



Minor Archaeological Services Call-Off Contract Caerlaverock Castle, Dumfries & Galloway (PIC182)

Boardwalk Renewal: Soil Investigation Watching Brief, August 2018 Report No. HES-PIC182-2018-03

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Minor Archaeological Services Call-Off Contract

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1. INTRODUCTION

1.1 General

This report presents the results of borehole monitoring by CFA Archaeology Ltd during the geotechnical recovery of a sediment core from within an area of marsh land situated between the old and new Caerlaverock Castles (Fig. 1). Historic Environment Scotland (HES) propose to install a new public boardwalk to replace the existing derelict boardwalk linking the two sites. A watching brief was put in place to determine the core's maximum depth and to record the sediment types contained within it.

A Written Scheme of Investigation (WSI) for the work, dated 4th July 2018 was produced by CFA and approved by HES. The work was commissioned by Historic Environment Scotland as part of the Minor Archaeological Services Call-off Contract.

1.2 Historical Background

The property of Caerlaverock Castle is comprised of two separate castles, the 'old' and the 'new' along with the surviving earthworks associated with the two castles and the site of the harbour initially associated with the old castle. The name may mean either 'fort of the lark' (from British caer 'fort'; and Old English laverock 'lark') or 'elm fort'.

The 'old' castle was constructed in the early 13th century on the instructions of John de Maccuswell. The castle was built on a trapezoidal platform measuring c. 30m by 27m. This was surrounded by a wet moat, the upcast from which was used to create flat topped outer banks. To its south lay a 70m-long basin, thought to have been used as a tidal harbour, and to the NW and NE were two ditched enclosures that probably served as baileys (outer service courts). Other banks and ditches have been recorded within the vicinity. It is possible that some of these earthworks predate the 13th-century castle. A length of structural timber thought to be from the access bridge crossing the moat from its northern side has been dated to c.1229.

The 'new' castle at Caerlaverock was constructed in the 1270s by Sir Herbert Maxwell to replace the 'old' castle and is amongst the foremost examples of Scottish medieval secular architecture. Its triangular-shaped curtain wall is thought to be unique in Britain, and the Nithsdale Lodging within, dating from the 1630s, is one of the finest examples of Renaissance architecture in Scotland.

Not long after the new residence was completed the Maxwell's were drawn into the religious turmoil of the 1630s. A ravelin was constructed beyond the 16th century defences to further strengthen the castle and in June 1640 it was besieged by the Covenanting Army. Following the garrison's surrender in September 1640 the castle was looted and abandoned.

1.3 Archaeological Background

Clearance work done in the 19th century at the 'new' castle was probably superficial, and therefore the potential for archaeological preservation is known to be high, both

within the enceinte, and in the ditch. The latter contained invaluable evidence in the form of midden material from centuries of occupation, as well as a wealth of palaoenvironmental data. This potential was revealed in the major campaign of excavations led by Iain MacIvor between 1955-66 in parallel with the consolidation programme. MacIvor retrieved an important assemblage of artifacts from the ditch, notably fine leather and pottery. His work concentrated on the bridge area of the inner ditch, along with the discovery of the outer rock-cut ditch, crossed by a timber bridge dated by dendrochronology to c 1559-94. Smaller scale work in the courtyard demonstrated the good survival of archaeological deposits here.

Survey work was carried out around the old castle, the adjacent harbour and throughout the surrounding woodland in the late 1990s, in advance of excavations at the old castle itself. Area excavation here in 1998-99 revealed the ground plan of the castle and demonstrated its phased development over a period of around 50 years. Fragments of an Islamic glass vessel were found when the hall floor was excavated. This object, which makes the surprising connection between 13th century Scotland and distant Mamaluk, Syria, was possibly brought to Caerlaverock as a souvenir of the Crusades.

