

**Project code:** FRCE10  
**Client:** Transport Scotland  
**Date:** 11<sup>th</sup> April 2011

## **The Results of an Archaeological Field Evaluation by Trial Trenching on the Forth Replacement Crossing at Dundas Castle Farms (Land Parcel 10)**

**Archaeological Consultant:** Jacobs Arup  
**Report Authors:** Ian Hill  
**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 10), NGR: NT 12143 77293 (centred), to establish 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, 2009a). 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 34 trenches totalling 3360m<sup>2</sup> were excavated comprising a 5% sample across two fields. Trenches were sited to ensure good spatial coverage. The trial trenching revealed furrows relating to post-medieval agricultural activity on site. No archaeological remains or deposits were identified during the evaluation.*

**ARCHAEOLOGICAL EVALUATION**  
**Forth Replacement Crossing: Land Parcel 10, Dundas Castle Farms**

**PROJECT SUMMARY SHEET (FRCE10)**

<i>Client</i>	Transport Scotland
<i>Consultant</i>	Jacobs Arup
<i>National Grid Reference</i>	NT 12143 77293
<i>Project Manager</i>	Edward Bailey
<i>Senior Archaeologist</i>	Kirsty Dingwall
<i>Text</i>	Ian Hill
<i>Illustrations</i>	Julia Bastek
<i>Evaluation Team</i>	Samira Ben Mohammed Kirsty Dingwall Ian Hill Elizabeth Jones Jurgen van Wessel
<i>Schedule</i>	
Fieldwork	5 <sup>th</sup> – 8 <sup>th</sup> April 2011
Report	April 2011

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## **1 Introduction**

### *1.1 General*

1.1.1 This Data Structure Report is submitted as a report on a programme of archaeological trial trenching to 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 the 5<sup>th</sup> and the 8<sup>th</sup> April 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching on Land Parcel 10 in the grounds of Dundas Castle Farms 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 Ian Hill. Four 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 provide mitigation measures to ameliorate any 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 Based on the results of the EIA the ES recommended that a programme of invasive and non-invasive archaeological works be undertaken to include resistivity survey and evaluation by 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 include prehistoric, Roman and early historic activity, with the Royal Burgh of South Queensferry originating in the medieval period.

2.1.3 The land parcel lies near Dundas Castle, the present keep of which dates to the 15<sup>th</sup> century, although the castle may originate as early as the 12<sup>th</sup> century (Jacobs Arup 2009a, 32).

### 2.2 *Site Topography and Land Use*

2.2.1 The parcel was divided into two fields. The western of the two fields consisted of rough pasture, with a jeep track running across the field in a north east to south west direction. The field was bounded by a shelter belt of trees to the north and a farm road to the south. The eastern field was a flat arable field that was under crop at the time of the evaluation. The eastern field was bounded by a shelter belt of trees to both the north and east, and a farm road to the south. Nine trenches were placed in the western field and twenty five trenches in the eastern field (Illus 2). The site is under the ownership of AWG Residential Ltd & Taylor Wimpey Development Ltd.

### 2.3 *Site Geology*

- 2.3.1 The results of geotechnical investigations (Jacobs Arup 2009b) carried out demonstrate that the subsurface stratigraphy underlying the development corridor generally constitutes glacial till deposits of varying thickness; these are predominantly comprised firm to very stiff boulder clay deposits with occasional granular till deposits.
- 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 measured 67,252 m<sup>2</sup>, of which a 5% sample (3360 m<sup>2</sup>) was investigated by trial trenching. An indicative trench plan was agreed with the consultant archaeologists, Jacobs Arup. Trenches were sited to test blank areas and to provide good spatial coverage of the entire site. The location of two trenches (Trenches 1 and 2) in the western field was altered to avoid standing trees.
- 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 turf, topsoil and subsoil were removed down to the first archaeological horizon or clean geological deposits, whichever was met first. Turf, 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 Thirty four trenches were excavated across Land Parcel 10 (Illus 2) with a combined total area of 3363 m<sup>2</sup> 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 seen in trenches 1-9 was largely dark orange-brown and dark grey clays, with stone and sand inclusions [018]. In general this was overlain by between 0.10 m and 0.20 m of subsoil [017] – a dark brown-grey clayey silt. Topsoil [016] was between 0.30 m and 0.50 m deep and contained little in the way of recent ceramic material. In trenches 10-34 the natural geology was generally mixed orange

and grey clays with stone and sand inclusions [021]. This was overlain by between 0.10 and 0.20 m mixed orange and brown clayey silt subsoil [020]. Topsoil [019] was generally 0.25-0.35m deep and consisted of a thick, heavy grey clayey loam.

