HIGH STATUS MEDIEVAL SITES
CASTELL CARNDOCHAN

Conservation and Assessment Excavation

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

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CASTELL CARNDOCHAN

Conservation and Assessment Excavation

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G2366 HIGH STATUS MEDIEVAL SITES.

CASTELL CARNDOCHAN: CONSERVATION AND ASSESSMENT EXCAVATION

PRN 4977, Location SH84703065, Status SAM ME049

SUMMARY

Castell Carndochan is a little-known and under-recorded castle of the Welsh princes. Two areas of on-going erosion were identified. These were excavated, demonstrating some survival of original masonry and were stabilised pending further conservation works. Three additional areas within the castle were cleared of surface rubble revealing a small D-shaped or half round tower and part of a rectangular building. Investigation of the central square keep revealed extensive collapse, but elsewhere extant and well-preserved masonry was shown to survive beneath the rubble.

1. INTRODUCTION

Castell Carndochan is a stone-built castle near Llanuwchllyn thought to have been built by either Llywelyn ap Iorweth or Llywelyn ap Gruffudd although no documentary evidence survives. The dating is based on similarity to other castles of this period and the presence of characteristic elongated D shaped towers found at Castell y Bere and Ewloe Castle (Avent 1983, 11). The site is currently visible as a pile of rubble with some protruding masonry. It has not changed substantially since it was planned by Hogg in 1955 (Fig 1). It was described in History of Merioneth Vol. II (Cathcart King and Kenyon in Smith J&L, 2001, p. 404) as "a neglected ruin at a particularly inaccessible site". It was noted that there has been little stone-robbing from the structure and most of the destruction appears to be natural, possibly in part due to the low lime content of the mortar. The site stands on a spectacular rocky ridge overlooking the Lliw valley. The approach from the south-west is however relatively flat and is protected by a rock-cut ditch that also functioned as a source of stone for the construction of the castle. The site is mostly covered with tumbled stone but there is some visible masonry. The most obvious structure is an apsidal tower on the south-west extent of the castle. Walls enclosing the top of the hill abut this forming a small ward. There are the remains of a half-round or round tower at the north-east and a bank of rubble on the line of the southern curtain wall was interpreted as a half-round tower by Hogg (1955, 179). The interior contains a square building interpreted by Kenyon and King as an early tower predating the apsidal tower. Only the inner face can be traced, the outer is a slope of rubble.

The works on this site form part of the 2014/15 phase of a Cadw grant-aided project examining high status medieval sites for management, conservation and scheduling enhancement purposes. Another site, Ty Newydd Motte, Llannor is also being examined and will be the subject of a separate report (Kenney forthcoming 2014/15). The focus of works the current phase of works at Castell Carndochan is the assessment and stabilisation of two areas of erosion in the D-shaped tower along with a small amount of rubble clearance/assessment excavation in order to determine the extent of survival of extant masonry beneath the tumbled stone. It should be noted that this is a modification of the original grant-aided project design, due to the perceived urgency of the stabilisation works.

2. METHODOLOGY

An initial assessment of the site was made on a field visit on 01/07/2014. All areas of erosion were catalogued, photographed and a brief description made (Appendix 1). This was followed by a site meeting with Ian Halfpenny from Cadw, John G Roberts from The Snowdonia National Park Authority (SNPA) and David Hopewell and Andrew Davidson from GAT along with historic buildings architect Mike Garner of Garner Southall Partnership. A strategy for stabilising the erosion was discussed and Mike Garner produced a report containing recommendations (appendix 2). As a result of this meeting the work programme agreed for the project was modified. It was felt that the erosion needed to be addressed as a priority; clearance and recording of two areas in the D shaped tower at the south-west end of the site was therefore prioritised and a proposed area of excavation was deferred until a later stage of the project.

The revised fieldwork programme comprised three main elements:

1. A new plan of the site was produced using a Trimble high resolution GPS survey system augmented with details from an orthogonal view produced from a 3D model. The 3D model was produced using multiple photographs processed by Agisoft Photoscan software. The resulting plans were checked, annotated and amended by hand on site.

2. Two Areas of on-going erosion were stabilised (collapses A and B see below). All loose stone was cleared from the collapses, the revealed masonry was recorded and the previously cleared stone was replaced in a stable fashion. The reinstatement was carried out by Alwyn Ellis (Stonewyrcs Cyfyngedig) and funded by SNPA.

3. The main body of the castle contains extensive areas of featureless rubble and the level of survival of archaeological structures in these areas was not known. It was decided to carry out limited areas of clearance of collapsed rubble in three locations in order to assess the level of preservation of buried masonry. Given the limited time available the clearance was limited to obviously collapsed rubble and no stratified deposits below this were disturbed. The excavations were recorded in detail and a 3D model was produced of the main trench, allowing an orthogonal plan view to be used to produce a drawn plan of the stone spread. All stone was reinstated following the original contours of the site and grey lichen covered stone was retained separately and placed on the surface.

3. RESULTS

A new plan of the site was produced (Fig. 2) along with a 3D model. Plate 1 shows an orthogonal projection of the site from above, and Plate 2 detail of the D-shaped tower. These projections eliminate parallax and perspective errors and are a useful basis for producing detailed drawings.

The five areas of work were assigned individual trench numbers (1-5). Trenches 1 and 2 were the main areas of erosion in the D-shaped tower, trenches 3-5 were areas of clearance in the central part of the castle. The locations of the trenches are shown on Fig 3.

3.1 Trench 1

This was a 6.5m-wide area of collapse in the north-eastern end of the D-shaped tower (collapse A, see appendix 1). The surviving masonry consisted of mortar bonded core, mostly regularly laid and

was generally stable. The facing had collapsed across all of the exposed masonry apart from a few stones that were still tied into the south-eastern wall. Exposed core survived to a height of 2.4m in the eastern corner of the tower although it ranged from 1.6 to 1.0m across the rest of the collapse. The collapse appeared to have been caused by the excavation of a hole in the eastern corner of the tower at an unknown date. Examination of historical photographs shows that the hole was present before 1921; an incorrectly captioned photograph in the Merioneth Inventory (RCAHMW 1921 No.447) clearly shows this area (Plate 3). The currently surviving stones in the corner of the building can be recognised. The facing was however still standing across the whole of the wall at this level before rising to close to the level of the wall top at the north western end. A photograph by A. J. Taylor shows the area in 1949 with only minor changes; a few stones may have been lost but there had been no major erosion. (RCAHMW/ C580597, Plate 4). More recent photographs suggest that erosion is gradual but on-going; a photograph copyrighted in 2000 shows the collapse as partially grass-grown and therefore presumably stable but with similar amounts of surviving facing to the present. (http://www.castlewales.com/carndoc.html). A photograph copyrighted in 2009 shows the area was actively eroding but with little change to the present (http://en.wikipedia.org/wiki/Carndochan_Castle). Unauthorised excavation in the 18th and 19th century were noted by Hughes (1885) "A writer in *Gwyliedydd*, 1828 p. 120, states that "fifty years ago an old man, in expectation of hidden treasure, had dug through the ruins to the floor (y llawr), but found nothing save human bones and burnt wood, whence it was inferred that the place had been burnt down." About 1872 further diggings were made, and search made for a doorway, but in vain. Charcoal, blackened soil, animal bones, and pieces of lead were found. "It should also be noted that Fenton described the north-eastern and south-western towers as "excavations" when he visited the site in 1804 (1917 p 42).

It is likely that one of these early excavations was responsible for the hole in the tower and that erosion has progressed slowly ever since. Examination of surviving facing elsewhere in the structure shows that that the masonry was mortared but that the mortar tends to erode, both as a result of the weather and also as a result of colonisation by a calcicolous subspecies of the fern, maidenhair spleenwort (*Asplenium trichomanes* subsp. quadrivalens). Cathcart-King and Kenyon (2001, 405) ascribe the "very thorough state of ruin" of the site, compared to Castell Dinas Bran and other roughly contemporary sites, to the poor quality of the mortar. This certainly seems to be an important factor. Little mortar is visible in exposed masonry and the site is covered in fine silty gravel. This appears to be the residue from mortar, the lime having dissolved or washed out. It appears that the mortar contained low levels of lime probably as a result of there being no local source. Neaverson (1947, 38) recovered pieces of carboniferous limestone from the site, the nearest source for this would be 22km to the north-east at Hafod y Calch near Corwen. Fragments of cockle shells in the gravel in parts of the castle also demonstrate a coastal source which must be a minimum of 22km away. It should however be noted that limestone has, in later periods, been mined on the east side of nearby Bala Lake (Llyn Tegid) at Bryniau Golau. It is presumed that this source was undiscovered in the Medieval Period.

It was noted that there was coarse and fairly hard mortar on the top of the wall in the D-shaped tower that could be a modern addition. Some soft and mostly degraded mortar survived in the wall core. Both were sampled and will be analysed. No cockle shell fragments were identified in the mortar in the D shaped tower in contrast to elsewhere in the castle where they are frequent. This could indicate that it is from a different phase of building.

There was a spread of un-weathered loose rubble in front of the collapse and there was some loose stone lying on the steep exposed surface of the core (Plate 5). The loose stone was first removed from the stable core to prevent it from falling into the trench during subsequent work. The core was stabilised with a temporary covering of wire mesh. The loose stone was then cleared from in front of the collapse while carefully monitoring the standing masonry for any signs of instability. The rubble was between 0.5m and 0.6m deep.

