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Client: Transport Scotland
Date: 20th April 2011

The Results of an Archaeological Field Evaluation by Trial Trenching at Dundas Castle Farms (Land Parcel 8)

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Report Status: Approved



Executive Summary

Headland Archaeology conducted an archaeological evaluation by trial trenching on the Forth Replacement Crossing at Dundas Castle Farms (Land Parcel 8), NGR: NT 1163 7757 (centred), to assess the presence/absence of archaeological remains or deposits in an area identified as having good archaeological potential in the Forth Replacement Crossing Environmental Statement (Jacobs Arup, 2009). The work was commissioned by Transport Scotland, managed and monitored by Jacobs Arup and undertaken in advance of the proposed commencement of construction works.

A total of 28 trenches totalling 2716m² were excavated comprising a 5% sample of Land Parcel 8. Trenches were sited to ensure good spatial coverage while avoiding a BP pipeline and overhead power line which ran across the south of the land parcel. The trial trenching identified ditches and furrows relating to the post-medieval agricultural activity on site, and a small number of field drains. A small area of stones was recorded in Trench 17 also related to post-medieval agricultural activity. No other archaeological remains or deposits were identified. .

ARCHAEOLOGICAL EVALUATION
Forth Replacement Crossing: Land Parcel 8, Dundas Castle Farms

PROJECT SUMMARY SHEET (FRCE10)

Client Transport Scotland

Consultant Jacobs Arup

National Grid Reference NT 1163 7757

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Schedule

Fieldwork 13th – 15th April 2011

Report 20th April 2011

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1 Introduction

1.1 General

1.1.1 This Data Structure Report is submitted as a report on the results of a programme of archaeological trial trenching undertaken on behalf of Jacobs Arup and Transport Scotland in respect of the proposed Forth Replacement Crossing (hereinafter 'FRC'), and in accordance with the mitigation measures recommended in the FRC Environmental Statement Chapter 14 (Cultural Heritage; Jacobs Arup 2009a) wherein the requirement for a programme of trial trenching was identified.

1.1.2 Between 13th and 15th April 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching in Land Parcel 8 on the southern side of the landfall for the FRC (Illus 1). The project was managed by Edward Bailey (Project Manager), the fieldwork and reporting was overseen by Don Wilson. Two additional staff members were involved throughout the evaluation.

1.2 Project Background

1.2.1 In December 2007, following the completion of the FRC Study as part of the Strategic Transport Project Review (hereinafter 'STPR'), the Scottish Government confirmed the intention to provide a new cable-stayed bridge to the west of the existing Forth Road Bridge. Jacobs Arup (as a joint venture) was commissioned in January 2008 to assist Transport Scotland to develop the FRC proposals, to undertake an Environmental Impact Assessment (hereinafter 'EIA') and to prepare an Environmental Statement (hereinafter 'ES') (Jacobs Arup 2009a).

1.2.2 The purpose of the cultural heritage component of the EIA was to identify the cultural heritage baseline, evaluate the likely significant impacts that the proposed development would have on this resource, and recommend measures to mitigate identified impacts.

1.2.3 The cultural heritage baseline data for the EIA was obtained via a desk-based assessment and walkover survey undertaken in 2008-2009 in accordance with the principles set out in DMRB Volume 11, Section 3 Part 2 'Cultural Heritage' (HA 208/07; Highways Agency 2007). Further information was also gathered during archaeological watching briefs on Ground Investigations for the proposed scheme carried out during 2008 and 2009 by variously Jacobs Arup, Glasgow University Archaeology Research Division and Headland Archaeology Ltd in accordance with the requirements of Historic Scotland to whom the results were reported (Transport Scotland 2010, 30).

1.2.4 The ES recommended that a programme of invasive and non-invasive archaeological works be undertaken, to include trial trenching. (Jacobs Arup 2009a).

