



Archaeological Watching Brief
Construction of Rock Armour Sea Defences
Inchcape Park Arbroath, Angus

AB25

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**ARCHAEOLOGICAL WATCHING BRIEF
INCHCAPE PARK, SEA DEFENCES
ARBROATH**

AB25

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Illustration 1: Site location plan

Illustration 2: Features revealed in Watching Brief

Illustration 3: Sections, section 06 and section 07

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ABSTRACT

During the period 1-22 September 2011, Alder Archaeology Ltd carried out a watching brief (Alder site code AB25) for Angus Council Infrastructure Services on coastal defence work at Inchcape Park, Arbroath, Angus. The coastal defence work was centred on NGR N0 640 402 and comprised the demolition of the existing red sandstone revetting wall, and a later concrete wall, and the grading of deposits behind these walls for the construction of a rock armour revetment. The work also included the replacement of a concrete slipway.

The site was considered to be archaeologically sensitive because the works lay in the vicinity of three known archaeological sites, which had produced a sculptured stone, medieval pottery and a long cist burial. These sites all suggested Early Medieval or Medieval period activity in the area, and it was believed that there was a high probability of archaeological deposits being unearthed during the construction works.

The watching brief recovered a moulded or sculptured stone, possibly Medieval, from the foreshore in front of the sea wall. Part of a wall feature aligned NE-SW and constructed of beach cobbles bonded with light brown mortar was revealed below turf and topsoil at the excavation top edge. No other deposits or finds of archaeological significance were encountered.

1 Background

1.1 Introduction

Angus Council, Infrastructure Services commissioned Alder Archaeology to undertake an archaeological watching brief (site code AB25) on the site of coastal defence works at Inchcape Park (centred on NGR N0 640 402), Arbroath. The works comprised the demolition of an existing red sandstone wall, a concrete revetting wall and a slipway, for the construction of rock armour sea defences and a new slipway.

The works lay in the vicinity of three known archaeological sites which had produced a sculptured stone, medieval pottery and a long cist burial. These sites all suggested Early Medieval or Medieval period activity in the area, and it was considered that there was a high probability of archaeological deposits being unearthed during the construction works which required cutting of the ground behind the sea walls to create a 2.5:1 slope for the laying of the rock armour.

The watching brief was undertaken in several visits during the period 1-22 September 2011, mainly in good weather conditions. The requirement was to archaeologically monitor the ground breaking works to provide information on any previously unrecorded archaeological features, deposits or finds. Special attention was to be paid to the possibility of encountering archaeological remains dating from the Medieval period.

The work was designed to satisfy the archaeological condition on development application reference (11/00105/FULL).

1.2 Aims and Objectives

The main aim of this watching brief was to record presence/absence, date, character and quality of any archaeological remains surviving within the development area for the new rock armour sea defences at Inchcape Park.

1.3 Reporting

The present document has been prepared as the final report on this watching brief. Copies will be sent to the client, The Royal Commission on the Ancient and Historical Monuments of Scotland the Angus Council Sites and Monuments Record.

1.4 Planning and Curatorial Issues

This watching brief is the final part of a programme of archaeological work designed to satisfy the outstanding archaeological condition on the planning consent for this development.

1.5 Acknowledgements

We wish to thank Peter Morton of Angus Council Engineering and Design Services, Roads Division, and Clerk of Works Neil Craske for their assistance and on site advice throughout this project. Thanks are also due to Bruce Mann of Aberdeenshire Council Archaeology Service for his advice and help with the project. The watching brief was fully funded by Angus Council Infrastructure Services.

2 Details of Work

2.1 The Site (Illus 1)

The site is located on the W side of Arbroath at Inchcape Park between Greyfield Park (Arbroath FC) and the Signal Tower Museum and adjacent to a sewerage pumping station. It consists of that part of the Inchcape Park coastline between the S end of the red sandstone revetting wall at NO 63971 40213 and a concrete ramp onto the beach at NO.64014 40298, a distance of approximately 115m. The turf or crest level adjacent to the demolished wall, at the top edge of new rock armour is at 5.50m AOD.

At the site S end was wall (01), a revetting seawall 40m long, of mainly red sandstone blocks. The S end of wall (01) terminated by curving into shoreline. Abutting the base of wall (01) was a more recent concrete apron (02), 0.70m thick and about 3m wide. The concrete apron also contained small sea boulders and some large reused red sandstone blocks. Wall (01) extended below the surface of the concrete apron by 0.70m.

The N end of wall (01) had been demolished and a concrete wall section (04) 9m in length had been built in its place. The concrete wall (04) was at the S end of a row of concrete buttresses forming an outer sea defence erected for the harbour in the 1960's. Two of these buttresses were demolished for the construction of the new rock armour.

