

AARE11/001



ABERDEEN AIRPORT RUNWAY EXTENSION, DYCE, ABERDEEN: RESULTS OF AN ARCHAEOLOGICAL WATCHING BRIEF

for BAA Scotland

June 2011

PROJECT SUMMARY SHEET (AARE11)

Aberdeen Airport Runway Extension, Dyce, Aberdeen: Results of an Archaeological Watching Brief

Client	BAA Scotland
National Grid Reference	NJ 87564 13517
Address	Aberdeen Airport, Dyce, Aberdeen
Parish	Dyce
Council	Aberdeen City Council
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Fieldwork	Dave McNicol, Don Wilson & Ian Hill
Fieldwork	14 th March – 6 th May 2011
Report	May 2011
Oasis Ref No.	headland1-101408

EXECUTIVE SUMMARY

Headland Archaeology Ltd undertook a watching brief at the site of a runway extension at Aberdeen Airport, Dyce in order to identify and record any archaeological remains that might be exposed by construction works. The work was commissioned by SKM Enviros on behalf of BAA Scotland, and a specification was agreed with Aberdeen City Council. An Environmental Statement had previously identified the potential for previously unrecorded archaeological remains to survive on the site.

The foundations and floors of a number of structures relating to the use of Aberdeen Airfield by the RAF in WWII were uncovered; as were two small undated pits. No other archaeological features were uncovered during the watching brief.

CONTENTS

1. INTRODUCTION	4
Site description & background	4
2. METHOD	5
The nature of the development and the proposed archaeological response	5
Objectives	6
Methodology	6
Archaeological topsoil strip monitoring	6
Recording	7
Reporting and Archive	7
3. RESULTS	7
Watching Brief Area B	7
4. DISCUSSION	9
5. REFERENCES	10
6. APPENDICES	11
Appendix 1 – Photographic register	11
Appendix 2 – Context register	12
Appendix 3 – Discovery and Excavation in Scotland	14