1.3 *Aims and Objectives of the Archaeological Works*

1.3.1 The general objectives of the programme of archaeological works (Transport Scotland 2010) were to:

- ensure that significant archaeological or palaeoenvironmental remains shall be neither needlessly destroyed, nor destroyed without record;
- identify any unknown archaeological remains that may be affected by the scheme;
- enable a more confident assessment of the impact of construction of the proposed scheme on archaeological remains;
- enable the identification and design of any measures that may be necessary to mitigate the impact of the proposed scheme on newly identified archaeological remains, and
- enhance available information about known archaeological remains, where existing information is insufficient to enable a full assessment of impact or the design of mitigation measures.

2 Site Background

2.1 *Archaeological and Historical Background*

2.1.1 Within a study area ranging in extent from 500m from the proposed route to 6km from the proposed main crossing a total of 356 cultural heritage sites were identified by the ES, whilst a desk-based assessment of a wider study area undertaken at route selection stage, identified a total of 1200 cultural heritage sites (Transport Scotland 2010, 30). The results from these studies show that the scheme is located in a landscape containing archaeological evidence dating from the Mesolithic period, through the prehistoric and medieval periods, up to post-medieval and modern times.

2.1.2 A number of archaeological sites were identified by the ES in and around South Queensferry. These included sites dating to prehistoric, Roman and early historic periods, with the Royal Burgh of South Queensferry originating in the medieval period.

2.1.3 The land parcel under investigation (Land Parcel 8) lies to the north of Dundas Castle, the present keep of which dates to the 15th century, although the castle may originate as early as the 12th century (Jacobs Arup 2009, 32).

2.1.4 Previous work as part of the FRC has identified prehistoric settlement several hundred metres to the north of Land Parcel 8, overlooking the Firth of Forth, in Land Parcel 4.

2.2 *Site Topography and Land Use*

2.2.1 The site comprised a long NW-SE aligned corridor that ran across two large fields divided by a low hedge and bank. The area was bounded by a copse of trees to the south and a stone wall field boundary to the north. Both fields were relatively flat and under a young crop at the time of evaluation. The site is under the ownership of the Trustees of S N M Bowlby.

2.3 *Site Geology*

2.3.1 The results of geotechnical investigations (Jacobs Arup 2009b) demonstrate that the subsurface stratigraphy generally constitutes glacial till deposits of varying thickness; these are predominantly comprised of firm to very stiff boulder clay deposits with occasional granular till deposits. The trial trenching (below) has identified small bands of bedrock.

2.3.2 The solid geology of the site is typified by igneous alkali dolerite (British Geological Survey 2008). The alkaline nature of the bedrock geology has the effect of breaking up the structure of clays within the soil matrix which negatively affects its water holding capacity, similar to the effect agricultural lime has on arable soils.

3 **Methodology**

3.1 All works were undertaken in accordance with the specification in the contract documents (Transport Scotland 2010), which had been agreed with Historic Scotland and Transport Scotland. The total area of the Land Parcel was 52, 214m², of which a 5% sample (2617m²) was evaluated by trial trenching. An indicative trench plan was agreed with the consultant archaeologists, Jacobs Arup. Trenches were sited to provide good spatial coverage of the entire site and to avoid the locations of known services. However, once on site, the location of a small number of trenches had to be altered from their original positions following an on site request by the BP Wayleaves team to increase the standoff from a BP pipeline to 15 m from an originally agreed 10 m.

3.2 All trenches were individually numbered and located using a pole-mounted Trimble G6 differential GPS programmed with the trench coordinates. The trenches were excavated using a 13 ton 360° tracked mechanical excavator, fitted with a 2m wide flat-bladed ditching bucket. The machine operated under continuous archaeological supervision and topsoil and subsoil were removed down to the first archaeological horizon or clean geological deposits, whichever was encountered first. Topsoil and subsoil were stored separately. Any potential features identified were hand cleaned and investigated appropriately. Archaeological features and deposits were hand excavated and recorded using standard archaeological methods and pro-forma record sheets. The excavated trenches and any archaeological contexts were recorded using a Trimble G6 differential GPS, as well as hand drawing where appropriate. Photographs were taken using colour slide film, black and white film, and digital.