More recent work has focused on the areas of proposed car parking to the N and NW of the new castle, which contain extensive cropmarks identified from aerial photographs. In 2009, ahead of soil investigations, a rapid resistivity survey was carried out in the field immediately to the N of the current visitor centre. The survey revealed potentially significant archaeological remains including an extended area of low resistance globular anomalies, in the western area of the field, coinciding with the line of a linear feature identified on aerial photographic survey, interpreted potentially as a roadway that provided the northern approach to the castle. A square high resistance anomaly in association with this may be further evidence of siege works, potentially representing a defensive enclosure. Additional unresolved linear anomalies and areas of disturbance may indicate ephemeral settlement remains or responses to minor geological features in the eastern half of the field.

This was followed up by a gradiometer and resistivity survey targeting the western half of the same field. This revealed further archaeological features within the area such as pits and linear features, some of which are visible on the aerial imagery running into the proposed development area. Trial trenching was undertaken in the field in 2011, targeting the geophysical survey anomalies. A number of archaeological features were recorded. These consisted of a combination of linear slots and ditch-like features plus a series of discrete pits of various sizes. Archaeological features were located in all of the trenches. The features are thought to mainly represent prehistoric activity across the whole site. A ditch and pit complex was partly excavated and prehistoric pottery was retrieved from the pit, with part of a rim of pottery also recorded in the ditch.

1.4. Archaeological Sensitivity

The proposed works target a zone between the 'old' and 'new' castles that is currently covered by oak and alder-rich woodland with wet flushes rich in flag iris and tall grasses with isolated pockets of bracken suggesting intermittent wet and dry areas. On the ground, a complex series of earthworks survive, which are likely to represent enclosed areas related to the medieval occupation of either the old or new castles, although it is also possible that some features pre-date the old castle. Certainly, there has been significant prehistoric activity in the area, as evidenced by the results of archaeological investigations a short distance further north and by the recovery of residual prehistoric material during excavations at the old castle site.

The southern section of the proposed boardwalk route crosses one of these low bankdefined enclosures, thought to be a possible candidate for a 'bailey' area associated with the occupation of the 'old' castle. This area may have contained structures, including possibly a range of ancillary functions located outwith the main castle site, such as stables, barns and workshops, along with midden material. The route crosses this area's northern bank, and beyond this crosses an area of boggy ground. Both zones have the potential to contain significant and sensitive buried archaeology, in the form of structural remains, occupation deposits and palaeo-environmental remains which could add to our understanding of the occupation of both castles and the nature of settlement and landscape management in the areas around them.

1.5 Objectives

The objectives were as follows:

- To bio-stratigraphically record the extracted core whilst on-site
- To produce a report on the results

2. METHODOLOGY

2.1 Core recovery

The coring device used was a Competitor Dart Percussion Rig (Fig. 2) used to take window samples by hammering in contiguous steel barrel casings (1000mm long x 100mm diameter) each containing clear plastic sample tubes that were split open with a sharp blade to allow the contents to be recorded whilst fresh. A second smaller sampler called an SPT probe (Standard Penetration Test) with a 500mm x 25mm chamber was also used. The main purpose of this test was to provide an indication of the relative density of granular deposits, such as sands and gravels, from which it is virtually impossible to obtain undisturbed samples.

The recovered core was bio-stratigraphically recorded using a combination of in-house core log recording sheets and photography (Appendix 1). Sediment description followed Hodgson *et al* 1976. The bio-stratigraphy of the core profile was plotted to scale using the notification devised by Troels Smith (1955) and Aaby and Berglund (1986). The respective sedimentary units within the core were fully described with accompanying Munsell colours in line with methodologies devised by English Heritage (2007 and 2011).

Where possible the aim was to record/provide the following:

• The position and maximum basal depth of the core

- The character of the clastic sediment types and presence of any marine or terrestrial inwash bands relating to historic flood events
- The nature and thickness of any woody layers or other organic remains present
- An assessment for the sites potential to contain a range of palaeoenvironmental indices that may allow the scientific reconstruction of the marsh since its inception

3. **RESULTS**

3.1 Sediment Characterization

The biostratigraphic units within the sediment profile are described in Table 1 and shown in Fig. 3. The profile is described from top to bottom.