- 4.1.3 A deposit of brick rubble (005) was found in Trench 9. Underlying the topsoil [016] and subsoil [017] it was 0.60m in depth and overlay the natural geology [018]. Subsequent discussions with the tenant farmer established that the deposit was modern landfill.
- 4.1.4 Rubble and ceramic-drains were encountered throughout the trenches. All damaged ceramic drains were repaired prior to backfilling.
- 4.1.5 Agricultural furrows were found in five trenches (Trench 13, 15, 22, 25 and 27). Two furrows were found in trenches 13 and 15, and one in each of trenches 22, 25 and 27. All furrows were aligned approximately north – south.
- 4.1.6 Furrows (001, 003) identified in Trenches 13 and 15 respectively were investigated by hand. Both furrows were between 1.50 m and 3 m wide, and up to 0.20 m in depth. They had shallow sloping sides and were filled (002 and 004) with compact mid brown-grey silty clay.

## **5 Conclusions**

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



## 6 References

### 6.1 *Bibliographic References*

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)	Depth (m)	Description
1	50	0.5	E-W running. No features.
2	50	1.06	E-W running. No features.
3	50	0.8	SE-NW running. No features.
4	50	0.7	S-N running. No features.
5	50	0.3	NE-SW running. No features.
6	50	0.6	W-E running. No features.
7	50	1	NE-SW running. No features.
8	50	0.3	NE-SW running. No features.
9	50	1	SE-NW running. No features.
10	50	0.3	NE-SW running. No features.
11	50	0.3	N-S running. No features.
12	50	0.55	NW-SE running. No features.
13	50	0.4	E-W running. Contains two furrows [001] & [006].
14	50	0.554	NNW-SSE running. No features.
15	50	0.45	NE-SW running. Contains two furrows [003] & [008].
16	50	0.6	ESE-WNW running. No features.
17	50	0.5	NE-SW running. No features.
18	50	0.5	E-W running. No features
19	50	0.65	SE-NW running. No features.
20	50	0.4	ENE-WSW running. No features.
21	50	0.5	N-S running. No features.
22	50	0.35	ENE-WSW running. Contains one furrow[010].
23	50	0.5	NNE-SSW running. No features.

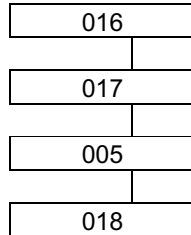
24	50	0.55	WNW-ESE running. No features.
25	50	0.5	NE-SW running. Contains one furrow [012].
26	50	0.5	ESE-WNW running. No features.
27	50	0.4	WSW-ENE running. Contains one furrow[014].
28	50	0.4	ENE-WSW running. No features.
29	50	0.4	NW-SE running. No features.
30	50	0.4	N-S running. No features.
31	50	0.65	E-W running. No features.
32	50	0.55	SE-NW running. No features.
33	50	0.5	NNW-SSE running. No features.
34	50	0.35	W-E running. No features.

## Appendix 2: Context Register

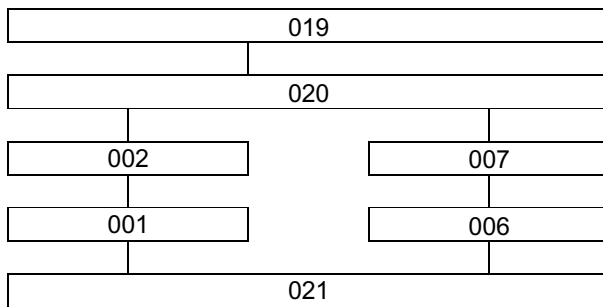
Context No.	Area	Description
001	Tr 13	Cut of Furrow. Measures 2m by 1.9m and 0.20 m deep. Orientated north-south
002	TR 13	Mid brown grey silty clay. Fill of [001]
003	Tr 15	Cut of Furrow. Measures 2.5m by 0.75m and 0.09m deep. Orientated north-south.
004	Tr 15	Mid brown grey silty clay. Fill of [003]
005	Tr 9	Brick rubble, made ground.
006	Tr 13	Cut of Furrow. Orientated north-south. Measures 3 m by 2m. Not investigated.
007	Tr 13	. Fill of [006]
008	Tr 15	Cut of Furrow. Orientated north-south. Measures 2.5 m by 2.3 m. Not investigated.
009	Tr 15	Fill of [008]
010	Tr 22	Cut of Furrow. Orientated north-south. Measures 2m by 1.8m. Not investigated
011	Tr 22	Fill of [010]
012	Tr 25	Cut of Furrow. Orientated north-south. Measures 3m by 2m. Not investigated.
013	Tr 25	Fill of [012]
014	Tr 27	Cut of Furrow. Orientated north-south. Measures 2m by 1.9m. Not investigated.
015	Tr 27	Fill of [014]
016	1 - 9	Topsoil. Dark grey clay silt loam, 0.3 – 0.5 m.
017	1 - 9	Subsoil. Dark brown clayey silt, 0.1 – 0.2 m.
018	1 - 9	Natural. Dark orange brown and dark grey clays with stones and sand.
019	10 - 34	Topsoil. Heavy grey clayey loam,, 0.25 – 0.35 m.
020	10 - 34	Subsoil. Orange brown clayey silt, 0.1 – 0.2 m.
021	10 - 34	Natural. Mixed orange and grey clays with stones and sand.