4 Results of Fieldwork (Illus 2)

4.1 Trial Trenching

- 4.1.1 Twenty eight trenches were excavated across Land Parcel 8 (Illus 2) with a combined total area of 2716m² comprising a 5% sample of the Parcel. Full detailed descriptions of each trench are provided in Appendix 1 and individual contexts are presented in Appendix 2. The results of the evaluation are summarised below.
- 4.1.2 The natural geology [006] seen in the trenches was largely yellowy grey clay with frequent stone inclusions, although outcropping of limestone bedrock was seen in some trenches in the northern half of the site. In trenches 16, 17 & 18 this was overlain by between 0.10m and 0.25m of subsoil [004] – an orangey brown sandy silt. Topsoil [003] was between 0.30m and 0.50m deep and contained little in the way of recent ceramic material.
- 4.1.3 Colluvial deposits [005] were identified in Trench 23 and were up to 0.20m in depth, comprising orangey brown clayey silt. This appeared to have filled in a series of undulations in the central part of the trench, and was removed to ensure that no archaeological remains or deposits were masked by the material.
- 4.1.4 A single archaeological deposit was recorded in Trench 17. This comprised a 2.2m wide irregularly shaped area of poorly sorted cobble sized stones (c 0.10m diameter) [001] within an orange/brown clay matrix [002]. This deposit may represent an area of hard standing for an animal feeder. No significant shape or cut was visible and the stones and matrix sat over the natural clay geology [006].
- 4.1.5 Furrows were identified in Trenches 2 - 4, 6, 7, 9 - 11, 13, 24, 25, and 28. Many of these could be seen continuing into a number of trenches. This was particularly apparent in Trenches 2 - 4, 6, 7, 9, 11 and 13 where all the furrows were aligned approximately N-S. The majority of these furrows were between 1.2m and 1.6m wide, between 0.15m and 0.20m deep and roughly 6m apart; sections were excavated through [008], [012], [016], [036] and [054]. They had shallow sloping sides and were filled with compact grey silty clay [007], [011], [015], [035] and [053] respectively. A considerable number of trenches also contained rubble and ceramic field drains that varied in alignment.

5 Conclusions

- 5.1.1 The evaluation has established that this area appears not to have been extensively used for human settlement activity. The only features identified relate to post-medieval agricultural activity in the area, with a few surviving furrows running across the site on a north-south alignment. This alignment respects the existing field boundaries. The absence of furrows in some of the trenches may be the result of later ploughing activity as the topsoil was not particularly deep across the site; however, no specific evidence was seen to suggest this was the case.
- 5.2 Based on the results of the fieldwork in which no finds or environmental samples were retrieved, the archaeological archive is assessed as having no potential and therefore no further works are recommended.

6 References

6.1 Bibliographic References

Harrison, S and Lyons, D 2010 *Results of an Earth Resistance Survey of Echline Fields, South Queensferry*. Unpublished client report. Headland Archaeology (UK) Ltd.

Highways Agency *et al* 2007 *DMRB Volume 11 Cultural Heritage, Section 3, Part 2, Revision HA 208/07*. The Highways Agency, Transport Scotland, Welsh Assembly Government and the Department for Regional Development Northern Ireland, August 2007.

Jacobs Arup 2009a *Forth Replacement Crossing: Environmental Statement*. November 2009.

Jacobs Arup 2009b *Transport Scotland Forth Replacement Crossing: Network Connections – South Ground Investigations Report*. Jacobs Arup November 2009.

Transport Scotland 2010 *Forth Replacement Crossing*. ‘Competition for the Land Based Invasive and Non-Invasive Archaeological Survey and Evaluation Contract Volume 2: Tender Document.’

6.2 Cartographic References

British Geological Survey 2008 *Linlithgow, S032W*, (version B&Sup), 1: 50 000.