Unit	Depth (m bgs)*	Summary Description	Density scale	Dominant colour
1	0.0-0.1	Dark organic detritus, fen peat well humified, abundant fine roots, stones absent. Merging with Unit 2	3	10YR 4/2 Dark Brown
2	0.1-0.3	Grey/brown compact clay with orange mottles. Occasional fine roots. Stones absent. Sharp boundary with Unit 1, merging with unit 3	3	10 YR 6/1 Yellowish Brown
3	0.3-1	Firm compact grey 'carse' clay with no inclusions.	3	10 YR 6/1 Grey
4	1-3.4	Plastic carse clay with becoming more saturated towards the base –merging with units 3 and 5.	3	10 YR 4/1 Dark Grey
5	3.4-3.6	Fractured red breccia conglomerate with feldspar and schist inclusions. Merging with unit 4. Saturated.	3	2.5YR 5/6 Red

Table 1. Biostratigraphic profile summary data. Density scale values after Abby and Berglund (1986) in Moore *et al* 1991

* metres depth below ground surface (bgs)

3.2 Bio-stratigraphic Interpretation

Unit 1 (Figs 3 & 4) was a fairly well humified shallow layer of fen peat formed by the slow breakdown of surface litter. The shallowness of this unit was surprising as in some cases fen deposits can have a rapid accumulation rate. However, the slow input of organic matter may have been controlled by the dominance of yellow flag iris (*Iris pseudacorus*) which is a bulbous perennial tolerant of submersion, low pH, and anoxic soils. The depth of Unit 1 allowing for compaction suggests that the marsh is relatively recent (c.200 years).

Unit 2 (Figs 3 & 4) was fairly homogenous, compact gleyed clay below the organic surface horizon. The gleying had resulted in the formation of bright orange mottles and was a result of oxidation and reduction driven by the presence of near surface ponding

due to the impermeability of the lower clay. The orange mottles are formed as iron is brought into solution to form iron hydroxide which is a solute of iron.

Unit 3 (Figs 3 & 5) was very uniform grey marine clay (carse clay) with a plastic consistency at its upper end becoming increasingly more compact with depth. The texture also became more gritty due to the presence of sand particles giving rise to compaction at the base of this unit.

Unit 4 (Figs 3 & 6) was continuous homogenous dark grey carse clay that became increasingly more saturated towards its base where it met Unit 5, the bed rock layer. The clay was almost liquefied at this point and was difficult to contain in the barrel. This was particularly evident at c.-3.4m bgs.

Unit 5 (Figs 3 & 7) contained angular and sub-rounded clasts ranging between 4-6mm with occasional large angular fragments. This is interpreted as a weathered Permian age volcanic conglomerate or breccia classified by the British Geological Survey as the Doweel Breccia Formation of Permian Age (299-251mya).

4. **DISCUSSION**

The carse clay (Units 3 and 4) has a combined thickness of approximately 3.1m. The proposed boardwalk site was classified earlier by Richard Tipping (Tipping and Adams 2007) as part of his research on the geomorphology of the local shoreline. Tipping explored a set of gravel storm ridges situated along a transect to the south of the Old Castle. He concluded that the ridges had formed during the twelfth and thirteenth centuries and that the medieval coastline was then very dynamic and greatly affected by an increase in storminess. The coring site lies within what Tipping called the 'New Castle Surface' which was mapped as nearly surrounding Old Caerlaverock Castle and reaching northwards to a low cliff more or less running east-west with the new Caerlaverock Castle. The altitude of the surface of the coring site (the New Castle Surface) was levelled (Tipping (2007 op.cit.) at approximately 9m aOD. This would provide a basal depth at roughly 5.4m aOD for the marine clay (Unit 4).