The clearance revealed extant facing on the north-west side of the collapse (Plate 6). This contained some voids but appeared to be fairly stable. The central 1.3 m of facing had collapsed from the base. The masonry was not hand-drawn on site for health and safety reasons but a drawing was produced from rectified photographs and an orthographic projection from a 3D model (Fig. 3). The clearance of the loose rubble revealed a surface of compacted gravel and small stones which appeared to coincide with the base of the wall and could be the remains of a floor level. There were, however, small voids beneath all of the extant facing stones suggesting that the wall had been undermined by the early excavations and the floor levels disturbed. This was presumably a contributory factor in the loss of the facing. The exposed core at the base of the wall appeared to be mostly *in situ* but contained frequent voids and in its present state threatens the stability of the wall above (Plate. 7).

The south-eastern wall of the tower, adjacent to the collapse, survives to a height of c. 1.8m and appears to be reasonably stable (collapse B, see plate 8). There is, however, a large void close to the base, again probably a result of the wall being undermined. This has, at some time in recent years, been packed with dry-stone masonry. This was not disturbed during the clearance. This facing was partially obscured by vegetation and a drawn elevation was not produced.

The stone from the clearance was packed back into the hole in the form of a deep buttress in order to retain the extant core in the lower part of the wall. This was covered with random stone in order to blend in with the rest of the interior (plates 9 and 10).

Recommendations for reinstatement

There is a stable surface at the base of the wall which provides additional options to those proposed by Mike Garner (appendix 2). Consideration should be given to pointing the extant facing and underpinning its base along with and packing and mortaring voids in the core. The photograph of the masonry that was extant in 1921 and 1949 demonstrates that there were no architectural features in the wall and this could be used as a guide for rebuilding at least the base of the facing if the architect considers that it would add to the long-term stability of the wall. Collapse B should be conserved as suggested in appendix 2 i.e. the packing stones should be removed from the void and replaced with mortared facing and the extant facing should be raked out and repointed. The supporting buttress will have to be at least partially removed in order to carry out the consolidation. This should be replaced in order to counterbalance the lateral thrust from the surcharge on the wall produced by rubble against the outer face.

3.2 Trench 2

This trench encompassed collapse C, in the middle of the apsidal end of the D-shaped tower, and investigated the masonry to either side. Before clearance there was a 2.2m wide collapse with

extant mortar-bonded wall-core standing to a height of 1.2m. This had eroded to a state of moderate short-term stability (Plate 11).

The collapsed stone was cleared from the collapse and its immediate surroundings; a total width of 4The lower levels of the rubble were in a matrix of fine, rounded gravel and sand with occasional pieces of unburnt limestone which was interpreted as being the remains of mortar. Clearance revealed extant, well-preserved facing across all but 1.7m of the trench. This was well built to a good face with galetting stones and retained its mortar bonding where it had been buried. Only loose rubble was cleared and the facing clearly extends beneath the stable collapse for at least another metre. Figure 5 shows a hand drawn elevation drawing; this depicts curving masonry and was drawn using three different alignments of base line as indicated on the site plan (Fig. 2). Coarse, hard, mortar capping was again visible on the wall tops in this area.

After the trench was recorded it was backfilled to the level of the original ground surface and some of the previously cleared stone was packed against the exposed core in order to support and protect it (Plate 12).

Recommendations for reinstatement

Reinstatement should be carried out as described by Mike Garner in Appendix 2. The eroding area should be built up with mortared core-work thus supporting the surviving masonry.

3.3 Trench 3

This trench was excavated in order to investigate a fairly featureless area of rubble (Plate 13). This comprised a roughly circular bank of stone with a further amorphous bank to the west. This had been variously interpreted as a gate between turrets and a half-round tower (Hogg 1953-6). Cathcart King and Kenyon (2001, 407) suggest that Hogg's interpretation of a round tower may be correct and also suggest that the gate into the castle is likely to be between this and the D-shaped tower, concluding that "the determination of its position, and the exact plan of the half-round tower, are the principal questions which excavation would help to solve at Carndochan"

Some of this area comprised grassed over rubble and was stable and well-consolidated, the rest consisted of loose rubble and there were signs of some disturbance in the western side. It was decided to clear the rubble from an irregular area comprising half of the "half round" tower along with a small area to the west and only to clear unconsolidated rubble. This resulted in an approximately H-shaped trench with overall dimensions of 5.5m x 7.2m.

The upper layer of rubble, one or two stones deep , was removed revealing further randomly orientated stones in a matrix of fine sandy gravel, similar in many ways to the material found in trenches 1 and 2. In contrast, however, to the material from the D-shaped tower, this contained fragments of cockle shell as well as pieces of unburnt limestone. This was cleared to a sufficient level to reveal extant facing but no attempt was made to excavate it to its full depth or to expose stratified deposits (Plate 14 general and Plate 15 orthographic).

Extant facing was shown to survive under the rubble revealing partial plans of two structures (Fig 6):

On the eastern side of the trench the outline of one half of a D-shaped tower with internal dimensions of 4.5m x 4.4m (projected) was revealed. The rubble was only partially cleared from the western wall but the facing appeared to continue beneath the collapse. The facing was exposed to a maximum height of 0.5m; probing suggests that it continues for at least a further 0.5m beneath the rubble. The facing comprised a mixture of quarried and field stones laid with their flat faces parallel with the wall face (Plates 16 and 17). It was laid in rough courses with fairly narrow joints and included galletting stones. The stones were irregular and did not appear to have been shaped beyond simple splitting. The relatively closely fitting masonry is probably a result of careful stone selection with only minimal shaping and trimming. The western wall retained well-laid mortar-bonded core to a height of 0.9m above the surviving facing. Figure 7 shows the elevation of the western wall and Fig. 8 the apsidal end of the tower. A group of distinctive thick slate slabs were found in the rubble against the apsidal end of the structure. These appeared to have come from a collapsed architectural feature associated with this part of the tower; similar stones were not encountered anywhere else on the site.

On the western side of the trench, a facing of similar masonry was identified, comprising what appears to be two sides of a rectangular structure (Plate 18). The eastern wall could be traced for 3.4m and the southern for 0.9m. The eastern face formed the outer face of the D-shaped tower 007. The eastern wall appeared to abut the southern although further clearance would be needed to confirm this and it is possible that the two walls could be bonded together. The full extent of this structure was not uncovered but the topography of the collapsed stone suggests dimensions of approximately 4m x 4m. The tumble was again not excavated to its full depth and only the top of the masonry was uncovered.

The trench was reinstated by laying two sheets of geotextile at the clearance limit in the interior of the buildings and careful replacement of the stone and matrix following the original contours of the ground and replacement of the weathered and lichen-covered stone on the surface (Plate 19).

3.4. Trench 4

The outside of the central square keep comprises a steep rubble slope about 2m high with no confirmed facing. The inner face appears to be well-preserved and can be traced at the same level as the top of the sloping exterior in several places. Bedrock is visible on the south-east side of the interior at the same level as the inner face suggesting that the main floor level was at this height.

The rubble was cleared from a 1.7m x 5.0m area of the outer slope. Only loose stone and the gravel matrix were cleared. This revealed a more stable layer of stone and a line of semi collapsed facing. Plate 20 shows the trench after clearance. The stable masonry was stepped, with a line of possible facing at the top of the slope. There was little at this level that could be confirmed as original undisturbed masonry and therefore any interpretation should be seen as being provisional.

The stepped slope could be interpreted as either semi-collapsed core or alternatively as tumble with the face still surviving beneath the rubble. Unfortunately there was no opportunity to excavate further. If the former, it is possible that the tower had a battered base in a similar fashion to the round tower at Castell y Bere and that the facing stones have been lost. The possible facing at the top of the slope appears to be relatively slight and did not continue down into the rubble. It would indicate a wall width of about 1.7m. The base of the stepped rubble slope was sitting on bedrock.

The bedrock in front of the masonry was sealed by a context of dark charcoal-rich soil perhaps indicating destruction by fire. This was not excavated but a small sample was taken. A preliminary examination indicates that the charcoal is very finely comminuted and may not be suitable for radio-carbon dating. Clearly more extensive excavation would be required to provide any definitive structural evidence but there is clearly potential for the recovery of further information in this area.

The trench was backfilled using the procedures established in trench 3 although no geotextile was used.

3.5 Trench 5

A 1.8m x 2.0 m trench was excavated through the low rubble slope marking the curtain wall of the castle (see Fig. 3) in order to investigate the level of survival and stability of the inner face. This revealed well-preserved and stable facing with some extant mortar in the joints between the facing stones. The masonry was again roughly coursed and built to a good face with a mixture of angular quarried stone and more rounded field stone (Fig. 11). The facing survived to a maximum height of 0.7m. The tumbled stone and gravel in front of the wall was overlying a rough surface of flat stones and mortar (Plate 21). The stones ran underneath the facing indicating that this was the base of the wall. The patches of mortar on the surface may either have been material dropped during the construction of the wall or indicate a mortared stone foundation.

The outer face could not be traced on this side of the curtain wall without excavation. A possible length on the south-eastern side suggests that the wall was about 2m thick.

