this feature relates to historic agriculture in the area.

16. A small sub-rectangular platform of stone, measuring 3.5m across is located c.12m S of the broch wall. The nature of this feature is unclear: it is possible that it relates to later agricultural activity, but it is also possible that the feature may represent a stone working area, where stone quarried from the broch was worked prior to removal for use in later structures.

**Character of the broch**

17. There can be little doubt that Altbreck broch was a broch tower, designed to stand as a tall building and probably containing at least a first floor. Although calculations of this nature can only be rough, and it is uncertain at what level the bedrock is to be found beneath the wall, there is probably in the region of 1.5 to 2m of rubble debris within and surrounding the broch. Allowing for the significant effects of stone robbing (which was very likely the source of stone for the construction of field boundaries and sheep enclosures in the vicinity) there is certainly sufficient stone in the rubble pile to account for a missing upper storey. The likelihood of tower-like stature is supported by the probability of stairs within the wall in Cell 3, where the W end of the gallery must ride over the corbelled roof of the E end of Cell 4, although no direct evidence for a stair can be seen without recourse to excavation. A small exploratory excavation in this area, removing only a small amount of rubble to test for the presence of the stair, would add considerably to an understanding of the monument and to the question of whether most brochs were originally designed be towers.
18. It is notable that the choice of position of Altbreck broch, at the E end of the prominent ridge at Allt Breac but by no means at the highest point might imply that the ‘attention’ of the settlement was on the land to the E, rather than towards Loch Shin, and it is likely that the main area of cultivation was the ground surrounding the broch to the NE and SE. This view is supported by the orientation of the entrance in the SE (cf. Mackie 2007, who records it in the NNE), facing away from the loch and down slope towards the east.

19. It has been noted by previous surveyors that the broch is distinctly oval in shape (see Mackie 2007; Mercer 1980). However, the orthographic view of the site provided by the digital survey undertaken here demonstrates that the site is in fact very nearly circular; it seems probable that the discrepancies in measurement in plan derive from the sloping surface onto which the broch was built, and the uneven survival of the upper portions of the wall itself, and the manual selection of points for measurement using a standard tape (see discussion by Barber in Appendix, below).

**Condition**

20. The broch is a Scheduled Ancient Monument and has been kept clear of forestry plantation and felling works. No damage attributable to modern activity could be demonstrated on the site, and the monument can be considered at low risk of further degradation, although regular monitoring is recommended in order to assess the impact of natural sapling colonisation.

**Survey Metadata**

21. The topographic survey of the site was carried out using a Faro Focus 3D laser scanner, using 139mm registration spheres and flat targets. The scanning survey was controlled using a Trimble S6 total station, recording the positions of spherical and flat targets. The data was registered using Faro Scene 5.1.6, with orthographic images produced using Pointools 1.8 and CAD plans produced using Rhino and Autocad 2009. Final layouts were produced in Adobe Illustrator CS. The photographic survey was carried out using a Canon 1100 digital SLR.

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<td>Registration sphere diameter: 139mm</td>
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*Table 1: Laser scan parameters used during the survey.*
Appendix: Structural Report by J. Barber

22. The remains at Altbreck (Alltbreac) are particularly interesting because they are on the interesting cusp of becoming meaningless to surface appraisal, but they have been surveyed when in a rather better condition by the Royal Commission for the 1911 Inventory. The writer examined them when colleagues undertook a laser scan survey of the monument and its immediate setting on behalf of the Forestry Commission Scotland (FCS). The latter had supplied a copy of the plan and associated text of a recent survey which had been undertaken by operatives innocent of the RCAHMS survey, or of the comments or the speculative interpretational survey prepared by Romankiewicz (2011, cAR 407). Original or authentic features which are at the point of final dissolution were interpreted as modern rearrangements of the fallen masonry, an approach no doubt influenced by the existence of a clearly recent (<100 yr.old.) shooting brake which straddles the inner wall of the broch at the 3 o’clock position (using MacKie’s (2007) notation).

23. This short report will cover those matters of structural deconstruction in which the writer is most interested, the general account of the survey and its results being provided elsewhere. These few points are made in respect of specific features or feature groups observable at the time of the visit (30/31 July 2013).