The onset of the carse clay is attributed to the Main Postglacial Transgression that occurred at 6590 ± 65^{14} C years BP and culminated at about 4000 ¹⁴C BP at Newbie Cottages near Annan (Dawson *et al* 1999, Cressey et al 2001a, 2001b). The work on diatoms by Susan Dawson at the Newbie Cottages along with Richard Tipping's later work on the storm beaches on the seaward side of the Old Caerlaverock Castle also demonstrated an increase in sea level during the 13th century. Sea levels at this time were about 1m higher than the present. The average rise in sea level during this period and the presence of increased storminess (based on the geomorphology of the present shoreline) show with some certainty that this led to the abandonment of the Old Castle as the mean high water mark on ordinary spring tides would have lain only a few meters from the castle walls.

5. CONCLUSION

The watching brief carried out to monitor the extraction of the geotechnical core close to the proposed new boardwalk has confirmed the nature of its contents. This was found to be dominated by inorganic marine clay to a depth of -3.4m below the present ground surface. The clay rested on a breccia of unknown depth. These results make a contribution to our understanding of the depth of the clay formation at a single location within the so-called New Castle Surface.

The persistence of the saturated ground surface (which has not been adversely affected by the exceptionally dry summer) shows that any near surface organic archaeological remains (wood, leather and other organic materials) associated with the two castles and earlier is likely to be exceptionally well preserved. The clay was uniform and was devoid of any datable organic remains.

The lack of any datable organic material (fossil wood, plant macro remains etc) negates any further palaeoenvironmental study. The timing and formation dynamics of the carse clay is widely understood based on the earlier research carried out at Caerlaverock and further east along the coastline at Newbie Cottages.

The project archive, comprising all CFA record sheets, maps and reports, will be deposited with the National Record for the Historic Environment (NRHE) and copies of reports will be lodged with Dumfries Council Historic Environment Record.

A summary statement will be submitted for publication in *Discovery and Excavation in Scotland* (Appendix 2) and will also be reported on through OASIS Scotland.

6. **REFERENCES**

Aaby, B. and Berglund, B.E 1986 'Characterization of peat and lake deposits'. In Handbook of Holocene Palaeoecology and Palaeohydrology Berglund (ed) 231-246. John Wiley

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Cressey, M, Bunting, M.J., Dawson, A., Dawson, S., Long, D. and Milburn, P 2001 (b) 'Relative sea-level changes at Newbie Cottages, near Annan, Upper Solway Firth, SW Scotland' *in* Raftery, B. and Hickey, J. 2001 (eds) *Recent Developments in Wetland Research* WARP (Wetland Archaeology Research Project) Occasional Paper 14 Vol 2.23, 257-270.

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English Heritage 2011 Environmental Archaeology, A guide to the theory and practice methods, from sampling and recovery to post-excavation. Centre for Archaeology Guidelines.

Tipping, R and Adams, 2007 'Structure, composition and significance of Medieval storm beach ridges at Caerlaverock, Dumfries and Galloway.Scottish' *Journal of Geology* 43 (2) 115-123

Troels-Smith, J 1955 'Characterisation of unconsolidated sediments', *Danm Geol Unders* IVR 3 (101) 1-73.

Photo No.	Description	Facing
001-002	Competitor Dart Percussion Rig (CDPR) taking core samples	Е
003	General view of the existing boardwalk and surrounding vegetation	S
004-006	General shot of the 0-1m depth core and its contents	Vertical
007-008	General shot of the SPT sampler and its contents Vertical	
009-010	General shots of the CDPR rig in operation	Е
011-012	General shot of 1-2m depth core and its contents	Vertical
013	General shot of the CDPR	Vertical
014-016	General shots of the 2-3m core and its contents	Vertical
017-019	General shots of the SPT sampler and the basal bedrock contents	Vertical
020	General shot of the CDPR	Е
021-022	General shots of the clay contents captured in the SPT chamber	Vertical
023	General shot of the existing boardwalk and flanking vegetation	Ν
024	General view of the parched lawn in front of Caerlaverock Castle	S
025-026	General working shots of the CDPR rig	Е
027	Mature oak tree growing close to the boardwalk	W
028-033	General shots of the CDPR	Е