7 Appendices

Appendix 1: Trench Register

Trench No	Length (m)	Maximum Depth (m)	Description
1	50	0.40	Trench aligned E-W containing 2 x rubble field drains.
2	50	0.45	Trench aligned E-W at the S end of the area. Included 4 field drains and two N-S aligned furrows [008], & [010].
3	30	0.64	Trench aligned E-W containing 2 x tile field drains and 2 x rubble drains plus a single furrow [012].
4	34	0.46	Trench aligned NW-SE with two furrows [014], [016] and 1 x tile drain.
5	50	0.30	Trench aligned N-S along the western edge of the field. No features recorded.
6	55	0.40	Trench aligned E-W with 4 x N-S aligned furrows [054], [056], [058], [060]. Up to 6m apart.
7	50	0.35	Trench aligned NW-SE with 5 x furrows [018], [020], [022], [024], [026] all aligned N-S and approximately 6m apart.
8	39	0.30	Trench aligned NW-SE with no features recorded
9	50	0.30	Trench aligned N-S along the eastern field boundary. Included 1x field drain and 1 x furrow [028] plus a modern test pit.
10	50	0.35	Trench aligned E-W with 5x furrows [030], [032], [034], [036], [038] all aligned N-S and approximately 6m apart.
11	50	0.35	Trench roughly aligned N-S with 2 x furrows [040], [042] and 3 x field drains.

12	50	0.35	Trench aligned NW-SE with 1 x tile drain and 1x rubble drain
13	50	0.35	Trench aligned SE-NW included 1 x furrow [044] and 2 x tile drains and a single rubble drain.
14	50	0.45	Trench aligned E-W and included up to 0.15m of subsoil [004]. A modern test pit was the only feature recorded.
15	50	0.30	Trench aligned NW-SE with no features recorded.
16	50	0.50	Trench aligned N-S with a 0.20 deep area of subsoil [004] recorded 15m from the S end and a single field drain.
17	50	0.40	Trench aligned N-S with a 0.15m layer of subsoil [004] across the N half of the trench. A large area of large cobble stones (001) was recorded 44m from the S end.
18	50	0.40	Trench aligned E-W with up to 0.25m of subsoil [004] but no features.
19	50	0.35	Trench aligned N-S had no features.
20	50	0.35	Trench aligned approximately N-S with no features recorded.
21	50	0.30	Trench aligned NW-SE with 2 x rubble drains and a modern test pit.
22	50	0.30	Trench aligned E-W with 4 x rubble field drains.
23	50	0.45	Trench aligned NW-SE with 4 x rubble drains and three areas of colluvium [005] 0.20m deep forming a slightly undulating surface.
24	50	0.30	Trench aligned E-W with a single furrow [046] and a field drain.
25	50	0.30	Trench aligned NW-SE with two furrows [048], [050] in the NW half of the

			trench. At 15m from the NW end the natural changes to a stone rich clay with no features. A test pit was recorded at the SE end.
26	50	0.30	Trench aligned E-W with a single field drain.
27	50	0.30	Trench aligned N-S with large boulders and cobble stones outcropping along the length of the trench
28	50	0.25	Trench aligned NW-SE with a single furrow [052]. Outcropping bedrock recorded at the NW end.