From the N end of concrete wall (04) a stone built wall (34) curved to the NW which abutted another stone built wall (35), 7.30m in length aligned NE. Continuing from wall (35) to the NE was wall (36), 32m in length. Located at the N end of wall (36) was the concrete vehicle ramp (37) leading onto the beach. Wall (36) formed the E edge of the sloping ramp.

A sewage pumping station, built in the 1980s, stands 25m to the W of the seawalls at the N end of the site. On either side of the pumping station are two buried large bore storm outfall pipes, one extends below the sea wall (01) on the S side and the other below the concrete ramp (37) on the N side.

2.2 Archaeological Potential

The works lay in the vicinity of three known archaeological sites. The first, National Monuments Record of Scotland card number NO64SW0203, is the findspot of a fragment of sculptured stone discovered on the foreshore and reported in 2001. The second, NMRS card number NO64SW51, relates to medieval pottery discovered in 1985 during the groundworks for the new sewage pumping station. Also found at the pumping station site in 1984 was a long cist, NMRS card number NO64SW50.

These three sites all suggest Early Medieval or Medieval period activity within the area, and it was considered that there was a high probability of archaeological deposits being exposed during the cutting back and grading to a slope of 2.5:1 behind the demolished seawalls for the construction of the new rock armour.

Cartographic evidence indicates that seawall (01) may date from around 1822 when Wood's map of that date shows a long structure named 'ropework' and an associated

building at the N end. The 'ropework' runs close to the shoreline and the N end is alongside the site of seawall (01). It is possible that the shoreline was reinforced with wall (01) at that time to protect the ropework from erosion. This is also the case for the 1st edition OS, 1859 map which clearly shows a seawall with the characteristic curved S terminus. So it appears that seawall (01) was definitely in place by 1859.

2.3 Archaeological Method

A photographic record was made of the seawalls and concrete ramp prior to the commencement of work. The watching brief monitored the dismantling of the red sandstone revetting wall (01), the solid concrete wall (04) and the S half of seawall (34). The deposits removed behind these walls for the regrading of the slope were recorded. Also monitored was the lifting of the concrete ramp (37) to the beach at the N end of the new works. The seawalls (35) and (36) were not demolished, and the rock armour revetment was abutted against them. As there was no dismantling of these walls no archaeological monitoring was required at these locations.

The work progressed from S to N. The sea wall (01) was taken down in sections and the deposits behind were cut back to form a 2.5:1 slope measuring 8m in length. The top edge of the slope was cut into the turf approximately 5m back from the wallhead. At the foot of the slope a trench was cut into beach deposits and edged with large stone to anchor the geotextile upon which was firstly laid small fragmented stone and then the large granite rock armour.

For recording purposes magnetic north was used (pointing towards the signal tower museum) and a hand held GPS was used to locate some edges and features.

2.4 Results of Investigations (Illus 2 and 3)

Architectural Stone (03)

Prior to the commencement of the works a large architectural building stone (03), measuring 0.9 x 0.49 x 0.24m was found on the foreshore at the edge of the concrete apron (02). One long edge was moulded and it was thought that the stone was possibly medieval. The stone most likely came from wall (01). The GPS location for the stone was NO64005 40229. The stone was removed to the store room in the signal tower museum.

Another stone (32) similar in size and with a moulded edge was found in the rubble of wall (01). The stone was very eroded and damaged, and most of the moulded edge was missing. For these reasons it was not retained.

Two large rectangular, red sandstone blocks (33) were resting on the surface of concrete wall (04) at its back edge. They measured 1.43 X 0.50 X 0.29m and 1.35 X 0.50 X 0.26. These stones were probably from part of wall (01) taken down when concrete (04) was put into place.

Red sandstone seawall (01) and concrete sea wall (04)

The demolished red sandstone seawall (01), was 40m in length, averaged 2.60m high and was 0.60-1.00m wide at the wall head and had a slight batter. It comprised mainly mortar bonded red sandstone, with c 15% grey sandstone, and some dark grey quarried whinstone with occasional small sea boulders. The wall contained many large plain rectangular cut blocks (re-used), of red sandstone, some of which had peckmarks. The

mid part and S part of the wall contained some brickwork repairs. At its S end, wall (01) curved into the shore line and was abutted by a recently constructed rock armour sea defence extending away from the site down the coast to the S. The N end of the seawall (01) had been demolished and replaced with by a modern concrete wall (04) which also abutted seawall (34).