The trench was backfilled using the procedures established in trenches 3 and 4 and again no geotextile was used.

4. SUMMARY OF THE STRUCTURAL COMPONENTS OF THE CASTLE

As noted above the site was resurveyed at the beginning of the project. It was also examined in detail as the project progressed and a record made of any structural features that were discovered.

An outline description of the various elements of the site follows along with an estimate of the levels of preservation.

4.1 The D shaped tower at the south western end of the site

As noted above this is a rectangular tower with an apsidal end on the outer side of the castle forming an elongated D-shape with external dimensions of 16.4 x 10.4m. The inner face survives for much of its circuit; the outer can be traced at the western end indicating that the walls are 2.2m thick. The walls are built from mortared stone and the inner face appears to survive to a height of at least 1.5m beneath the rubble, there is less information about the outer face but the north-eastern end is clearly well preserved and good survival can be expected around some of the wall. There is no obvious entrance, a dip in the north-western wall leads to a steep scree slope and may be the result of unauthorised excavation or a serious collapse as supposed to anything structural. A line of rock that was not quarried away during the excavation of the ditch leads to the south-western end of the tower and it is possible that this represents an approach to an entranceway at a, now lost, higher level in the tower.

4.2 The square keep

This is a square tower with external dimensions of about 10m x10m. The inner face is visible on all but the north-eastern side. The outer face is not clearly visible although there is a possible length on the north-eastern side. The tower is built on bedrock sloping from east to west; the outer face would only be a maximum 0.5m high at the east rising to 2m at the west where there may be a battered platform or wall base.

4.3 The round or half round tower at the north-east

This has been much disturbed in recent decades. The interior has been cleared of rubble and this has been used to build a semi-circular dry-stone shelter. One or two courses of the original inner face are visible on the northern side and both the inner and outer are visible between outcrops on the south-eastern side, demonstrating that the wall is 2.4m thick. The overall structure of the tower is somewhat unclear due to the presence of bedrock and recent rebuilding. The north-eastern end is clearly round with a diameter of 12m. It consists of walls linking massive rock outcrops. There is no presently visible evidence to indicate the shape of the south-western end and either a circular or half round plan is possible. The current masonry at this end is mostly modern although the base of the wall between an outcrop and the curtain wall could be early and would indicate that the tower was round. This is supported by an antiquarian reference. Edward Lhuyd in Bishop Gibson's edition of Camden's *Britannia* (1695, 783) describes "three turrets, a square, a round and an oval one, which is the largest" It is likely the site was better preserved at this time and this tower may have been visible as a circular structure. The description of the D shaped tower as being oval could imply that the square end had not been cleared of rubble at this time.

4.4 The D-shaped/half round tower

As described above, this is a short-D shaped tower with external dimensions of about 9.5m x 8.0m and is close in plan to the half-round tower projected by Hogg from the form of the rubble bank. The apsidal end of the tower projects beyond the line of the curtain wall. Masonry appears to survive to a height of close to 1m beneath the rubble.

4.5 The rectangular or square building

As described above, a rectangular or square building abuts or conjoins the D-shaped/half round tower. Its dimensions are not known but could be about 4m square. Again there is good preservation of masonry up to a height of 0.5 to 1.0m.

4.6 The curtain wall

This mostly consists of a spread of loose rubble, much of it spilling down the slope on the outside of the castle. A few lengths of the inner face are visible beneath a scatter of stone and the excavation suggests that survival may be good around the circumference of the castle but only to a height of less than a metre. The outer face is less obvious but a few stones on the south-east of the fort suggest that the curtain wall was about 2m thick. The wall was probably built against a steep break of slope and the outer face was presumably much taller than the inner. The line of the outer is currently, generally lower than the inner and is obscured by a considerable amount of rubble. It is

likely that at least some parts of the outer face are preserved beneath the tumble although if it was built on a scree slope it could have failed from the base.

4.7 Other features

The interior of the castle is obscured by tumble from the keep and walls. Hogg recorded a length of wall running from the main D shaped tower to the keep, but describes it a dry built, perhaps indicating a modern construction. This is still visible and its origin is not clear.

There has been much debate about the position of the entrance, an external entrance to the main D-shaped tower is a possibility, a parallel being the external stair to the "Welsh Tower" at Ewloe (Avent 1983, 38). Cathcart King and Kenyon (2001, 407) suggest that the entrance is between the small D-shaped/half round tower and the main D shaped tower. This is a possibility and one of the few places where the external ground level is high enough to make this practical. One of the main gaps in the accounts of the site is the relationship of the curtain wall to the two towers. These areas are obscured by rubble and it seems likely that these relationships and the position of the entrance could be resolved by excavation.

5. CONCLUSIONS

It is perhaps surprising how little has been written about Castell Carndochan. Most descriptions seem to be based on Hogg's brief survey and description in 1955 and there has been no official excavation. Cathcart King and Kenyon (2001, 408) summarise the state of knowledge in a narrative that, by their own admission, not based on much evidence. This suggests that the square keep is the earliest structure on site, perhaps built by Llywelyn ap Iorwerth or Llywelyn ap Gruffudd and that the rest of the castle was subsequently built around it. The keep was, however, retained after the construction of the rest of the castle. Hogg even suggests, based on the low levels of rubble from the round tower at the north-east, that the castle was never completed.

The current minor excavations have added a little to this narrative and have discovered two further structures. It is significant that the main D-shaped tower appears to have used a different source of lime, perhaps indicating that it was built in a different, perhaps later, phase of construction. The overall impression of the site is that it was less substantial than many of the other castles of this period. It shares many constructional features with sites such as Castell y Bere but seems relatively slight in comparison. The amount of tumbled stone on site suggests that the towers and curtain wall were not particularly high. The ditch barely functions as an obstacle and may have been more of a symbolic barrier than a military installation. Several writers have indicated that the Castles of the Princes were not designed to withstand sieges from enemies outside their territories but were rather designed to function as centres of government within Wales and to raise the princes' status among their own people (Roberts c.2014 and Pryce 2007). It is also noted that castles were often used to detain important prisoners (Butler 2010, 30). This small castle seems to reinforce these views.

It should be stressed that the six days fieldwork only represents a preliminary assessment. The new discoveries, however, show that there is considerable potential for the recovery of further information on this neglected site. Far from being a site which is so inaccessible as to make "any serious excavation or consolidation unlikely, while its state of ruin is so advanced that such activity

might well prove to be of little value" (Cathcart King and Kenyon2001, 404) the site retains well-preserved masonry beneath the rubble and has the potential to produce hard dating evidence.

The site is fairly stable apart from the two obvious areas of erosion and does not seem to be under serious threat by the present numbers of visitors. The site is, however, on open access land and the current availability of digital information and active promotion of the archaeology of Wales will inevitably lead to increased visitor numbers. The effects of this could be, to some extent, mitigated by the provision of information on the access routes to the site or online. Education of visitors about the fragility and importance of the site can lead lower levels of damage and erosion. Further targeted excavation would allow areas of vulnerability to be identified and also lead to a more informed interpretation of the site. The buried masonry is of sufficient stability to be at least partially exposed if there is likely to be a move to present the site in a more interesting and understandable light. This would, however, leave parts of the site more open to erosion, would require a programme of consolidation and would require a different approach to the current management and promotion of the site.

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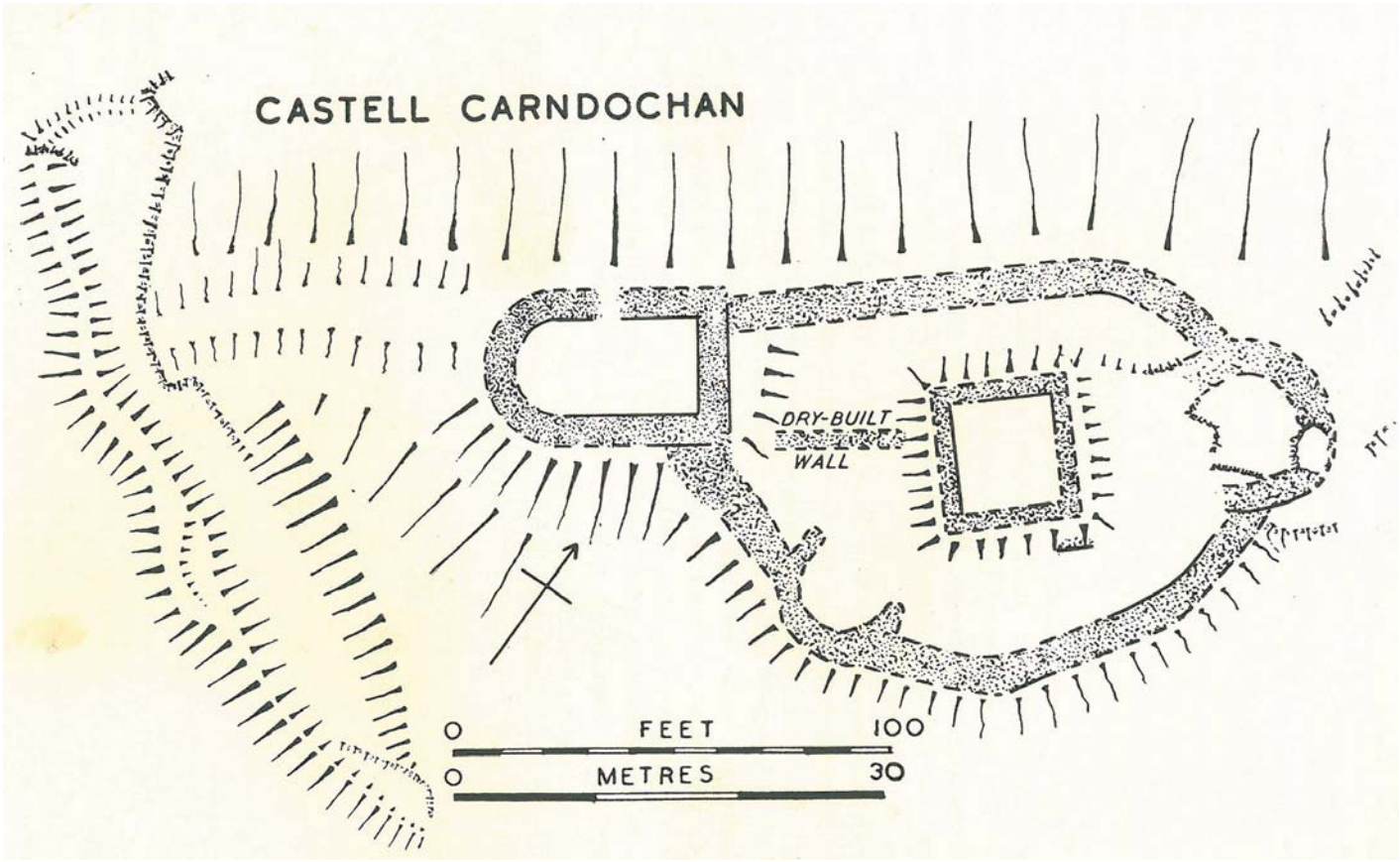