24. The entrance area is situated at magnetic bearing 111 degrees from the approximate centre of the monument, which places it close to ESE (112.5 degrees) and not, as MacKie reported in the NNE. The left hand side (LHS) of the passage is much disturbed and its true line could only be determined by excavation. However, a slab which lies obliquely across the passage may have been the LHS jambstone, rotated through 180 degrees and tilted forward. On the right hand side, the line of the passage is relatively well preserved. Opposite the foot of the putative jambstone, there is a gap in the surviving masonry that could have housed its opposite number. Inwards of that gap, a large slab appears to be in situ and this is identified as the capstone of the RHS guardcell. Beneath masonry, a
second lintel can be seen to abut the first. These form the roofing of the entrance passage to the RHS guardcell.

25. The side wall of the guard cell is clearly visible amongst tumbled stones but its innermost terminal is obscured. However, at a higher level, laid stones make an irregular face and are interpreted as a section cut or quarried through the solid wall core that separated the guard cell from the gallery beyond it. Conversely the LHS guard cell at the entrance passage is disturbed at its outer end and buried under rubble at its inner, so that its wall line is rather more speculative. Nonetheless, the cell’s existence is clearly flagged by the line of very large stone blocks fallen, or tipped, into the void of the gallery. The innermost end of the guard cell is clearly visible.

26. Continuing to the left of the entrance, clockwise in plan, the next feature to be observed is the stair-guard cell, of which more than 1.4 m of its depth can be seen in 6 corbelled courses. It is likely that the true depth of this cell is greater than that observed and improbable that it was significantly higher than its current upper limit, certainly not by more than 1 m. In the voided rubble a return can be discerned, marking the entrance from the garth into the stairway gallery.

27. It is speculated, supported by the RCAHMS’ 1911 observations, that the stair proper lies clockwise of the cell just described. The gallery side walls may be defined by collinear stones now visible at the surface, but demarcating a rather thin passage. However, comparison with better preserved brochs suggests that galleries are commonly narrowed for the insertion of the stairway, presumably to limit the length of the slabs required for the steps. The visible upper surface clockwise of the stair gallery entrance is compounded of rubble fallen over the steps of the stair and rubble from the core of the masonry on which the steps of the stair were set. This terminated in a rather coarsely built, and still visible, stair-back wallface. This was previously interpreted as the terminus of the next (clockwise) gallery, and indeed it would have fulfilled that role, but its significance is that it supports the interpretation of a stair structure at this point.

28. Further clockwise, the structure of a gallery can be verified in fleeting views through voided rubble but its character, continuity and access from the garth cannot be confirmed by observation. Romanciewicz offers a speculative interpretation, showing a continuous gallery from the back of the stairwell around to the rear of the RHS guardcell, and that is certainly a possible interpretation. Her positions for the access from the garth are not inherently improbable, albeit that they cannot be confirmed by observation at this time. The best preserved visible wallface (the outer wallface) of the gallery is visible over a length of 8m and to a height of over 1.5 m in 4 courses, the lowest of which is a massive stone, possible a basal stone.

29. Mackie has suggested that the monument is not circular, but markedly elliptical with major and minor axes of 18.61 m and 15.86 m, contra the RCAHMS 1911, who render the monument as a circular one. Mackay is an acute field observer and his account merits exploration. The laser scan suggests that the monument is in fact circular. The averaged plane of the monument’s erosion lies at slightly less than 5 degrees to the horizontal. If the broch had been a right cylinder, this oblique cut would yield an elliptical form, measured on the erosion surface, but the axes would differ by a mere 6 cm, not the 2.75 m that Euan implies. However, the broch is not a right cylinder, rather, where measurable, its outer face inclined inwards at c 25 degrees. This would reduce the measured, horizontal, diameter by 92 cm for every metre of height. Across the diameter at present, the
difference in height of highest and lowest wallheads is 1.45 m. Pro rata, this would shorten the
diameter by c 1.33 m on the basis of the current erosion plane. Thus, simple diameter
measurements in the erosion plane can vary from truly circular to elliptical shapes with
eccentricities of up to approximately 1.5 m in current circumstances. When examined by MacKie in
1963, the highest surviving parts were no doubt higher than they now are and this alone may
account for his interpretation of the plan as elliptical. This brief exegesis is included here to
emphasise the significance of the third dimension in all broch metrics and if it is argued at the
expense of one of the subject’s finest scholars, it is not from disrespect but because the writer
believes that he might actually approve.