Natural deposits behind the sea wall were observed below the turf and topsoil at the back edge of the machine cut. The turf and topsoil deposit was 0.40m thick. There were two variations of beach shingle. The uppermost, below turf and topsoil, was a mix of shingle and loam or bioturbated shingle (26) 0.60m thick. Below (26) was a clean, shell rich shingle which overlay bedrock at the bottom of wall (01).

One feature which was considered to predate wall (01) was observed at the top of the section. This feature was only seen in part and comprised part of the edge of a wall (28) aligned NE-SW. The wall was constructed of large beach cobbles, with a core of small beach cobbles and stone fragments bonded with a mid brown mortar. The wall remains were 1.60m wide and 1m high and over natural deposit (26). The function of this wall was not ascertained.

The makeup deposits at the back of seawall 01 at the S end were mixed and comprised sandy silt loam (10) below turf, fragmented stone (11), light brown gritty sand (12) and grey ash (13). Other infill deposits which formed tip lines down towards the back of wall (01) were two deposits of shale/slate chippings (18), mortar and stone fragments (19), large stone cobbles (22). A rough wooden pole or beam (14), 4.40m in length was observed at the base of the wall which may have been used in the construction of the wall.

About half way along wall (01) in the mid section, repair had taken place in the form of concrete pumped behind the wall face and the insertion of some steel reinforcing bars. The concrete had filled voids behind the wall and ran down the wall face through small openings. Other infill deposits were noted behind the concrete repair, comprising abundant loose small quarry stone, a deposit of light brown sand (29), black loam (30), some large stone mixed in with grey crushed sandstone and silt loam (31). Similar deposits to (31) were recorded at the N end of the wall. These included medium-large loose sea cobbles, and some bricks with no frogs in a matrix of dark silt loam. Of interest was a well preserved large mason's trowel was found in amongst the debris of the wall scattered on the beach but its exact context could not be confirmed.

Abutting the N end of wall (01) was the concrete section of seawall (04). Behind wall (04) at its S end, the N edge of a wide deep cut (41) was recorded. The backfill of the cut comprised sand, loam and crushed sandstone contexts (29-31). The cut had been made through a layer of compacted gravel and sand (40) and natural shingle. It was considered that this cut and fill represented the outfall pipe trench located on the S side of the pumping station; however there was no positive indication within the wall structure to show that the wall had been dismantled for the laying of the outfall pipe.

Other infilling deposits behind concrete wall (04) were crushed sandstone (38), broken up modern road tarmac (39) and brick, rubble mortar and sand.

Part of seawall (34) was also demolished and deposits behind this wall were mixed, comprising black silty loam, stone fragments and cobbles with occasional fragments of pantile (41).

Concrete ramp (37)

The concrete ramp or slipway (37) onto the beach was located at the N end of a grass and gravel slope, above wall (36). It was 14m long and 3.90m wide in mid section. Upon lifting the concrete was seen to be 0.20m thick.

The concrete was bedded on about 0.05m of clean sand. Below this were mixed deposits of disturbed beach sand and shingle. The bases of two metal posts (45) and (47) were recorded below the concrete of the ramp which may have been the remains of a barrier.

Deposit (48) was clean silty sand with sea cobbles and pebbles 0.10m thick. Below this was a dark compacted silty sand and lighter sand (49), only observed in a small trial pit. Deposit (49) may be infilling for the storm outfall pipe as it aligns with the outfall pipe observed at shore edge at low tide.

3 Interpretation

3.1 Architectural Stone (03)

The stone recovered from the foreshore and the similar one, found in the fabric of wall (01) may be medieval, suggesting they were originally sourced from a demolished medieval building. If indeed they are medieval then it is quite possible that the various other large worked rectangular blocks were also medieval and from the same source.

3.2 Red sandstone seawall (01) and concrete sea wall (04)

Natural deposits behind sea wall (01) were observed below the turf and topsoil at the edge of the machine cut. There were two variations of beach shingle. The uppermost, below turf and topsoil was a mix of shingle and loam or 'bioturbated' shingle (26) 0.60m thick. This 'bioturbated' shingle may have developed as a result of plant growth (roots) on the raised beach which sealed the clean shell rich shingle below. Bedrock below the wall (01) was quite soft and easily cut by the machine.

Infill deposits behind the demolished walls were quite varied and included ash, stone chippings, tarmac, loam, stone sand, etc and seem to have come from a variety of sources. The most modern were the sandy deposits in cut (41) for the outfall pipe, the concrete in the repaired section and the tarmac behind concrete wall (04). The only pottery sherds (only one kept) observed in earlier infill deposits were of 19th century date. The source of the earliest infilling (probably dating from the early 19th C) may have been nearby development sites such as buildings being erected along Lady Loan.