APPENDIX 1: Photographic Record

LOCAL AUTHORITY:	Dumfries and Galloway
PROJECT TITLE/SITE NAME:	Boardwalk renewal: soil investigation watching brief
PROJECT CODE:	MINA68
PARISH:	Caerlaverock
NAME OF CONTRIBUTOR:	M Cressey
NAME OF ORGANISATION:	CFA Archaeology Ltd
TYPE(S) OF PROJECT:	Archaeological Watching Brief
NMRS NO(S):	NY06NW 6, NY06NW 7 NY06NW 12
SITE/MONUMENT TYPE(S):	Castle Wood
SIGNIFICANT FINDS:	N/A
NGR (2 letters, 6 figures)	NY 0261 6549
START DATE (this season)	July 2018
END DATE (this season)	July 2018
PREVIOUS WORK (incl. DES ref.)	N/a
MAIN (NARRATIVE) DESCRIPTION: (May include information from other fields)	An archaeological watching brief was carried out at Castle Wood between Old and New Caelaverock Castle to monitor the recovery of a geotechnical core extracted from a borehole close to the proposed location of a new boardwalk. The core attained a maximum depth of -3.6m below the present ground surface and it contained five biostratigraphical units. The most dominant unit was Units 3 and 4 that comprised a deep deposit of marine (Carse) clay which was locally extensive. This deposit overlay breccia bedrock comprising of fractured rock and gravel. The carse clay (classified as the New Castle Surface) relates to the Main Postglacial Transgression of high sea level the onset of which is dated to $c.6590 \pm 65^{-14}$ C years BP and culminating at about 4000 ⁻¹⁴ C BP at Newbie Cottages near Annan.
PROPOSED FUTURE WORK:	None
CAPTION(S) FOR ILLUSTRS:	None
SPONSOR OR FUNDING BODY:	Historic Environment Scotland
ADDRESS OF MAIN CONTRIBUTOR:	CFA Archaeology Ltd, Old Engine House, Eskmills Park, Musselburgh, EH21 7PQ.
EMAIL ADDRESS:	cfa@cfa-archaeology.co.uk
ARCHIVE LOCATION (intended/deposited)	Archive to be deposited with NRHE, reports lodged with Dumfries & Galloway Council HER