Fig. 1 Plan of Castell Carndochan (from Hogg 1955)

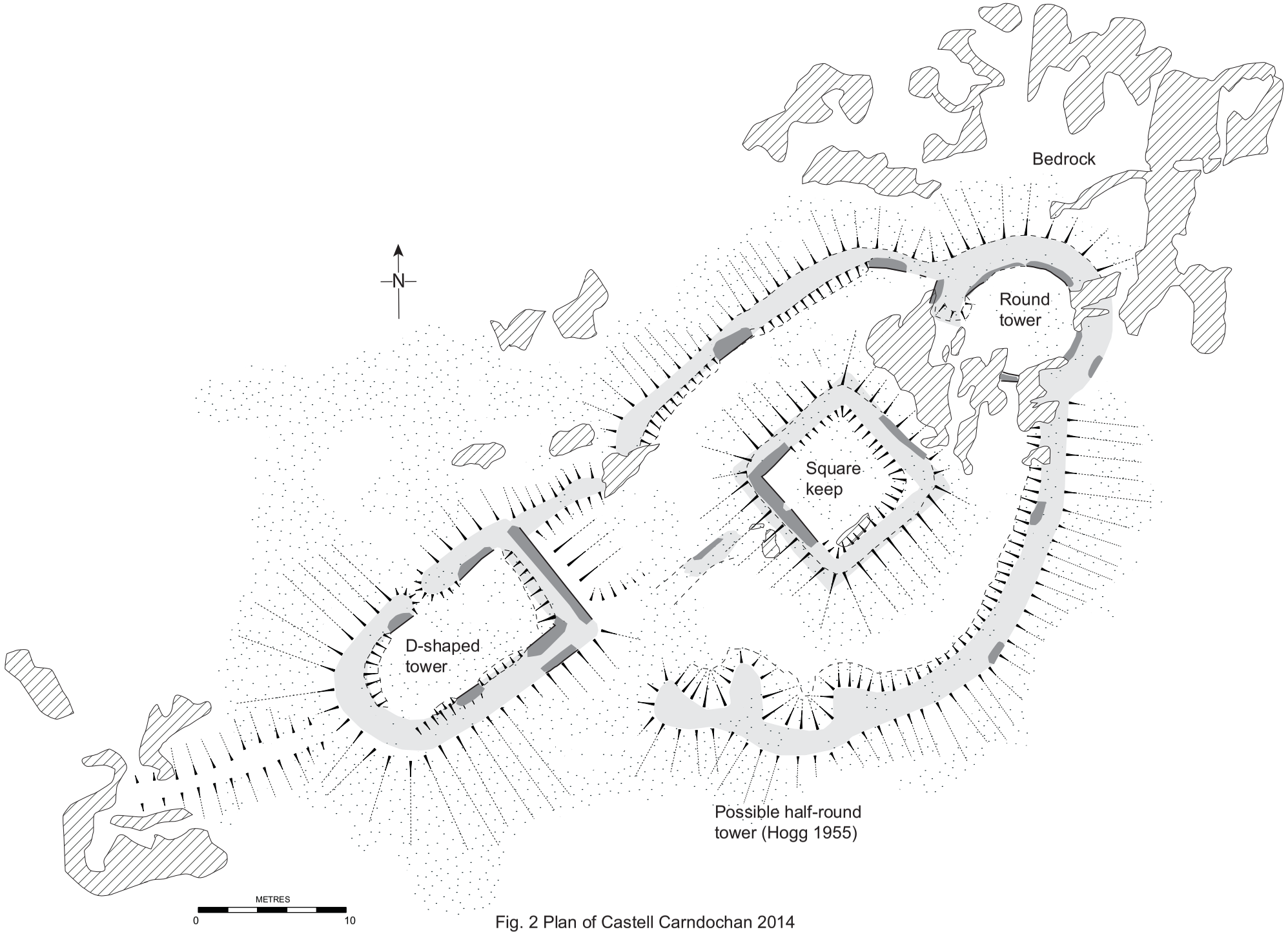


Fig. 2 Plan of Castell Carndochan 2014

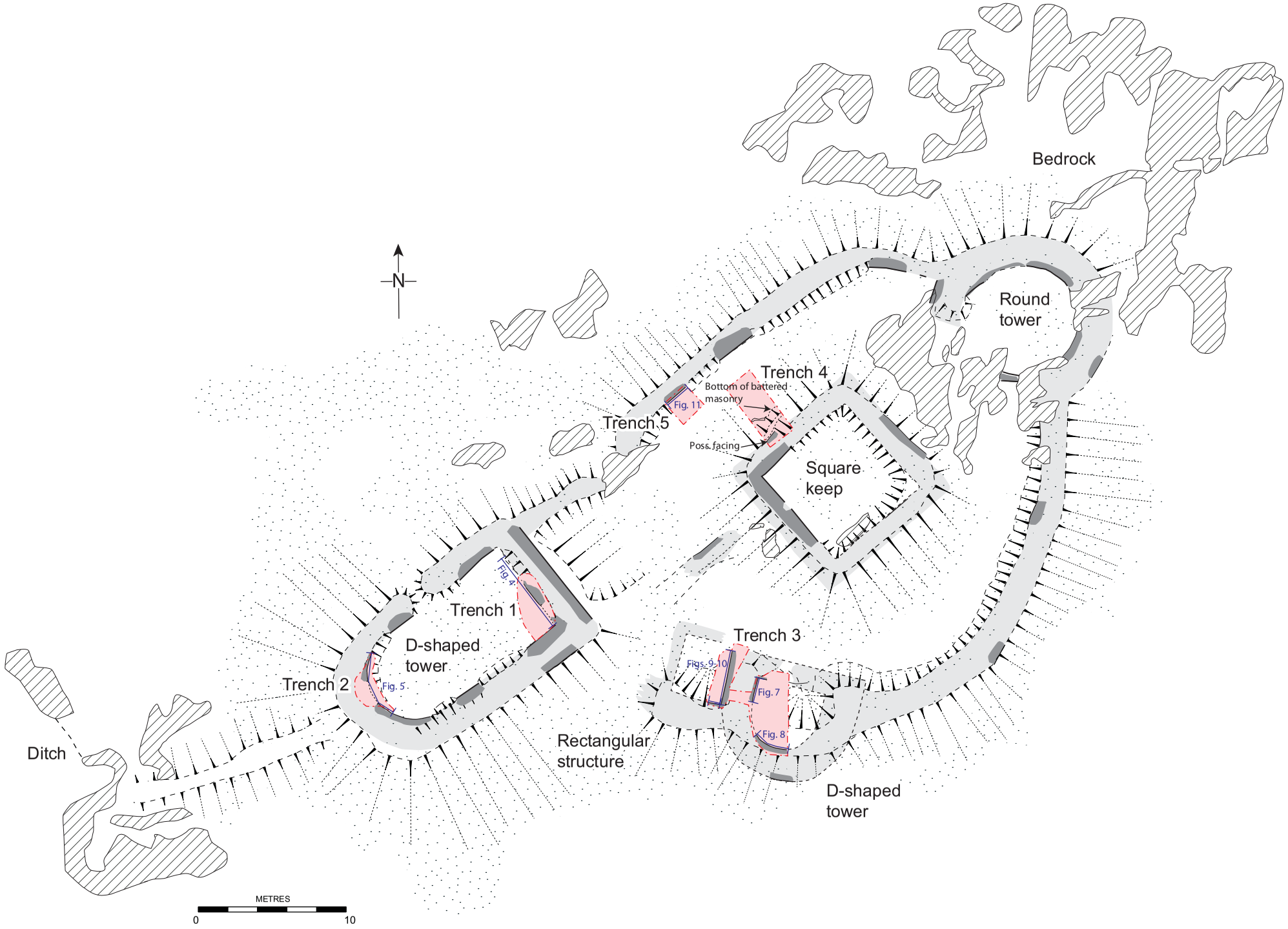


Fig. 3 Castell Carndochan showing areas of clearance and consolidation

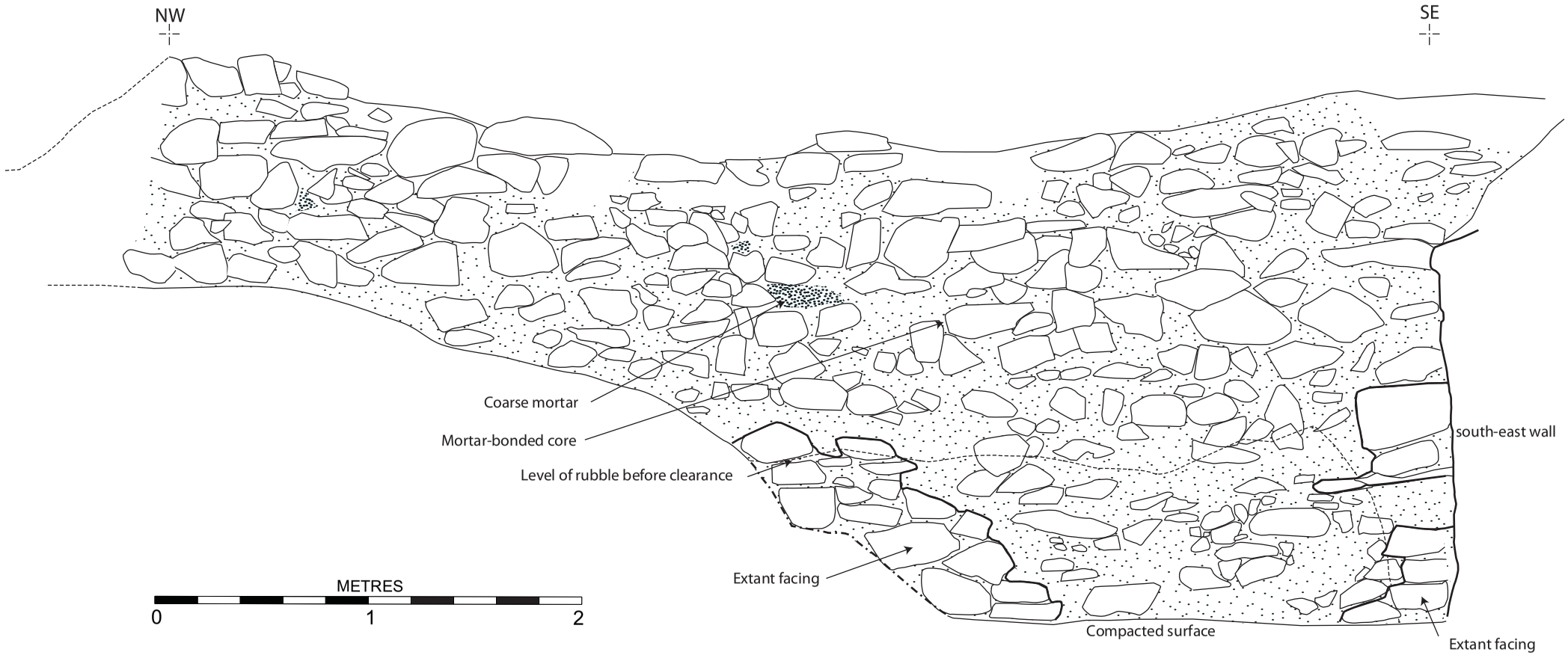


Fig. 4 Trench 1, Collapse A, elevation after clearance

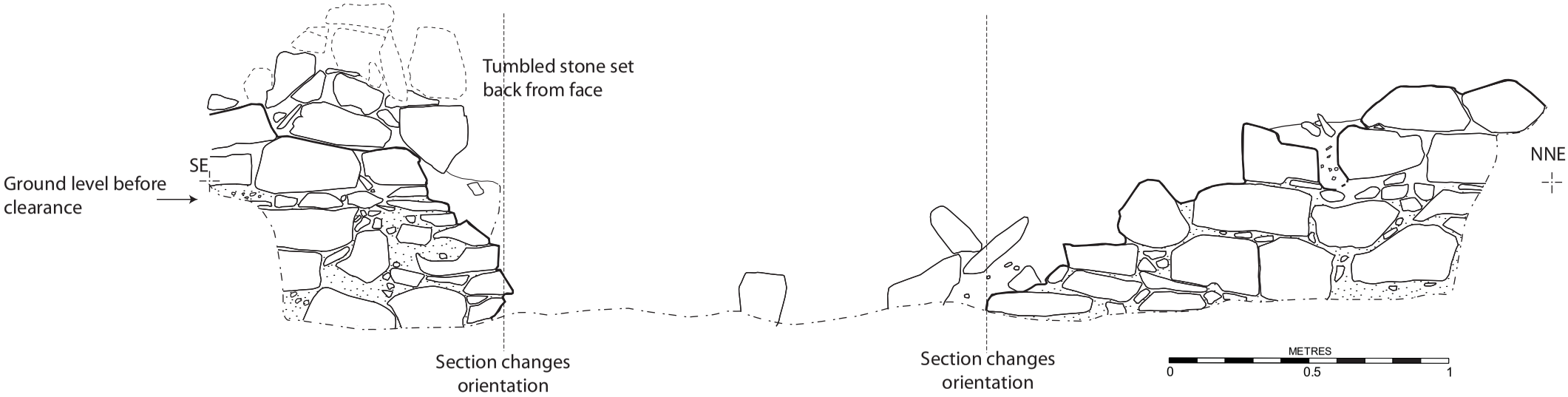


Fig.5 Trench 2, Collapse B, elevation after clearance