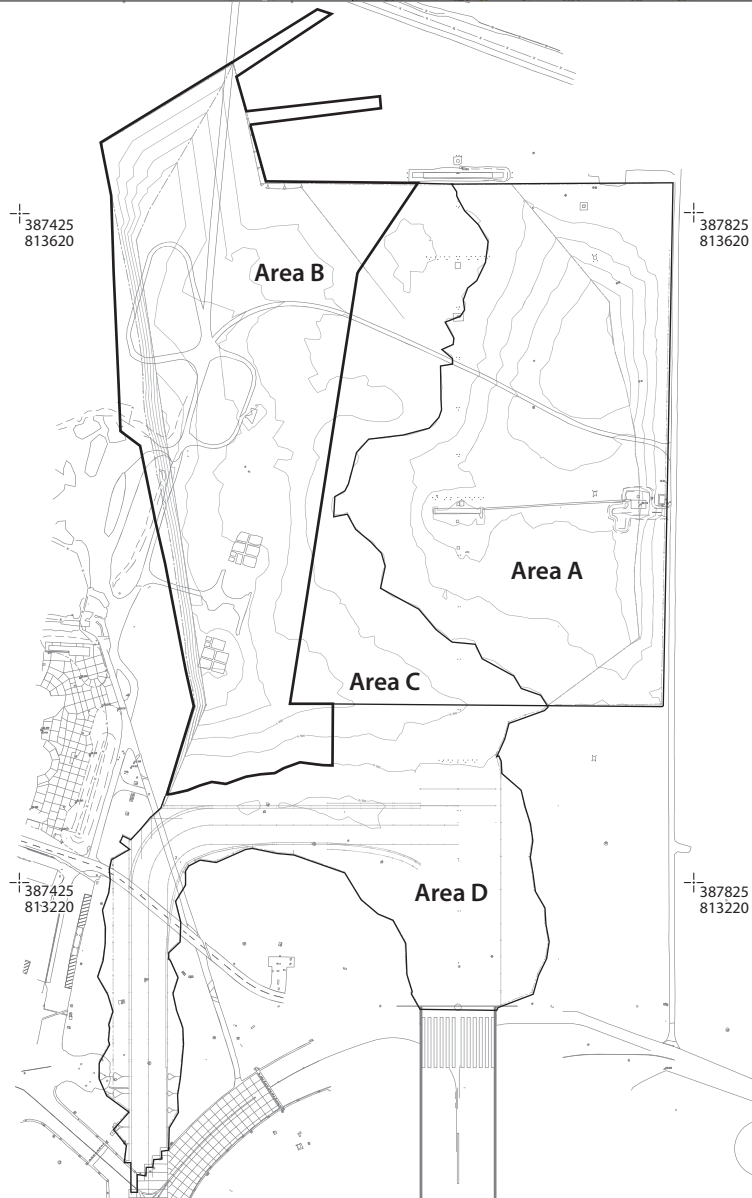
LIST OF ILLUSTRATIONS

- 1) Location plan
- 2) Plan of the monitored area
- 3) View of Feature B facing S
- 4) View of Feature D facing N
- 5) General view of Features E & F facing S
- 6) Detail of section through Cut 004
- 7) Detail of section through Cut 006
- 8) General view of site facing S



Aberdeen Airport
Dyce
Aberdeen

0 100km



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Scale 1:4,500 @ A4



0 200m

Illus 1
Location plan

1. INTRODUCTION

This report presents the results of an archaeological watching brief, carried out in response to a planning condition on the development of a runway extension at Aberdeen Airport, Dyce. The work was carried out in accordance with a Written Scheme of Investigation prepared by Headland Archaeology (UK) Ltd and approved by the planning authority (Aberdeen City Council).

An Environmental Statement (ES) had been produced by SKM Enviros in 2006, which considered the impacts of the proposed works on cultural heritage and archaeological features (Chapter 9).

Site description & background

Aberdeen Airport is situated approximately 1km to the west of Dyce. The runway extension lies at the northern end of the airport on open grassland and is centred on NGR NJ 87564 13517 (Illus 1). The site was divided into four separate zones (Areas A – D) based on the limits of the instrument landing system (ILS) and the requirements of the development. The limits of these areas are discussed further below. The initial watching brief area (Area B) outside the ILS zone was bounded by the functioning airport to the east and south, by an oil pipeline to the north, and grassland to the west.

A general potential for previously unknown sites unrelated to the airfield was suggested in the ES because of a significant number of prehistoric features listed in the NMRS from the surrounding area including a possible cairn (NJ81SE 0043) and a number stray finds of prehistoric artefacts including stone axes (NJ81SE 21), flint tools (NJ 81SE 22 & 30) and carved stone balls (NJ81SE 13 & 18).

The Environmental Statement identified two known features subject to direct impacts by the development works. These are the sites of World War II type-27 pillboxes (NMR: NJ81SE 44.02 & NJ81SE 44.03), known from aerial photographs taken in 1941. Nothing was visible above ground, but it was unknown whether anything remained of them immediately below ground.

Aberdeen Airport was established in 1934 by Eric Gander Dower and was intended to link the northern islands of Scotland with London. During World War II it became an RAF base, used mainly for aerial reconnaissance, although fighter planes were stationed here to provide protection from German bombing raids originating in occupied Norway. One of the main squadrons based at the airfield, No. 612 squadron, was formed at Dyce in 1937 as an army co-operation unit of the auxiliary air force. They converted to a general reconnaissance role in 1939 flying Avro Ansons. One famous incident that took place at the airfield in May 1943 involved the landing of a German Junkers Ju88 bomber. According to sources the aircraft surrendered and was guided to the airport by spitfires (Simpson 2007).

The airport was subsequently nationalised in 1947 and was transferred to control of British Airports Authority (BAA) in 1975. As Aberdeen became the largest oil-related centre in Europe the airport became the world's largest heliport.

The base geology of the area comprises Aberdeen Pluton foliated granite of the Ordovician period with a mix of superficial geology comprising alluvial deposits of Flandrian clay and silt along with areas of Devensian Locton sand and gravel formations (BGS 2011).