APPENDIX 2: Discovery and Excavation in Scotland Entry

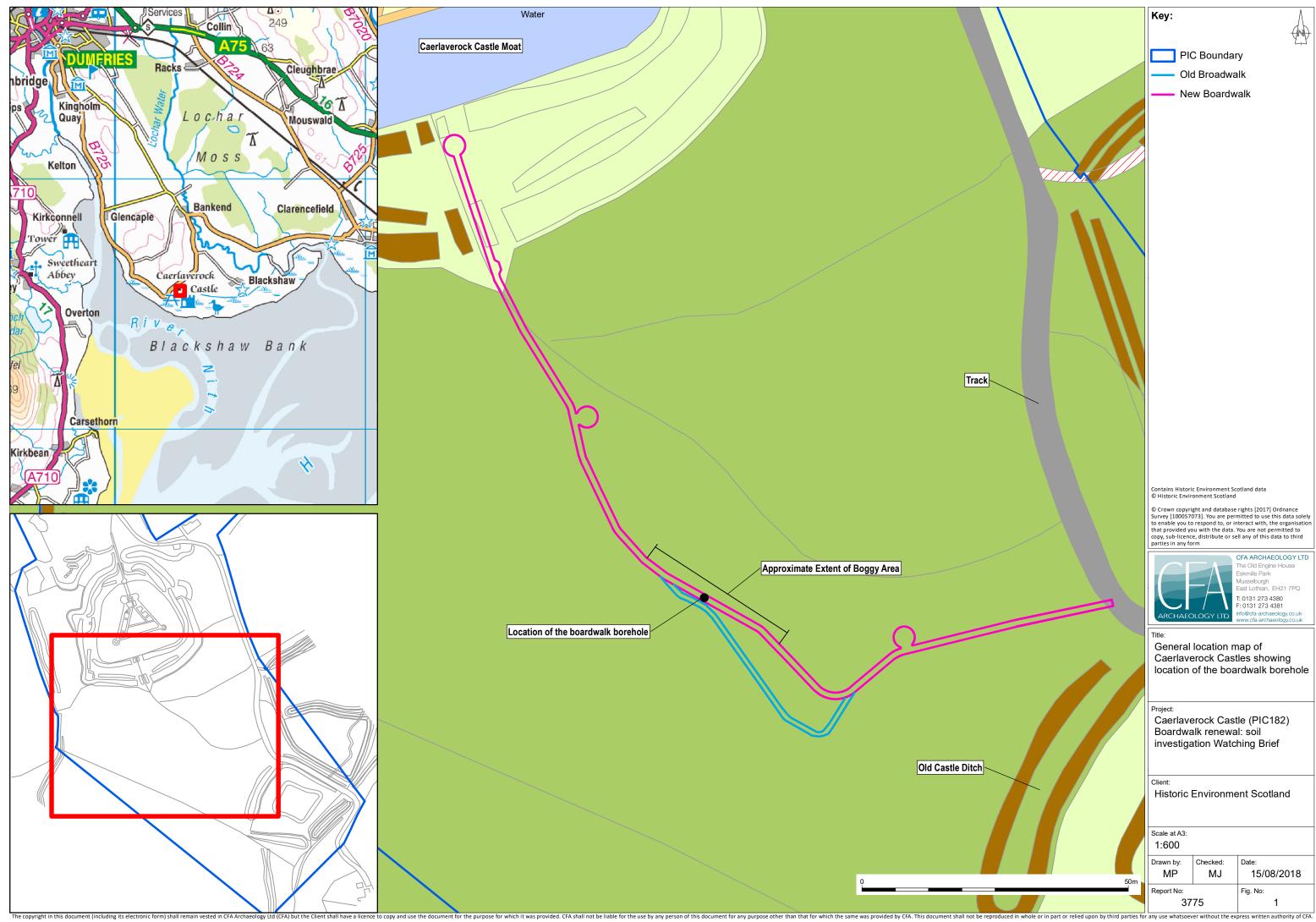




Fig. 2 - Competitor Dart Percussion Rig used to take borehole window samples

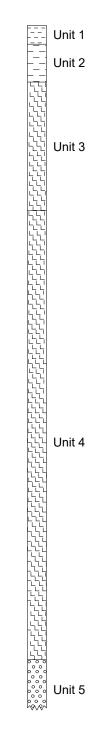


Fig. 3 - Reconstruction of the bio-stratigraphic profile from the borehole



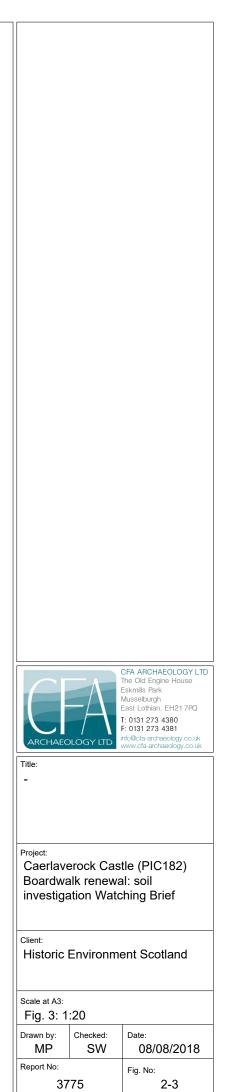




Fig. 4 - Top of the core (-1-2m) in the window sample tube showing Unit 1 the fen peat



Fig. 5 - Middle of the core (-2-3m) in the window sample tube (Unit 3)

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Fig. 6 - Bottom of the core (-3-3.6m) in the window sample tube (Units 3-4)



Fig. 7 - Fractured bedrock exposed in the SPT sampler barrel at -3.6m

Project:

Caerlaverock Castle (PIC182) Boardwalk renewal: soil investigation Watching Brief



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