Fig. 6 Plan of trench 3 after excavation

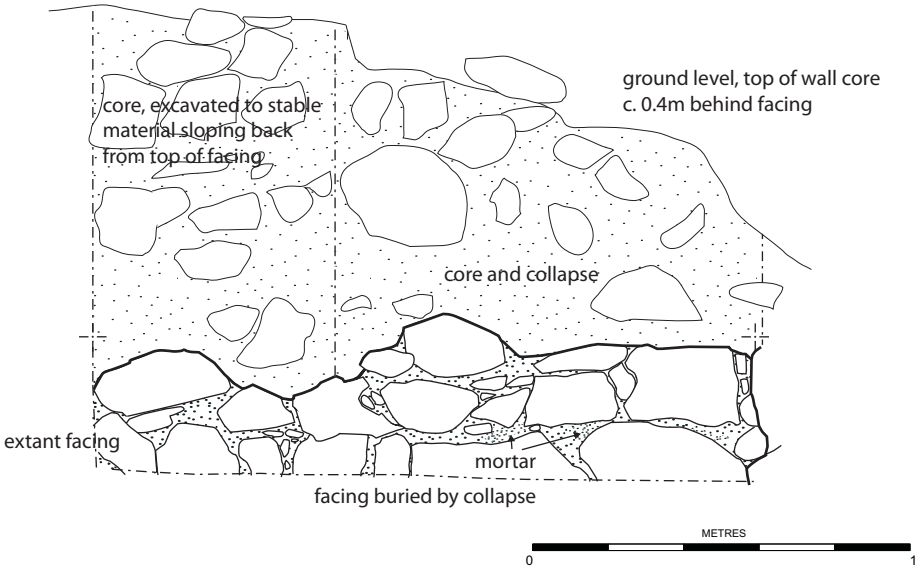


Fig. 7 Trench 3, D-shaped tower. Elevation of western wall

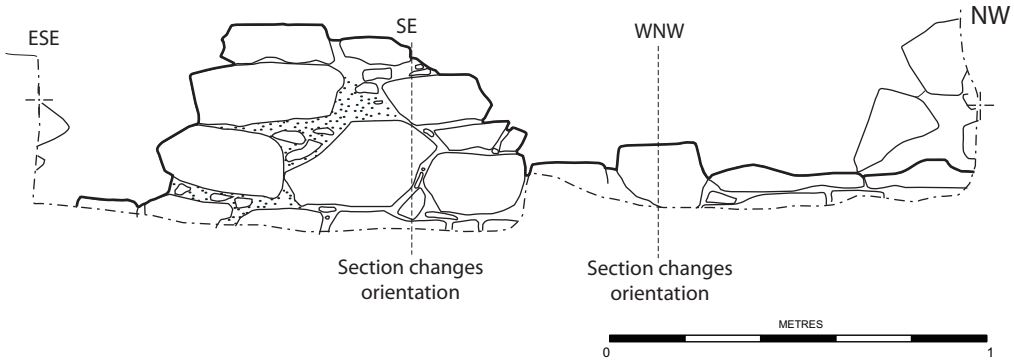


Fig. 8 Trench 3, D-shaped tower. Elevation of southern apsidal wall

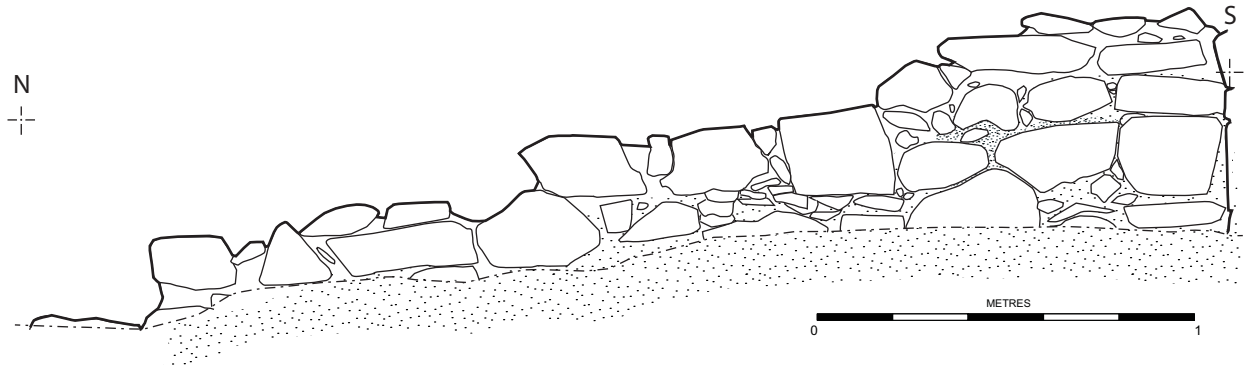


Fig. 9 Trench 3, rectangular structure. Elevation of eastern wall

Fig. 10 Trench 3, rectangular structure. Elevation of southern wall