Appendix 2: Context Register

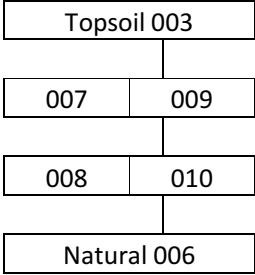
Context No.	Area	Description
001	Tr17	A poorly sorted area of 0.10m diameter cobbles to large (0.3 x 0.2 x 0.1m) sub-rounded stones within [002] below topsoil [003]. The full extent was not revealed as they continued into the E section of trench 17. The stones were 2.3m wide and 0.30m below the surface. Possibly an area of hard standing for a cattle feeder.
002	17	Orange brown clay, contains [001].
003	All	Greyish brown sandy silt loam, topsoil. Depth: 0.3 – 0.5m.
004	16, 17, 18	Orange brown sandy silt, subsoil. Depth 0.1 – 0.25m.
005	23	Orange brown clayey silt, colluvium. Depth: up to 0.20m.
006	All	Yellowish grey clay, natural.
007	2	Fill of [008], grey silty clay. D: 0.19m.
008	2	Furrow. N-S, with gently sloping sides and flattish base. L:2m,W: 1.3m, D: 0.19m.
009	2	Fill of [010].
010	2	Furrow. N-S, L:2m,W: 1.45m. Not excavated.
011	3	Fill of [012], grey silty clay. D: 0.2m.
012	3	Furrow. N-S, with gently sloping sides and flattish base. L:2m, W: 1m, D: 0.2m.
013	4	Fill of [014].
014	4	Furrow. N-S, L: 2m, W: 2m, not excavated.
015	4	Fill of [016], grey silty clay. D: 0.23m.
016	4	Furrow, N-S, with gently sloping sides and flattish base. L:2m, W: 2m, D: 0.23m.
017	7	Fill of [018].
018	7	Furrow, N-S, L: 2.3m, W: 1.4m, not excavated.
019	7	Fill of [020].
020	7	Furrow, N-S, L: 2.3m, W: 2m, not excavated.

021	7	Fill of [022].
022	7	Furrow, N-S, L: 2.3m, W: 1.4m, not excavated.
023	7	Fill of [024].
024	7	Furrow, N-S, L: 2.3m, W: 2.5m, not excavated.
025	7	Fill of [026].
026	7	Furrow, N-S, L: 2.3m, W: 2.4m, not excavated.
027	9	Fill of [028].
028	9	Furrow, N-S, L: 7m, W: 1.7m not excavated.
029	10	Fill of [030].
030	10	Furrow, N-S, L: 2m, W: 2.4m, not excavated.
031	10	Fill of [032].
032	10	Furrow, N-S, L: 2m, W: 2.6m, not excavated.
033	10	Fill of [034].
034	10	Furrow, N-S, L: 2m, W: 1.5m not excavated.
035	10	Fill of [036], grey silty clay, D: 0.17m.
036	10	Furrow, N-S, with gently sloping sides and flattish base, L: 2m, W: 1.9m, D: 0.17m.
037	10	Fill of [038].
038	10	Furrow, N-S, L: 2m, W: 1.6m, not excavated.
039	11	Fill of [040].
040	11	Furrow, N-S, L: 6.5m, W: 1.85m, not excavated.
041	11	Fill of [042].
042	11	Furrow, N-S, L: 6.5m, W: 1.96m, not excavated.
043	13	Fill of [044].

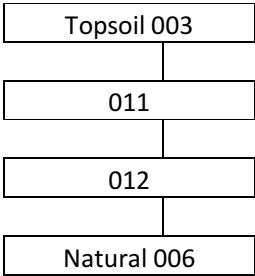
044	13	Furrow, NE-SW, L: 2m, W: 2.2m, not excavated.
045	24	Fill of [046].
046	24	Furrow, N-S, L: 2m, W: 1.8m, not excavated.
047	25	Fill of [048].
048	25	Furrow, N-S, L: 2m, W: 1.7m, not excavated.
049	25	Fill of [050].
050	25	Furrow, N-S, L: 2m, W: 1.7m, not excavated.
051	28	Fill of [052].
052	28	Furrow, N-S, L: 2 m, W: 1.8m, not excavated.
053	6	Fill of [054], grey silty clay
054	6	Furrow, N-S, L: 2m, W: 1.5m , 0.12m deep
055	6	Fill of [056]
056	6	Furrow, N-S, L: 2m, W: 1.25m, not excavated.
057	6	Fill of [058]
058	6	Furrow, N-S, L: 2m, W: 1.61m, not excavated.
059	6	Fill of [060]
060	6	Furrow, N-S, L:2m, W: 1.30m, not excavated.