One feature was considered to predate wall (01). This was wall (28) which was only seen in part and comprised mortar bonded large beach cobbles, with a core of small beach cobbles. The function of this wall was not ascertained it was considered to predate wall (01) due to its rather crude construction. It is possible that wall (28) was associated with the site of the ropeworks marked on Wood's map of 1822.

The part of seawall (34) that was demolished had infill deposits behind it which were mixed, comprising black silty loam, stone fragments and cobbles with occasional fragments of pantile. The pantile inclusions suggest that demolition material of an earlier building were being used as infill.

3.3 Concrete Ramp (37)

The removal of the concrete ramp at the N end of the site revealed what appeared to be two bases for posts, (45) and (47) for a metal barrier. Below the makeup for the concrete sandy deposit (49) may have been back filling for the storm outfall pipe.

4 Conclusions and Recommendations

4.1 Conclusions

The moulded stone (03) found on the beach and thought to come from seawall (01) was possibly medieval, another similar but badly damaged stone (32) and some other undecorated rectangular stones in the wall may also be medieval. These stones, if indeed they are medieval suggest the reuse of stonework from a demolished medieval building.

The watching brief showed that to the rear of the main seawall (01) were mixed deposits of infilling dating from the wall construction and with various intrusion of more recent material for repairs and the insertion of an outfall pipe.

Of interest was part of a mortar bonded cobble wall (28) which could predate the seawall (01) and may have been associated with the early 19th C rope works. This showed that other early 19th foundations may well still survive below the topsoil of Inchcape Park.

4.2 Recommendations

Alder recommends that a specialist in the forms of medieval stonework should examine stone (03) in order to establish its date.

4.3 Recommendations for Further Work

Since all groundbreaking work on the site is now complete no further archaeological monitoring visits are required.

5 References

Aberdeenshire Council Archaeology Service 2011 *Scope and Framework of an Archaeological Watching Brief for Coastal Defence Works at Inchcape Park Arbroath*

Cartographic sources

Wood, John *Plan of the Town of Arbroath from actual survey* Edinburgh 1822

Ordnance Survey Six-inch 1st edition, *Forfarshire, Sheet XLVI*, published 1865

Ordnance Survey 1:500 *Town Plan of Arbroath XLVI.15.13 and XLVI 15.18* surveyed 1859 published 1864

Appendix 1 Context Register

No:	Description
01	Structure, sea wall, mainly red sandstone, with c 15% grey sandstone, and some dark grey whinstone, occasional small sea boulders, slight batter, 2.60m high, 40m long and 1m thick at top; many rectangular cut blocks (re-used), some with peckmarks S end is curving into beach slope N end has been partly demolished a replaced with modern concrete wall ctx 04; at base of wall ctx 01 there is a more recent concrete apron ctx 02
02	Structure, apron or toe at bottom of sea wall 01, c 0.70m high (thick) 2.3m wide, abutting and bonded to lower courses of ctx 01 modern concrete some iron reinforcing, with inclusions of small sea boulders also has inclusions of worked rectangular blocks of red sandstone, shallow slope to sea, extra protection at foot of sea wall
03	Architectural stone 0.92m X 0.49 X 0.24m high, one long edge is moulded, red sandstone, possibly medieval, wave worn found on beach at foot of apron ctx 02 close to wall most likely came from wall (01); GPS location 64005 40229, moved to store room in signal tower museum
04	Structure, recent reinforced concrete forming N end of sea wall ctx 01, 8.70m long, 3.10m high and 3.20m at its N end and c 1.30 wide at its S end, abutting curving sea wall ctx 34; this forms the S end of a set of concrete piers or buttresses put into place between the seawall ctx 01 and the 19 th C breakwater approximately 95m to the NE
05	General area at top of sea wall and between wall and grass c 1.5m wide, where it is washed by overtopping waves, abundant random large red sandstone rubble, some mortared together, some large rectangular blocks, rubble no doubt comes from demolished part of seawall ctx 01 when concrete ctx 04 replaced it
06	Turf and topsoil, cut grass at top edge of seawall, has been cut into in places to a depth of 0.60m
07	Deposit, below turf ctx 06 dark brown silty loam with mortar, glass, cement, mixed modern make up behind sea wall
08	Deposit, medium sized fragmented red sandstone backing behind sea wall as observed upon demolition of sea wall
09	Deposit, natural shingle and beach cobbles below apron ctx 02
10	Deposit, sandy silt loam makeup behind ctx 01
11	Deposit, fractured flat stone, part of makeup behind wall ctx 01
12	Deposit, light brown gritty sand, below ctx 10 and ctx 11, makeup behind wall ctx 01
13	Deposit, grey ash, below ctx 12, makeup behind wall ctx 01
14	Wooden pole, eroded, 4.4m in length, at rear of wall ctx 01, may have something to do with construction of wall
15	Deposit, black ash with shale chippings, 0.10m thick, part of fill/makeup to rear of wall ctx 01