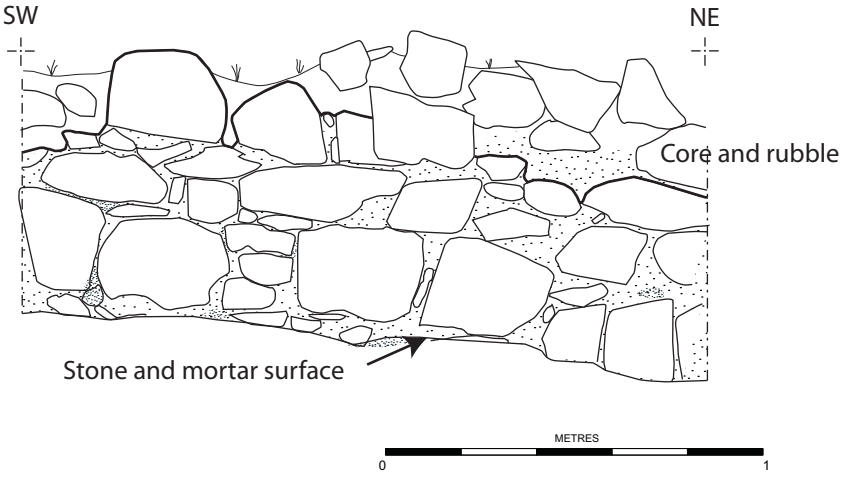


Fig. 11 Trench 5, Elevation of inner face of curtain wall

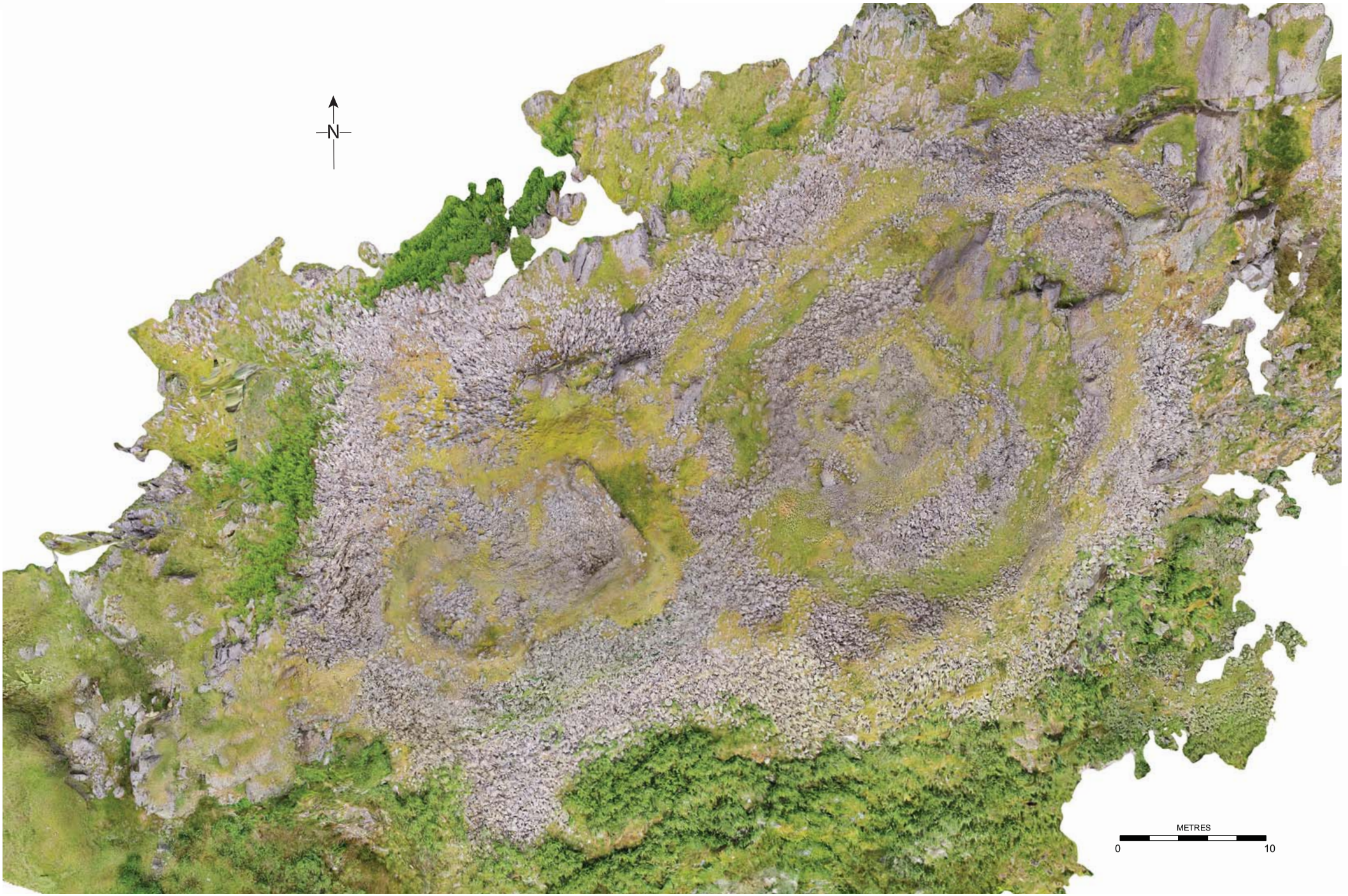


Plate 1 Castell Carndochan, orthogonal view from 3d model

Plate 2 The D-shaped tower, orthogonal view from 3D model

Plate 3 Collapse A (RCAHMW, 1921)

Plate 4 Collapse A in 1949
(From the collections of the National Monuments Record of Wales: © Crown copyright: Cadw)