2. METHOD

The nature of the development and the proposed archaeological response

The archaeological response was designed in response to the type of ground disturbance associated with the development and the operational requirements of the airport (Illus 2). The planning application covered the construction of 120m of runway extension, and the landscaping of an area of land at the end of the runway to meet the stringent requirements for operating the instrument landing system (ILS). These systems provide both lateral and vertical guidance to aircraft, and are highly sensitive to obstructions and even minor terrain deviations in the signal broadcast area. This meant firstly that no work at all could take place in the ILS critical area while it was operational, and secondly, no open trenches or spoil heaps could be left in the critical area during operational hours.

The planning application area was divided into 4 main zones:

1. Bulk earthworks fill area (Area A; within ILS critical area)
This area was not subject to any topsoil stripping. No archaeological response was therefore necessary in this area.
2. Bulk earthworks cut area (Area B; outside ILS critical area)
This area, excluding roads, services and hard standings, was subject to a watching brief during topsoil stripping operations according to the methodology set out below. This area comprises 41, 620 sq m.
3. Bulk earthworks cut area (Area C; within ILS critical area)
A watching brief was considered to be too high risk in terms of possible delays and failure to restore the ground surface within the critical area, preventing flights from operating. The following course of action was proposed:
 - Take into account the results of the watching brief on the substantially larger Area B – if no significant archaeological remains were found outside the critical area, the potential of Area C can be considered negligible and no further archaeological work would be undertaken.

- If significant archaeological remains are found in Area B which cross into Area C, limited test pitting would be carried out to sample excavate the portions of those archaeological features within the critical area.
4. Runway extension (Area D; within the ILS critical area)
A more detailed desk-based study was carried out to establish the precise location of the site of the pillbox (RCAHMS NJ81SE 44.3) and compare this with plans of known services and underground installations at the end of the runway.

Soil test pits excavated during ground investigation works at the end of the existing runway in 2006 indicate that this area has already been subject to disturbance from earlier landscaping work – made ground including asbestos tiles and brick fragments was found up to 0.90m in depth. Although the potential for survival seems low, arrangements will be set in place to record the pillbox should in situ remains be discovered. The likelihood of any other remains surviving is considered to be negligible in this area.

Objectives

The objectives of the archaeological work were:

- to evaluate the potential for previously unknown archaeological remains to survive on the development site
- to undertake appropriate mitigation of direct impacts of the development on known and any previously unknown archaeological remains which might be discovered, through archaeological recording and excavation

Methodology

Archaeological topsoil strip monitoring

Ground breaking works were archaeologically monitored at a ratio of one monitoring archaeologist to each machine undertaking topsoil stripping. Isolated features or artefacts were recorded according to normal watching brief methodology, with up to one hour stoppage time per find considered reasonable to record and sample such features.

The excavation of soft deposits was mainly undertaken using a tracked mechanical excavator with a flat-edged bucket, although limited use of a bulldozer was also undertaken. Any small features of archaeological significance revealed were recorded in accordance with the codes of practice and current guidance provided by the Institute for Archaeologists (IfA).

Recording

- All recording followed standards and guidance as set out by the Institute for Archaeologists.
- All contexts, small finds and environmental samples were given unique numbers.
- Colour transparency and print photographs were taken. A full register can be found in Appendix 1
- An overall site plan was recorded at 1:2000 relative to the National Grid
- Sections and elevations were drawn at 1:10
- All recording was undertaken on *pro forma* record cards. A full register of contexts can be found in Appendix 2

Reporting and Archive

The results of the investigation were communicated verbally to the client and City of Aberdeen Council immediately on completion of fieldwork. This report presents the results of this work.

The complete project archive will be deposited with the National Monuments Record of Scotland (NMRS) within six months of the completion of the project. A summary report will be prepared for submission to *Discovery & Excavation in Scotland* a copy of which can be found in Appendix 3, and the work has also been recorded on the OASIS database (headland1-101408).