16	Deposit, mortar and stone frags, 0.25m maximum thickness, demolition rubble below ctx 15
17	Deposit, loose stone fragments, medium sized, makeup max 0.60m thick below ctx 16
18	Deposit, black shale chippings, max 0.60m thick, below ctx 17
19	Deposit, sandy mortar, occasional brick fragments, demolition rubble makeup below ctx 18
20	Deposit, shale chippings, 0.60m thick, below ctx 19
21	Deposit, natural shell rich beach gravel/single below bioturbated shingle ctx 26
22	Deposit, large sea cobbles, in matrix of black clay loam, behind mortared stonework of sea wall ctx 01
23	Deposit, red sandstone blocks, part of packing below ctx 22, behind ctx 01
24	Structure, redundant saltglaze sewer pipe extending below turf towards sea, likely from former buildings in this area close to seawall ctx 01
25	Deposit, black silt, mortar, some ash, makeup below turf
26	Deposit, natural bioturbated, beach material, shingle, below turf and topsoil ctx 06 and over natural shell rich beach deposit with no bioturbation.
27	Concrete, behind wall ctx 01, looks like it has been pumped in located at around chain 40
28	Structure, wall feature, revealed below turf and topsoil at excavation edge, only seen in part, face constructed of large beach cobbles, light brown mortar, core of small beach cobbles and stone fragments, 1.60m wide and 1m high over natural deposit 26, part of wall aligned NE-SW, purpose not ascertained
29	Deposit, light brown sand fill, abutting wall ctx 28 on its NE side, modern glass found in this c 0.50m thick, slopes down to wall ctx 01
30	Deposit, black loam, max thickness 0.30m, modern cloth in this, part infill behind wall ctx 01, below ctx 29
31	Deposit, grey, crushed sandstone mixed with grey clayey silt, some large stone inclusions, infilling, below ctx 30
32	Moulded stone, from wall ctx 01, very eroded and damaged, 1.07 X 0.52 X 0.20m thick, with moulded edge not much of moulded edge intact, not retained, similar to stone ctx 03,
33	Two large rectangular, red sand stone blocks, resting on surface of concrete wall ctx 04, 1.43 X 0.50 X 0.29m; 1.35 X 0.50 X 0.26m, probably from part of wall taken down when concrete ctx 04 put into place.
34	Structure, sea wall, to N of concrete wall 04, curves to NNW, abuts sea wall ctx 35, 3.30m high, quarry blocks of red and grey sandstone average size 0.70 X 0.20m, uneven rough face, recently repointed, wall is 0.65m thick, this wall will not be demolished
35	Structure, sea wall, 7.30m long to N of wall ctx 34, 2.65 high, large sea cobbles, some shaped red sandstone blocks at base of wall, facing stones average 0.23 X 0.22m, some larger red sandstone, 0.50 X 0.13m, wall length is 7.30m, rounded N end and abutting wall 36, not being demolished
36	Structure, sea wall, 32m long, 2.90m high at S end and dropping down to beach level at N end

	increase in batter (stepped out) by c 1m at base, comprises large sea cobbles with large angular blocks of quarried red sandstone, some large grey sandstone, generally of mixed stone of differing sizes, top coped with sea cobbles, also concrete or ramp along top edge, heavily repointed, relatively smooth face, not to be demolished.
37	Structure, concrete ramp or slipway onto beach, at N end of grass and gravel slope, above wall ctx 36, 14m long and 3.90m wide in mid section, concrete 0.18m thick
38	Deposit, crushed red and grey sandstone and reused road tarmac at rear of concrete wall ctx 04
39	Deposit, type 1 gravel, with some loose tarmac, packing to rear of concrete wall ctx 04 at its N end
40	Deposit, layer of mixed deposits, 0.60m thick, below topsoil and turf 0.25m thick, compacted layers of crushed coal, some brick rubble, white mortar and sand over bioturbated shingle ctx 26, packing/fill to rear of wall, may be to do with demolition and levelling of former buildings at this location
41	Deposit, fill behind wall 34, black silty loam, some sea cobbles, occasional fragments of pantile fill to rear of wall 34, extends back c 4m
42	Cut, through ctx 40 and ctx 26, steeply sloping contains layers of sand and crushed sandstone
43	Deposit, natural sand and shingle at base of seawalls (35) and (36)
44	Deposit of clean sand below concrete of ramp or slipway
45	Structure, metal base for post or flange, centre of ramp and 7.60m to the S of N end of ramp
46	Deposit, spread of fragmented stone, infill behind sea wall (36)
47	Structure, metal base for post or flange, centre of ramp and 5.90m to the S of N end of ramp on the W edge of the ramp
48	Deposit general surface after removal of concrete and clean sand, silty sand with sea cobbles and pebbles 0.10m thick
49	Deposit, below dark compacted silty sand and lighter sand, only observed in small trial pit, may be infilling for storm outfall pipe as it aligns with outfall pipe observed at shore edge at low tide