Appendix 3: Trench Matrices

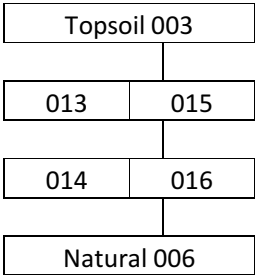
Trench 2



Trench 3



Trench 4

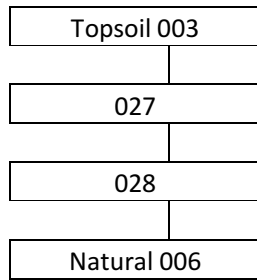


	Trench 6				
	Topsoil 003				
	053	055	057	059	

	054	056	058	060
	Natural 006			

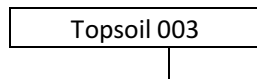
Trench 7				
Topsoil 003				
017	019	021	023	025
018	020	022	024	026
Natural 006				

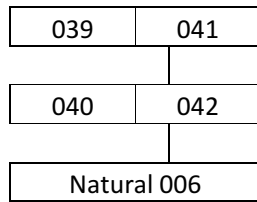
Trench 9



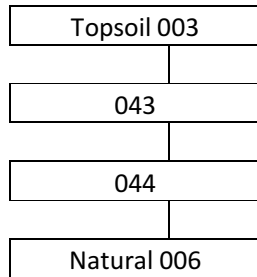
Trench 10				
Topsoil 003				
029	031	033	035	037
030	032	034	036	038
Natural 006				

Trench 11

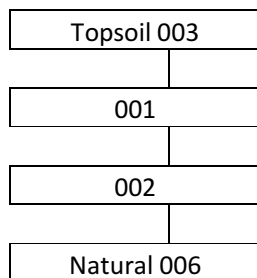




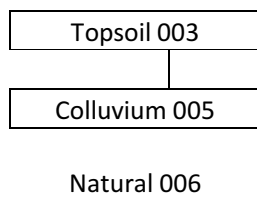
Trench 13



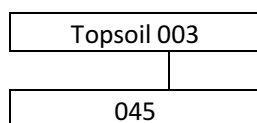
Trench 17

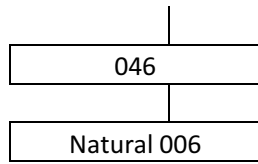


Trench 23

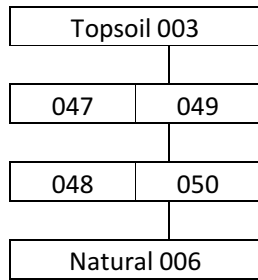


Trench 24

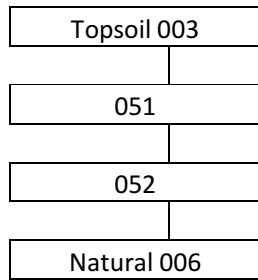




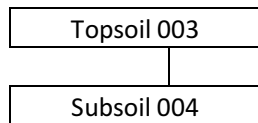
Trench 25



Trench 28



**Remaining
Trenches**



Natural 006

Appendix 4: Photographic Register

Photo No.	Direction	Description
109		ID shot Film 4
110	E	General shot of Tr. 1
111	W	General shot of Tr.2
112	E	General shot of Tr.3
113	NW	General shot of Tr.4
114	S	General shot of Tr.5
115	ESE	General shot of Tr.6
116	SE	General shot of Tr.7
117	NW	General shot of Tr.8
118	N	General shot of Tr.9
119	W	General shot of Tr.10
120	N	General shot of Tr.11
121	NW	General shot of Tr.12
122	NW	General shot of Tr.13
123	S	N facing section through furrow in Tr.10
124	WNW	General shot of Tr.14
125	SE	General shot of Tr.15
126	N	General shot of Tr.16
127	E	W facing section through stone feature 001
128	S	General shot of Tr.17
129	W	General shot of Tr.18
130	NW	General shot of Tr.19
132	N	General shot of Tr.20
133	SE	General shot of Tr.21
134	NW	General shot of Tr.22
135	NW	General shot of Tr.23
136	W	General shot of Tr.24
137	SE	General shot of Tr.25
138	W	General shot of Tr.26
139	N	General shot of Tr.27
140	SE	General shot of Tr.28