3. RESULTS

Watching Brief Area B

A number of features (A-G; Illus 2) were recorded during the watching brief, all of which were adjacent to existing concrete roads that related to the development of the airfield during WWII. These roads formed a series of small sub-oval loops off a central north/south aligned road located away from the main offices and runway of the airfield.

Feature A, which was located near the western edge of the site, comprised the remains of a series of concrete foundations forming a rectangular shaped base immediately below the turf. Immediately south of the concrete foundations was a foundation layer of a brick wall bonded with cement running approximately north-south abutting the concrete road. Again this was revealed just below the turf, no more than 0.10 m below the current ground level.

Feature B (Illus 3) comprised a 9m x 6m concrete floor slab directly to the west of Area A on the opposite side of the concrete road. The edges of the slab included a

brick lining bonded with cement probably indicating the location of demolished walls. The brick wall foundations continued both north and south of the concrete floor and abutted the edge of the concrete road. The surviving sections of wall base suggested the building they were once part of may have been over 20 m in length. As with feature A these remains were revealed immediately below the turf, no more than 0.10 m below the surface.

An east-west aligned 5 m long cement-bonded brick wall and two concrete foundations (Feature C) formed 3 sides to a small structure that had been truncated by a modern road surface on the western edge of the development area. The brick wall included a concrete foundation and survived to a maximum height of 2m. This was revealed within redeposited topsoil that covered not only the wall but also the associated concrete road. The east end of the wall was joined to a north-south aligned concrete foundation 3.5m long with a further east-west return wall foundation partially revealed.

To the east a further concrete platform (Feature D; Illus 4) immediately below the turf and measuring 8.5m x 6m was bounded by a cement bonded brick lining on three sides. The western edge abutted the outer edge of a loop of the concrete road. A series of four postholes forming a 3m x 2.5m rectangle in the middle of the platform was recorded.

Two concrete floors (Features E & F; Illus 5) measuring approximately 18 m x 20 m and visible on the surface prior to any excavations were recorded to the S end of the monitored area. Both these floors included the remains of substantial brick wall foundations bonded with cement around the edges and forming 6 internal rooms. In each building one of these areas was further divided into three smaller partitions. Both these features were accessed via an east-west aligned central concrete road that separated the two features.

Feature G comprised a substantial area of poorly sorted stone cobbles and lumps of concrete covering an area of approximately 10 m² recorded immediately below the turf. Within this area a large metal case containing ammunition was uncovered. Work was halted and the site cleared until the police arrived and removed the items. It was thought this ammunition may have been either for an anti-aircraft gun or for use in a fighter plane, as it was too big for a hand-held weapon. Whilst clearing the spoil from this area using a tracked excavator an unexploded bomb was also revealed. Again the site was cleared and the explosive safely removed from site.

Two small possible pits [004] and [006] were also recorded during the watching brief (Illus 2). These were both found towards the northern end of the site. Feature 004 (Illus 6) was roughly circular and measured approximately 1m in diameter and 0.35m deep with slightly irregular sides and base. The feature had two fills, the main upper fill (002) comprising poorly sorted granite stones in a dark brown silt matrix. Below this the primary fill (003) comprised grey sandy clay. Feature 006 (Illus 7) had

a more irregular plan (1 m diameter) and the sides and base (0.24 m deep) were uneven. Again the fill (005) comprised poorly sorted stone in a dark brown silt matrix. No artefacts were recovered from the fills of these two pits.

A number of field drains and service trenches were also uncovered throughout the watching brief area (Illus 8). The topsoil (001) across the site ranged from 0.3 to 0.5 m in depth with one area close to the western edge of the site being 1.3 m deep. This topsoil comprised dark reddish-brown clayey silt with frequent small to medium sized stone inclusions and occasional larger granite stones. The topsoil overlay a fairly flat geological deposit of homogeneous yellowish brown sandy clay with frequent small stone inclusions and occasional lenses of gravel. The interface between these two layers was very sharp and clean, which was not typical of a naturally developed soil profile. This may suggest that the area had been subject to previous landscaping, possibly having been previously stripped and levelled when the modern airport was established. The much deeper topsoil recorded over Feature C may have been an area of 'fill' in order to create a level ground surface, although levelling here may be associated with the adjacent modern road surface.