30. The rock-type from which the broch is constructed appears to be a local psammite (per the British
Geological Survey) some of which is clearly micaceous. Field observation suggests that the larger
blocks are water worn and may derive from glacial deposits weathering out from the glacial till.
Much of the remainder is sharp edged and arguable quarried, either from bedrock or from larger
erratics. The use of weathered fragments for the larger stones makes structural sense because
glacial detachment from bedrock and subsequent working in glacial transport and fluvial deposition
will have forced fracture along all the planes that were available for easy fracture. Thus, these larger
fragments, having been selected by natural processes, are less likely to fracture in tension when
used as lintels or corbels or in any similar use.

31. The sizes of the stones on site range from 98 kg to just over 600 kg, assuming a density of 2. These
are larger and heavier than might be expected on a broch site and suggests that the smaller size
fraction has been removed for use in general construction of stone walls, farm buildings etc. A small
stone working area was noted c. 12 m S of the broch on which larger stones may have been broken
up for re-use.

32. The largest stones in the external wallface are partially buried beneath soils developed on older
collapse and their full extent is not known. They fracture into roughly prismatic shapes that are close
to kite-shapes in cross section and taper to one end. They are sometimes disposed in alternating tall
and short orthostatic arrangements and this assists the building on of the next course by providing a
three-point contact for the stones of the next course. These are laid onto the lower orthostat and
propped between the taller flankers, their [built] upper surfaces being levelled up with smaller
stones in the core of the wall. Their tapering shapes make them ideal for building circular structures.
No doubt the sizes of the stones would have reduced with height, as observed in all of the well
preserved brochs, but as noted above, these will have been preferentially stripped away for reuse.
Nonetheless, the surviving masses imply an ability to gather, transport and position stones of over
half a metric tonne. This is unlikely to have been achieved without cartage and a substantial labour
force.

33. The heights above solum noted above are not based on a common ground level, because the
current solum undulates, not least in consequence of the annulus of fallen stone surrounding the
structure. MacKie noted a maximum wall height of 1.2 m and this remains representative of heights
above solum. The basal layers of stone in the outer wallface within the shieling that abuts the broch,
indicate a height of just over 1 m in that area. The two courses that comprise that area of wallface
are lost further clockwise under collapse and the one or two courses visible on the higher ground
further clockwise measure a further, approximately, 1 m. In the aggregate, and assuming a relatively
level original building site, these data imply that up to 2 m of the external wall survive on parts of the site. At the entrance area, the external wallhead is rarely over 50 cm high, but this is set at the level of the base of the lintel for the RHS guardcell. Thus, even in this damaged area, something close to 1.1 to 1.5 m of structure survives, *in situ*.

34. Whilst it must be conceded that brochs are often built from very uneven footings (up to 3 m at Clachtoll, for example) the estimate of surviving height in the entrance area would still be reliable evidence for better than apparent preservation on the site. Furthermore, the depth of the exposure of the outer wallface of the gallery on the NW side, measures 1.3 m, even though the adjacent external wallface is significantly lower, relative to the current solum. Taken in the round, the indications are that this is a well preserved broch parts of which may survive to levels close to the top of the ground floor.

35. The garth, or internal space within the broch wall measures c.10 m in diameter, while the wall is up to 4.5 m thick and it is filled to the current wallhead with collapsed masonry. Outwith the broch, a lense of collapse survives tapering down to about 5 to 6 m from the wallface. Calculating the relative volumes, there is sufficient material from the garth to lift the entire annulus of the wall by 50 cm if evenly applied over its surface. The external debris deposits would add a further 1.14 m. If then it be allowed that the wall above the first floor level is in effect hollow, a further uplift of built matter to about 2.13 m can be envisioned. These numbers are subject to several key assumptions, not least the assumption that the broch is built from a level surface. Nonetheless, they imply that sufficient rubble exists on site to carry the build of the broch well into the second storey and possibly to complete that storey. The difference between the 1911 description and its current state make it clear that much has been removed in the interim. Adding back, conceptually, the materials removed since 1911, makes it clear that this structure had more than two floor levels. It is difficult to escape the conclusion that Altbreck was a broch tower.
Figure 4: 3D views of the Broch and surrounding topography.
Figure 6: Aerial Photo of Altreck Broch (Forestry Commission Scotland)
1: Dun A' Choin Duibh
2: Dun Boredale
3: Kraiknish
4: Druim an Duin
5: Calsteal Grugaig
6: Altbreck

1:1000 AT A4
Figure 7: Ortho-Image of the Laser Scan Data, Filtered by Elevation
Plate 1: View of the entrance passage, showing the fallen door check slab on the S side

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