Plate 5 Trench 1, (collapse A) before clearance

Plate 6 Trench 1 (collapse A) after clearance

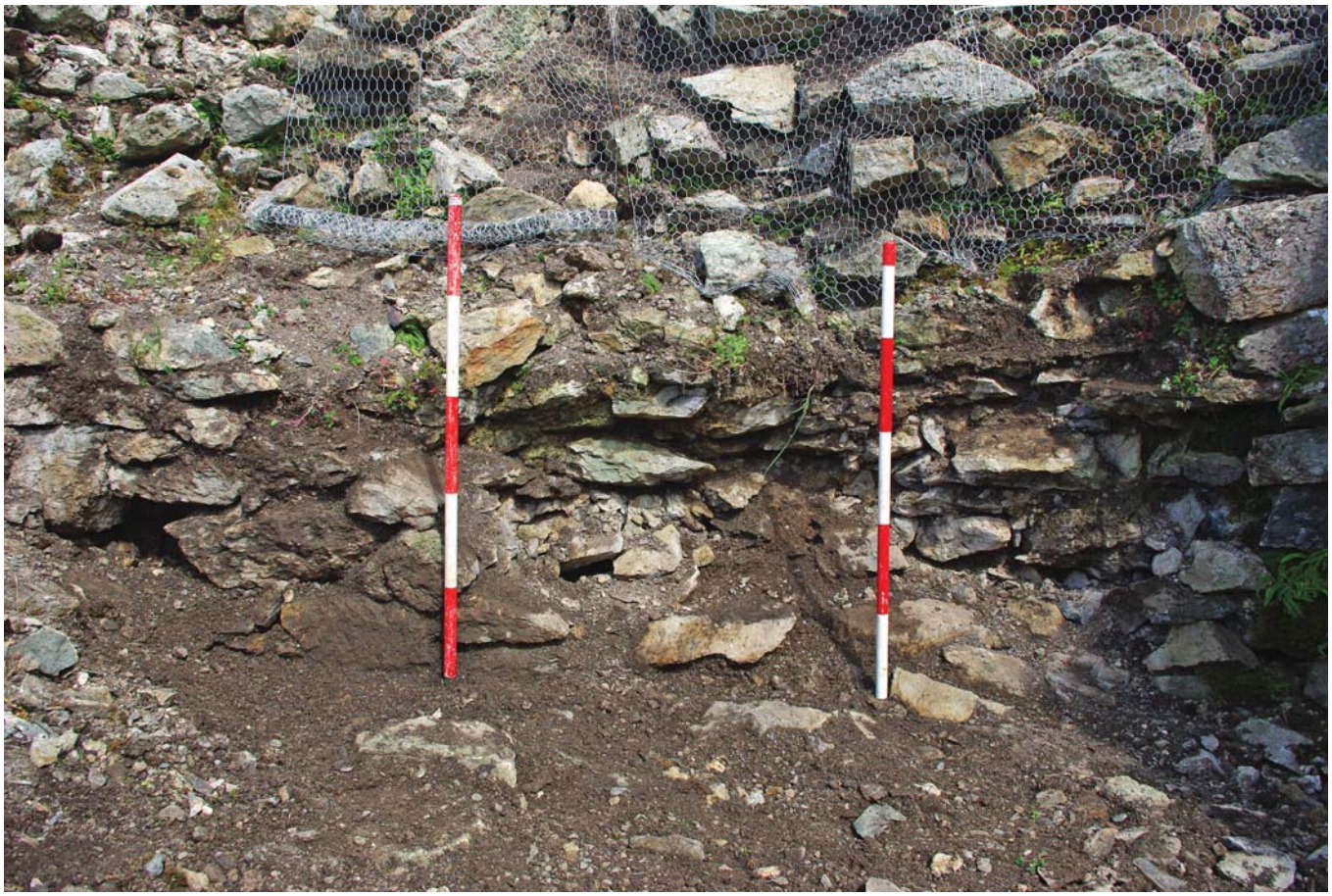


Plate 7 Trench 1 (collapse A) after clearance, detail of wall base and extant facing

Plate 8 Trench 1, Collapse B after clearance

Plate 9 Trench 1, buttress during construction

Plate 10 Trench 1, after consolidation

Plate 11 Trench 2, collapse C before clearance

Plate 12 Trench 2, collapse C after clearance

Plate 13 Trench 3 before excavation

Plate 14 Trench 3 after excavation

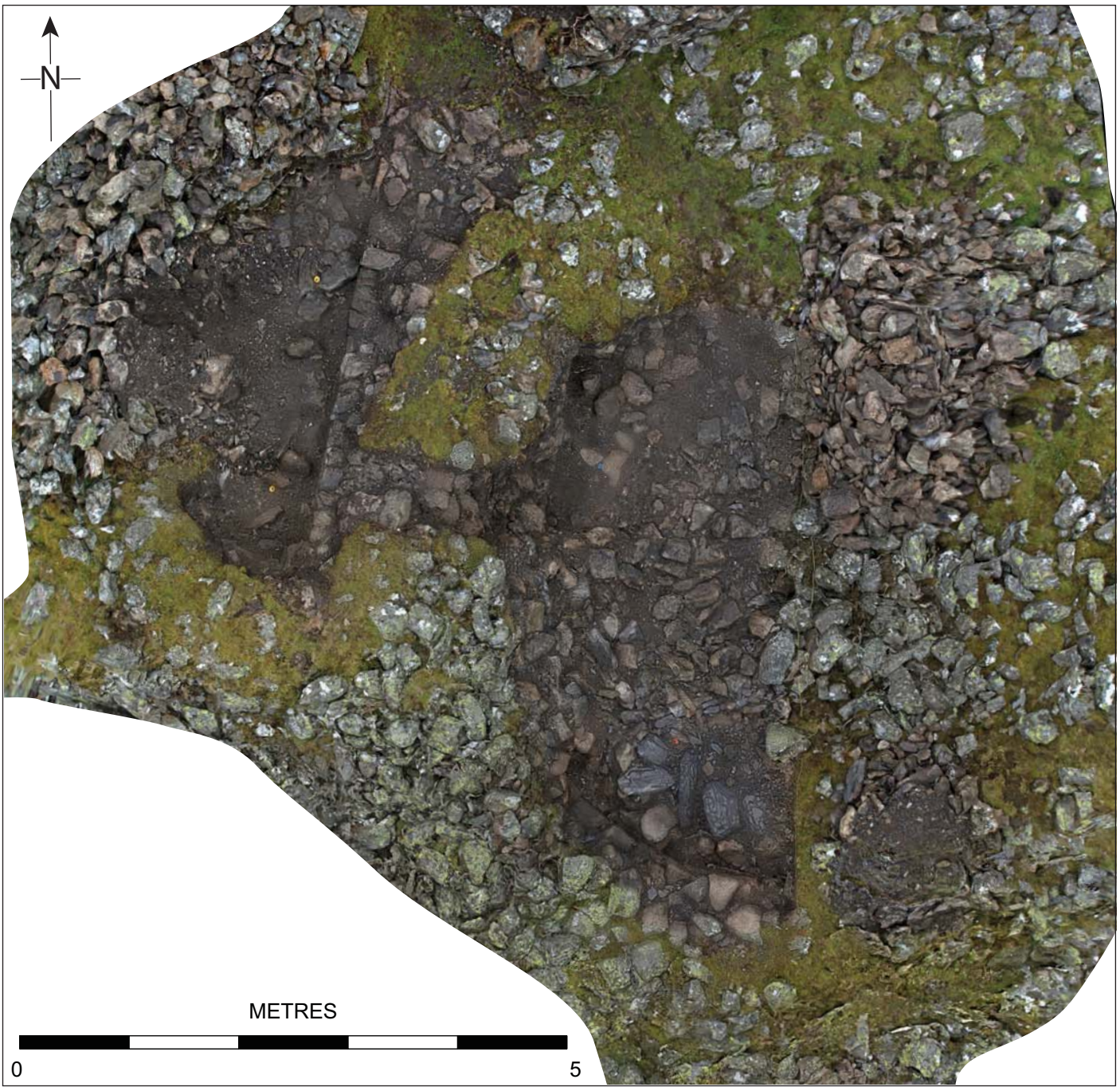


Plate 15 Trench 3 vertical orthogonal view from 3D model

Plate 16 Trench 3, D-shaped tower, western wall after excavation

Plate 17 Trench 3, D-shaped tower, southern apsidal end after excavation

Plate 18 Trench 3, rectangular building after excavation

Plate 19 Trench3, after backfilling

Plate 20 Trench 4, battered masonry and collapse at the base of the square keep

Plate 21 Trench 5, inner face of curtain wall with stone and mortar surface

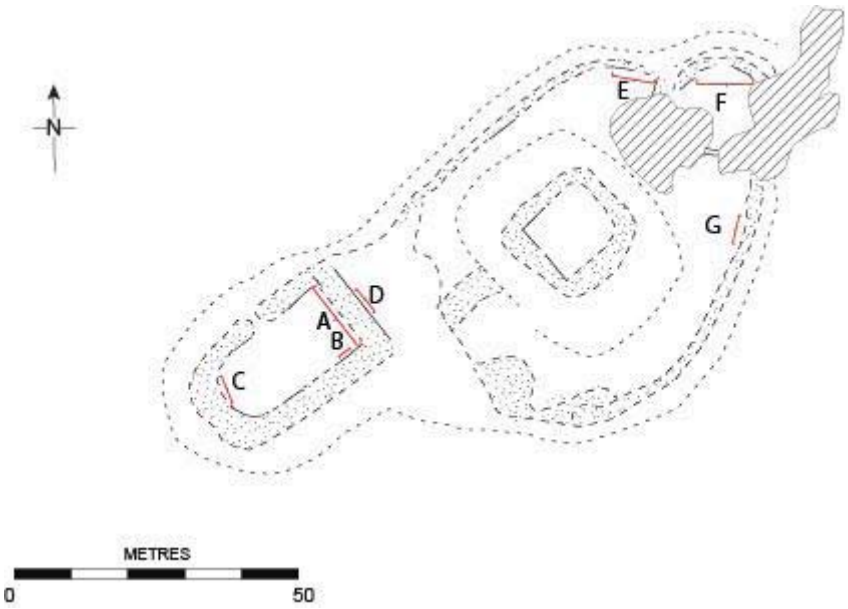
APPENDIX 1

CASTELL CARNDOCHAN. ASSESSMENT OF EROSION 01/07/2014

D. Hopewell

CASTELL CARNDOCHAN. ASSESSMENT OF EROSION 01/07/2014

Transcription of site notes. Catalogue of collapses and on-going erosion.



Outline survey of site showing location of erosion and collapses

Collapse A

Dimensions and location: 6.3m wide - 2.2m high. East end of apsidal tower.

Description

A collapse in the inner face of the straight side of the apsidal tower. The facing has collapsed apart from a few stones in the NE corner. Mortar bonded wall core is still standing and has eroded to a state of moderate short-term stability.

Cause

Examination of adjacent masonry shows that the lime mortar has weathered from between the facing stones making them vulnerable to erosion and collapse. This was presumably the case in collapse A. This instability appears to have been compounded by the digging of a hole within the rubble on the NE corner of the tower to below floor level thus undermining the wall.