4. DISCUSSION

The concrete and brick foundations, platforms and floors uncovered during the watching brief (features A-G) were of similar construction typified by substantial concrete slab floors surrounded by cement-bonded brick wall foundations. These were typical of structures found on many WWII sites such as Boyndie Airfield (Wilson 2009) and Tain Airfield (Kendrick & Wordsworth 1999) and are likely to relate to buildings built by the RAF during this period. The design of the airfield would have mirrored many similar sites across the UK such as those mentioned above. The two partitioned features (E and F) may have been offices and rest rooms for the pilots located close to the runway. The looped concrete roads would have led to the various ammunition and fuel stores that were kept away from the rest of the airfield in case they were attacked. The presence of ammunition and an unexploded bomb close to Feature G supports the suggestion that some of these buildings may have been ammunition stores, however it is impossible to be sure of the exact nature of these buildings from the plan. The cobble and concrete of Feature G may have represented the remains of a blast wall that would have been formed from a large concrete wall and a sloping grass bank filled with stone rubble. Given the close proximity to the possible ammunition store a blast wall of this kind would have been necessary to protect any staff in the area during possible attacks.

The two possible pits uncovered during the watching brief had fairly irregular sides and bases. Unfortunately no finds were recovered from the fills that would have helped to date them. The lack of other features in the vicinity and the large number of stone-holes uncovered during the course of the watching brief may suggest that these represent the former locations of large stones pulled out of glacial deposits by

ploughing or earth-moving. No other features were revealed during the watching brief.

No visible remains of the pillbox (NJ81SE 44.3) recorded in the NMRS at the south end of the site were found during this work.

5. REFERENCES

Headland Archaeology, 2010 *Aberdeen Airport Runway Extension: Written Scheme of Investigation for Archaeological Watching Brief.*

Kendrick, J. & Wordsworth, J. 1999 *Tain Airfield (Tain Parish), WWII airfield.* Discovery and excavation in Scotland, 61

Simpson, A. 2007 Royal Airforce Museum records A/C serial no. W/NR.360043 Section B.

Wilson, D. 2009 *Boyndie Windfarm, Portsoy, Archaeological watching brief.* Unpublished Data Structure Report, Headland Archaeology Ltd, BWFP09.

http://maps.bgs.ac.uk/geologyviewer_google/googleviewer.html 2011-05-19

6. APPENDICES

Appendix 1 – Photographic register

Frame	Print	Digital	Direction	Description
1	16\1	1		Film 1 I D Shot
2	15\1	2	E	Pre excavation shot of area
3	14\1	3	S	Pre excavation shot of area
4	13\1	4	S	Pre excavation shot of area
5	12\1	5	SW	Detail of section through cut 004
6	11\1	6	SW	Location of pit cut 004
7	10\1	7	NE	View of excavated haul road
8	9\1	8	SW	View of stripped area in SW corner of site
9		9		Working shot
10		10		Working shot
11	8\1	11	W	Half section through pit cut 006
12	7\1	12	E	View of spread of cobbles and concrete
13		13		Working shot
14		14		Working shot
15		15		Working shot
16	6\1	16	NE	View of area stripped on 16/3/11
17	5\1	17	SE	View of linear ditch
18	4\1	18	NE	View of building B remains
19	3\1	19	S	View of building B remains
20	2\1	20	SE	View of building B remains
21		21		Detail of ammunitions box
22		22		Detail of ammunitions box
23		23		Detail of ammunitions box
24		24		Film 2 I D Shot
25	36\2	25	S	View of second linear cut within oval road
26	35\2	26	N	Concrete floors at the S end of site
27	34\2	27	S	Concrete floors at the S end of site
28	33\2	28	S	View of area stripped 17/3/11
29	32\2	29	N	View of brick wall of Building C