Appendix 2 Photographic Register

<i>Image No</i>	<i>Description</i>	<i>View</i>
	09.01.2011	
001	General of slipway onto beach	S
002-003	General of slipway and seawall	NW
004-005	General of seawall	NW
006-007	General of seawall	W and SW
008-009	General of seawall	NW and SW

010-011	General of seawall	W and NW
012-013	General of seawall concrete part	SW and W
014-015	General of seawall, concrete part	SW and NW
016-017	General of seawall	NW
018-019	General of seawall	NW
020-021	General of seawall	NW and N
022-023	General of seawall S end	W
024	General of seawall	N
025	Sea defences concrete buttresses	NE
026	Erosion at wall head of sea defences	SW
027-036	Architectural or moulded stone found on beach ctx 03	various
037-038	Concrete sea defence buttresses	N
039-041	Detail of wall 01 facing stones	NW
042	Concrete sea defence buttresses	SE
	09.02.2011	
43-44	General of concrete sea defence buttresses	SE
45	General towards main harbour	NE
46	Machine working on site	SW
47	Lorries carrying large rock armour	N
48-50	Machine working on site	NE
51-52	Top of seawall	SW-S
53	Top of seawall	NE
54	Rock for new work	SW
55	Top of seawall	NE
56	Detail, of edge of erosion of turf and topsoil ctx 07	NW
57	General of eroded edge ctx 07	SW
58-59	General start of work on seawall	NW
60-63	Machine on beach	SE

64-65	Red sandstone blocks imbedded in concrete of apron at base of sea wall ctx 02	SW and NE
66-68	Machine demolition of seawall	W
69	Machine demolition of seawall	N
70	Ctx 08 red sandstone fragments	NW
71	Machine demolition of seawall	N
72	Deposit ctx 13 ash	NW
73	Seawall and ctx 13	N
74	Makeup deposits behind sea wall	N
75-77	Makeup deposits behind sea wall	N
78	Forming slope for formation level	N
79	Machine working cutting back to form slope	N
80-81	Getting angle of slope correct	N
82-84	Reduction behind seawall for slope, revealing natural beach deposits	SW
85	Ctx 14, wooden beam, when first found	W
	09.03.2011	
86	Machine on beach	S
87-88	Deposits behind seawall	NE
89-90	Deposits behind seawall and seawall in section	NE
91-94	Forming slope	N
95-96	Showing section of seawall	N
97-99	Deposits behind seawall	NW
100-101	Ctx 14 wooden pole removed to beach	NE and SW
102-103	Putting down geotextile	SW
104-105	General working	W
	09.05.2011	
106-107	General working with machine grading slope	N
108	Demolishing seawall	N
109-113	Ctx 22 sea cobbles at rear of seawall	N

114-115	Finished formation level and slope	N
116	Demolition of seawall from wall head	N
117-119	Machines working from below and above the seawall	N
120	Showing ctx 26 biturbated beach shingle through which a modern drain has been cut	NW
121	General view showing beach shingle being exposed behind the sea wall	N
122	Fill at rear of seawall and section of seawall	N
123	Machine breaking out concrete apron ctx 02	N
124-126	General working of machines	NW and SW
127	Fallen sea defences concrete buttresses	N
128	Machine pecking out concrete of apron ctx 02	SW
129-130	Section of seawall, showing concrete at the rear	N
131-133	Concrete ctx 27 and stone fragments at rear of seawall	N
	09.06.11	
134	General view of working	NE
135-138	Showing concrete and boulders of apron ctx 02	NE
139-140	Machine pecking out seawall	SW
141	General working	NW
142	General view of N end of seawall works	NW
143	General fill behind seawall	N
144-145	General pecking out of seawall	N
146-149	General pecking out of seawall	N
150-152	General wall demolition rubble and fill behind wall	N
153	General demolition of wall	N
154-155	Earlier wall feature ctx 28	NW
156-157	Earlier wall feature ctx 28	W
158-162	Section of deposits to rear of seawall	NE
163-164	Forming formation level slope	NE
	09.07.2011	