Recommendations

Clearance of collapsed masonry followed by prompt reinstatement of mortared facing stone following the building style in the adjacent wall. Backfilling of hole to appropriate level.

Collapse B

Dimensions and location: 0.9m wide – 0.7m high. Southern wall of apsidal tower.

Description

A collapse in the inner face. A small area of facing has collapsed in the lower part of the wall. The void has recently been packed with stones. The surrounding facing is stable but mortar has mostly weathered from between the facing stones.

Cause

The lime mortar has weathered from between the facing stones making them vulnerable to erosion and collapse. The collapse appears to be a direct result of the undermining of the base of the wall.

Recommendations

Clearance of collapsed masonry followed by prompt reinstatement of mortared facing stone following the building style in the adjacent wall. Backfilling of hole to appropriate level. Pointing of surrounding facing with lime mortar.

Collapse C

Dimensions and location: 2.2m wide - 1.2m high. West end of apsidal tower.

Description

A collapse in the inner face of the apsidal end of the tower. The upper 1.2m of facing has collapsed leaving mortar bonded wall core that has eroded to a state of moderate short-term stability.

Cause

As elsewhere on the site mortar has weathered from between the exposed facing stones making them vulnerable to erosion and collapse. This area is vulnerable to erosion being on the line of the access path.

Recommendations

Clearance of collapsed masonry followed by prompt reinstatement of mortared facing stone.

Collapse D

Dimensions and location: 1.8m wide – 0.7m high East end of apsidal tower.

Description

A collapse in the outer face of the straight side of the apsidal tower. The facing is generally well preserved, neatly built and retains some mortar. An area of facing has collapsed and has been recently repaired with roughly built dry-stone facing.

Cause

Weathering of mortar from between the stones and visitors and sheep walking on the wall top.

Recommendations

Reinstatement of mortared facing stone following the building style in the adjacent wall.

Collapse E

Dimensions and location: 3.4m wide – 0.5m high. Curtain wall

Description

A collapse in the inner face of the curtain wall. The facing is low and partially overgrown with turf which provides some stability. It is however slowly eroding. No extant mortar is visible. Fine gravel with occasional pieces of unburnt limestone between the stones is almost certainly all that remains of the mortar in this area.

Cause

Loss of mortar

Recommendations

Clearance of collapsed masonry followed by reinstatement of mortared stone.

Collapse F

Dimensions and location: 5.0m wide – 0.4m high NE side of semi-circular tower

Description

The possible tower has mostly been cleared of rubble which has been used to build a sheep pen or shelter. Original masonry is still visible at the base of the wall. Fine gravel with occasional pieces of unburnt limestone again indicates that the masonry was mortared. Now stable.

Cause

Clearance to build shelter, currently stable.

Recommendations

No urgent need to carry out remedial work.

Collapse G

Dimensions and location: 2.0m wide – 0.5m high. Curtain wall

Description

A collapse in the inner face of the curtain wall. The facing is low and shows some signs of erosion. No extant mortar is visible. Fine gravel with occasional pieces of unburnt limestone between the stones is almost certainly all that remains of the mortar in this area.

Cause

Probably caused by visitors digging a small hole to look for the wall face.

Recommendations

Reburying of the stonework.

General recommendations

The main cause of collapses in the masonry seems to be due to loss of mortar from exposed masonry compounded by visitor and sheep erosion. Exposed masonry needs to be pointed and some rebuilding is necessary for stability. The rest of the site appears to be generally stable beneath a substantial covering of rubble. The stones are weathered and covered in crustose lichens making any disturbed rubble very obvious and there have been only occasional movements in the surface stones. This is to a large extent a result of low visitor numbers. Any attempt to promote the site or to permanently uncover buried masonry would entail a substantial amount of remedial work.

Occasional lengths of facing are visible on most features suggesting that there is extant masonry across much of the site. The level of preservation of masonry beneath the rubble is unknown and further information is necessary for the long term management of the site.

David Hopewell

Gwynedd Archaeological Trust

APPENDIX 2

CASTELL CARNDOCHAN- RECOMMENDATIONS FOR THE CONSERVATION OF UNSTABLE SECTIONS OF WALLING

M. J. Garner

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CASTELL CARNDOCHAN – RECOMMENDATIONS FOR THE CONSERVATION OF UNSTABLE SECTIONS OF WALLING

1.0 Introduction

1.1 This report is prepared following a site inspection on 15 July 2014. Attended by

Andrew Davidson	Gwynedd Archaeological Trust
Ian Halfpenney	Cadw
David Hopewell	Gwynedd Archaeological Trust
John Roberts	Snowdonia National Park Authority
Mike Garner	Garner Southall Partnership

1.2 The references used in the report are the same as those included in David Hopewell's report of 1 July 2014

2.0 Nature of Walling and Mortar

2.1 The facework still visible in the Apsidal Tower and the base of the curtain wall is of good quality with relatively tight joints. Galletting stones have been carefully cut to fit into the irregularities of the larger stones

2.2 Bedding mortar within the wall is a fine sand/silt with sparse evidence of unburnt lime

2.3 There is another mortar mix, more graded from 25mm round pebbles down to sharp sand in a hard cement. This appears on facework, on the face of eroded surfaces and as capping on the top of wall surfaces. It suggests a phase of consolidation, probably early 20th Century. A mortar analysis to establish the nature of the cement will help confirm this assumption and there may be documentation for work at this date

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2.4 The wall thickness on the plans and in the description of Merioneth Castles is about 2.1 metres, but doesn't appear to be that much on site. This needs testing by excavation as the wall thickness will have a bearing on stability during consolidation

2.5 The outer face of the Apsidal Tower wall is buried up to the standing wall tops by collapsed turf covered masonry except in the centre of the north wall (collapse D). Where the level inside the tower is lower, there is, therefore, a surcharge on the wall giving it a retaining function. In the east corner where the internal face of the south east wall is visible about 2.4m high there is a distinct lean inwards. If the wall is only 1200mm thick the whole wall may be leaning. If however it is 2100mm thick or has a batter it could be parting of the inner skin from the core

3.0 Discussion and Recommendations

3.1 An approach to conservation which involves rebuilding facework requires a sound foundation. Where the collapse is a small area of facework below which there is sound well aligned facework such as collapse B, D and E, this approach is suitable as long as any masonry above the collapse is properly supported

3.2 In the case of collapses A & C, however, the collapsed inner face forms an unstable tumble of stone below the eroding corework. Removing the tumble of stone to find a face, off which to build, will increase the risk of instability in the standing masonry above it the future down one excavates and it may not be possible to find a suitable stable face

3.3 In these circumstances I suggest the following procedure:-

3.4 Collapse A & B

3.4.1 Record their location, label and remove loose inner corework stones

3.4.2 Secure corework above the tumbled masonry with wire netting

3.4.3 Needle and prop masonry above collapse B, remove drystone filling and build back up in mortared facework

3.4.4 Remove upper layers of tumbled stone to a relatively stable surface and relay the loose recovered stones to form a homogeneous horizontal surface using dry stone walling techniques and galletting stones. This surface will be about 2.1 metres below the wall top and will probably bury the collapse B repair. A small compactor will a rubberised plate would help stabilise the surface if access is not impossible

3.4.5 Consolidate the exposed face in mortared corework laid at an angle of 15° from the vertical using new masonry built off the consolidated collapsed masonry to buttress and underpin the base of the wall

3.4.6 On completion of this and the work to the collapse of the outer face (Ref D) cap the wall with capping mortar and turf

3.5 Collapse C

3.5.1 Consolidate the collapsed masonry as described in 3.4.4 infilling the hole in the south corner

3.5.2 Consolidate and cap the wall as describe din 3.4.5 & 3.4.6

3.6 Collapse E, F & G

3.6.1 Consolidate E & G as described in David Hopewells report. No work required in F

3.7 Pointing – On completion of consolidation, point all open joints in areas of facework, removing only that loose hard gravelly mortar which can easily be removed without damaging. the stone.

3.8 Mortar Mix

3.8.1 The joints in much of the facework are relatively tight. The pointing mix is to be 1 part NHL 3.5 moderately hydraulic lime mortar to 2 parts aggregate graded from grit (Size one third of the joint width.) down to 0.3mm sharp sand. Thoroughly wash out all joints prior to pointing. Point in a single operation and strike off excess mortar after initial set to leave a slightly rough flush joint. Do not brush damp mortar to avoid smearing stone faces. Where stones are weathered keep mortar to the back of radiused edges. Protect against frost, drying winds and hot sun with hessian. Add polythene to protect from driving rain until set

3.8.2 The mix used previously for capping mortar has been very successful in encouraging colonisation of turf soft capping. I therefore suggest using a low fines mix of 1 part Portland cement to parts lime and 9 parts pebbly gravel down to 0.3mm sand. Throw the mix on to the wall tops to build up an undulating surface with exposed large aggregate. After it is fully set lay soil and turf and secure with mesh until established

4.0 Conclusion

4.1 This strategy is based on the assumption that the immediate priority is that of consolidation. Nothing suggested precludes further investigation as time and funds allow

Michael J Garner Dip Arch RIBA SCA FRSA July 2014

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