30	31\1	30	N	Gen shot of excavated area 18/3/11
31	30\2	31	SE	Gen shot of concrete floor of building D
32	29\2	32	S	Detail of post holes in concrete floor
33	28\2	33	NW	Gen shot of concrete floor of building D
34		34		Detail of bomb found
35		35		Detail of bomb found
36	36/3	36		General site shot
37	35\3	37	SW	general view of stone drain 009
38		38	WSW	Ditch cut 007
39		39	ENE	Ditch cut 007
40	34\3	40	SE	Working shot
41	33\3	41	NW	Working shot
42	32\3	42	SW	Ditch cut 007
43	31\3	43	SE	Working shot
44	30\3	44	NW	Working shot

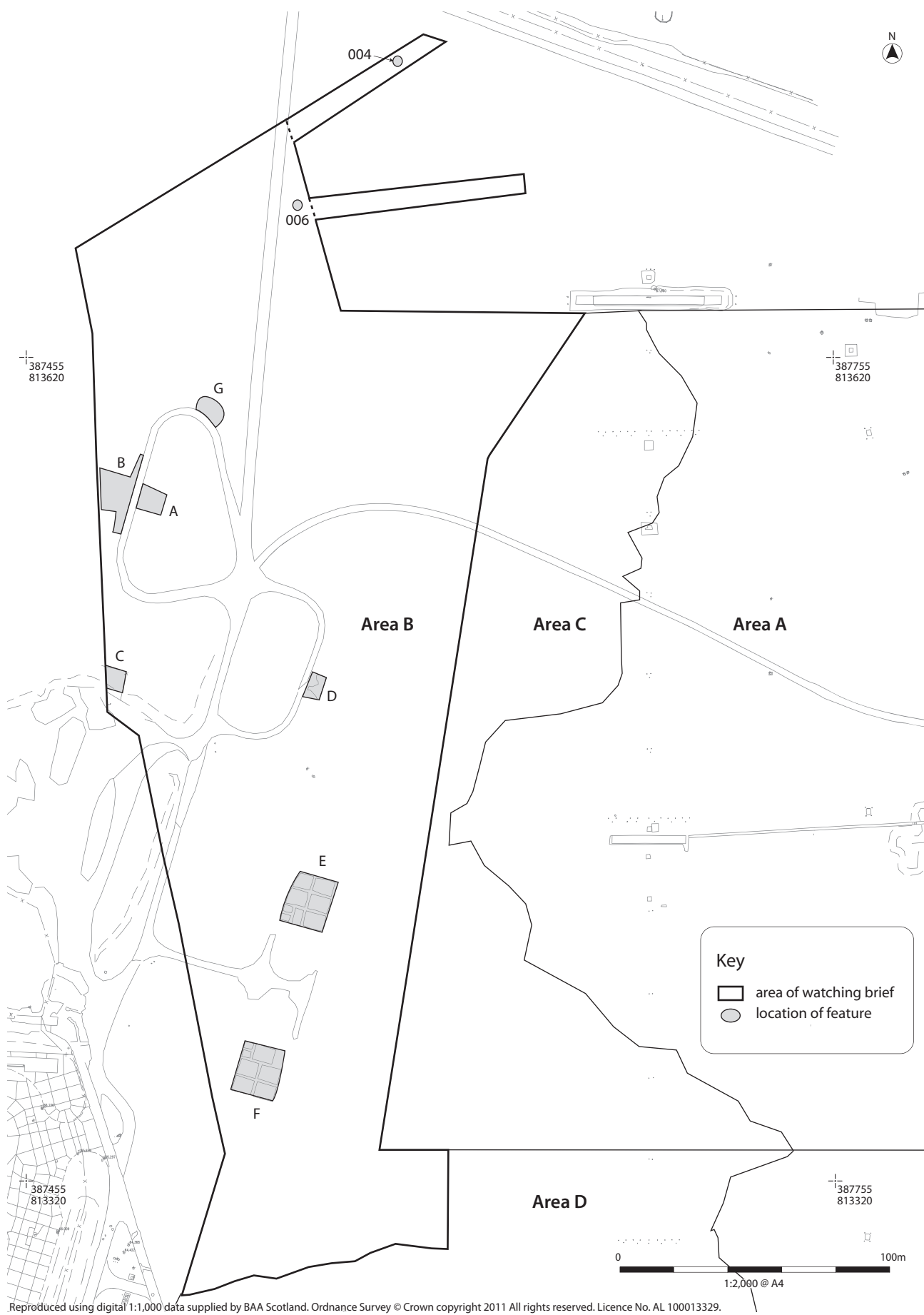
Appendix 2 – Context register

Context	Type	Description
1	Layer	A dark reddish brown compact clayey silt with frequent small to medium sized stone inclusions and occasional large stones. The layer was between 0.3 and 0.5 m thick over the natural yellow silt/clay deposits
2	Fill	Fill of pit cut 004. A 0.3 m thick deposit of poorly sorted angular stones in a dark brown silt matrix. Above fill 003 and below topsoil 001
3	Fill	Primary fill of pit cut 004. A 0.05 m thick deposit of blueish-grey compact sandy clay
4	Cut	A sub-oval shaped pit cut in plan with fairly steep and irregular sides leading to a slightly concave base. Filled with 002 and 003. 1.6 m diameter and 0.35 m deep.
5	Fill	Fill of pit cut 006. A 0.24 m thick deposit of poorly sorted angular stones in a dark brown silt matrix.
6	Cut	Sub-circular cut with sharp to gradual but irregular sides leading to a concave base. The cut was 1 m long and 0.24 m deep filled with 005

- | | | |
|----|-------|---|
| 7 | Cut | A linear cut with steep sides and a V shaped base.
Cut of a modern service drain |
| 8 | Fill | Fill of cut 007 comprising mottled grey/brown
clayey sand with frequent small stone inclusions |
| 9 | Cut | A linear stone drain 1.3 m wide recorded for 30 m
across the site |
| 10 | Layer | A brownish grey firm clayey silt topsoil with
occasional stone inclusions |