165-166	Detail of section of apron 02	NE
167-168	Deposit, sand ctx 29	NE
169	General of work towards N end of wall 01	N
170-171	General of new rock armour	N
172-173	General demolition of seawall ctx 01	W
174-177	General demolition of seawall ctx 01	SW and W
178-181	Very worn moulded stone ctx 32	Various
182	General removal of spoil from behind wall ctx 01	N
183-186	Section of wall ctx 01 adjacent to concrete wall ctx 04	N and NW
187-189	Forming slope at formation level	N
190	Showing fill of grey crushed sandstone ctx 31	NW
191-192	Concrete buttresses sea defences	NE
193-197	Large squared stones ctx 33 on concrete wall ctx 04	Various
198	Section of rock armour	SW
	09.08.2011	
199-200	Pecking out concrete wall ctx 04	N and SW
201	General view of works	NW
204	Concrete rubble from wall ctx 04	SW and NW
205-206	Context 28, mortar bonded wall	NW
207	Pecking out concrete wall ctx 04	SE
208-209	General view to harbour	N
210-212	Sea wall ctx 34	SW and W
213-214	Sea wall ctx 35	NW
215-216	Sea wall ctx 36	NW-SW
217	Sea wall ctx 36	N
218	General sea walls 34,35, 36	SW
219-220	Concrete ramp down to beach ctx 37	SW
221-222	Pecking out concrete wall ctx 04	N

223	General machine moving between sea defence concrete buttresses	NE
224-227	Context 38, deposit behind concrete sea wall ctx 04	NE
228-233	Context 38, deposit behind concrete sea wall ctx 04	N
234	General machine working on concrete sea defence buttresses	N
235-239	Deposit ctx 39 tarmac and type 1 gravel behind wall ctx 04	N
240-242	General grading the slope behind concrete wall ctx 04 after its demolition	NW
243-244	General grading the slope behind concrete wall ctx 04 after its demolition	SW
245-246	General grading the slope behind concrete wall ctx 04 after its demolition	SW and N
247	General deposits behind demolished concrete wall ctx 04	NE
248-249	Mixed deposits ctx 40 below topsoil	NW and N
250-252	Deposit ctx 39, tarmac and type 1 behind demolished concrete wall 04	N
253	Formation level slope complete	N
	09.13.2011.	
254-257	Deposits behind sea wall ctx 35	N
258-259	Cutting back deposits behind sea wall ctx 35	SW
260	General formation level of slope behind wall ctx 35	S
261-265	Machine removing a concrete buttress	Various
	09.21-22.2011	
266-268	General of ramp ctx 37	SE
269-270	General working on rock armour at edge of ramp ctx 37	SE
271	General view of completed rock armour	N
272	General view working on rock armour at edge of ramp ctx 37	S
273	General view working on rock armour at edge of ramp ctx 37	SE
274-275	General view working on rock armour at edge of ramp ctx 37	SW
276	General view towards signal tower museum	N
277	General view of foreshore	N
278	General view of foreshore	NE
279-280	General view removing concrete ramp ctx 37	SE

281-282	General view removing concrete ramp ctx 37	SE
283-285	General view removing concrete ramp ctx 37	S
286-287	Metal post base ctx 45	S
288	Deposit ctx 46	S
289	Metal post base ctx 47	
290-291	General of surface after removal of concrete (37)	N
292	General view to SW showing alignment of outfall pipe at shoreline at low tide	E

Appendix 3 Drawing Register

<i>Sheet No.</i>	<i>Description</i>	<i>Scale</i>
1	General notes, field sketch (section 1 and plan 2) of architectural detail stone ctx 03: section 02 of ctx 06 and 07	1:10
2	General notes, field sketch; section 3 ctx 10-13 not to scale; section 4, ctx 15-21; section 5 ctx 25, 26 at 1:20	1:20
3	General notes; field sketch section 6 ctx 29-31 not to scale;	
4	General notes; section 7 ctx 25, 26, 29-31 40 and cut 42	1:20
5	General notes; field sketch concrete buttress, not to scale	

Appendix 4 Finds Register

AB25 Finds List

Context	Material type	Details
29	Glass	1 clear bottle neck, moulded; slightly denatured 1 clear bottle base; slightly denatured
30	Pottery	1 sherd tin-glazed earthenware, glazed white
unstratified	Iron, wood	Large, complete plasterer's trowel with iron blade and socketed wooden handle.