### Appendix 3: Trench Matrices

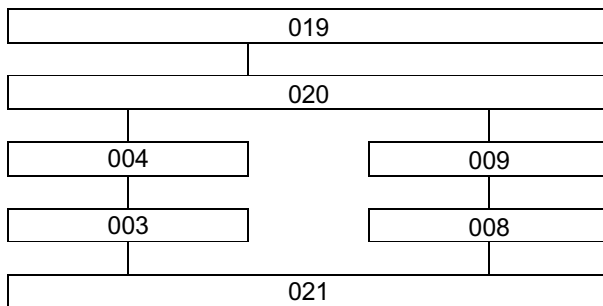
#### Trench 9



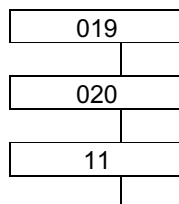
#### Trench 13

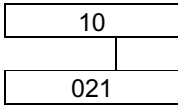


#### Trench 15

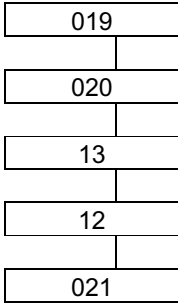


#### Trench 22

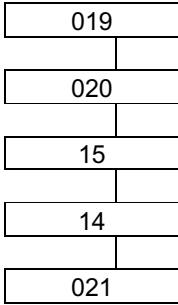




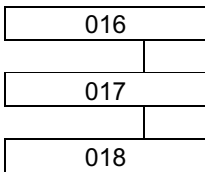
**Trench  
25**



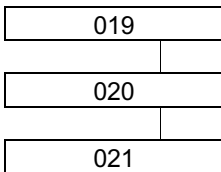
**Trench  
27**



**Trenches  
1- 8**



**Remaining  
Trenches**



#### Appendix 4: Photographic Register

Photo No.	Direction	Description
563	W	General shot f Trench 1
564	W	General shot f Trench 2
565	E	General shot f Trench 3
566	N	General shot f Trench 4
567	NE	General shot f Trench 5
568	E	General shot f Trench 6
569	E	General shot f Trench 7
570	NE	General shot f Trench 8
571	NW	General shot f Trench 9
572	NE	General shot f Trench 10
573	-	I.D. Shot
574	SE	General shot of Trench 11
575	SE	General shot of Trench 12
576	E	General shot of Trench 13
577	SE	General shot of Trench 14
578	NE	General shot of Trench 15
579	SE	N facing section of furrow [003] Trench 15
580	N	S facing section of furrow [001] Trench 13
581	E	General shot of Trench 16
582	SW	General shot of Trench 17
583	SE	General shot of Trench 18
584	N	General shot of Trench 19
585	E	General shot of Trench 20
586	S	General shot of Trench 21
587	E	General shot of Trench 22
588	SW	General shot of Trench 23
589	NNW	General shot of Trench 24
590	SW	General shot of Trench 25
591	NW	General shot of Trench 26
592	SW	General shot of Trench 27
593	NE	General shot of Trench 28
594	SE	General shot of Trench 29
595	-	General shot of Trench 30
596	W	General shot of Trench 31
597	NW	General shot of Trench 32
598	NW	General shot of Trench 33
599	W	General shot of Trench 34