| 11 | Layer | A light yellow brown firm clayey sand with
gravel lenses and moderate stone inclusions.
Natural alluvial deposit. |

Appendix 3 – Discovery and Excavation in Scotland

LOCAL AUTHORITY:	Aberdeen, City of
PROJECT TITLE/SITE NAME:	A watching brief at Aberdeen Airport
PROJECT CODE:	AARE11
PARISH:	Dyce
NAME OF CONTRIBUTOR:	Donald Wilson
NAME OF ORGANISATION:	Headland Archaeology Ltd
TYPE(S) OF PROJECT:	Watching brief
NMRS NO(S):	
SITE/MONUMENT TYPE(S):	NJ81SE 44.00
SIGNIFICANT FINDS:	none
NGR (2 letters, 8 or 10 figures)	NGR: NJ 87564 13517
START DATE (this season)	March 2011
END DATE (this season)	May 2011
PREVIOUS WORK (incl. DES ref.)	none
MAIN (NARRATIVE) DESCRIPTION: (May include information from other fields)	<p>A watching brief was undertaken at the site of a runway extension at Aberdeen Airport, Dyce in order to identify and record any archaeological remains that might be exposed by construction works. An Environmental Statement had previously identified the potential for previously unrecorded archaeological remains to survive on the site.</p> <p>The foundations and floors of a number of structures relating to the use of Aberdeen Airfield by the RAF in WWII were uncovered; as were two small undated pits. No other archaeological features were uncovered during the watching brief.</p>
PROPOSED FUTURE WORK:	None
CAPTION(S) FOR ILLUSTRS:	
SPONSOR OR FUNDING BODY:	SKM Environs
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EMAIL ADDRESS:	donald.wilson@headlandarchaeology.com
ARCHIVE LOCATION (intended/deposited)	NMRS



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Illus 2
Plan of the monitored area



Illus 3
View of feature B facing S



Illus 4
View of feature D facing N



Illus 5

General view of features E & F facing S



Illus 6

Detail of the section through cut [004]



Illus 7

Detail of section through cut [006]



Illus 8

General site view facing S



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