		Mortar/plaster adhering
unstratified	Stone	Worked stone. Now located in Arbroath Signal Tower Museum

Appendix 5 Discovery & Excavation in Scotland Entry

LOCAL AUTHORITY:	Angus Council
PROJECT TITLE/SITE NAME:	New Sea Defences at Inchcape Park, Arbroath
PROJECT CODE:	AB25
PARISH:	Arbroath & St Vigeans
NAME OF CONTRIBUTOR(S):	Ray Cachart
NAME OF ORGANISATION:	Alder Archaeology Ltd
TYPE(S) OF PROJECT:	Watching Brief
NMRS NO(S):	NO64SW50; NO64SW0051; NO64SW298
SITE/MONUMENT TYPE(S):	Sea wall
SIGNIFICANT FINDS:	Moulded building stone possibly medieval
NGR (2 letters, 8 or 10 figures)	NO 6400 4024
START DATE	1 September 2011
END DATE	22 September 2011
PREVIOUS WORK (incl. <i>DES</i> ref.)	DES 1984, 37 Arbroath, <i>Medieval Grave</i> . DES 2001, 15 <i>Carved Stone</i> Benvie, R DES 1985, 61 Arbroath Burgh, <i>Medieval Pottery</i>
MAIN (NARRATIVE) DESCRIPTION: (May include information from other fields)	During the period 1-22 September 2011 Alder Archaeology Ltd carried out a watching brief (Alder site code AB25) for Angus Council, Infrastructure Services on coastal defence work at Inchcape Park, (centred on NGR NO 640 402) Arbroath, Angus. The coastal defence work comprised the demolition of the existing red sandstone revetting wall, and a later concrete wall and the grading of deposits behind these walls for the construction of a rock armour revetment. The work also included the replacement of a concrete slipway. The site was considered to be archaeologically sensitive because the works lay in the vicinity of three known archaeological sites which had produced, a sculptured stone, medieval pottery and a long cist burial. These sites all suggested Early Medieval or Medieval period activity in the area and it was

	considered that there was a high probability of archaeological deposits being unearthed during the construction works. The watching brief recovered a moulded or sculptured stone, possibly Medieval, from the foreshore in front of the sea wall. Part of a wall feature aligned NE-SW and constructed of beach cobbles bonded with light brown mortar was revealed below turf and topsoil at the excavation top edge. No other deposits or finds of archaeological significance were encountered.
PROPOSED FUTURE WORK:	None
SPONSOR OR FUNDING BODY:	Angus Council
CAPTIONS FOR ILLUSTRS	
ADDRESS OF MAIN CONTRIBUTOR:	Alder Archaeology Ltd, 55 South Methven Street, Perth PH1 5NX
ARCHIVE LOCATION (intended)	NMRS
EMAIL ADDRESS:	Director@AlderArchaeology.co.uk

Appendix 6 Standard Terms of Reference for all Fieldwork

6.1 Recording Methodology

Alder Archaeology employs a Single Context Recording System that allows full cross-referencing of stratigraphy, finds and environmental samples, as well as site-wide phasing. All features will be planned at scale 1:20, and sections drawn at scale 1:10. Sections and profiles will be drawn and all features will be photographed with metric scale included. Environmental samples will be taken from archaeologically significant contexts, if the analysis of these samples would aid significantly in the interpretation of any features identified.

6.2 Human Remains

If human remains are encountered they will be left in situ and the local police will be informed. If removal is required this will take place in compliance with Historic Scotland's Policy Paper *The Treatment of Human Remains in Archaeology*.

6.3 Products and Reporting

A Data Structure Report will normally be prepared within a period agreed within the Written Scheme of Investigation/ Project Design, after the completion of the fieldwork. This forms the basic level of reporting. Further reporting may be required on the basis of discoveries made during excavations.

A copy of the report and the project archive will be deposited in the NMRS. Further copies will be sent to the client, LAAO and others, as appropriate.

6.4 Artefacts

Finds of objects will be subject to the Scots Laws of Treasure Trove and *Bona Vacantia*. We will report such finds, if recovered, with supporting documentation to the Secretariat of the Treasure Trove Panel for disposal to the appropriate museum.

6.5 Discovery and Excavation in Scotland

A brief summary of the results will be submitted to *Discovery and Excavation in Scotland*.

6.6 General Conditions and Health and Safety

We adhere to the Code of Conduct of the Institute for Archaeologists.

Alder Archaeology Ltd has public liability insurance of £2,000,000. Details of this can be provided on request.

We operate a strict health and safety policy and conforms to the Health and Safety at Work Act. We undertakes Risk Assessments on all fieldwork carried out.

Alder Archaeology representatives will at all times wear protective footwear, high visibility clothing and other appropriate clothing. Hard hats will be worn if there is active plant on site or at all times if the site is deemed a hard hat area.

If lightly contaminated deposits are uncovered disposable boiler suits and gloves will be worn. A source of clean water will be made available for staff to clean hands with. If the health risk posed by site contamination is felt to be too high all further archaeological work will stop in that area.